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92d CONGRESS, SECOND SESSION

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DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1973

HEARINGS

BEFORE A

SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS UNITED STATES SENATE

NINETY-SECOND CONGRESS

SECOND SESSION

ON

H.R. ———

AN ACT MAKING APPROPRIATIONS FOR THE DEPARTMENT OF DEFENSE FOR THE FISCAL YEAR ENDING JUNE 30, 1973, AND FOR OTHER PURPOSES

Printed for the use of the Committee on Appropriations

PART 2

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[1] Deceased, July 27, 1972.
[2] Appointed, Aug. 10, 1972.

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1973

TUESDAY, MARCH 7, 1972

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 10 a.m., in room S–126, the Capitol, Hon. Allen J. Ellender (chairman) presiding.

Present: Senators Ellender, Pastore, Young, and Allott.

DEPARTMENT OF DEFENSE

DEPARTMENT OF THE ARMY

STATEMENTS OF:

HON. ROBERT F. FROEHLKE, SECRETARY OF THE ARMY
GEN. WILLIAM C. WESTMORELAND, CHIEF OF STAFF, U.S. ARMY
LT. GEN. WALTER P. LEBER, SAFEGUARD SYSTEM MANAGER, OFFICE, CHIEF OF STAFF OF THE ARMY
MAJ. GEN. JOHN A. KJELLSTROM, DIRECTOR OF ARMY BUDGET, OFFICE, COMPTROLLER OF THE ARMY

ACCOMPANIED BY:

MAJ. GEN. BERNARD W. ROGERS, CHIEF, LEGISLATIVE LIAISON, OFFICE, SECRETARY OF THE ARMY
COL. RICHARD L. LIVERMORE, OFFICE, SECRETARY OF THE ARMY
COL. ROBERT W. SENNEWALD, OFFICE, CHIEF OF STAFF OF THE ARMY
LT. COL. GARY C. MAHAN, OFFICE, CHIEF OF STAFF OF THE ARMY
LT. COL. JOHN E. BLOOMFIELD, OFFICE, DIRECTOR OF ARMY BUDGET
ARTHUR NEWELL, OFFICE, DIRECTOR OF ARMY BUDGET

BUDGET REQUEST

Chairman ELLENDER. The subcommittee will come to order.

Today we shall begin hearings on the budget of the Department of the Army, for which the fiscal year 1973 request is $21,615,313,000 as compared with the fiscal year 1972 appropriation of $21,174,508,000.

(Clerk's note.—The total Air Force budget requests were increased to $21,643,313,000 by the President's budget amendment of March 29,

1972 (H. Doc. 92–272). Based on final action on the fiscal 1972 supplemental requests, the fiscal 1972 appropriations total $20,941,289,000.)

COMPONENT ALLOCATIONS

Chairman ELLENDER. The fiscal year 1973 request for the Department of the Army is comprised of the following:

Military personnel	$7,703,063,000
Reserve personnel	529,534,000
National Guard personnel	616,250,000
Operation and maintenance	6,903,714,000
Operation and maintenance, National Guard	468,510,000
National Board for the Promotion of Rifle Practice	126,000
Aircraft procurement	134,500,000
Missile procurement	1,153,400,000
Procurement of weapons and tracked combat vehicles	259,500,000
Procurement of ammunition	1,129,200,000
Other procurement	648,800,000
Research, development, test, and evaluation	[1] 2,096,716,000

[1] Includes $28 million in the Mar. 29, 1972, budget amendment (H. Doc. 92–272).

INTRODUCTION OF ASSOCIATES

The principal witnesses will be the Secretary of the Army, Hon. Robert F. Froehlke, and Gen. William Westmoreland, Chief of Staff of the Army.

I believe that you would wish to begin, Mr. Secretary.

Secretary FROEHLKE. Thank you, Mr. Chairman and Senator Young.

I would like to introduce those individuals with General Westmoreland and me.

On my right is Lieutenant General Leber, who is the Safeguard System Manager.

On General Westmoreland's left is Major General Kjellstrom, who is Director of the Army Budget.

In the rear row is Maj. Gen. Bernard Rogers, who is our Chief of Legislative Liaison.

Behind John Kjellstrom we have Col. Robert Sennewald and Lt. Col. Gary Mahan, with General Westmoreland and Lt. Col. John Bloomfield with General Kjellstrom.

Behind me is Colonel Livermore, who will, hopefully, supply me with all of the right answers.

PRESENTATION FORMAT

I am pleased to have the privilege of appearing before this committee.

We will tell you about today's Army and where we intend to go with tomorrow's Army.

The Chief of Staff's prepared statement will highlight our forces—their role in the national security strategy of realistic deterrence, their readiness, their modernization, and the manpower which makes them up.

I will concentrate on our 1973 budget with emphasis on the funding requested for those programs necessary to insure a high-quality force as we move to a smaller Army in a zero-draft environment. We consider this request to be a soldier-oriented budget.

ARMY MISSION AND PERSONNEL

I am proud to be the Secretary of the Army because of the Army's mission and its people.

The Army's mission is vital to world peace. The people in the Army are dedicated to that mission. Because the Army is made up of mortals, mistakes have been made. Fortunately, the Army has done the extremely difficult job of identifying these mistakes and attempting to clean its own house.

I think historians will some day say that about this time the Army "turned the corner" with respect to the problems and turbulence induced largely by a war.

Whenever my tenure ceases, I hope it can be said that our men and women are wearing the Army green even more proudly. It is only with proud soldiers—proud of themselves and knowing that America shares their pride—that the Army will be able to face up to the future.

U.S. SECURITY ROLE OF ARMY

I have only one primary objective as Secretary of the Army. That is to manage the Army in a way that will allow it to fulfill its responsibilities in the security of the United States.

The Army plays a major role in Secretary Laird's national security strategy of realistic deterrence. This strategy is designed to prevent conflict at all levels by building a structure of peace based on strength, partnership and meaningful negotiations.

We cannot have a strong United States without a strong Army. And when I use the word "Army," I mean the one Army made up of the Active Army and the Reserve components, both of which are critical elements of our total force planning for the Army.

MILITARY PERSONNEL

The backbone of this strong Army is its people and, as Secretary of the Army, I am devoting most of my time to those people.

My interest in people is dictated by a pragmatic concern. It is only through working with people that we can solve problems and accomplish our goals.

The career members of the Active Army have had a difficult time for the past 6 or 7 years. There were repetitive assignments to short tour and war areas with the attendant family separations. The requirements of the war kept the Army from providing the minimum standard of living that our soldiers and their dependents deserved. Considering this depressed level of support of our people, you see that we face a formidable challenge.

CONSTRUCTION OF HOUSES DURING VIETNAM WAR PERIOD

Senator YOUNG. Has the Army built new housing during the Vietnam war?

Secretary FROEHLKE. Yes, we have, Senator Young. We have not built a sufficient number because, of course, during the war we gave the war No. 1 priority. We did build some, but not enough.

Senator YOUNG. Has new housing been built in Germany?

Secretary FROEHLKE. In Germany, a minimum, I believe.

General WESTMORELAND. Very few new and some rehabilitated, but not enough.

Secretary FROEHLKE. Of course, the Southeast Asia conflict was a No. 1 priority ahead of both family housing and barracks. That is why we found ourselves in the deplorable condition, which we are presently correcting.

PUBLICITY RESPECTING HOUSING IN GERMANY

Senator YOUNG. There was considerable bad publicity concerning the housing in Germany. Has that situation been corrected?

Secretary FROEHLKE. No, it has not been corrected and the publicity is correct. The housing is bad. We were aware of it. Unfortunately, we did not have the wherewithal to correct it, and it is one of those things you don't correct in a few months.

We presently have a program. As you will recall, last fall the Federal Republic of Germany gave us 600 million deutsche marks, which is about $186 million, for renovation of the enlisted barracks and $176 million of that went to the Army.

So, presently we do have programs which will, when completed, provide satisfactory barracks for our men.

PAYMENT OF E–4 AND UNDER PERSONNEL OF EXORBITANT RENTALS FOR HOUSING OF FAMILIES

There is another very troublesome area—and I don't think we can solve this—and that is that the German economy is going full blast. As a result, there is a housing shortage in Germany. We have a number of E–4's and under who have brought their wives and families to Germany and they do not live on the posts. They are living within the German economy and are paying, where they can find housing, exorbitant rates. There really is no answer to that problem.

That problem won't be solved by this budget.

Senator YOUNG. Doesn't Germany have an inflation problem?

Secretary FROEHLKE. Yes.

Senator YOUNG. Is the situation of Germany the same in all areas, or do some have worse housing than others?

Secretary FROEHLKE. Some have worse housing, but I think it is correct to say that no large unit has a good setup. Some are deplorable. All are not deplorable.

Senator YOUNG. Thank you.

FAMILY HOUSING PROGRAM

Secretary FROEHLKE. As far as family housing in Europe is concerned, we have not in the past few years increased the number of homes. In this budget, we primarily are concentrating on the Kasernes, the barracks for the enlisted men.

RECRUITMENT AND RETENTION

The challenge is to get and keep the numbers of high quality personnel required for an increasingly technical Army. Some of our initiatives to meet this challenge cost almost nothing: Stabilization of tours, elimination of unnecessary formations, adventure training, and expanded enlistment options are some of these.

These initiatives have been well received by our soldiers, and the expanded options improved our enlistments. However, the challenge cannot be resolved with no-cost initiatives alone and in this year's budget soldier-oriented programs which have been deferred or underfunded in the past have moved to our top priority.

To respond to the challenge, we must make an Army career personally and professionally rewarding. To reach these goals, we must remove irritants which are obstacles to enlistment and reenlistment. The social and industrial psychologists refer to this requirement as "hygienic."

SAFE AND REASONABLY PLEASANT HOUSING

For example, our men must have safe and reasonably pleasant housing.

Parenthetically, surveys show that the Army is perceived as having the poorest living conditions for single servicemen; and this, of course, is a major deterrent to enlistment. Our men and women must also receive pay that is competitive with the civilian economy.

Senator YOUNG. I didn't ask a while ago about the housing situation of the Army within the continental United States. Is that lagging, too?

Secretary FROEHLKE. That, I would not call ideal, but it has certainly substantially improved over Europe. We have a number of new barracks construction projects and renovation of existing barracks in this year's budget.

But the situation in the continental United States is not anywhere near comparable to Europe. We are reasonably satisfied.

Would you like to amplify any of that, General Westmoreland?

General WESTMORELAND. Senator, approximately 50 percent of our men stationed in the continental United States are living in World War II barracks. These barracks, when constructed, were designed for 5 years of occupancy. They have now been occupied over 30 years.

There is a serious need for construction funds to provide more adequate living conditions for our troops. The newer barracks are quite satisfactory.

HOUSING INCREASE REQUISITE IN UNITED STATES RESULTING FROM WITHDRAWAL OF FORCES FROM VIETNAM

Senator YOUNG. When you complete the present demobilization program, will we have about the same number of personnel stationed in the United States as we had prior to the Vietnam war?

General WESTMORELAND. We will have more because of withdrawals and the importance of having strategic Reserve forces here in the United States in a state of readiness.

Senator YOUNG. You will have a need for more housing?

General WESTMORELAND. Yes, sir.

Secretary FROEHLKE. The need for housing is going to be ever with us because, even though we have a stable force, as the barracks and homes get older, they must be replaced. So, we are never going to catch up, and that is a fact of life.

Senator YOUNG. I think all of the services have the problem of insufficient base housing. More often than not, the cities near the bases overcharge the servicemen for rent.

General WESTMORELAND. Frequently, this has been the case.

Secretary FROEHLKE. These factors are a must to keep the soldier psychologically happy, the so-called hygienic factors, but they are not enough—they do not motivate.

JOB SATISFACTION

Concurrently with increasing the attractiveness of Army life, we must provide job satisfaction. Job satisfaction comes when units are well manned and equipped, when equipment is properly maintained, and when the people and the units have the time and money to train.

Job satisfaction also comes when soldiers are permitted to perform their primary duties without diversion to nonmilitary chores or menial tasks.

American youth has rated the Army the lowest in potential for job satisfaction and the least likely to provide interesting and challenging work—another deterrent to enlistment.

PERSONNEL TURBULENCE

I might parenthetically state that in this area of job satisfaction, the one greatest deterrent the Army has encountered is the personnel turbulence. It has been impossible to satisfy our young soldiers the way General Westmoreland and I would like to satisfy them with the extremely turbulent personnel situation with which we have been faced. This, in my opinion, is our No. 1 problem.

Senator YOUNG. When do you think that turbulent situation will be generally resolved. Is this caused by the sharp decrease in forces?

Secretary FROEHLKE. Exactly. This is caused by the sharp decrease in forces and by Southeast Asia and, to some extent, Korea, where you have a number of young men and officers going for only 1 year. So, it is the cutback in forces and the short-tour assignments that have caused this turbulence.

If the Congress is willing, General Westmoreland and I believe that by early fall the turbulence will be settled down. That is why we make the plea to the Congress that in fiscal year 1973, the Army be allowed to settle down. More than anything else we must stop this turbulence. If we continue to cut the size of the Army, and if we add, for instance, other short-tour areas, turbulence will increase.

We believe we have turbulence under control. We are aiming for early fall or late summer. If nothing further happens, we think fiscal year 1973 will be an outstanding year for the Army.

Senator YOUNG. How long is a tour of duty in South Korea?

General WESTMORELAND. Thirteen months.

Senator YOUNG. As against 12 in Vietnam?

General WESTMORELAND. In Southeast Asia, it is 12 months.

Senator YOUNG. Has it always been 13 in Korea?

General WESTMORELAND. It has, sir.

Secretary FROEHLKE. The observations of our young people are, for the most part, accurate. With the fiscal year 1973 budget we have taken steps to reduce irritants and to enhance job satisfaction. This budget emphasizes improved living conditions and services, and reduced diversions to nonmilitary tasks.

Finally, this budget emphasizes the need to modernize our military personnel procurement system.

One thing I have observed about people is that they cannot work up to their full potential unless they are respected and appreciated by their peers. That is the reason one of my major goals is to raise the respect and appreciation of our citizens for the Army.

Or, to put it another way, the Army's image and credibility must be improved as it shifts from war to peace, from a largely conscripted to a volunteer force, and from a rapidly expanded Army to a smaller, highly professional Army.

Senator YOUNG. Your on-campus problems are not as great today as they were a couple of years ago, are they?

Secretary FROEHLKE. Much less. I think it would be naive to say we have enthusiasm for the Army on the campus. We do not have that. But, certainly, there is not this manifest anger toward the Army.

Senator YOUNG. They opposed having a soldier in uniform on the campus of many schools?

Secretary FROEHLKE. That is correct, and, at this stage, I am sorry to say it is still not the most popular garb on a campus. We have a long way to go, but the trend is definitely in the right direction.

Do you have anything to add? You have been on campuses recently.

General WESTMORELAND. Certainly what the Secretary said, Senator Young, is supported fully by the facts. We have had very few incidents on the campuses during the last 12 months. This is in contrast to what we had in calendar year 1970.

Senator YOUNG. Probably some of those who were making trouble on the campuses are among those 50,000 or more that are in foreign countries now and want to return.

Secretary FROEHLKE. I also think it is a good indication, Senator Young, of the inherent sense of justice that most Americans have and the fact that eventually commonsense takes over.

I think the young Americans were misled by a relative few. It took instances like the bombings at the University of Wisconsin to show the great majority of young students where the very few leaders were leading them. I think they have begun to come to their senses.

There is an awareness that this country needs an Army. If they sit back and constantly harp at and criticize the Army, they are going to have an Army on which they cannot rely and an Army of which they cannot be proud.

Senator YOUNG. I think you are right. The sentiment has changed for the better.

General WESTMORELAND. I might add, if I may, Senator Young, I think that the activity focused toward the ROTC included a certain emotion, not only against the Army, but against the war and against the establishment. The ROTC, in effect, became a lightning rod that became symbolic of many things: Symbolic of the military, symbolic of the war, and symbolic of the establishment. It was a ready-made lightning rod for these emotional youngsters to strike at and vent their frustrations. The activity was not exclusively against the Army or the military. It was a convenient lightning rod.

BUDGET REQUEST

Secretary FROEHLKE. The Army budget for fiscal year 1973 requests $22.7 billion in total obligational authority.

(Table 1 follows:)

TABLE 1. *Fiscal Year 1973 Army Budget*[1]

	Millions
Military personnel	$8,849
Operation and maintenance	7,373
Procurement	3,325
Research, development, testing, and evaluation	2,069
Military construction	1,097
Total obligational authority	22,713

[1] Includes the Jan. 1, 1972, pay increase and the following amounts for the Reserve components:

Military personnel	$1,146
Operations and maintenance	678
Military construction	78

ALLOCATIONS TO MAJOR CATEGORIES: RESERVE COMPONENTS

Secretary FROEHLKE. The above table summarizes the new budget request by major category. As the footnote indicates, $1.9 billion is included for the Reserve components.

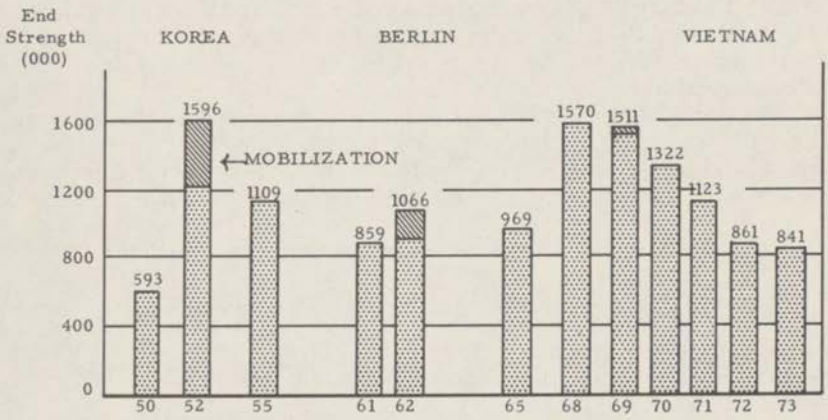
1971, 1972 AND 1973 END STRENGTHS

The fiscal year 1973 budget continues to reflect the declining strength of the Army. The total active Army strength at the end of fiscal year 1973 will be 841,000, which is 20,000 below the end strength of fiscal year 1972 and 282,000 less than at the end of fiscal year 1971.

That decrease is displayed in table 2.

(Table 2 follows:)

TABLE 2
THE ARMY'S CHANGING SIZE



	STRENGTH (000)		REDUCTION: ANNUAL/CUMULATIVE			
		Direct Hire			Direct Hire	
	Military	Civilian	Military		Civilian	
FY 69 1/	1511	455	59- 4%	59- 4%	0- 0%	0- 0%
70 1/	1322	411	189-13%	248-16%	44-10%	44-10%
71 1/	1123	388	199-15%	447-28%	23- 6%	67-15%
72 2/	861	368	262-23%	709-45%	20- 5%	87-19%
73 2/	841	367	20- 2%	729-46%	1- 0%	88-19%

1/ Actual Strengths
2/ Projected Strengths - FY 73 Presidential Budget

SERVICE TERMINATIONS AND EARLY RELEASE ARRANGEMENTS

Secretary FROEHLKE. To meet this strength decrease and to continue to bring in replacements for the lower ranks requires that about 480,000 military personnel, including officers, leave the Army rolls during fiscal year 1972. A significant number of these will depart before their normal term of service is up under a variety of early release arrangements.

The result of this significant personnel turnover has created a high level of personnel turbulence, skill mismatches, disrupted training plans, and some reduced unit readiness. We are resolving these problems which are very real and affect our current capabilities.

CIVILIAN PERSONNEL REDUCTION

In addition to accommodating reductions in military strength, the fiscal year 1973 budget provides reductions in the number of civilians employed by the Army. By the end of fiscal year 1973, we will have reduced our direct hire civilian force to 367,000, which is 21,000 less than at end of fiscal year 1971.

Senator YOUNG. How much of this reduction will be accomplished by attrition?

Secretary FROEHLKE. We are hopeful it will, in its entirety, be accomplished by attrition. We think that is the case.

As you know, in the past we did have to go through the RIF process, but this we believe can be accomplished almost exclusively by attrition.

SOUTHEAST ASIA AND NATO COMMITMENTS

The budget not only provides adequate support for Southeast Asia commitments, including the Vietnamization program, but also emphasizes increased readiness of United States Army units deployed in Europe and the CONUS-based NATO reinforcing units.

TEST OF APPLICABILITY OF AIR MOBILITY CONCEPTS

The budget also supports testing the applicability of air mobility concepts—developed in Vietnam—for possible application in mid- and high-intensity war environments. The Chief of Staff's statement will discuss this testing.

MODERN VOLUNTEER ARMY

Last year at this time, you were told of the initial Army efforts to achieve the President's objectives of an all-volunteer force. Those efforts consisted of field experiments to determine the effect on enlistments and reenlistments of new measures and policies.

Our recruiting efforts, to include substantial increases in advertising, were also expanded.

Before discussing the volunteer Army program further, let me make two important points:

DESIRABILITY AND ATTAINABILITY

Whether a volunteer Army is desirable and attainable is open for debate. I answer both questions in the affirmative but recognize there

is room for an honest disagreement. I believe there is not room for disagreement on the program we have developed to achieve a volunteer Army. This program is a must whether or not the draft disappears.

Quality and Quantity

To achieve a volunteer Army, we need quality and quantity. At times these objectives tend to conflict.

I want to make it very clear, as I have to the Army staff and to Army recruiters, that the highest priority must be given to quality. If we fail, it will be because of insufficient men of quality. We will not end up with an Army of misfits and hoodlums. I hope that the days of the judge saying "jail or the Army" are over.

Senator Young. Approximately how many volunteers will the Army require?

Secretary Froehlke. We estimate we will need approximately 20,000 a month. Of those, approximately 5,000 will have to be in the combat arms. Traditionally, it has been hardest to attract the young man to the combat arms: infantry, armor, artillery.

Senator Young. You say, "I hope that the days of the judge saying 'jail or the Army' are over."

The Army has done a good job in straightening out some bad young characters. The judge and everyone else thought the Army was a good place to send them although it has presented a problem for the Army.

Secretary Froehlke. We are not saying we should not take any young man who has made a mistake, but what we do not want is the "hoodlum," and there is a difference between a young man who has made a mistake and the hoodlum. We do have an obligation to society, and, we are very happy to assume the obligation of taking the immature young man, giving him responsibility and straightening him out. But, we insist we should not be asked to take the hoodlum who is going to be a hoodlum wherever he is. That is the man we want to keep out of the service.

Senator Young. I am always impressed by the graduates at the academies. They are outstanding young men in every respect. The academies do a lot for them.

Utilization of 1972 Program Funding

Secretary Froehlke. Our efforts to reduce the Army's reliance on the draft have expanded considerably in fiscal year 1972, supported in large measure by approximately $200 million in "add-on" funds earmarked in the Project Volunteer proposal presented by the Department of Defense.

These moneys are devoted to three broad areas mentioned earlier: improvement of Army life, improvement of job satisfaction, and modernization of our personnel procurement system.

Efforts to improve Army life are designed to turn the way military people live from a source of dissatisfaction to a source of pride. Bachelor and family housing construction and maintenance, long deferred in many locations, are getting priority attention.

The whole range of post and community services is being improved by such measures as establishment of one-stop in-and-out processing

centers, more attractive dining facilities attuned more closely to the youth of today, longer operating hours for commissaries and quartermaster sales stores and fully supported Army Community Service Centers.

Actions to improve job satisfaction are directed toward improving professional competence and building among soldiers of all ranks a sense of purpose and achievement in doing an important job well.

Actions to modernize our personnel procurement system include opening more than 500 new recruiting stations, improving existing recruiting facilities, increasing the number of recruiters from about 3,500 to over 6,000, creating new enlistment options, and expanding our advertising program to increase the awareness among young Americans of the opportunities available in the Army.

1970, 1971 and 1972 Enlistments

Thus far the results have been encouraging. During calendar year 1971, enlistments were 9 percent greater than in 1970, and combat arms volunteers grew 760 percent.

Introduction of stricter entrance standards in October 1971 caused a short-term reduction in the number of qualified volunteers, along with a substantial improvement in quality.

Senator Young. Would you explain further this 760 percent increase? That is a huge increase.

Secretary Froehlke. That is a huge and very encouraging increase. As you will recall, earlier I said we need 5,000 combat arms volunteers a month. When we had the draft, we got almost exclusively all of our combat forces from the draft. Therefore, I think we will admit we relaxed a little bit on getting people to volunteer for the combat arms.

Now, as we look forward to a volunteer Army, we recognize that perhaps our greatest challenge is to get people to volunteer for the combat arms. We can't rely on the draft. Therefore, we have been using a number of enlistment options. For instance, if you come to the combat arms, you can select your unit and you can select a certain area of the world in which you want to serve.

Therefore, this 760 percent does appear to be very large. It is a large percentage. One of the reasons it is so large is that we recruited practically none in 1970 and a substantial number in 1971.

In 1971, we averaged, I would guess, between 2,000 and 3,000 a month. Some months it went up as high as 3,500 in the combat arms.

However, we still have a substantial distance to go to hit the 5,000 monthly average that we need.

But, you are right. It is a tremendous increase. To that extent, it is encouraging, but the challenge which remains in front of us is that it is still not enough.

Chairman Ellender. What does that 760 percent amount to in the number of personnel?

Secretary Froehlke. Approximately 25,000 enlisted in 1971 for the combat arms.

Enlistment Inducements

In December of 1971, there were approximately the same number of enlistments in the combat arms as in all of 1970.

Chairman Ellender. Do you have any inducements to make this more popular now than it was previously?

Secretary Froehlke. I will mention two, and maybe you have more, General Westmoreland.

One inducement is that we allow them to sign up for a unit. For instance, we have a brigade at Fort Benning, Ga. We allow people in that area to enlist and we guarantee them that for a specified period of time they will serve in that unit. This is attractive to young men.

Also, we tell them they may enlist and pick a section of the world in which they want to serve, Europe being the most attractive. If they go into the combat arms, they can do that.

Combat Arms Bonus

Chairman Ellender. You do have monetary inducements.

Secretary Froehlke. The Congress has authorized the use of combat arms bonus money for enlistments, which, as of now, we have not utilized.

Chairman Ellender. You have not used it?

Secretary Froehlke. No.

Chairman Ellender. Why haven't you used the combat-arms enlistment bonus?

Secretary Froehlke. We have not for this reason. We want to first determine what effects the substantial pay increases of November 14 and January 1 of last year have on our enlistments. Once we determine that, we will take another look at the use of the combat arms bonus.

Chairman Ellender. What is the highest amount you can offer in order to induce an individual to enter the service?

Secretary Froehlke. I believe it is $3,000 for a 3-year enlistment.

General Westmoreland. $1,000 a year.

Secretary Froehlke. Paid over a 3-year period.

General Westmoreland. Provided he meets the skill qualifications. I can provide those figures for calendar year 1970, Mr. Chairman. We had 3,000 volunteers into the combat arms. In calendar year 1971, we had 25,000. That is 3,000 versus 25,000.

Other Inducements

The Secretary mentioned several reasons. I would add a couple as he suggested I do. We advertise the combat arms. We have told the recruiters to put emphasis on recruiting men for the combat arms.

As the Secretary pointed out, we have the unit-of-choice program where a unit such as the 197th Brigade at Fort Benning goes throughout Georgia, South Carolina, and Alabama encouraging young men to join the 197th Brigade stationed at Fort Benning, with assurance that they will serve at Fort Benning at least 16 months of a 3-year enlistment.

Chairman Ellender. They first take basic training, do they not?

General Westmoreland. They go to basic training and, as soon as they finish their basic training, they come back to the 197th at Fort Benning for their advanced individual training.

School Programs

Chairman Ellender. What areas of the Army are most popular?

General Westmoreland. Most of our recruits come in under a program associated with attending a school where they are given the opportunity to learn a skill. We will enlist them with the commitment that we will allow them to attend a school: communications school, cook school, computer school—we have a variety of school programs.

Chairman Ellender. Within their capabilities, they are entitled to select a specialty?

General Westmoreland. We give them aptitude tests. If they pass those aptitude tests, we will allow them to enlist for a specific program and we make a commitment to put them into that program as long as they maintain their proficiency.

Secretary Froehlke. By yearend, the monthly rate had climbed again, ending almost 1,700 percent above the December 1970 figure. More than 3,000 men enlisted for the combat arms in December 1971—a number nearly equal to the total combat arms enlistments for all of 1970.

Results from our first comprehensive attitudinal studies clearly indicate that moneys spent on modern Volunteer Army innovations at selected posts have favorably influenced soldiers' reenlistment intentions.

1973 Program

All of these are tentative results, of course, and a great deal remains to be done. The Army's program for fiscal year 1973 has been built around pay increases that went into effect last November.

The pay measures already adopted, as well as those proposed by the administration, will essentially rectify past pay inequities of first-term enlisted men and young officers.

Pay incentives alone, however, will not meet the July 1, 1973, goal of the zero draft Army. We believed that the requirement for other incentives was so great that we did not expect the funds earmarked for Project Volunteer would be adequate.

Therefore, we deferred some other items in order to place additional emphasis on key soldier-oriented programs to support the modern volunteer Army effort.

We emphasize five areas in fiscal year 1973 that will reduce the main sources of frustration among our soldiers and will improve the chance that young Americans will join the Army team. These areas are:

Freeing soldiers to concentrate on their military duties through hiring civilians to perform administrative support tasks such as kitchen police. On the average, four civilians added to the payroll return five soldiers to their units.

Creating privacy in and accelerating the repair and modernization of inadequate barracks.

Construction of new barracks and family housing units.

Leasing houses in locations where sufficient family quarters are not available.

Increasing and improving recruiting efforts.

FUNDING OF SOLDIER-ORIENTED PROGRAMS

Table 3 displays the funding for our soldier-oriented programs. (Table 3 follows:)

TABLE 3.—FUNDING FOR SOLDIER ORIENTED PROGRAMS

[In millions of dollars]

Program	Fiscal year— 1971	1972	1973	Project volunteer included in fiscal year 1973
Strengthen professionalism	6.3	32.5	138.6	16.4
Increase training time	(6.3)	(31.2)	(134.1)	(16.4)
Enhance education	(0)	(1.3)	(4.5)	
Improve Army life	1,190.7	1,503.9	1,946.6	30.3
Soldier living conditions	(289.3)	(364.6)	(540.6)	(1.7)
Services to soldiers	(576.2)	(748.5)	(889.5)	(26.5)
Services to dependents	(325.2)	(390.8)	(516.5)	(2.1)
Modernize accession system	110.8	164.3	208.3	72.7
Military pay raise and enlistment bonus (Nov. 14, 1971)	0	702.4	1,014.0	55.0
Total obligational authority	1,307.8	2,403.1	3,307.5	174.4

MILITARY PERSONNEL (MPA, RPA, NGPA)

Secretary FROEHLKE. To properly pay and feed the soldier and to move him and his family costs a great deal. This year Active and Reserve military pay will be 39 percent of the Army budget.

That has been the average pay cost for the last 21 budget years but is lower than the 42 to 50 percent range during the years 1955 to 1959.

TOTAL PAY COST PERCENTAGE OF BUDGET

Adding costs from other appropriations, we find that military and civilian pay total 58 percent of the budget. When the Army's share of retirement is added, the total Army pay cost is 62 percent of the budget.

Chairman ELLENDER. Your reference to 62 percent of the budget includes what beside the pay of military personnel?

Secretary FROEHLKE. It also includes the allowances paid the military personnel, such as clothing, quarters, transportation, subsistence, and the like. Also in the 62 percent are certain operation and maintenance items, such as the pay of civilian personnel, CHAMPUS, which is the medical care of military personnel. The Army's share of retired pay is also figured in the total of 62 percent.

Chairman ELLENDER. Would it include training and field exercises?

Secretary FROEHLKE. No, Mr. Chairman.

Chairman ELLENDER. And it takes 62 percent of the budget?

COMPARISON WITH RUSSIA

Secretary FROEHLKE. That is correct.

As you can see, Mr. Chairman, that is a substantial amount, and it is particularly substantial when you compare it, for instance, to the Soviet Union, for which the figures, I believe, are around 30 to 35 percent. That is quite a differential. What it boils down to is the standard of living.

COMPARISON WITH OTHER SERVICES

Chairman ELLENDER. How does that 62 percent compare with the figures for the other services?

Secretary FROEHLKE. We are higher. From a percentage standpoint, we do not have as expensive equipment as ships and airplanes, but we have more men. So, I do not know, specifically, what their percentage is, but I would assume that we are higher.

General WESTMORELAND. I would assume so, but not by a major margin.

Secretary FROEHLKE. It is because we have more men and they have more expensive pieces of machinery.

Chairman ELLENDER. The costs of such equipment and machinery would not be included as a benefit to the soldier.

Secretary FROEHLKE. No. We take the benefit to the soldier and compare it to the total budget, and the procurement of the expensive equipment makes up a part of the total budget to which you are comparing it.

Chairman ELLENDER. In other words, the fact that the Army doesn't spend as much for equipment makes the percentage higher for pay and allowances.

Secretary FROEHLKE. That would be my assumption, Mr. Chairman.

General WESTMORELAND. As a percentage of the total budget.

PAYMENT OF SALARIES COMPARABLE TO CIVILIAN PAY

Secretary FROEHLKE. Right. I don't cite this 62 percent figure in a defensive way at all. I think we must pay that amount if we want to attract the right kind of young man. It is unrealistic to say that we can get the high-caliber young man and not pay him a competitive salary with the civilians.

Chairman ELLENDER. What you are really doing here is raising salaries to a point where they are comparable to those of individuals in civilian life.

Secretary FROEHLKE. That is exactly correct, Mr. Chairman. We don't want to pay him more. We don't want to use only the dollar sign to attract young people. But we also believe it would be naive to expect the right kind of a young man to come in to the Army and make it a career when the pay is not comparable to civilian pay.

Senator PASTORE. Do you take into account all of the fringe benefits?

Secretary FROEHLKE. We would have to do that.

TOTAL DEFENSE PERSONNEL PAY PERCENTAGE OF BUDGET

Chairman ELLENDER. I am informed, taking all of the services together, that 56 percent of the entire budget goes to manpower-related costs.

Secretary FROEHLKE. And heading toward 60 percent some time in the mid or late 1970's.

Chairman ELLENDER. Yours is evidently higher.

Secretary FROEHLKE. I assume it would be.

General WESTMORELAND. Mr. Chairman, if I might comment, to put this into perspective, I would point out that the Navy and Air Force are organizations with huge, sophisticated machines that are manned by men, but the Army is basically an organization of men supported by machines.

PERSONNEL PERCENTAGE INCREASE SINCE 1964

The increase in the percentage of the budget being applied to personnel is not as great as you might suspect. There has only been a 3 percent increase from fiscal 1964 to fiscal 1973. In fiscal 1964, 59.2 percent of the Army budget was devoted to personnel and associated costs. In fiscal 1973, it is 62.3, or a 3-percent increase.

Chairman ELLENDER. Secretary Laird had some illustrative increases in military pay. As I recall, in fiscal 1964 a private, I think you now refer to them as E–1's, was receiving $78 per month. An E–1 is now receiving $288 per month, and this is likely to increase to $332 per month in January of 1973.

General WESTMORELAND. Yes; there has been a substantial pay increase. In 1964, we had a smaller Army, of course. We had an Army in 1964 generally comparable in size to the one we will have at the end of fiscal 1972.

There was a program at that time to replace as many soldiers with civilians as possible. Additional funds were allocated at that time to try to improve the barracks living conditions. The 3 percent, of course, still represents a substantial amount of money, which, I believe, is going to reap dividends in improving morale and service attractiveness. It will help make Army life more appealing to young men in the country.

SERVICE RECRUITMENT ATTRACTIONS: REWARDS ON SALESMANSHIP

Senator PASTORE. As to this matter of recruitment, either in the Army or Navy or Air Force, is it more difficult to recruit in the Army because of the work involved?

Secretary FROEHLKE. I was formerly in the sales profession and I think it is primarily a matter of salesmanship, which includes identifying the market to which you are going.

I believe, if you just say American youth generally, perhaps the Air Force and the Navy would be more attractive because it could be said to be a cleaner kind of a life, an easier kind of life.

However, if we identified the market to which we want to address ourselves, that is, the young man who likes physical challenge, the young man who wants to learn how to live with his fellowmen in a very close, basically physical situation, and just try to sell him, I think, as good salesmen, we can make the sale.

If, however, we just try to go across the board and appeal to everyone, I think your point is well taken. But we are not. We are trying to use a rifle, not a shotgun, and go to the young men who should be appealed to.

Senator PASTORE. The experience in the past is that individuals are not attracted to the Army.

Secretary FROEHLKE. The experience in the past is that we needed the draft and not the enlistments. We had what I call the luxury of the draft. We did not have to worry.

Now that we are looking at July 1973 and turning into salesmen inasmuch as we can be overconfident, I think the statistics are quite encouraging.

Senator PASTORE. I am glad to hear that. I have had instances myself where ROTC graduates in the infantry were seeking transfers. I don't

think you have to go deeply into the books to find out why. I think it is a more arduous life. In many instances, it is not attractive, and, as you pointed out, there is the difference in the weapons you have in the other services.

As far as civilian pursuits are concerned, it may be more attractive in the other direction. You need to develop more attractions in the infantry, as well as in the other branches.

Personnel Percentage Increases Since 1964

Chairman Ellender. General Westmoreland, I may have misunderstood the figures you gave. Did you not indicate that personnel and associated costs, between 1964 and 1973, have only increased about 3 percent of the overall budget for the Army?

General Westmoreland. Yes.

Chairman Ellender. But during the same period the pay of an E–1 has escalated from $78 per month to $332.10.

General Westmoreland. But at the same time, between 1964 and 1973 the cost of a tank has escalated comparably. The costs of construction have been affected by inflation. Inflation has affected every appropriation.

Secretary Froehlke. Maybe I can make the point.

In 1964 the total Army budget was $13 billion. This fiscal year 1973 has almost but not quite doubled that.

Chairman Ellender. I find it most surprising that although pay and associated costs have increased during the period in question so markedly, yet in its relationship to the total Army budget, it has increased only 3 percent.

General Westmoreland. There has been inflation in every area and the cost of everything has risen. It is not only a matter of inflation being associated with pay; it has been associated with hardware, services, construction, and with everything.

Chairman Ellender. I probably would like to refer to this matter on the Senate floor when the bill comes up. I wish you would look into it for me.

General Westmoreland. We can provide an analysis in depth.

(The information follows:)

The following displays a detailed breakdown of the fiscal year 1964 and fiscal 1973 budgets into "Personnel/Personnel Related Costs" and "Non-Personnel Related Costs."

PERCENT OF PAY AND RELATED COSTS TO THE TOTAL BUDGET

	Fiscal year 1964 percent of total (cumulative)	Fiscal year 1973 percent of total (cumulative)
1. Military pay	35	36
2. Military/civilian pay	54	53
3. Military/civilian/other related	59	62

PAY AND RELATED COSTS INCLUDED IN THE ARMY BUDGET

	Fiscal year 1964		Fiscal year 1973	
	Cost (billions)	Percent of total	Cost (billions)	Percent of total
1. Military personnel appropriation	$4.6	35.4	$8.8	35.9
2. Civilian payroll	2.4	18.5	4.3	17.4
Subtotal	7.0	53.9	13.1	53.3
3. Retired pay [1]	.5	3.8	1.6	6.3
Subtotal	7.5	57.7	14.7	59.6
4. Other personnel related costs [2]	.2	1.5	.7	2.7
Subtotal	7.7	59.2	15.4	62.3
5. All other (nonpersonnel related)	5.3	40.8	9.3	37.7
6. Total, Army TOA [3]	13.0	100.0	24.7	100.0

[1] DOD appropriation, however applicable Army portion has been added for this display.
[2] Applicable Army portion of DOD family housing appropriation is included for this display, plus CHAMPUS, plus MVA costs (less MVA pay and construction).
[3] Total exceeds total Army budget TOA of $22,700,000,000 for fiscal year 1973 and $12,200,000,000 for fiscal year 1964, because of the inclusion of the applicable Army portion of DOD appropriations for retired pay and family housing.

Based on the above data it can be noted that the series of military pay increases from 1964 through 1973 does not reflect as a similar increase in the percent of the Army Budget that is Personnel/Personnel Related. A direct result would have occurred if other influencing factors such as size and mix of the Force and non-personnel related costs had remained static. However, for the years 1964 and 1973 total personnel/personnel related costs increased from $7.7 billion to $15.4 while non-personnel costs increased from $5.3 billion to $9.3 billion. The increases were such that only a minor change occurred in their percentage relationship to the budget.

PERSONNEL COSTS RELATED TO TOTAL COSTS

Chairman ELLENDER. I wish you would do that. I believe that it relates directly to the desire on the part of many people to reduce the budget for the Department of Defense. From what you have stated, I would conclude that the cost of all the hardware procured, the cost of all the research and development, and the cost of operating and maintaining the Army, aside from the pay of military and civilian personnel, and the related costs, would total only about 38 percent of the Army budget for fiscal year 1973.

Senator PASTORE. I think the chairman raises an excellent point. I think somehow it ought to be simplified, General Westmoreland, without making an in-depth analysis.

When you realize that the pay of a private in 1964 was only $78 and that this pay has increased to $332, yet the overall costs of salaries and related costs have only increased about 3 percent vis-a-vis the entire budget, then the inflationary aspect of the other costs, including hardware, must be examined. If relatively the same amount of hardware, research and maintenance are budgeted for fiscal year 1973 as was provided for in fiscal year 1964, this would indicate something like a 4-to-1 increase ratio for hardware and the other items, which would imply that the acquisition cost of hardware and the other items necessary to maintain our defense posture has increased astronomically.

I wonder if private industry is not taking advantage of our defense needs. If a factor of 4 to 1 means a percentage increase of three percent on your entire budget, it means that this tremendous cost must be weighted on the side of the equipment costs.

If this is a factor of 4 to 1, it must include large-scale inflation.

Secretary FROEHLKE. I think I must add that we are not talking about only the lower enlisted persons, but also about the officers and everyone. The total has not gone up that 4 to 1.

Chairman ELLENDER. When you represent to us that you need "X" number of men for your needed operations, I don't suppose there is a man in the Senate who would want to cut back that number. The Senate would not want to deprive the soldier of anything that is needed.

That is the reason I wish you would analyze those comparisons and percentages. If 62 percent of the Army budget relates to personnel costs, leaving only 38 percent for everything else, including hardware, then substantial reductions in those areas would be most difficult to make. I would want to include a statement of the facts in this matter when the bill goes to the floor of the Senate.

General WESTMORELAND. The equipment to which you referred is more costly for several reasons.

First of all, it is more sophisticated equipment.

Second, the civilian labor costs involved in the new materiel have risen considerably.

Chairman ELLENDER. I wonder if you would furnish some figures for the record. You mentioned the figure for fiscal 1964.

Could you give us figures indicating the number of civilians and men in the service you then had, including officers, enlisted personnel, and civilians and compare that to the situation in fiscal year 1973?

PERCENTAGE INCREASE SINCE 1965

Secretary FROEHLKE. On page 7 of my statement and on the facing page, there is a roughly comparable figure. We don't have it for 1964, but in 1965 we had 969,000 compared to 861,000 at the end of fiscal year 1972. So, we had a few more. [See p. 9.]

General WESTMORELAND. The year previous, 1964, we had 973,000; 4,000 more than in 1965.

Chairman ELLENDER. That included all the military personnel?

Secretary FROEHLKE. Yes, sir.

Chairman ELLENDER. What about the civilians?

General WESTMORELAND. The direct hire civilian payroll at that time was 338,000. For fiscal year 1973, it is 367,000.

TRANSPORTATION OF PERSONNEL FROM VIETNAM

Senator YOUNG. How are the personnel being brought back from Vietnam? By commercial and military aircraft, and ships?

General WESTMORELAND. A combination of both but mostly air carriers. We move all of our personnel, with rare exceptions, by air.

Senator YOUNG. Commercial carriers?

General WESTMORELAND. Commercial carriers.

DISTRIBUTION OF EQUIPMENT IN SOUTH VIETNAM

Senator YOUNG. What percentage of the equipment of the Army is being brought back, how is it returned, and what percentage is given to the South Vietnamese?

Secretary FROEHLKE. We have what we call our Keystone Project for retrograde of equipment from Southeast Asia. We look at every piece of equipment as a unit is drawn down, clean it up as best we can and determine, first of all, can it be used as it presently exists. If it can be, we tend to give that to the South Vietnamese Government.

Second, we determine if it can be repaired in South Vietnam. If it can, we then turn it over to the South Vietnamese and they use their Saigon arsenal that can do a marvelous job of repair work. They repair it and they get credit for that piece of machinery.

Third, we ask if we can send it to Okinawa or Taiwan where we have the facilities to repair it. If it can be repaired there, we do so and determine if the equipment is needed by the South Vietnamese. If so, we send it back. If not, we send it to the United States, where it is used by our Active Army or, more probably, by our Army Reserves and National Guard units.

Fourth, if a piece of equipment looks like it would cost too much to repair and renovate, we then declare it as excess scrap and sell it for scrap right in South Vietnam.

PERCENTAGE GOING TO INVENTORY

Senator YOUNG. What percent of the equipment is now being brought back? The latest equipment is highly sophisticated; is it not?

Secretary FROEHLKE. Yes; it is the equipment that our Army is using.

General WESTMORELAND. I have the figures right here. We are putting back into our inventory for use 49.8 percent as of the latest accounting; 14.1 percent has been turned over for property disposal.

Secretary FROEHLKE. A good portion of that is expended to scrap.

General WESTMORELAND. Some of that turned over to property disposal we can put into use and some is sold for scrap.

PERCENTAGE GIVEN TO SOUTH VIETNAM

Senator YOUNG. What percent goes to the South Vietnamese? Do you have that figure?

General WESTMORELAND. Some of the 49.8 percent goes to the South Vietnamese. I would have to provide that for the record.

(The information follows:)

RETURN TO UNITED STATES BY SHIPS

The acquisition value of the property turned over by Disposal Activities to the Vietnamese Armed Forces during FY 1971 and the 1st Half of FY 1972 was $16.5 million which represented 9% of all the property disposed of during the 18 month period.

Senator YOUNG. Has all of this equipment been brought back by ship?

General WESTMORELAND. It is all being brought back by ship.

Senator YOUNG. Does the dock strike affect that?

General WESTMORELAND. The striking union has agreed to handle military cargo.

PERCENTAGE GOING TO KOREA

Chairman ELLENDER. I was under the impression that some of this excess materiel went to Korea. Have I been misinformed?

General WESTMORELAND. Some of it will be sent to Korea. I can provide that for the record.

(The information follows:)

Since July 1, 1971, 23,916 short tons of general cargo and 3,151 short tons of class V items have been shipped to Korea from Vietnam. The general cargo figure includes some unserviceable repairables shipped to Korea for depot rebuild. More major items will be programed for Korea from Vietnam under the "Major Items Distribution Instructions IV" (MIDI IV), soon to be published

ECONOMIC AND SCANDAL-FREE WITHDRAWAL

General WESTMORDLAND. I would like to comment, Mr. Chairman, that we have gone to great extremes and exercised considerable initiative and ingenuity in trying to save the taxpayers money as we withdraw out of South Vietnam.

Secretary FROEHLKE. I would also add that both General Westmoreland and I in January and early February were in South Vietnam, and both of us spent a great deal of time looking at our program for this retrograde move, both from the standpoint of saving money and from I think on equally if not a more important standpoint—scandal. In every previous engagement in which the Army has been involved, scandals have arisen as a result of scrap and as a result of getting this materiel back in to proper hands.

We spent many hours of our stay in Vietnam looking at this and satisfying ourselves that this is as scandal-free as it probably can be. Frankly, I still have my fingers crossed. Looking at history, you have to. But I am satisfied that the retrograde movement right now is where it should be.

AGREEMENT WITH KOREA RESPECTING WITHDRAWAL OF U.S. TROOPS

Chairman ELLENDER. As you no doubt recall, when a substantial number of American troops were recalled from Korea, we agreed to furnish the South Koreans with a considerable amount of equipment.

You are going to use some of this excess equipment to fulfill that obligation to South Korea?

General WESTMORELAND. That is correct, Mr. Chairman, and I can provide for the record more detail on that.

(The information appears at top of this page.)

TURNOVER OF EQUIPMENT TO ARMY RESERVE AND NATIONAL GUARD

Secretary FROEHLKE. You are probably aware that in fiscal year 1971 about $723 million of equipment was turned over to the Army Reserve and National Guard.

In fiscal year 1972, it will be a little over $900 million. This is long overdue. We are using a lot of this equipment that is retrograded for the Reserves and National Guard.

Transportation Costs

Chairman Ellender. The committee, I am sure, would want you to consider transportation costs as well as the requirements of the South Vietnamese and the South Koreans.

Value of Usable Equipment

General Westmoreland. The total value of this equipment that we have rehabilitated and put back into service was over $4 billion.

Senator Young. This is modern equipment?

General Westmoreland. It is good equipment. I would say relatively modern but it varies. As an example a 105 howitzer has been in inventory for some time. It is a World War II weapon, but it is still an excellent weapon.

Chairman Ellender. Continue, please.

Operation and Maintenance

Secretary Froehlke. The operation and maintenance (O. & M.) appropriations are significant in two major respects.

First, they essentially determine the standard of living of the Army. They provide for the maintenance and repair of troop housing, an improved Army food program, and they insure the health of our soldiers through the medical program.

I cannot overemphasize the importance of a well-fed, adequately housed, and physically fit Army.

The second major point is that O. & M. contributes significantly to the combat readiness of the forces. O. & M. provides individual, specialized, and professional training and supports unit training for all divisions, brigades, and battalions of the Army.

O. & M. provides overhauled equipment through the depot maintenance program and assists in command and control of the forces through the communications and intelligence program.

Soldier-Oriented Cost Percentage

Chairman Ellender. Could you furnish, percentagewise, operation and maintenance costs associated with the welfare of the soldier? I believe some of those items, like CHAMPUS, were mentioned a little earlier in your testimony.

Secretary Froehlke. The O.&M.A. account is about $6.9 billion. Of that, $1.4 billion goes to what I call the soldier-oriented program—strengthened professionalism, improved Army life, and that sort of thing.

Percentagewise, what is 1.4 to 6.9?

Chairman Ellender. I will be glad to have that for the record.

Secretary Froehlke. I will go home and take out my paper and pencil and supply it for the record.

(The information follows:)

Approximately 20.3 percent of the fiscal year 1973, operation and maintenance Army budget request is for soldier-oriented programs.

MANAGEMENT IMPROVEMENT

Secretary FROEHLKE. Because of the size and complexity of the active Army O. & M. appropriations, the Army has concentrated on improving its management.

We have recently instituted a separate administrative program, which will be monitored by the Deputy Chief of Staff for Logistics, for base operations. This will provide increased visibility for these key functions and increased emphasis for those programs that require it.

In addition, the Army has had under development for the past 2 years O. & M. cost estimating relationships to validate and substantiate our requirements and to achieve proper balance.

These relationships are oriented toward the military man-year because the number of individual soldiers and how they are equipped and deployed are the basic determinants of the level of O. & M. funds required to sustain a given force.

BUDGET REQUEST INCREASE

Our O. & M. request for fiscal year 1973 is $7.4 billion, including $678 million for the Reserve components. This is a net increase of $87 million over the revised fiscal year 1972 budget.

O. & M. has increased by $88 million for the Army National Guard and $42 million for the Army Reserve.

BARRACKS REHABILITATION IN UNITED STATES AND OVERSEAS

As mentioned previously, we have focused on the living conditions of the soldier. Part of this is a barracks rehabilitation program at home and abroad.

GERMAN PAYMENT TOWARD REHABILITATION OF BARRACKS IN GERMANY

I should also note that, under the terms of the December 10, 1971 offset agreement, the Federal Republic of Germany will provide goods and services equal to 600 million Deutsche marks (the Army's share is approximately $176 million) during the remainder of fiscal year 1972 and fiscal year 1973 for rehabilitation of U.S. barracks and troop facilities.

Chairman ELLENDER. You state the Army's share is $176 million. Is this a reference to the Army's portion of the $186 million made available by the Germans, or is it the Army's share of the total cost of this program?

Secretary FROEHLKE. That is the Army's share of the total of $186 million put up by the Germans.

Senator PASTORE. So by "share" you mean the Army's share of the German contribution, and not the Army's share of the cost.

Secretary FROEHLKE. That is correct, Senator Pastore. It is not stated well.

Chairman ELLENDER. Does your request include any funds for this barracks rehabilitation program?

U.S. Cost for Rehabilitation of Barracks in Germany

Secretary Froehlke. As a result of this offset agreement in fiscal year 1973, we have withdrawn our request for approximately $89 million. So, as a result of getting this, we saved, in effect, $89 million and also got much more renovation done than we originally intended.

Chairman Ellender. Will the $176 million contributed by the Germans complete the program?

General Westmoreland. It will take about $60 million to finish the job of rehabilitating these barracks. [Deleted.]

Secretary Froehlke. That is why I said, Mr. Chairman, that it is significant that they made this move now. Maybe they should have in the past, but they didn't.

Chairman Ellender. They should have done it years ago. Had we insisted upon it, they would have done it.

Secretary Froehlke. They have done it now and we hope this will be continued, but there is no agreement to this effect.

Chairman Ellender. You had better stick to your guns to make them do it.

Article "Army in Anguish" in the Washington Post

Senator Pastore. I think you will recall this. Several months ago, a very shocking story appeared in the Washington Post to the effect that our soldiers were being held up by our own soldiers and being stripped of their money. Is there any credence to that story?

Secretary Froehlke. Yes. There was credence to that story. I don't mean to imply this is the general rule, that it occurred frequently. If it occurs once, it is too often. It was Haynes Johnson's and George Wilson's articles on "Army in Anguish." Basically, they have a true account of how it was in the spring of 1971. We could argue on details; basically, the facts as they reported them were true.

Corrective Program

What the article did not bring out was that when the article was printed in the summer of 1971 we already had programs. We were aware of the problem and programs were underway to correct the problem.

For instance, in every unit where you did have this criminal element in the barracks, the commanding officers had ordered that there would be a noncommissioned officer at all times in the barracks.

The commanding officers had ordered that there would be barracks guards at the door at all times to allow in the barracks only men who lived in the barracks. They lighted more areas outside so the streets were safe. Very strong corrective action was taken.

Now, I cannot report to you that it has been eliminated, but I can report to you that there has been substantial improvement as a result of these programs.

Protection Imperative

Senator Pastore. Why should they not be completely eliminated? A mother sends her son to Germany, first of all, very reluctantly, but he goes there to serve his country. The least we can do for him is to make sure one of his comrades doesn't hold him up or abuse him.

I think it is a bad reflection on the whole posture of the Army if we can't give that kind of protection.

Secretary FROEHLKE. I don't want to give a smart-aleck reply, but if you go into a college dormitory today you will be shocked at the amount of thievery that goes on since you and I were in school. I think it is a reflection of our society. I agree with you that we have to stamp it out, but, unfortunately, I think, because we are a cross-section of the society——

Senator PASTORE. But if a boy gets held up in the college, mamma can write to the college and say, "Come home, son." You can't do that in the Army. There is a difference between a college campus and military post.

I think that once the American Government calls upon the patriotism and integrity of a family to give up one of its members to the armed services, the individual should be free of violence from his comrades. I think anyone apprehended for such an offense ought to receive very, very severe punishment.

Secretary FROEHLKE. I agree 100 percent.

I don't want to be in the position of saying it is good. We do have to cut it down, but I think from my standpoint we are not going to eliminate it, because it is not eliminated in our society.

Senator PASTORE. But you must put the fear of God into the people who are guilty if you wish to stop it. If you set the example by punishing those who do it, you will clean it up.

Secretary FROEHLKE. This we are doing, Senator.

Senator PASTORE. I hope we are. I received some letters on this.

Secretary FROEHLKE. Maybe General Westmoreland would like to make a few comments.

ARMY WAR BURDEN AND ATTENDANT LOWERING OF STANDARDS: ENTRY OF CRIMINAL ELEMENT AND MILITANT BLACK AGITATORS

General WESTMORELAND. I would like to elaborate on this, Senator Pastore.

During this 6½ years, when the Army has had the major burden of the war, we have taken in great numbers of men to expand our ranks of 969,000 in 1965 to over a million and a half men. We had to take in a number of men with lower standards.

During this process, a criminal element came into the Army. There were waivers on police records and there were some judges and justices of the peace around this country who dropped criminal charges if a man would join the Army. We did get into our ranks a criminal element.

The problems of race in our society crept into our ranks; and we had quite a problem in Europe in connection with race. There were militant black agitators from the United States who went to Europe to aggravate this problem.

Some of these muggings were associated with racial incidents. There were a number of discharged soldiers who took their discharges in Europe and who were associated with criminal activities of the type you have described.

These instances were not commonplace. On the other hand, they were happening much too often.

Correction Program

Upon learning of this, the chain of command was tightened up. We encouraged them to try to get rid of this criminal element by court-martial if they could get the evidence or otherwise by administrative discharges. Thousands have been given administrative discharges and many have been court-martialed.

We have put, I assure you, tremendous emphasis on this.

I share your concern and so does the Secretary. As a matter of fact, I have sent messages to the field and talked to the commanders and told them they have to get tough with these people. They are doing just that. The situation has vastly improved, I can assure you.

Senator Pastore. I am glad to hear that.

Chairman Ellender. Proceed.

Medical and Community Services

Secretary Froehlke. Medical and community services are extremely important to the soldier and his family. We have included in this request funds for making improvements in these areas.

We want to increase the hours of operations of the post medical facilities and to increase the effort to provide information regarding the benefits of the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS). We want to continue to improve the service in such community facilities as commissaries, laundries, and post exchanges.

Increases in Excess of Savings Resulting Man-Year and Combat Decreases

With total military man-year decreasing by over 100,000 between fiscal year 1972 and fiscal year 1973, one might ask why the O. & M. appropriation is essentially the same for the 2 years.

The answer is that there have been reductions in the programs that are directly related to the size of the Army and the decreased combat activity in Vietnam. The normal reduction of this number of man-years would ordinarily save the Army over $500 million because so many of the man-years came out of Southeast Asia. However, during this same time period there have been unavoidable and necessary increases in O. & M. Three areas can be highlighted which more than exceed the savings because of reduced man-years:

1. The civilian pay raise, currency revaluation and cost growth, which in fiscal year 1973 total $253 million more than in fiscal year 1972.
2. Our soldier-oriented programs require an increase of $307 million over fiscal year 1972.
3. The increased readiness of the Army Reserve will require $42 million more in fiscal year 1973.

Logistics and Procurement

Management Improvement

In July 1971, DOD revised the weapon systems acquisition policies. We are working to achieve the policy objectives by improving our personnel development and management practices.

Last year, the Army started a number of management improvements in the areas of system definition, cost estimating, prototyping, contracting, contractor performance measurement, and test and evaluation. The overall objectives of these improvements are to insure that we acquire weapon systems which meet our technical requirements, within desired delivery schedules, and at reasonable prices.

We are continuing to review, test, and implement additional improvements.

Examples of our accomplishments are:

The Should Cost technique for evaluating sole source cost proposals saved $37.1 million in the evaluation of 10 contractor proposals totaling $342.3 million.

In July 1971, we began a new program for the test and evaluation of materiel. This program will assist in assuring that tests are performed in a thorough and objective manner and that deficiencies are identified before susbtantial funds are committed.

Professional Program Management and Procurement Work Force

Also essential is a strong professional program management and procurement work force. The career development of high potential people is intensively managed. The Army has upgraded 14 positions to general officer level (even while decreasing the overall number of generals) and we have submitted to OSD a draft bill to authorize appointment of an increased number of procurement supergrades.

Chairman Ellender. Can you give us a few examples of what you are talking about here?

Secretary Froehlke. Yes. In the area of general officers in charge of specific projects, we have a general officer in charge of the Sandia Base. We have a general officer, of course, in charge of our Safeguard program. Additionally, we have a number of general officers in charge of specific aspects of our Safeguard program.

In the large, important programs—important from the standpoints of cost, technical development, and Army need—we put a general officer in charge.

The 1971 and 1972 End Strengths and General Officers

Chairman Ellender. I have some figures indicating that in June of 1971, we had a total Army strength of 1,123,000, of which 498 were generals. And on June 30, 1972, a year later, the plan calls for an Army with the strength of 861,228 men, of which 497 will be general officers. Are these figures correct?

Secretary Froehlke. Yes. That figure, at first blush, I don't agree with, because it also struck me as being unrealistic. I am not completely satisfied, but this is how I have rationalized it in my mind.

First of all, I think another date and number which is important to look at is the number of general officers in 1965 before the buildup in Vietnam. I don't have the exact figure, but it is approximately the same number.

There were 475 general officers in 1965. Therefore, the first thing this tells me is that the Army absorbed that huge increase in number of soldiers without a resultant increase in general officers. So, as the Army goes down, I don't think you should expect the Army to go

down in number of general officers, but to go down to where the general officer level was before the buildup.

The second point which impresses me is to see if the Army may have about the right number of generals. You may liken the Army to a corporation. In the corporations with which I have been associated, we have had our increases in good times and decreases in bad times.

It always was pointed out by the field that you had the same number of vice presidents and the same number of presidents and chairmen of the board.

The answer, I believe, Mr. Chairman, is that when you have great increases in corporations or Armies, the increases occur at the lower levels. But whether you have in a corporation 100 employees or 100,000 or 10,000, you need a chairman of the board, you need a president, you need a vice president of sales, you need a vice president of personnel, you need a vice president for manufacturing, and you need management in each of the cities where you have a branch office.

The point being, I believe, you cannot expect the top rank of any organization to contract and expand as the total organization contracts and expands.

Chairman ELLENDER. I cannot understand how you can reduce the overall strength of the Army by over 260,000 during 1 year, and reduce the number of generals by only one—from 498 to 497. In looking at the tabulation on page 25 of the justifications, I note that there will be another reduction of about 20,000 in the strength of the Army during fiscal year 1973, and that the number of generals is reduced by only eight.

Secretary FROEHLKE. I recognize what you are saying, but if you go back to 1965 and see the buildup in the Army from 969,000 to over 1.5 million, you will note that as the Army size built up, the number of generals did not. In other words, the number of generals has stayed here and the Army has gone up and down, and there are approximately the same number of generals at the beginning of the buildup as there were at the peak of the buildup and at the end of the buildup.

Chairman ELLENDER. I have no means of determining if all of these are necessary. But you have often heard it said around Washington that there are too many generals and too many admirals. This seems to fortify that attitude.

General WESTMORELAND. May I comment?

Senator Ellender, as you know, we had 368,000 troops in Vietnam at the peak of the war. The Army expanded from roughly 969,000 to over a million and a half people.

We increased the number of general officers only by 14. At the peak of the Vietnam buildup, we had 72 general officers in Vietnam—72 in Vietnam with only an increase of 14. We were able to do that by manning many of the general officer slots with colonels throughout the rest of the Army. We had to get those spaces somewhere to man our organizations in Vietnam.

As we move into this transition period, we are trying to restore these general officers in the Army of the United States and Europe. Also, we are putting more emphasis, as the Secretary pointed out, on procurement. We have upgraded some of our project managers to general officers.

OTHER OFFICER STRENGTHS

Chairman ELLENDER. I wish you would provide for the record a tabulation of officers by grade for the years 1965, 1971, 1972, and estimates through 1973.

General WESTMORELAND. I will provide that for the record.

(The information follows:)

OFFICERS BY GRADE[1]

	June 30, 1965	June 30, 1971	June 30, 1972[2]	June 30, 1973[2]
General	505	513	497	489
Colonel	5,205	6,008	5,694	[3] 5,779
Lieutenant colonel	12,434	14,607	13,009	12,573
Major	17,193	22,302	19,862	18,549
Captain	30,032	49,310	38,071	38,002
Lieutenant	36,443	37,701	29,114	26,061
Warrant officer	10,308	18,689	16,271	15,683
Total	112,120	148,950	122,518	117,136

[1] Includes reimbursables.
[2] President's budget submission.
[3] Reflects an increase in the number of Medical and Dental Corps officers. Nonmedical colonels decrease from fiscal year 1972 to fiscal year 1973.

MONTHLY BASIC PAY OF COMMISSIONED OFFICERS, 1968–72

Chairman ELLENDER. Would you provide for the record the increases in pay for officers over the past several years.

Secretary FROEHLKE. We will supply that.

(The information follows:)

MONTHLY BASIC PAY OF COMMISSIONED OFFICERS, 1968-72

Rank	July 1, 1968	July 1, 1969	Jan. 1, 1970	Jan. 1, 1971	Nov. 14, 1971	Jan. 1, 1972
Chief of Staff	$2,493.00	$2,807.10	$3,000.00	$3,000.00	$3,000.00	$3,000.00
General	2,259.60	2,544.30	2,750.40	2,967.60	2,967.60	3,000.00
Lieutenant general	1,993.80	2,244.90	2,426.70	2,618.40	2,618.40	2,807.10
Major general	1,797.60	2,024.10	2,188.20	2 361.00	2,361.00	2,531.10
Brigadier general	1,563.00	1,759.80	1,902.30	2,052.60	2,052.60	2,200.50
Colonel	1,373.10	1,546.29	1,671.30	1,803.30	1,803.30	1,993.20
Lieutenant colonel	1,120.20	1,261.20	1,363.50	1,471.20	1,471.20	1,577.40
Major	911.40	1,026.30	1,109.40	1,197.00	1,197.00	1,283.40
Captain	753.30	848.10	916.80	989.10	989.10	1,060.50
1st lieutenant	588.60	662.70	716.40	773.10	773.10	828.90
2d lieutenant	343.20	386.40	417.60	450.60	495.00	530.70

Note: This table reflects basic pay only. It does not include basic allowance for subsistence of $47.88 per month, and basic allowance for quarters, which varies depending upon the pay grade of the member.

EXPENDITURE REDUCTIONS AND MAINTENANCE OF ESSENTIAL MISSIONS

Secretary FROEHLKE. During 1969, we started a series of improvements to reduce expenditures without significantly risking the disruption of our essential missions:

Oversea supply stockage lists have been reduced about 70 percent.

Initial support items for new major equipment and items within CONARC were reduced from 57,896 to zero.

Project Clean redistributed/retrograded/shipped $6.3 billion worth of materiel.

The Selected Item Management System (SIMS) has been expanded from 4,620 to 7,174 items. This provides centralized control over repair parts and secondary items which have annual demands in excess of $50,000.

Increased application of inventory in motion principles minimizes large stocks at immobile combat zone depots. These principles are now being applied in over 20 projects including a direct support system. This concept delivers supplies directly from a depot in the United States to support units, bypassing oversea depots, reducing order ship time by almost one-half.

PROGRAM SAVINGS

Senator YOUNG. How much money was saved by this process?

Secretary FROEHLKE. I wouldn't want to guess. I could supply that for the record. We estimated a substantial amount.

(The information follows:)

Savings accrue over a period of time as stocks in oversea depots are drawn down and as the total pipeline reduces. The Direct Support System has been extended incrementally in Europe with approximately 50% of the units on the system as of 31 March, with the remainder scheduled during the succeeding three to five months. In Korea, Direct Support has been extended to all activities except a Depot Maintenance Account.

With full implementation of the system to these two oversea commands, a one time pipeline savings estimated at approximately $15 million and savings in operating costs approximately $5 to $7 million per year will be realized.

CORRECTIVE MAINTENANCE OF EQUIPMENT

Secretary FROEHLKE. Because of the complexity of new equipment and lessons learned in Vietnam, we are reassessing our concepts in order to reduce piece-part repair, especially in forward areas, and move to performance of corrective maintenance chiefly by component and modular replacement.

To do this, we are emphasizing the use of module design techniques in new equipment and built-in simplified go-no-go, diagnostic/fault isolation capabilities wherever feasible and cost effective.

PROCUREMENT

The Department of Defense Materiel Support Planning Guidance (MSPG) supports the peacetime consumption and the planned strategic employment of our Active and Reserve forces. We consider the budget adequate to comply with that guidance.

There are cases where for good and prudent reasons, such as the availability of a warm production base, we did not budget for our full authorized acquisition objectives.

The economic benefits resulting from what we call the logistics offensive program are tremendous. The Army has been able to reduce its budget requests in this area by $1.7 billion and to satisfy other higher priority requirements that would have required approximately $2.8 billion over the past 3 years.

Of greater importance is the fact that the logistical readiness of the Army has increased markedly during the same time. From June of 1969 to June of 1971, the worldwide logistics readiness rates for equipment on hand increased from 74 to 93 percent.

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PROCUREMENT PROGRAMS

Table 4 is an overview of our procurement programs.
(Table 4 follows:)

TABLE 4.—ARMY PROCUREMENT APPROPRIATIONS

[In millions of dollars]

	Fiscal year—		
	1971	1972	1973
Appropriations:			
Requiring authorization:			
Aircraft procurement, Army	220.0	106.6	134.5
Missile procurement, Army	956.1	1,033.3	1,153.4
(Safeguard)	(648.2)	(639.0)	(753.0)
Procurement of weapons and tracked combat vehicles	286.7	145.5	259.4
Subtotal	1,462.8	1,285.4	1,547.4
Not requiring authorization:			
Ammunition procurement, Army	1,364.7	1,718.3	1,129.2
Other procurement, Army	733.9	498.8	648.8
(Safeguard)	(2.8)	(1.0)	(1.4)
Subtotal	2,098.6	2,217.1	1,778.0
Total, obligational authority	3,561.4	3,502.5	3,325.4

AMMUNITION

Secretary FROEHLKE. This year's ammunition request is the lowest request since 1965. It reflects the phase down of U.S. combat operations and the start of our long-range plan for sustaining an active, viable production base. The latter point will help to avoid immediate and costly initial procurement and storage of large mobilization reserve stocks.

Ammunition consumption from 1965 to 1970 required the mobilization of almost the entire production base. We are now phasing down the base to essentially one active line for each essential item.

Having learned our World War II and Korean lessons, we are not ending Vietnam with huge excesses and a cold production base.

Our $229.7 million ammunition production base support request is the minimum necessary to support current demands while at the same time phasing down some operations. It also continues the modernization program started in fiscal year 1970, to upgrade World War II vintage ammunition facilities.

RESEARCH, DEVELOPMENT, TEST, AND EVALUATION (R.D.T. & E.)

The fiscal year 1973 R.D.T. & E. request of $2.1 billion is based on requirements ranging from experimental efforts in basic research to the development of new systems.

Chairman ELLENDER. How much was it last year?

Secretary FROEHLKE. Last year, I believe it was $1.9 billion.

STRATEGIC AND JOINT PROGRAMS OF NATIONAL IMPORTANCE

A high priority has been placed on several strategic and joint programs of national importance. These programs, which will require about 40 percent of the request, include Safeguard, Hardsite, now

known as the Site Defense of Minuteman, Advanced Ballistic Missile Defense, the Kwajalein Test Range, White Sands Missile Range, Satellite communications ground stations and some smaller programs.

SUPPORT OF GENERAL PURPOSE FORCES

Of equal importance is the emphasis we have placed on the support of our general purpose forces. These forces must be equipped with modern materiel in order to make the most efficient use of the available manpower in a smaller Army.

When faced with the tradeoff of machine costs versus casualties, we opt for better equipment albeit more expensive.

APPROPRIATION OBJECTIVES

In reviewing our requirements to assure that we ask for no more than is really necessary, I became convinced that the R.D.T. & E. budget must meet three important objectives:

First, we must maintain a technology base sufficient to prevent technological surprise, and adequate to undertake the most important improvements in our military capabilities.

Second, we must reorient our test and evaluation organizations and procedures to more effectively and efficiently test major items of new materiel.

Finally, we must provide for the thorough design and engineering work needed to assure reliability and performance, at reasonable cost, of the new materiel necessary to improve the capabilities of the Army in the field.

SAFEGUARD AND SITE DEFENSE OF MINUTEMAN

Safeguard R. & D. is progressing satisfactorily. System integration of all the major components except the perimeter acquisition radar (PAR) is in progress at Meck Island in the Pacific.

There have been 23 system tests, of which 19 were completely successful, two partially successful, and two unsuccessful.

There have been five successful Spartan missile intercepts of target reentry vehicles, four launched by ICBM from California and one launched by a Polaris from a ship.

Sprint missiles have successfully intercepted four Minuteman launched reentry vehicles and three launched by Polaris missiles fired from a Navy ship.

SITE ACQUISITION COSTS

The total DOD acquisition costs are estimated to be $8.0 billion for the four-site program, and if the fastest possible schedule were to be adopted in fiscal year 1974, $16.3 billion for the full 12-site program.

These estimates include increases of $0.9 billion and $2.6 billion, respectively, over the early 1971 estimates.

GRAND FORKS, N. DAK. SITE COST

Senator YOUNG. Does each one of these, such as the one in North Dakota, cost over a billion dollars? According to these estimates, the Safeguard site in North Dakota would cost about $1.5 billion, or does that include research and development?

General LEBER. The site in North Dakota does include both types of radar, the PAR and MSR, whereas the site in Whiteman would only include MSR, so it would not be as expensive as North Dakota.

Senator YOUNG. Omitting research and development, what is the cost of the site in North Dakota?

General LEBER. The PAR cost is about $240 million and the MSR cost is about $270 million. These cost estimates include the equipment that goes into them. The construction there is costing about $280 million. That is about the cost of the North Dakota site.

Secretary FROEHLKE. The Sprints are included?

General LEBER. Let me add the interceptors. Each Sprint costs about [deleted] and there will be about [deleted] of them. Each Spartan costs about [deleted] and there will be [deleted] of those. So that is the cost of the equipment and the construction for the Grand Forks site.

Senator YOUNG. What is that total?

Secretary FROEHLKE. A little under a billion, if I correctly added it up.

SYSTEMS INTEGRATION: PERIMETER ACQUISITION

Senator PASTORE. May I ask a question, Mr. Chairman?

Taking you back to page 22, Mr. Secretary, on the systems integration. What is the status of the acquisition of the perimeter acquisition radar stand right now?

General LEBER. The perimeter acquisition radar (PAR) is under construction in North Dakota.

Senator PASTORE. How is that progressing?

General LEBER. Very well. It is over 80 percent complete. Construction will be completed this coming summer. Then the weapons system contractor will go in and install the radar components and data processor. It is scheduled to be operational in October of 1974. The whole project is going along on schedule.

MISSILE INTERCEPTS

Senator PASTORE. Consider the next paragraph: "There have been five successful Spartan missile intercepts of target reentry vehicles." Have all of those been firings?

General LEBER. First of all, there are missile test firings of the interceptors, the Spartan and the Sprint. In the case of the Spartan, there were a total of 15 of those fired. In the case of the Sprint, there were some 42.

SYSTEMS TESTS

When that part of the test program was completed, they went into systems tests. There have been a total of 23 systems tests. That is where we put together the radar, the interceptor and incoming target. Of those systems tests, 19 have been successful, two unsuccessful and two partially successful.

Senator PASTORE. It is fair to say there were only two failures?

General LEBER. Of the systems tests; yes, sir.

COST INCREASES

Secretary FROEHLKE. These increases, the $0.9 billion and $2.6 billion, resulted from a further stretch out of the schedule, from increased price levels and more realistic allowances for future inflation, and from program changes and revised cost estimates.

COST AND SCHEDULES

The cost and schedules follow:
(Table 5 follows:)

TABLE 5.—*Cost and schedules for recommended program*

	Equipment readiness dates
Deployment schedule:	
Grand Forks	October 1974.
Malmstrom	April 1976.
Whiteman	Early 1977.
Warren	Late 1977.
Initial Defense of NCA [1]	Early 1979.

[1] The initial defense of the NCA, Washington, D.C., is the same as would be provided in the 12-site Safeguard deployment and consists of a single MSR and interceptors. Under an arms control agreement limiting ABM defenses to national capitals, the deployment configuration in defense of the NCA would be delineated by the provisions of the arms limitation agreement.

Total DOD funding requirements (NOA) through fiscal year 1973

	Amount (millions)
Fiscal year:	
Fiscal year 1968–71	[1] $3,764.6
Fiscal year 1972	[1] 1,206.7
Fiscal year 1973	1,595.4

[1] $42,000,000 of the amount shown for fiscal year 1968–71 has been released for use against the fiscal year 1972 RDTE requirements.

NUCLEAR WARHEADS AND INDIRECT COSTS

Secretary FROEHLKE. These costs estimates do not include nuclear warheads and certain indirect costs, budgeted elsewhere, such as national range support, family housing, hospitalization, maintenance of the Army training base, and some base operations support.

SITE DEFENSE OF MINUTEMAN (SDM)

In January 1971, DOD directed the Army to ". . . plan and carryout a hardsite prototype demonstration program." This task, now called the prototype demonstration program for site defense of Minuteman, was assigned to the Safeguard system manager.

SDM will provide for the protection of Minuteman against increasing levels of threat sophistication (in quantity and quality) beyond those which Safeguard is designed to counter.

1971, 1972, AND 1973 FUNDING

SDM was funded at $25 million for fiscal year 1971 and $59.7 million for fiscal year 1972. For fiscal year 1973, $80.1 million R.D.T. & E., plus $20.4 million MCA, funding is requested for the prototype demonstration program. This program would preserve the option to deploy should evolution of the threat so dictate.

DIFFERENTIATION OF HARDSITE DEFENSE AND HARDSITE PROGRAMS

Senator YOUNG. I wish you would differentiate between the hardsite defense program you just mentioned and the hardsite program being administered by the Department of the Air Force.

Secretary FROEHLKE. That question, Senator, is a good example of why we changed the name of this project from hardsite to site defense of Minuteman, because it had nothing to do with hardsites of the Minuteman missile. Everyone was being confused.

This site defense of Minuteman, formerly called hardsite, has nothing to do with hardening the sites for the Minuteman silos.

AIR FORCE HARDSITE PROGRAM MISSION

Senator YOUNG. The Air Force does have a separate program for hardsiting?

Secretary FROEHLKE. Yes.

Senator YOUNG. What does their programs accomplish?

General LEBER. What it does is increase the degree of hardness so that they can sustain a shock of [deleted] pounds per square inch. They are now at [deleted] pounds per square inch.

In other words, they will be able to sustain detonation of an incoming weapon closer to the silo without knocking it out of action.

Now, if, as the Russians increase the accuracy of their incoming reentry vehicles or warheads, they can knock out the hardened silo, even if it is [deleted] psi, it is just a matter of improving the accuracy of the arriving warheads. That is why it will be necessary to come in and defend these silos even though they are hardened.

Secretary FROEHLKE. And we explained what site defense of Minuteman is doing.

HARDSITE DEFENSE PROGRAM MISSION

Senator YOUNG. Your program is separate?

General LEBER. Yes; it is entirely separate. It uses one type of radar and one type of interceptor, the Sprint. It is an augmentation to Safeguard—not a replacement. It is a complement. In other words, the Safeguard radars put in, in North Dakota, would still be used. Should we later, if necessary, because of a threat, add the site defense of Minuteman system, it would be in augmentation to the Safeguard deployment.

Senator YOUNG. Would this affect both the Minot and Grand Forks Wing?

General LEBER. Yes. It could, but the level of deployment would depend entirely on the threat.

Senator YOUNG. This will function from the Safeguard site?

General LEBER. Yes. It would be tied in with the command and control system of Safeguard.

General WESTMORELAND. In effect, it is just a thickening of the system.

General LEBER. Yes. The defense is responding to the threat.

MILITARY CONSTRUCTION, ARMY (MCA)

Secretary FROEHLKE. We request $1 billion for military construction, Army, and $78 million for the Reserve components.

Although greater than fiscal year 1972, this funding is adequate only for our most urgent requirements and to insure the health, welfare, and safety of our personnel.

APPROPRIATION COMPONENTS

MCA budget consists of these principal items

	Amount (millions)
NATO infrastructure	$48.0
Safeguard	390.0
Site Defense of Minuteman R&D construction	20.4
Minor construction and planning	41.0
Other major construction	519.8

Two-thirds of the amount for other major construction, $335 million, is allocated to soldier-oriented projects. The bulk of this amount is for a major thrust to replace temporary barracks with new construction and to modernize existing permanent barracks.

In addition, $72 million is included for air and water pollution abatement projects, leaving only $113 million and for all other worldwide facilities construction requirements. The total program includes about $316 million for replacement and modernization of facilities.

ARMY FAMILY HOUSING

The Army plans a greatly expanded and accelerated family housing program during the next 5 years. This is a balanced program which, in addition to reducing the housing deficit, will accomplish urgently needed improvements and repairs to the existing inventory.

We are proposing the construction of 4,409 new units, the expansion of the domestic leasing program from 3,241 units in fiscal year 1972 to 4,615 units in fiscal year 1973, the reduction of the backlog of deferred maintenance by $16 million, and the improvement of existing units in the amount of $22 million.

STRATEGIC MOBILITY

Strategic mobility is becoming even more important as the Army is reduced in size and units are returned to the United States.

Airlift forces are required for the early deployment of selected units and for the continuing support of the deployed force for the duration of a conflict. Our capability to respond rapidly has been greatly enhanced by the introductions of the C–141 and C–5 into the military fleet, and the C–747 into the commercial inventory.

This increased capability, however, still falls short of the requirements of the war plans of overseas commanders.

While major airlift improvements have been made, the Army will continue to rely on sealift for more than 90 percent of its requirements. The decline in the size of the U.S. Merchant Marine, and the change from traditional break-bulk cargo ships to specialized container ships, have compounded our deployment problems. For this reason, we strongly support the chartering of a minimum of 10 multipurpose ships.

These ships, in addition to being immediately available for our use, are designed to efficiently deploy the large numbers of vehicles and

aircraft that account for the bulk of Army deployment tonnage. These ships, coupled with our other mobility programs, would provide the Army with a greatly improved strategic mobility capability.

PROFESSIONAL, DEDICATED AND MOTIVATED ARMY

The Army has an important mission. It has the personnel, military and civilian—active and reserve, who are dedicated to fulfilling that mission. We do have challenges. However, with the support of the Congress I am confident that today's Army will measure up. Today's Army is, and will continue to be, professional, dedicated and motivated.

We believe our budget is adequate and realistic. With it we will be able to get on with the job. We urgently request your support.

QUESTIONS BY SENATOR THURMOND

Chairman ELLENDER. Mr. Secretary, Senator Thurmond was unable to be here today but has asked, Mr. Secretary, that responses to questions he has supplied will be answered for the record. The questions and answers will appear at this point in the record.

(The information follows:)

EARLY RETIREMENT

Senator THURMOND. Mr. Secretary, in view of the high personnel costs facing the Army, has any consideration been given toward retirement policy changes to discourage early retirements?

Secretary FROEHLKE. Yes. The Army is currently studying improved personnel management systems such as the Defense Officers Management System and the President's Interagency Committee Report on Non-Disability Retirement with a view toward encouraging longer service and achieving overall reduction in retirement costs.

Senator THURMOND. It seems that a lot of bright and talented Army Officers are retiring in their early forties when they would be at their peak of value to the Army. If we could make it more attractive for them to stay in we would save on retirement costs. What are your views on this subject?

Secretary FROEHLKE. We are losing a number of talented officers we would like to retain. We are studying management methods such as the Defense Officers Management System and the President's Interagency Committee Report on Non-Disability Retirement to improve attractiveness for longer service for those select individuals needed by the Army.

ARMY RESERVE STRENGTH

Senator THURMOND. Secretary Froehlke, what additional incentives do you feel might be necessary to keep the Army Reserve strength from falling below acceptable levels?

Secretary FROEHLKE. The Army presently has a study in progress to determine the most cost-effective total package of incentives to attract and retain the required numbers of personnel in the Reserve Components without the pressure of the draft. I stress "cost-effective," because we obviously cannot afford to price ourselves out of the market by hasty adoption of a number of unproven high-cost incentives. While I cannot tell you at this time what specific incentives we feel will be required, I will say that we are looking at a broad range of ideas, to include bonuses, full-time life insurance, education benefits, earlier entitlement to retirement pay and survivor benefits.

Senator THURMOND. What order of preference would you give to these proposals?

Secretary FROEHLKE. I hesitate to pass judgment on individual proposals before our study is completed, but I think that we should go for the maximum

number of low-cost or no-cost incentives, coupled with other incentives which may provide some savings to offset the total cost. One example of an incentive with potential offsetting savings is a reenlistment bonus. If we can retain a large number of trained soldiers by paying a bonus at a level less than the costs of training a new accession, we should be able to reduce the net cost of the bonus, while reducing personnel turbulence and thus contributing to increased readiness at the same time.

Alternatives to Volunteer Army

Senator Thurmond. Mr. Secretary, if the Army cannot attain the quality-type people needed through the volunteer system, what alternatives are most likely to meet this problem?

Secretary Froehlke. We are optimistic that we can improve the quality of the overall force with an all-volunteer Army. We have raised our quality standards to reflect the needs of a smaller Army. We have also increased the size of the recruiting force, developed new and better enlistment options and increased the advertising program. During the past five months this combination of quality and improvement of the recruiting effort has increased the number of high caliber volunteers. However, the total number of volunteers is still below the level that we need in order to meet a glide path to the all-volunteer Army by end fiscal year 1973.

If our efforts do not fulfill our requirements, we will have to have additional incentives. I consider this the main alternative to solve the problem. Other alternatives, which I consider highly undesirable, are to continue the draft, reduce the quality requirements or reduce arbitrarily the force to a level which can be sustained by volunteers.

Removal of Slot Machines

Senator Thurmond. Mr. Secretary, what is the status of the program to remove slot machines from military service clubs in the Army?

Secretary Froehlke. On 3 March 1971 the Army issued contingency instructions to overseas commanders for the disposition of slot machines. At the same time the Army prohibited the purchase of new machines and limited the repair of disabled machines to spare parts already on hand.

On 14 October 1971 overseas commanders were advised of the decision to eliminate slot machines by 1 July 1972 and were directed to dispose of machines per the previously dispatched contingency instructions. Slot machines will be eliminated totally from all Army installations worldwide by 30 June 1972.

Senator Thurmond. Will additional money be needed to support these clubs after the slots have been discontinued?

Secretary Froehlke. During calendar year 1970 slot machines at Army installations overseas produced a net income of $23.15 million. $20.52 million of this was at Army open messes with the balance at other Army sundry funds. During the same period open messes in foreign countries where slot machines are operated showed a net profit of $3.83 million which included slot machine profits. Without slot machine income Army open messes overseas would have required an additional $16.69 million to operate at a break even point.

During the first three quarters of calendar year 1971, Army open messes overseas had a slot machine net income of $14.50 million and a net operating profit of $1.32 million. Without slot machine income for this period open messes overseas would have required an additional $13.18 million to break even.

Improved management methods and centralization of functions should improve our club operations without slot machines.

Subcommittee Recess

Chairman Ellender. Are there any questions?

Thank you.

This is a good time to recess. We will come back at 2 p.m.

(Whereupon, at 12 noon, the subcommittee was recessed, to reconvene at 2 p.m.)

(Afternoon Session, 2 O'Clock, Tuesday, March 7, 1972)

DEPARTMENT OF DEFENSE

STATEMENT OF GEN. WILLIAM C. WESTMORELAND, CHIEF OF STAFF, U.S. ARMY

CONCLUSION OF SERVICE AS CHIEF OF STAFF BY AND COMMENDATION OF GENERAL WESTMORELAND

Chairman Ellender. Are there any further questions of Secretary Froehlke?

Senator Young. General Westmoreland, I believe this will be your last appearance, will it not?

General Westmoreland. Yes; I believe it will.

Chairman Ellender. Are you going to retire?

General Westmoreland. When I finish as Chief of Staff of the Army, I plan to retire.

Senator Young. I want to commend you for a long and distinguished service. You have spent a lifetime in the service of your country. You directed the most difficult war we were ever engaged in: Vietnam. One problem was that it was not fought to be won. It certainly involved difficult decisions which were not of your making. It is a war in which our people were not permitted to fight to their best advantage. Despite this, I have often marveled at how you took these young people and made fighters of them. You have had a tremendous record, and I want to commend you for it.

Chairman Ellender. I want to echo those sentiments. I didn't know about your leaving. I thought you were entirely too young to retire.

General Westmoreland. I finish my statutory 4-year tour as Chief of Staff, sir.

Chairman Ellender. You are not going into seclusion?

General Westmoreland. I do not know about that. I will cross that bridge when I retire.

Secretary Froehlke. I will make the prediction, Mr. Chairman, that he will be active wherever he is.

Chairman Ellender. You may proceed, General.

REVIEW OF ARMY POSTURE

General Westmoreland. Mr. Chairman and Senator Young, I am honored to appear before you again to review the posture of the Army in light of today's realities and tomorrow's challenges, and I wish to acknowledge our pleasant and rewarding association with you gentlemen over the last 4 turbulent years.

PAST AND PRESENT DEMANDS OF VIETNAM WAR

For the past 6 years, the requirement to provide our best effort in Vietnam has placed great stress on the remainder of the Army.

Two years ago, in my statement before this committee, I alluded to this fact when I described two priority objectives—first, to insure that our Army forces in Vietnam were properly supported, and, second, to improve the remainder of the Army.

Today active participation by U.S. ground forces in a combat role in Vietnam has been greatly reduced. For those remaining, it is still a tough, dangerous job.

REBUILDING SPIRIT AND SUBSTANCE OF TOTAL ARMY FOR PEACETIME FORCE

In spite of the fact that some forces may remain in South Vietnam during fiscal year 1973, the Vietnam war no longer places major demands on management of our people or our materiel resources. Instead, we have before us the major task of continuing to rebuild the spirit and substance of the total Army as we move toward a smaller, more professional, peacetime force.

Consequently, I think that it is important that we reexamine the role of the Army today in light of our national interests, and that I speak to you of the Army's status today and its goals for the future.

ROLE OF THE ARMY

Within the framework of the Nixon doctrine and the strategy of realistic deterrence, the broad purposes of U.S. military power and of its allies are to:

Deter war at all levels.

Strengthen the U.S. national position in negotiations.

Support collective security arrangements which are mutual ventures characterized by true partnership.

Protect U.S. and allied interests if deterrence fails.

The U.S. Army performs a major role in each of these purposes. The Army is a vital element of the resources available to meet the requirements of the free world security—a potent part of the "total force" which includes both Active and Reserve components of the United States and our allies.

INFLUENCES ON FORCE QUANTITY AND QUALITY

Within the world arena today, I see three major factors that influence the quantity and quality of Army forces.

The shifting realinement of nations from a bipolar to a multipolar structure.

Soviet achievement of strategic nuclear parity, expansion and modernization of Soviet conventional forces, and increased belligerence with emphasis on the export of the Soviet influence.

New Presidential economic and political initiatives that influence our national interests.

Shifting Realinement

A multipolar power structure presents definite risks for the United States. The risks are the result of greater unpredictability and lessened control over initiatives by the various power blocs in their relations with other nations.

It is evident to me that confrontations and the probability of conflict have increased in such a dynamic world situation. We must be flexible enough to accept the changing international order while at the same time maintaining an acceptable level of credibility as a responsible world leader.

To me, this means having readily available conventional ground forces that are perceived as a credible deterrent to both minor and major conflicts. To provide our Nation any lesser capability would deny the President a potent alternative in exercising U.S. influence to attain national objectives.

Soviet Influence

From an analysis of the threat, it is safe to conclude that the Soviets are approaching strategic nuclear balance, a condition which many believe raises the question of the credibility of general nuclear response. Therefore, it seems essential to me that the United States maintain a dual-purpose fighting capability that provides sufficiency in both strategic and theater forces (nuclear and conventional) to make credible our intent to respond within the framework of our national security strategy of realistic deterrence.

We must not limit our decisionmakers to the options of either too little or too much. A capability for executing controlled initiatives represents a solution to an international crisis: Deterrence first; if deterrence fails, then conventional conflict can provide added time for thought, negotiation, and possible solution before the nuclear threshold is reached.

Erosion of the credibility of our willingness to fight with conventional forces will, in my judgment, unduly increase the reliance on tactical and strategic nuclear weapons. For this reason, conventional forces in this era of strategic nuclear parity clearly stand out as an increasingly effective and likely means for exerting military or diplomatic pressure.

U.S. Initiatives

In the past few months, President Nixon has initiated new economic policies that have culminated in new agreements on trade among free-world countries. Similarly, he has held political summit meetings with Asian and European allies, has conferred with Communist leaders in Peking, and is scheduled to visit Moscow.

While we all have great hopes that these initiatives will produce greater stability among nations, it is not a time to initiate force adjustments that may be perceived as a weakening of the U.S. will and commitment to world peace.

Our baseline force and forward deployments must remain stable through this period of negotiation to insure that the credibility of our national resolve and commitment to our allies is apparent to the world community.

Although the future holds prospects for significantly improving the capabilities of land forces, I see no change in their traditional role so long as the basic objective of war is to impose one nation's will upon another.

A clear fighting capability for any level of conflict, as well as the unmistakable national determination to use that capability, is required to protect U.S. interests.

Because of our national interests and wide-ranging security obligations, we are faced with the requirement—more demanding than ever before—that the U.S. Army be capable of decisive action wherever land forces are required.

Minimum Force To Support U.S. Interests and Commitments

It is my conclusion that the 13 active division force along with our Reserve components currently programed in the fiscal year 1973 budget constitutes the minimum force that will support our national interests and commitments, and the present international atmosphere that I have just described.

Further, the full effectiveness of this force is necessary and can best be realized by maintaining our forward deployments, particularly in Europe, and by achieving and maintaining a high state of readiness among all units.

Reliance of NATO Allies Upon United States and U.S. Economic Depletion

Chairman Ellender. General, I have heard this for a long time. I am wondering if you have any plans whereby we can get our allies to cooperate with us. They don't seem to see the dangers that you do. They may be right and you are wrong.

But you are asking—and this has been the situation for the past 24 years—that we undertake to protect all free nations against Russia.

Now, I think our capability is going to be waning more and more because of the situation in which we find ourselves financially. Our debt today is most burdensome. By the end of this fiscal year, the interest charge alone on our debt will be $23 billion—just interest.

Then you have retirement pay for all of those who retire. That is another $5.5 million by the end of 1973.

It strikes me that something ought to be done to get our allies to help out if the situation is as bad as you say it is.

Ally 1971 $1 Billion 5-Year Pledge

General Westmoreland. Mr. Chairman, we have made some rather encouraging progress in getting our NATO Allies to contribute more to the NATO alliance. As a matter of fact, in calendar year 1971, based on the decision made by the NATO alliance in December of 1970, about $1 billion was devoted to improving the defenses of our NATO alliance.

Chairman Ellender. The billion-dollar contribution to NATO by our allies will be made over a 5-year period. A great deal of it will be utilized for the construction of aircraft shelters in the homelands of the contributors. I view such a contribution as insignificant when com-

pared to the protective umbrella the United States has provided in Europe, in the Atlantic, and in the Mediterranean for the past 25 years. I go back to the proposition that, if the danger of aggression is as great as we are told, our allies should be the first to recognize it and provide far more toward their own defenses. But just as long as we show a willingness to bear the major burden, they will permit us to do so.

General WESTMORELAND. Mr. Chairman, you are quite correct. The billion dollars to which I referred as being made available in 1970 is to be spread over a 5-year period. Half of that is associated with the construction of 200 shelters for both U.S. and NATO aircraft. The remainder, which amounts to one half billion, is to be used for improving the ground, air and naval forces of the U.S. allies.

Chairman ELLENDER. A half billion dollars amounts to a drop in the bucket.

1972 COMBINED $1 BILLION INCREASE IN ALLY DEFENSE BUDGETS

General WESTMORELAND. In December of 1970 the same group met and announced a $1 billion combined total increase in their 1971 defense budgets. So the following year, December of 1971, this same group agreed to add another billion dollars for the coming year in 1972 to their defense budgets, which should have an impact on improving tanks, antiaircraft weapons, antitank weapons, artillery, helicopters and antisubmarine warfare and combatant air transport aircraft.

SUGGESTED DECREASE IN U.S. FORCES IN EUROPE

Chairman ELLENDER. In view of the economic prosperity of our allies and our own economic plight, if they are strengthening their own forces, it should be possible for us to withdraw some of ours or at least require greater financial support from them for our own forces in Europe.

General WESTMORELAND. I would like to comment, Mr. Chairman, that the European allies have basically achieved the force goals in connection with their commitment to NATO. Of course we have certain commitments ourselves to NATO which we have attempted to maintain.

Further, I would say that this would seem to me to be a very poor time to lower our guard when we are attempting to negotiate with the Russians.

Chairman ELLENDER. I have heard that in past years. Please proceed.

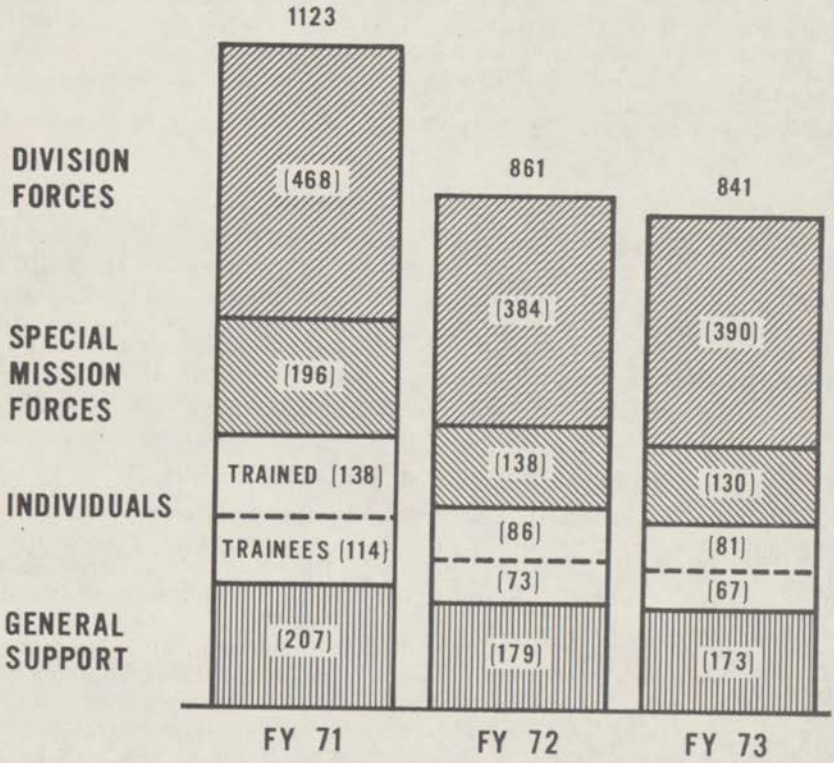
1973 MANPOWER GOAL

General WESTMORELAND. During fiscal year 1973 we expect to reach our goal of 13 active combat divisions within a total Army of approximately 841,000 men. The chart illustrates our manpower program in relationship to previous years.

(The chart follows:)

THE MANPOWER PROGRAM

(END STRENGTHS, ×1000)



NOTE: FIGURES MAY NOT ADD DUE TO ROUNDING.

COMBAT DIVISIONS

General WESTMORELAND. Currently in the Active Army, we have [deleted] divisions backed up by an eight-division Reserve component force.

The deployment of these forces is shown below:

Worldwide deployment of combat divisions, February 1, 1972

Vietnam	[Deleted.]
Europe	
Korea	
United States:	
Active Army	
Reserve component	
Total	

FORCES IN VIETNAM

You will note that in Vietnam we have the [deleted] as compared to a high of 8⅓ divisions in early 1969. In number of soldiers, this represents a reduction of approximately 264,000, or 70 percent, since 1969. Recently, the President announced another cut in the number of American troops in Vietnam. The Army's share of this reduction is approximately 55,000 men.

Strength reductions in Vietnam have not been limited to troop units. As the Republic of Vietnam Armed Forces have increased in operational proficiency, we have also substantially reduced the number of U.S. Army advisors.

FORCES IN KOREA

Chairman ELLENDER. Now, General, I notice you mentioned here you have one division left in Korea. Isn't it more than that?

General WESTMORELAND. No, sir, just one division.

Chairman ELLENDER. You pulled out 20,000 men?

General WESTMORELAND. We withdrew 20,000 men in 1970, which is one division.

Chairman ELLENDER. Are you going to withdraw any more?

General WESTMORELAND. We have no additional withdrawals programed at this time, Mr. Chairman.

Chairman ELLENDER. I thought we had 56,000 soldiers there comprising two divisions.

General WESTMORELAND. We did, but we have withdrawn one division. The only division we have remaining now is the 2d Division.

Chairman ELLENDER. How many people does that comprise?

General WESTMORELAND. That leaves us about [deleted].

Chairman ELLENDER. That is more than a division.

General WESTMORELAND. We also have antiaircraft, missile and logistics support units and headquarters personnel.

[Deleted] it was [deleted] at the end of fiscal year 1971, and we have programed [deleted] for 1973.

COMBAT SUPPORT AND COMBAT SERVICE SUPPORT TROOPS

Chairman ELLENDER. In discussing Army divisions I always figured we were talking about 15,000 to 16,000 men.

General WESTMORELAND. A division normally consists of 16,000 men, but this is the fighting division itself. To support that division

in combat, we have to add additional combat support and combat service support troops.

Chairman ELLENDER. In this case it is [deleted].

General WESTMORELAND. In this case it is [deleted]. We have about [deleted] in the division. Then we have about [deleted] in headquarters and support units.

Chairman ELLENDER. What is required to support that one division?

General WESTMORELAND. We have a multiplicity of units. We have one division [deleted] Honest John [deleted] Hawk [deleted] and [deleted] Hercules battalions.

We have [deleted] separate aviation companies, and [deleted] battalion.

In addition to that, we have logistic troops operating the depots, the ports, providing maintenance of our materiel, and we have communications troops.

Chairman ELLENDER. I am surprised that so many persons are required to maintain one division.

COMBAT READINESS

General WESTMORELAND. Continuing my statement, strength reductions in Vietnam have not been limited to troop units.

Since I have stressed the importance of combat readiness when an evaluation is made pertaining to the adequacy of our force to fulfill our national commitments and strategy, it would be a pleasure for me to report that the Army is completely combat ready—unfortunately, this is not the case.

Excluding our forces in Vietnam, Army readiness continues to be less than desirable and the prospect for improvement on a worldwide basis is not good when considering the current and projected personnel situation. [Deleted.]

LOGISTICAL READINESS

On the other hand, our logistical readiness posture has been maintained at a high level. Although modernization of certain items for U.S. forces will not be attained as rapidly as desired, we will continue to maintain an adequate logistical posture through fiscal year 1973.

COMBAT READINESS OF FORCES IN EUROPE

During the period of our temporary personnel shortfalls, our forces in Europe, due to the critical nature of our NATO commitment, will be given first priority after those in the Republic of Vietnam. I can report to you that the U.S. Army, Europe [deleted]. Some shortages of technical skilled personnel and middle-grade officers exist. However, actions are being taken to continue to improve Europe's qualitative strength posture.

STRATEGIC ARMY FORCE READINESS

Last year I expressed my concern at the inadequate level of readiness within our Strategic Army Force (STRAF) elements stationed in the United States. Today I must tell you that this condition continues, caused primarily by a shortage of trained personnel and the severe reductions in strength we are undergoing in fiscal year 1972. Vigorous efforts are being taken to correct this situation.

AIR DEFENSE FORCE READINESS

Overall readiness of our air defense forces is generally satisfactory. As could be expected in view of my previous comments, personnel problems preclude optimum readiness. However, our air and missile defense units, on a continuous basis, have been able to maintain a high state of training and are currently performing their assigned defense missions.

SAFEGUARD

Secretary Froehlke has already covered our efforts for the Safeguard system and I will not duplicate his remarks. I will only state that the Army, regardless of the future strategic decisions made concerning this system, is prepared to meet and overcome the many challenges presented by the development of this complex ballistic missile defense system.

NATIONAL GUARD AND RESERVE READINESS

The Army National Guard and the Army Reserve continue to progress toward attaining an improved capability to accomplish assigned missions as components of the Army's total force. Such progress is in line with the increased reliance placed on them as the initial and primary source for augmentation of the active force in any future emergencies requiring a rapid and substantial expansion of the active forces. The chart graphically depicts the vital contribution of our Reserve components to NATO.

(The chart referred to is classified and was furnished separately to the committee.)

TRAINING OF INDIVIDUALS AND UNITS

General WESTMORELAND. Training of individuals and units of the Reserve components has progressed sufficiently to eliminate most of the temporary reductions in readiness caused by earlier reorganization actions. Combat divisions and brigades have improved deployment capabilities by an average of 2 weeks during the past year. A test and evaluation program is currently on-going to determine other methods of further improving readiness.

EQUIPMENT INCREASE

Increased equipment issues to the Reserve components have been a major factor in achieving improved readiness. Issues in fiscal year 1971 totaled $727 million compared to $300 million in fiscal year 1970 and $150 million in fiscal year 1969. Current forecasts indicate equipment issues in fiscal year 1972 will be as high or higher than in fiscal year 1971. New issues of equipment include the M60 tank, increased quantities of the M16 rifle, the new family of tactical radios, and numerous modern wheeled vehicles. Most impressive has been the increased inventory of aircraft in the Reserve components, with 99 percent of the aircraft requirements to be met by the end of fiscal year 1973.

Recruiting and Retention

A major challenge to the Reserve components is the recruiting of personnel with no prior service and the retention of prior service personnel in order to maintain authorized strength levels in a volunteer army environment. To accomplish this, we are considering various incentives, some of which parallel those envisioned for the Active Army. Positive steps have been taken in developing effective organized recruiting in both the Army National Guard and the U.S. Army Reserve.

Active forces: effect on readiness of statutory average strength

Turning again to the active force, the major factors that are affecting readiness stem from personnel strength problems. An explanation concerning how we arrive at this situation is appropriate.

When Congress placed a ceiling on the average strength of the Army (man-years) in Public Law 92–129, we entered a new era in manpower management. By this average strength ceiling, Congress is exercising its right to legislate the size of the Army. However, this control by the use of the man-year or average strength ceiling has created some very real manpower management problems for the Army.

Chairman Ellender. General, I regret that we will have to discontinue. The light up there indicates that this is the last call for a rollcall vote.

We will take a brief recess.

(Brief recess.)

Chairman Ellender. The committee will come to order.

General Westmoreland, you may proceed, sir.

General Westmoreland. The management problems stem from two interrelated features of this type of ceiling—timing and the size of the total reduction.

Since we are dealing with an average figure, the factors of when the ceiling is imposed and the time frame in which the goal must be met are extremely critical. As an example, if we are dealing on a fiscal year basis, a 1,000 man-year reduction in average strength means a 1,000 man change in end strength, if the decision is made early enough to permit a constant reduction of 1,000 men from the beginning of the fiscal year. However, it means a 2,000 man change in end strength if it begins in the middle of the fiscal year or a 12,000 man change if begun in the last month of the fiscal year. Hence, the timing of an average strength or man-year change is critical.

Trained Strength Leadtime

A planned, orderly change in the trained strength of the Army requires about 10 months leadtime. When a change in average strength or man-years is directed with little leadtime, we face undesirable choices—either a much larger change in actual strength or a resort to crash programs, or normally a combination of the two.

The result of these undesirable attrition measures is a dip or valley in total strength. Thus, our strength at the end of fiscal year 1972 will fall below the planned smooth glide path to baseline force levels.

Then, in the first half of fiscal year 1973, total strength will move back to that glide path as new accessions are brought into the Army. Such fluctuations are an undesirable result of managing man-year reductions without adequate leadtime.

1972 Strength Reduction

In fiscal year 1972, this leadtime problem has been further complicated by the magnitude of the reduction. The President's fiscal year 1972 budget, which was submitted to the Congress a year ago, called for a reduction in Army average strength of 203,000 man-years. The congressional reduction of 50,000 man-years which was added to this, plus the fact that we entered the fiscal year at a higher strength than planned, caused the average annual strength reduction to be 263,000 man-years. This means that we are reducing the average strength of the Army by 21 percent in 1 year. Additionally, the average annual strength ceiling for fiscal year 1973 is approximately 100,000 less than in fiscal year 1972.

During the cutbacks after World War II and the Korean war, much of the reduction was accomplished by releasing Reserves (both units and individuals) ordered to active duty for the duration of the conflict. This time, with practically no Reserves called to active duty, this course was not open. Therefore, the reduction has been harder to achieve.

Effect of Release Actions

In addition to the undesirable strength fluctuations, the effects of the release actions are many. As an example, in Europe, we have been able to maintain our forces at an acceptable manning level. [Deleted.] Moreover, to maintain this posture in Europe, we have been forced to draw down elsewhere in the world, especially our STRAF units in the United States. [Deleted.]

Let me emphasize that our shortfalls are temporary and not related to the adequacy of the fiscal year 1973 budget. However, I hope that any future manpower changes directed by the Congress will not force us to compromise long-range objectives.

Modern Volunteer Army

Last year, in my statement to this committee, I described our initial plans for developing an Army which attracts and retains high quality people. We have identified three major objectives in our overall goal to improve the way the Army does things. The objectives are enhanced professionalism, improved Service life, and a modernized accession system.

Achievement of Highest Standards of Professionalism

Of the three interrelated and mutually dependent objectives, the first is overriding. Achievement of the highest standards of professionalism is paramount. This requires equally high standards of discipline—all else is secondary. As I have said before, we are not condoning permissiveness, compromising standards, or engaging in a "giveaway" program.

Training

Revitalization of Army training is one of our highest priority projects in improving professionalism. Last June, I established a decentralized training program whereby the training management responsibility was given over largely to those commanders most intimately and directly involved in the day-to-day training of their troops—commanders of battalions and separate companies.

Not only should our training be meaningful and challenging but the training should be accomplished with full strength units. Every single day, approximately 45,000 soldiers are drawn away from their primary duties to perform administrative chores. This confronts the soldier with tasks not directly related to his readiness mission, and frustrates efforts of his leaders to build teamwork and a sense of professional excellence in their units. Certain fiscal year 1973 budget items are designed to reduce diversions from unit strength by:

Completing the worldwide program to hire civilian mess attendants.

Replacing soldiers performing base support functions with civilians.

Leadership

Ultimately, a professional Army hinges on the quality of its leadership—on leaders at all levels who are actively concerned for the professional excellence and well-being of those who serve under them. To upgrade the quality of leadership, formal instruction on the subjects of professional ethics, individual and group communications, and counseling of subordinates is being emphasized in addition to other leadership subjects.

We are taking actions to improve the leadership, pride, and confidence of the noncommissioned officer corps as well as the officer corps. These actions comprise the entire personnel management cycle—military training and education, assignment, promotion, and evaluation.

The quality of leadership also depends upon the qualifications of the leader. A selection board process is being used to eliminate those people who do not meet the high standards required for today's Army and to select for command and leadership positions only those most qualified. This is the philosophy and policy in all of our current personnel programs, officer and enlisted.

In the past year, we have made great progress in stabilizing the assignments of our leaders. We have already stabilized brigade, battalion, and company commander tours. This policy is starting to show positive results. Many of our problems are being identified and eliminated because of the continuity and increased experience of commanders. A parallel stabilization policy was announced in September 1971 for key senior NCO's—sergeants major and first sergeants. Our goal is to achieve an optimum 24-month tour for key NCO's, with a minimum of 18 months for sergeants major and at least 12 months for first sergeants.

Improvement of Housing

The modern volunteer Army program has served to focus attention on some of the inadequacies of Army life, especially the substandard housing conditions under which many of the Army's soldiers and their families now live. The Secretary of the Army has already de-

scribed how our budget has been designed to overcome these problems at a faster pace. I cannot overemphasize the importance of your support to this vital area.

Recruitment

In addition to the heightened appeal of service in an improved force, the Army must possess a comprehensive, systematic method of attracting and bringing into its ranks both the quality and number of volunteers its mission requires. The major points of our program are:

Increasing the size of the recruiting force.
Developing new and better enlistment options.
Increasing the advertising program.

Discipline and Leadership

Before leaving the subject of people I would like to acknowledge that our discipline and leadership—like those of all institutions—have been, on occasion, less than perfect. However, the publicity afforded the few exceptions or aberrations has unfairly maligned the vast majority—the very fine soldiers in our ranks. Many of the programs I have described to you are designed to further strengthen our performance in the areas of discipline and leadership. I am certain we are moving in the right direction.

Although it may be a little too early to assess the situation accurately, several of the traditional statistical indicators of discipline are now showing improvement. A case in point is absenteeism, which has been and continues to be a significant problem. During the 6-month period ending in September 1971, our absentee incident rate was lower than for the previous 6-month period. Likewise, our desertion rates decreased during the same period.

Materiel Programs

The 1973 budget has been characterized as a soldier-oriented budget; however, continued effort and adequate funding are vital in the field of materiel. I highlighted earlier in my presentation our goal of a fully manned 13-active-division force. Implied in my discussion was a 13-active-division force fully equipped with weapons, equipment, and ammunition having a qualitative advantage over those of our potential enemies. It is abundantly clear that, in view of our current and projected force levels, the need to maintain this advantage is critical.

As in the past, we are concentrating on a number of systems which will make the greatest contribution to the effectiveness and combat capability of the Army. In short, we are continuing the programs which have been initiated in past years. No problems of any magnitude have been uncovered and we are progressing satisfactorily.

Advanced Attack Helicopter

The advanced attack helicopter continues to be one of the Army's highest priority development programs. The Army's position for the past 2 years has been, and continues to be, that alternate approaches to meeting this requirement would be considered objectively on a

cost-and-effectiveness basis and that a production decision must be based on selection of the weapons system which is the best buy. The Army has, for the past 2 years, been involved in an analytical study examining in detail the basic requirement for an advanced attack helicopter. We now have a unique situation in that we have available industry-sponsored experimental aircraft that are proposed to meet this requirement.

Selection Between A–X and Cheyenne Aircraft

Chairman Ellender. General, the Army is requesting $53.5 million to continue with the development of the Cheyenne armed helicopter, and the Air Force is requesting $48.1 million for the continuation of the development of the A–X close support aircraft. Sometime ago I discussed with Mr. Packard the feasibility of selecting either the A–X or Cheyenne for the close air support mission instead of continuing with the development of both of these expensive systems.

Now I am told that we need to provide these additional funds for the development of both of these aircraft in order to determine which is the best for the close air support mission. What is your view on this matter?

Complementary, Not Competitive, Aircraft

General Westmoreland. Mr. Chairman, Mr. Packard appointed an advisory board of officers, and after deliberating and studying the matter in great depth over a period of a number of months, this board concluded that the A–X and the Cheyenne were not competitive but complementary.

That is the Army position, and I personally feel strongly that it is not a question of either/or, but a question of both. The two are complementary.

The A–X will not do what the Cheyenne can do to support the infantrymen on the ground.

Whether or not the A–X function envisioned by the Air Force could be performed by the A–7 or other plane is up to the Air Force to decide. The A–X, of course, has not been developed, whereas we have developed the Cheyenne and have several planes that are flying. We are pleased with the performance.

The A–X is in development—on paper—now. We do not know what its capabilities will be, but we do know it will be a fixed-wing aircraft.

Chairman Ellender. You say the A–X is on paper?

General Westmoreland. Yes, sir. The A–X has not been fully developed in hardware form. As I understand it, there is not a fully developed flying model of the A–X at this time.

Same Objective but Different Capabilities

Chairman Ellender. I understood they would have the same objectives.

General Westmoreland. They both have the objective of supporting Army ground troops. But their capabilities are quite different.

Chairman Ellender. Are you satisfied that the Cheyenne will do the job?

General WESTMORELAND. We are satisfied that the Cheyenne will provide the support that the Army infantryman needs in a helicopter gunship.

The Cheyenne is not going to replace the fixed-wing, close support aircraft that can carry heavy bombs; that support we have always received from the Air Force and always expect to receive from the Air Force.

The Cheyenne can deliver very close machinegun, cannon, rocket, and missile fire, much closer to the infantry than a fixed-wing aircraft.

CHEYENNE COST

Chairman ELLENDER. What about the cost of the Cheyenne? Don't you think it is excessive and more than you anticipated?

General WESTMORELAND. It is more than we initially anticipated. As with everything else, inflation has had its effect in connection with the development of this aircraft which started some years ago. We feel that the flyaway cost is about $2.7 million.

Chairman ELLENDER. That does not include research?

General WESTMORELAND. That does not include R. & D. If you include all procurement and R. & D., it is about $4.8 million; however, this figure includes inflation and compares favorably with acquisition costs of other aerial systems.

CHEYENNE TECHNOLOGY AND WEAPONS

The Cheyenne incorporates the latest in technology, not only with respect to the airframe, the helicopter platform for the weapons system, but also the latest in weapons (both machinegun-type weapons and antitank-type weapons), the latest in fire control, and the latest in night vision—all of which produce a tremendous advance as far as a ground weapons system is concerned.

We look at the helicopter gunship as permitting the Army to operate its traditional weapons tactically in the third dimension, not at high altitude but on the nap of the earth. Of course, we will continue to have machineguns and antitank guns on the ground, but the helicopter permits us to also move these weapons into the third dimension, above the battlefield.

Therefore, the helicopter gunship is of tremendous importance to the Army, Mr. Chairman, in taking advantage of technology and improving our ground combat capability and saving the lives of infantrymen by virtue of giving them the best support that can be made available.

CHEYENNE ARMY CHOICE

Chairman ELLENDER. Are you in a position to state which of the two would be best for the Army?

General WESTMORELAND. I will state categorically that the Cheyenne would be better for the Army for the simple reason that the function to be performed by the A–X, in large measure, can be performed by the A–7, or other aircraft now in the inventory. Under certain conditions, I can visualize that the A–X may be a better tactical support aircraft than the A–7 or the F–100 or the F–4, all of which can perform

this close support mission. Those aircraft now in the inventory can drop big bombs and can strafe using their machineguns, but they cannot provide that very close in and continuous support that the helicopter gunship can provide. The helicopter gunship, Mr. Chairman, came of age during the Vietnam war.

Helicopter Survival Capability

Senator Young. The helicopter did surprise me in what it could do in Vietnam. I don't profess to be a military authority, but how well could a helicopter survive in, say, a European war like World War II?

General Westmoreland. It could not survive, Senator Young, if we flew over the enemy's lines and his antiaircraft guns and exposed it to this type of fire. But we would not use it that way. It would operate primarily over friendly lines. Because this aircraft is capable of taking advantage of the terrain, it can pop up and fire antipersonnel weapons or antitank weapons. It can pop down again and then sideslip and then pop up again. It is a very elusive vehicle with a good standoff capability against a variety of targets.

It does not have to fly over the enemy to drop its ordnance as a fixed-wing aircraft must.

I am not suggesting it is always going to operate behind friendly lines. As required, we will locate the enemy's antiaircraft weapons and we will suppress those weapons with fire. When we suppress those weapons, then the gunship can make penetrations. But normally we would not penetrate the enemy lines until we have acquired the intelligence and suppressed the antiaircraft fire.

We feel that the helicopter is survivable in the European type of environment if properly employed. We feel that we have developed tactics and we will continue to develop tactics that will enhance its survivability. We have been running numerous tests out on the west coast as to its survivability, and we have been rather pleased with the results.

Now, referring to our experience in Vietnam, we have lost a lot of helicopters. On the other hand, we have also lost a lot of fixed-wing aircraft of all types.

Frequently, when a helicopter is knocked down, it is salvageable. It can go into autorotation, and land. It may be damaged, but it can be pulled out of the battlefield in many cases and repaired. We have repaired thousands of them that have crashed, many of them by virtue of enemy action in Vietnam. When a fixed-wing aircraft crashes, it is not usually salvageable or repairable. When a helicopter is knocked down, the loss is relatively less than when a very expensive fighter-bomber is knocked down, such as the F–4.

In considering the dollar value per flying hour, the cost of the Air Force losses has been higher than ours.

We have statistics as a function of cost per flying hour, showing that the helicopter losses are much less in total dollar value than those of fixed-wing aircraft, despite the fact we have lost more helicopters in Vietnam than fixed-wing aircraft. I can provide for the record some statistics to prove my statement, if you would like, sir.

Senator Young. That is all.

(The information follows:)

An analysis of the combat loss rate and the comparative dollar cost per 1,000 flying hours of Army attack helicopters compared to USAF tactical fighter aircraft operating in South Vietnam indicates the USAF has a much higher loss rate to the inventory per 1,000 flying hours. Dollar loss cost per 1,000 flying hours for the USAF tactical fighters is also considerably higher as reflected below. On a per sortie basis, the results are even more favorable to the attack helicopter.

	Loss rate	Cost of losses per 1,000 hours
USAF (A-1, F-4, F-100):		
Calendar year 1968	[Deleted]	$353,850
Calendar year 1969		509,164
Calendar year 1970		288,149
Calendar year 1971		442,064
U.S. Army (AH-1G):		
Calendar year 1968	[Deleted]	$71,930
Calendar year 1969		65,716
Calendar year 1970		52,978
Calendar year 1971		94,088

To provide the best comparable data on USAF fighters and Cobra attack helicopters performing similar troop support missions, loss data is based on South Vietnam experience (specifically, does not include both Vietnam and other country experience where fighter aircraft clearly were performing in the interdiction and air superiority roles) except that 1971 figures include Laos and Cambodia experience where extensive ground operations were conducted (LAMSON 719, etc.).

Helicopter Bomb Delivery Capability

Senator Allott. Mr. Chairman, I would like to ask a question or two. Did you indicate that the aircraft would not have to fly over the lines in order to drop its ordnance?

General Westmoreland. Senator, we are not going to drop ordnance by gravity. We do not deliver that type of ordnance from the helicopter.

The type of ordnance we deliver from the helicopter is either an antitank missile which is wire guided—namely, the TOW, where you can stand back and hover the aircraft and shoot at a tank on the other side of the lines of to 3,000 meters—or the helicopter can use a machine-gun that fires ahead or to the sides and fires rockets to the front, or, in the case of the Cheyenne, could fire to the flanks as well as to the front.

In addition to that, we have 40-millimeter grenade launches that we can mount on the helicopter. But we do not drop bombs from a helicopter the way we do from a fixed-wing plane, a fighter bomber.

Policy of Defense Department

Senator Allott. One thing bothers me, General. We on this committee have been led to believe that the Defense Department was engaging in competition to determine not two vehicles—one to be employed by the Army and one to be employed by the Air Force—but, rather, that there was going to be an evaluation to determine which should be produced. I think the members of the committee will agree with me on this.

However, in the last few days, we have had testimony by the individual services leading us to believe, as you are doing here today, that both should be procured. Has the policy of the Defense Department been changed in this respect?

General WESTMORELAND. To the best of my knowledge, the policy of the Defense Department is that the two systems are complementary and they should both be developed. The Secretary of Defense has not made a decision as to whether both would be produced, but he has made the decision that we will proceed to develop both.

I know of no plans to have any shootoff, any competition, between the A–X and Cheyenne, because the two vehicles are so totally different it would be impossible to have a flyoff or competition between the two.

A–7 CAPABILITIES

Chairman ELLENDER. General, you stated awhile ago that the Air Force had its inventory airplanes that were capable of doing the work that the A–X will do.

General WESTMORELAND. They have the A–7, which was designed as a close support bomber. It will be able to perform many of the functions that the A–X is expected to perform.

Whether it will be able to perform all of those functions, I do not know. I do not know what the A–X will be able to do and neither does the Air Force, because it is not yet developed.

The Cheyenne is not on paper, sir. We have been flying the Cheyenne, and we have several thousand hours on it.

ALTERNATIVE HELICOPTER DEVELOPMENT

Chairman ELLENDER. There has been quite a substantial amount of money spent in order to develop it. Would it be possible to develop a helicopter more cheaply that would perform the same mission? Such a possibility might enable you to have a greater inventory.

General WESTMORELAND. Mr. Chairman, as I alluded to in my statement, Sikorsky and Bell aircraft have come in with what Sikorsky calls the Blackhawk, and Bell calls the King Cobra, which are potential advanced helicopter gunships.

Now, for $10 million—we have $5 million of that and in the supplemental we have $5 million—we would like to run a test to examine what the capabilities are for the Blackhawk and King Cobra. We will then evaluate these two aircraft. We will examine their cost effectiveness.

Having done that, we will determine whether or not we want to change our military requirements for the advanced helicopter gunship or whether it would be better for the Army to stay with the Cheyenne, which has far greater capabilities than the Blackhawk or King Cobra. However, the Cheyenne will definitely cost more money than the King Cobra.

After the evaluation, we will determine what will be most cost effective, a vehicle that will cost less and has less capability, such as the Blackhawk and King Cobra, or the Cheyenne, which costs more money but which has much greater capability.

Once we have done that, we will either continue with the Cheyenne—and we have funds in this budget for that purpose—or we will come up with a new requirement. If we do the latter, we will have to go out to industry for other competitors based on the new requirement with respect to the characteristics of the aircraft.

The Blackhawk and King Cobra cannot compete with the Cheyenne now. The Cheyenne has far greater capabilities, but it is more costly.

DEVELOPMENT COST OF CHEYENNE

Chairman ELLENDER. How much more money do you expect to spend on the Cheyenne before it is put into inventory?

General WESTMORELAND. We have $17.1 million in this budget for research and development and then we have $36.5 million for the purpose of three pre-production prototypes. One of these prototypes will be produced from hard tool dies, production type dies. The other two will be obtained by rebuilding two R. & D. aircraft which are presently in storage. With these three prototypes, we will be able to run sufficient tests to insure that the bugs are worked out preliminary to going into production; in other words, from these we will be able to get sufficient data to make a production decision.

PROTOTYPE REQUIREMENTS

Chairman ELLENDER. You said some have been tried out.

General WESTMORELAND. Yes, sir. A total of 10 R. & D. airframes were fabricated in the development program.

Chairman ELLENDER. And you want two more?

General WESTMORELAND. Two aircraft were destroyed in accidents, one is being used for static ground testing, one for electromagnetic compatibility testing, three are in storage and three are flying. None are in production configuration. We need three complete preproduction prototypes to proceed with transitioning into production by achieving early service and operational test data that could preclude later retrofit programs, and thus reduce life cycle costs.

Chairman ELLENDER. To make the actual test?

General WESTMORELAND. To make the necessary tests preliminary to making the decision to go into full production.

BUDGETED FUNDS

Chairman ELLENDER. We have in this budget, as I pointed out, $53.5 million for the Cheyenne and $48.1 million for the A–X. The Air Force wants the A–X. You want the Cheyenne.

General WESTMORELAND. The A–X will not be an adequate substitute for the Cheyenne. It will not perform the support that the Army requires for its infantry, to the extent that the Cheyenne will provide that support.

CHEYENNE ROTOR PROBLEMS

Senator YOUNG. I understood the Cheyenne has rotor problems.

General WESTMORELAND. We did, sir. We had a problem with the rotor. By virtue of a number of wind tunnel tests, we have determined what caused this, and the problem has been corrected by a redesign of the rotor.

Senator YOUNG. Complete redesign?

General WESTMORELAND. Yes, sir. We had trouble with the rotor at speeds over 190 knots. We now have a rotor that has been run for hundreds of hours and at speeds in excess of 200 knots. It has stood up quite well.

Senator YOUNG. How fast is the helicopter?

General WESTMORELAND. We hope it will have a maximum speed of 212 knots straight and level and more in a dive. That is the Cheyenne.

With respect to the rotor, the controls or gyroscopes have been redesigned. They were above the rotor blades themselves. A new arrangement has been developed by the scientists and engineers to provide these rotor control gyroscopes in another, more reliable way. All three of the prototypes will have the new rotor system on it.

Chairman ELLENDER. Proceed.

CHEYENNE EVOLUTION PROGRAM

General WESTMORELAND. During the next 6 months, the Army will complete an analytical and flight evaluation of these aircraft. This evaluation and continued testing of Cheyenne will provide the basis for a sound decision on the advanced attack helicopter program before the end of the year. If the presently stated performance requirement is validated the Cheyenne program will continue as currently budgeted. The Army is not married to the Cheyenne. If we select an alternative other than Cheyenne a determination will be made at that time as to what portion of the fiscal year 1973 funds will be required to complete sufficient of the Cheyenne program to capitalize on the technologies gained and applicable to any future helicopter program. Determination must also be made of the funds required in fiscal year 1973 to be reprogramed to initiate the new attack helicopter program.

Before reading this in my prepared statement, I had already explained this to you in more detail, this particular process.

As a note of interest, we have indications that the [deleted].

FUTURE ORGANIZATIONS AND DOCTRINE

When I last appeared before you, I told you of our planned "TRICAP" Division which was to bring together, for the first time in one division, the triple capabilities of an armored brigade, an airmobile brigade, and an air cavalry combat brigade. On May 5, 1971, the 1st Cavalry Division was activated at Fort Hood as the Army's TRICAP Division.

The purpose of the TRICAP test program is to evaluate proposed organizational concepts and doctrine, to determine additional requirements for doctrine, and to evaluate our triple capability concept in mid- and high-intensity warfare environments. The first TRICAP test started in February 1972. The program is expected to provide us information for a major force structure decision concerning TRICAP [deleted].

IN REVIEW

The Army's commitment to Vietnam during my 4-year tenure as Army Chief of Staff has placed enormous strains on our resources. I pay tribute to our many officers and men who served there with honor and distinction and at great personal sacrifice.

The most significant problem before the Army today is to assure the continuing accession and retention of quality manpower. We may soon enter a unique period in our history—a total Volunteer Military Establishment. Our first goal in the 1970's must be to offer our young men and women a challenging career in which there is room to grow as citizens, to achieve high standards, and to develop a strong sense of pride in themselves and their units. This we will do without sacrifice

of discipline, in fact we are tightening discipline, but in a fashion that is relevant to our mission and in the eyes of the young people who join our ranks. Increased MPA funds, which Congress has provided, and a significant increase in OMA outlays will be required to improve living conditions and support challenging training, in order to attract and retain the type of men we need.

The buildup of Army forces in Vietnam was accomplished at the expense of much needed Army modernization. Procurement of authorized levels of some critical equipment was deferred, and development and procurement of other modernization items have been marginally funded. The Army has identified capabilities that require modernization in order to maintain our qualitative advantage, which is essential. We may not be able to afford the largest Armed Forces in the world, but we must have the very best.

I have stressed our key goals for the 1970's, those which I feel are essential to strength, readiness and morale. How well we perform in these areas during this period of transition will depend upon leadership, resources provided, and support by the American people. With these ingredients, the Army will perform magnificently, as it has done in the past. Much of the freedom that is enjoyed in the world today is directly a result of the stability that our military strength provides. If we are to maintain our position as a world leader, and until our national interests or commitments change, our Army must be made strong and ready and of a size commensurate with its assigned missions. Our citizens should neither expect nor receive any less.

Thank you, Mr. Chairman.

Chairman ELLENDER. Are there any further questions?

Thank you very much.

QUESTIONS BY SENATOR THURMOND

Chairman ELLENDER. As I mentioned earlier, Senator Thurmond was unable to be here today but has asked that responses to questions he has supplied will be answered for the record. The questions as well as the answers of General Westmoreland will appear at this point in the record.

(The questions and answers follow:)

ROLE OF ARMY IN WITHDRAWAL FROM VIETNAM

Senator THURMOND. General Westmoreland, as our withdrawal from Vietnam progresses, what do you see as the major problems the Army will face in its new role as a deterrent force not committed to combat?

General WESTMORELAND. It is difficult to predict with absolute certainty what major problems the Army will face as it relinquishes its role as a combatant and reverts to being primarily committed as a deterrent force.

However, the Army is currently facing some societal trends that, when coupled with the MVA, could precipitate major problems as we move forward in our role as a deterrent force.

As a result of the MVA goal to reach an All Volunteer Army by 1 July 1973, we are currently experiencing low or no draft. This reliance on volunteers instead of draftees is diminishing the composition of the Army forces from that of a heretofore cross section of men to that of a more homogeneous force. The impact of this may be a lessening of civilian concerned attention focused on the role of the Army and the welfare of its members.

Inherent in a situation of lesser visibility is the problem of adequate Congressional support which is necessary to insure that the Army has adequate

funds and resources to continue to maintain the Army as a healthy, viable force able to cope with any contingencies which may arise. Further, transition from a combatant force to one of deterrence makes mandatory a worldwide credibility that, although our primary mission is one of deterrence, we are able to defend our nation and our principles. Without this credibility, deterrence as an effective defense is negated.

To this end, we must maintain a driving force, an esprit de corps, within the Army. In order to do this, we must have adequate support in resources and finances so that such programs as the new Dynamic Training Program will insure that our forces are constantly maintained as a "ready" Army.

Low or no draft may also cause a problem in recruiting personnel for our Reserve Components. As fewer men are drafted the impetus for joining the Reserve is diminished and necessitates formulation of another method of manning our Reserve Components.

Recent disenchantment with the Army over military involvement in Vietnam has left the Army with lessened public support. We are making progress in reinstilling spirit and pride within the Army, while simultaneously restoring the faith and confidence of the public.

In conjunction with this is the theory held by a small vocal minority that our society may no longer be willing to fight for general moral principles; rather, the morals involved must meet more stringent tests in line with current societal philosophies and beliefs.

The Army in the post-Vietnam environment is devoting more time to the community services, as it has throughout our history. As long as such community services are in line with the mission training of our forces, this is beneficial both to the Army and to society, and it has the collateral advantage of meeting the stringent moral standards of our evolving society.

Logistic Readiness of Army

Senator Thurmond. Generally speaking in what shape, equipment-wise, does the Army find itself in today?

General Westmoreland. There are 1046 Army units reporting logistic readiness to Department of the Army. This does not include USARV units which do not report readiness. Currently [deleted] of these units are achieving their authorized level for equipment. This is up from a low in 1969 of only 35%. As the requirement for equipment in Southeast Asia has declined, assets have become available for issue to other units. This improvement is expected to continue. The current objective is to have a minimum of [deleted] of all readiness reporting units achieve their authorized level of equipment by 30 June 1972. Despite the considerable improvement in the equipment posture of the Army, shortages still exist. These are primarily in the [deleted] area. Close management is being exercised to insure that these shortages are filled at the earliest practicable date.

Army Helicopter Gunship

Senator Thurmond. Do you feel that the Army will be able to state in the FY–1974 budget which one of the helicopter gunships it wishes to acquire?

General Westmoreland. The Army will know in time for the FY–1974 budget submission precisely which direction its advanced attack helicopter program should take. The advanced attack helicopter requirements evaluation is underway to redefine the capabilities which the Army wants in its advanced attack helicopter. Should the capabilities be similar to those of the Cheyenne, the Army will request procurement funds for Cheyenne. If the desired capabilities are substantially different than those possessed by the Cheyenne, the Army will request a new program based upon an industry competition. In such a case, the 36.5 million shown in the FY-1973 budget for three preproduction prototype Cheyennes will be the subject of reprogramming to the new program.

Cheyenne Prototype

Senator Thurmond. Why is it important to build production prototypes of the Cheyenne?

General Westmoreland. The three aircraft for which FY 1973 funds are requested are pre-production prototypes which will be as representative of the production configuration as feasible. They will be used to conduct extensive service and operational testing. The data gathered during these tests, which will

be performed by Army personnel, will allow correction of any deficiencies discovered during these tests to be incorporated into the production aircraft, as one year of testing will be completed prior to hardware procurement. Additionally, the prototype effort by the contractor will maintain the industrial team necessary to enter production.

Attack Helicopters

Senator Thurmond. How does the helicopter gunship relate to the Army's future force structure planning such as TRICAP?

General Westmoreland. The helicopter gunship is now integrated into the maneuver elements of land combat forces. Attack helicopters are organic to all divisions, and to cavalry units placed in direct support of or attached to the corps. They are, therefore, stationed with and commanded by forward unit commanders who will integrate their capabilities with the fire and maneuver of supported ground combat units. The TRICAP Division is currently equipped with 99 AH–1G (Cobra) attack helicopters. This chart reflects the current aircraft authorization for the TRICAP Division.

The advanced attack helicopter will fill existing operational limitations that exist in current attack helicopter systems in terms of responsiveness, mission effectiveness, sustained availability, accuracy, and discrete ordinance delivery under conditions of day, night, and adverse weather. The TRICAP attack helicopter authorizations, when the advanced attack helicopter is available, are 27 AH–1G (Cobra) helicopters and 60 advanced attack helicopters. The chart also reflects attack helicopter authorizations for the TRICAP Division when equipped with the advanced attack helicopter.

ATTACK HELICOPTER AUTHORIZATIONS

		With advanced attack helicopter	
	Current, AH–1G	AH–1G	Advanced attack helicopter
TRICAP Division:			
Aviation battalion: Assault helicopter company (3)	18	18	
Armored cavalry squadron: Air cavalry troop (1)	9	[2] 9	
Air cavalry attack squadron: Attack helicopter company (3)	[1] 45		45
Air cavalry squadron: Air cavalry troop	27		15
Total	99	27	60

[1] 15 AH–1G are armed with Tow missiles.
[2] 4 AH–1G are armed with Tow missiles in addition to the advanced attack helicopters.

Helicopter Gunship Concept Studies and Evaluations

Senator Thurmond. Are these new concepts tested and proven?

General Westmoreland. Yes, the Army is continually validating its attack helicopter concepts. The Army has been conducting studies and evaluation of helicopter gunship concepts since 1956. The Army has done extensive work in this area. It is consistently refining and improving upon the knowledge of attack helicopter employment gained through these tests and evaluations and combat experience in SEA. Currently the Combat Developments Command (CDC) is working on a continuing study to determine survivability of helicopters operating in various terrain and under simulated battlefield situations. Currently, the Army is conducting an extensive series of scientific tests on a fully instrumented range in California to resolve the uncertainties highlighted in the Assistant Secretary of Defense's close air support study which dealt with target acquisition and helicopter survivability. The results of these experiments have shown a marked advantage to a force with helicopters as an integrated member of the combat team. Additional tests will be conducted during April–July on new terrain at Fort Knox, Kentucky, or Fort Lewis, Washington to confirm the findings of CDC test 43.6. We intend to continue to evaluate our attack helicopter concepts through extensive evaluation during TRICAP testing being accomplished at Fort Hood, TX during the next two years. Data obtained thus far from these tests have confirmed the Army's conviction that the survivability of the land battle team is sufficiently high to warrant the incorporation of this weapon into the arsenal of the ground commander.

Army New Force Structures

Senator Thurmond. When will the Army decide on what new force structures it desires in the late seventies?

General Westmoreland. Annually, DOD makes decisions on the Army's Five Year Defense Program. The Army is presently in the midst of formulating its total program for fiscal years 1974 through 1978. Based upon planning assumptions, the Army's overall force structure program for the late seventies includes [deleted] divisions the same as programed for end FY [deleted]. This force structure was devised upon the assumption that no significant changes would occur affecting the presently planned strategy for the 70's, forward deployments (less Southeast Asia), and the end FY [deleted] programed funding and manpower levels.

As foreseen at this time, any changes that do occur will be internal to the [deleted] division force structure and would be caused primarily by the introduction of new technology, improved equipment and weapons systems such as tanks, aircraft, air defense and artillery systems. In this modernization we strive for greater combat power.

STATEMENT OF MAJ. GEN. JOHN A. KJELLSTROM

Chairman Ellender. Major General Kjellstrom, the Director of the Army budget has a prepared statement that will be included in the record at this point, dealing with the highlights of the fiscal year 1973 budget.

(The statement follows:)

I. Introduction.

Mr. Chairman and Members of the Committee:

It is a privilege to appear before you to present a summary of the Army's FY 1973 budget request. I will be followed by other Army witnesses who will present the details of each appropriation request within the purview of this committee.

Budget Formulation Objectives

The Army's budget was formulated with the objective of supporting the approved force structure required to accomplish its mission within the national strategy and, in so doing, to achieve a balance between the operating and investment appropriations. The most significant factors considered during the development and review of the budget were the achievement of a zero draft in accordance with the President's directive, the continued support of US and Free World forces in Southeast Asia, the continued improvement of our combat readiness posture and the development and procurement of the equipment necessary to sustain our authorized force.

Budget Review Process

The Army's FY 1973 budget request has undergone a series of review and analysis procedures beginning with the receipt of strategic and fiscal guidance from the Secretary of Defense early in 1971.

ARMY BUDGET PLAN
(In Millions of Dollars)

	TOA FY 1972	TOA FY 1973	Budget Authority FY 1973
Military Personnel, Army	8,172.4	7,703.1	7,703.1
Reserve Personnel, Army	476.0	529.5	529.5
National Guard Personnel, Army	597.0	616.3	616.3
Operation and Maintenance, Army	6,904.7	6,903.7	6,903.7
Operation and Maintenance, Army National Guard	380.1	468.5	468.5
National Board for the Promotion of Rifle Practice	.1	.1	.1
Procurement Appropriations	3,502.5	3,325.4	3,325.4
Research, Development, Test and Evaluation, Army	1,878.7	2,068.7	2,068.7
Subtotal	21,911.5 1/	21,615.3	21,615.3
Military Construction, Army	539.0	1,019.2	1,009.2
Military Construction, Army Reserve	33.5	38.2	38.2
Military Construction, Army National Guard	29.0	40.0	40.0
Subtotal, Construction	601.5	1,097.4	1,087.4
TOTAL ARMY PROGRAM	22,513.0	22,712.7	22,702.7

May not add due to rounding.

1/ Includes following supplemental request:

14 November 1971 Military Pay Raise	$702.4
Wage Grade and Foreign National Increases	53.3
RDT&E,A Programs	28.0
1 January 1972 Military and Civilian Pay Raises	305.9
	$1,089.6

All Army programs were reviewed by the Program Guidance and Review Committee prior to submission of the Program Objective Memorandum (POM) to the Office, Secretary of Defense (OSD) in June 1971. The Budget, based upon the POM, was further refined prior to its submission to OSD 30 September 1971 by the Secretary of the Army. The final review and analysis was performed jointly by the Office of the Secretary of Defense and the Office of Management and Budget. The Army's portion of the FY 1973 President's Budget is the product of extensive reviews and analyses and represents a well-balanced budget within available resources. In our estimation, the Planning, Programing and Budgeting System revised by OSD last year has worked quite effectively.

II. Army Budget Summary

The total Army program for FY 1973 is $22.7 billion compared to $22.5 billion in FY 1972. This varies from the President's Budget due to the addition of the 1 January 1972 military and civilian pay raise. These additional costs are included for a half year in FY 1972 and a full year in FY 1973.

The chart on the opposite page shows the Army's FY 1973 Budget Plan by appropriation. Although military construction requests are not made before this subcommittee, this chart includes these requirements to provide a more comprehensive perspective of the Army's total budget request.

BUDGET TRACK FROM FY 1972 ENACTMENT
(In Millions of Dollars)

	FY 1972 Enactment	Supplemental Requests	Transfers & Adjustments	FY 1972 Revised Program
Military Personnel, Army	7,315.6	761.7	95.0	8,172.4
Reserve Personnel, Army	385.1	62.2	28.7	476.0
National Guard Personnel, Army	485.9	111.1	-	597.0
Operation and Maintenance, Army	6,661.2	105.3	138.2	6,904.7
Operation and Maintenance, Army National Guard	369.9	10.1	-	380.1
National Board for the Promotion of Rifle Practice	.1	-	-	.1
Aircraft Procurement, Army	90.4	-	16.2	106.6
Missile Procurement, Army	940.8	-	92.5	1,033.3
Weapons and Tracked Combat Vehicles, Army	145.5	-	-	145.5
Procurement of Ammunition, Army	1,418.3	-	300.0	1,718.3
Other Procurement, Army	512.3	-	-13.5	498.8
Research, Development, Test and Evaluation, Army	1,787.7	39.1	51.9	1,878.7
TOTAL	20,112.9	1,089.6	708.9	21,911.5

FY 1972 Budget Track

The chart on the opposite page shows a budget track from enactment of the Department of Defense Appropriation Act, 1972 (P. L. 92-204) to the FY 1972 program as presented in the FY 1973 budget. Supplemental requests for pay raises and for a program increase in RDT&E amount to $1,089.6 million. The remaining increase of $708.9 million is for the following:

Public Law 92-204 authorizes the transfer from prior year funds of $100 million to Missile Procurement, $200 million to Procurement of Ammunition and $51.9 million to Research, Development, Test and Evaluation.

Pursuant to Section 736, P. L. 92-204, the following transfers have been requested:

Military Personnel, Army - $95 million: This requirement results primarily from a temporary overstrength in the grade of Captain and increases in Permanent Change of Station, Travel rates.

Reserve Personnel, Army - $28.7 million. This increase provides for the funding of additional FY 1972 Active Duty training for officer requirements and additional ROTC subsistence allowances.

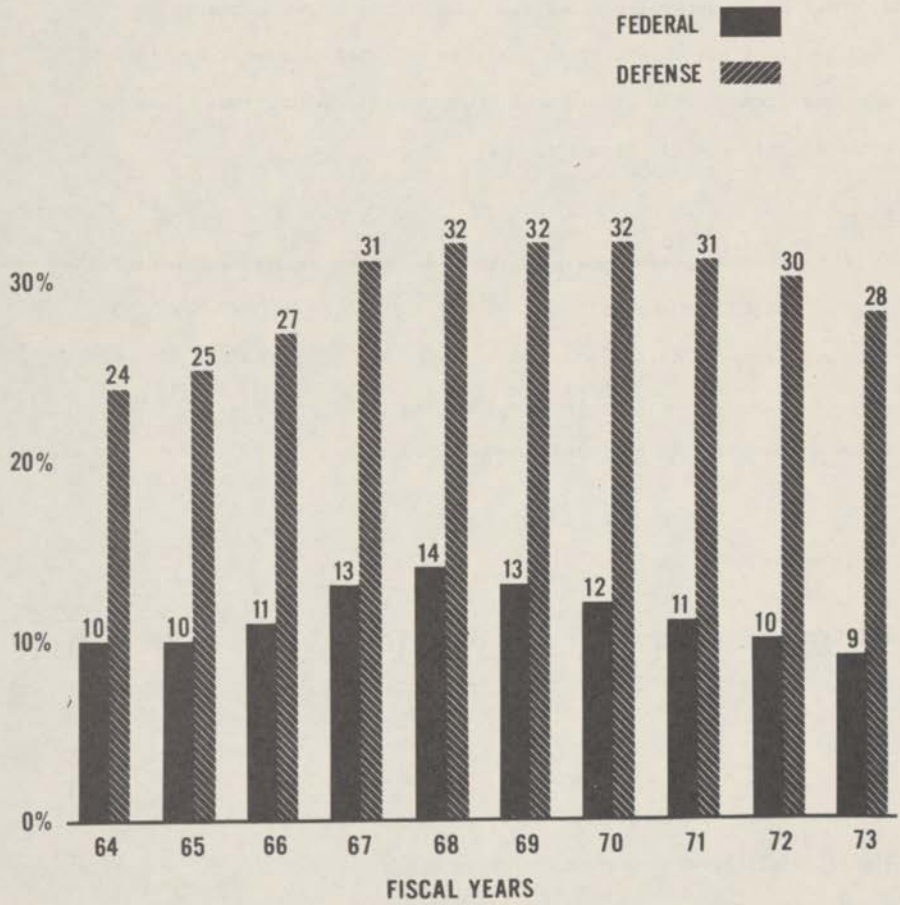
Operation and Maintenance, Army - $141 million. This requirement results from increases in CHAMPUS ($53 million), medical supplies ($27 million), recruiting activities ($20 million), currency revaluation

($38.1 million) and civilian health benefits insurance ($2.9 million).

Aircraft Procurement, Army - $16.2 million. These funds are required to finance the procurement program for aircraft and related support items approved by Congress for FY 1972 through the use of available prior year funds.

Receipts for augmentation and modernization sales in Procurement of Ammunition, Army are estimated to be $100 million and will be applied to finance the FY 1972 program. A transfer of $2.7 million to the General Services Administration from Operation and Maintenance, Army for real property leases in accordance with current Office of Management and Budget directives has been requested. Program reductions of $7.5 million in Missile Procurement and $13.5 million in Other Procurement were made by OSD during the FY 1973 budget review process.

ARMY OUTLAYS AS A PERCENT OF
THE FEDERAL AND DEFENSE BUDGET



Army Budget Trend

The chart on the opposite page shows Army outlays as a percentage of the Federal and Defense Budget. The Army's share continues to decline since the peak Vietnam war year (FY 1968), consistent with the downward trend of the effort in Southeast Asia and the reductions in both military and civilian manpower.

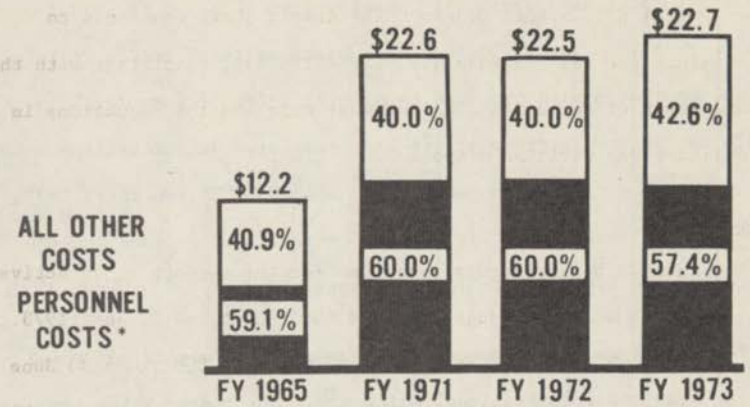
Manpower

The FY 1973 budget request provides for the support of an active Army of 861,228 at end 30 June 1972 and 841,190 at end 30 June 1973. This represents a force reduction of more than 282,000 since 30 June 1971 and almost a half million in the span of three years. The table below summarizes the approved manpower program:

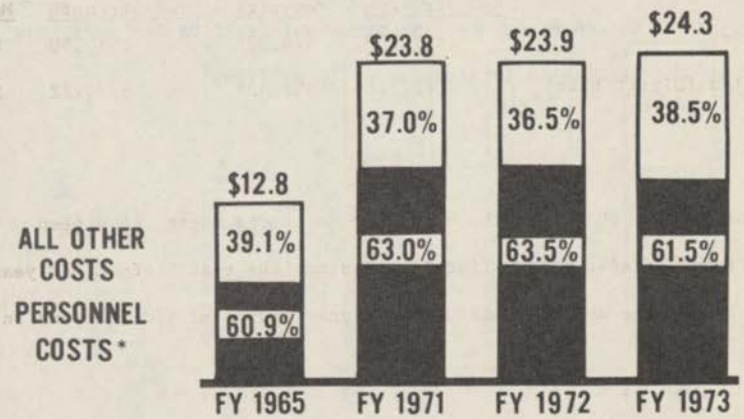
	FY 1972		FY 1973	
	End Strength	Manyears	End Strength	Manyears
Military	861,228	974,309	841,190	869,932
Civilian (Direct Hire)	368,216	397,424	367,122	372,306

Man-years, which are the basis for computing costs, have been significantly reduced each fiscal year since the peak Vietnam war year in FY 1968. The approved military man-year figure of 870 thousand in

PERSONNEL COSTS AS A PERCENTAGE OF THE ARMY BUDGET
(TOTAL TOA IN BILLIONS OF DOLLARS)



*PERSONNEL COSTS INCLUDE MILITARY, CIVILIAN AND RESERVE PAY



*PERSONNEL COSTS INCLUDE MILITARY, CIVILIAN AND RESERVE AND RETIRED PAY

FY 1973 represents a reduction of 617 thousand man-years or 42% since FY 1968 and 104 thousand man-years since FY 1972. The percentage of officers to total man-years will decrease from 14.2% in FY 1972 to 13.7% in FY 1973. The percentage of top six enlisted grades to total enlisted man-years will increase from 69.2% in FY 1972 to 70.2% in FY 1973 as the Army approaches its baseline force authorizations within these grades. Civilian man-years will decline by 25,000 in FY 1973, reflecting the President's Directive, Congressional actions and the transfer of the Ryukyuans to indirect hire status.

The charts on the opposite page show a comparison of personnel costs to Army total obligational authority. The chart at the top includes military, civilian and reserve pay, while the bottom chart adds retired pay to these totals. Personnel costs decline in FY 1973 and represent a smaller percentage of the Army budget than in any of the prior years shown except FY 1965 when retired pay is added to the total. Thus, increases in pay and personnel benefits are more than offset by the decline in total manpower in FY 1973.

A. SOLDIER ORIENTED PROGRAMS

The Army's response to achieving a zero draft has been described by the Secretary of the Army and the Chief of Staff. Within the FY 1973 budget request are many programs, which we refer to as Soldier Oriented Programs, orchestrated to attain this overall objective. These programs are categorized by what they do, e.g., enhance professionalism, improve Service life and modernize the accession system.

Enhance Professionalism

Certain budget items are designed to improve training by reducing diversions from unit strength by completing the worldwide program to hire civilian mess attendants and to replace soldiers performing base support functions with civilians. Closely allied to military training is the educational development of the individual soldier. The Army has initiated a ten year civil education program which includes expanded schooling opportunities for both officers and enlisted men. The Army continues to emphasize a number of programs to prepare the soldier to become a more valuable citizen, such as:

-- The general education development program in which the soldier can obtain a high school diploma or receive college credits.

-- Project Transition which, just prior to discharge, trains and orients the soldier to return to civilian life.

-- The referral program, which endeavors to match the skills of a retiring soldier with available job vacancies.

Improve Service Life

There are, in this budget request, programs designed to improve Service life. Because of higher priorities for limited funds during the past several years, resources have not been available to achieve and maintain desired standards of living for many of the Army's soldiers and their families. Unsatisfactory living conditions have developed in many areas, particularly in troop housing in Europe. The current worldwide estimate is that 118,000 of our military families and 450,000 of our bachelor officers and enlisted personnel are inadequately housed. Over 110,000 new barracks and BOQ spaces are needed to replace the inadequate structures now in use. Virtually all existing permanent troop housing must be modernized to provide living conditions which meet today's desired standards. The Army is proposing to undertake a vastly expanded and accelerated housing program during the next five years. In the FY 1973 budget we are requesting funds to:

-- Construct barracks for approximately 16,000 soldiers.

-- Modernize barracks for approximately 52,000 soldiers.

-- Construct 4,400 new family housing units.

-- Increase Family Housing leases from 4,100 in FY 1972 to 5,500 in FY 1973.

-- Expand our programs for the maintenance and repair of all types of housing.

The completed negotiations with the Federal Republic of Germany (FRG) will provide goods and services for the rehabilitation of long-

neglected US soldier and airman barracks and troop facilities in Germany. Under the terms of the Offset Agreement, the FRG will provide goods and services equal to 600 million Deutschemarks (approximately $186 million) during the remainder of FY 1972 and FY 1973. The Army's share amounts to approximately $176 million, which will be used to accomplish a substantial portion of the barracks rehabilitation program. The Army's budget request to OSD in FY 1973 was reduced $89 million as a result of the Offset Agreement.

Post facilities also contribute to the standard of living and well-being of the soldier and his family. These facilities include the commissaries, laundries, post exchanges, and medical services. Commissary store service was expanded and improved this past fiscal year by increasing the number of employees, extending sales hours, accepting merchandise coupons, authorizing in-store sales promotion, and increasing the variety of items authorized for sale. Similar improvements were made in the laundry and dry cleaning service.

Extremely important to the soldier and his family are medical services. We are intensifying our health education programs in our military communities as a means of furnishing advice on the maintenance of health. The Civilian Health and Medical Program of the Uniformed Services (CHAMPUS) program is acknowledged as one

of the great benefits bestowed by Congress on servicemen and we are continuing our efforts to provide information to all eligible personnel regarding the benefits of this program.

The Army appreciates the actions of the Congress in enacting Public Law 92-129 which increased the quarters allowance and the pay of the lower officer and enlisted grades in September of last year, as well as providing for the additional increase in basic pay which became effective on 1 January 1972. The adjustments have substantially closed the gap between military compensation and private enterprise pay. These increases in basic pay and basic allowances for quarters, the new enlistment bonus for combat arms enlistees, and the authority to reimburse recruiters for out-of-pocket expenses are all provisions of the new law which will contribute to service attractiveness. As you know, the Army is now paying a variable reenlistment bonus to selected military occupational specialities in the combat arms. These are the men who bear the burden of fighting in wartime and endure the greatest hardship. They are also the hardest to recruit and retain. Drill sergeants are also being paid a special proficiency pay to encourage retention of these essential noncommissioned officers.

Modernize the Accession System

The Army has taken three steps within the accession system to reduce reliance on the draft by:

-- Increasing the size of the recruiting force from 3,500 to 6,100 by the end of FY 1972 and opening up over 600 new recruiting

stations throughout the country to locate these new recruiters in new geographical areas.

-- Developing new and better enlistment options. The option for combat arms enlistees offering a choice of assignment to one of twelve major units in CONUS, and the option which offers a choice of training in one of our military occupational specialty career groups combined with a choice of assignment to either Europe or Korea are of particular interest.

-- Increasing the advertising program. The FY 1972 advertising program was designed to increase enlistments by presenting enlistment opportunities to the target audience. Our experience up to the present has made us realize that an ambitious advertising program is essential in obtaining the target audience required for enlistments in the Army. For this reason, we plan to continue an ambitious advertising program throughout FY 1973.

Two procurement programs for professional personnel are of particular importance -- lawyers and doctors. Of the 1,668 judge advocates now on active duty 1,190 are junior officers serving their initial obligated service. Experience has shown that less than 10 percent of these officers remain on active duty after completion of their obligation. DoD proposed legislation before Congress provides for increased monetary compensation for military lawyers. Passage of this bill will assist in our efforts to retain career lawyers in the Armed Services.

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The primary reason for our inability to retain professional health-care officers beyond their obligatory period of service is the great disparity between their military salaries and their potential earnings in civilian practice. As in the case of lawyers, prompt enactment of the pending legislation would help our efforts to achieve a volunteer medical force. The act provides scholarships for medical professional personnel and establishes a university of health sciences. The latter includes a medical school and offers opportunities for medical personnel to continue their education and to update their skills and knowledge.

B. MATERIEL PROGRAMS

While the objective of achieving a zero draft is important, the development and procurement of modern weapons is equally important, and the FY 1973 budget request provides for a balance of funds to achieve and maintain a qualitative advantage in weapons systems. The following are highlights of these systems.

Tank and Antitank Systems

Future funding beyond the authorized FY 1971 and 1972 funds for the M60A1E2 SHILLELAGH missile firing tank was dependent on the results of engineering and service testing during calendar year 1971. As a result of these successful tests, the M60A1E2 was designated the M60A2 and type classified Standard A in November 1971. We have included funds in the FY 1973 budget to complete the retrofit production of the last 316 of the 540 total. The M60A2 will provide a much needed missile firing tank capability to complement our M60A1 tank inventory.

In addition, we are asking for funds to buy 166 M60A1 tanks -- our current standard main battle tank. These 166 plus the 316 M60A2 retrofits will continue the Army's plan to upgrade its tank inventory to tanks mounting 105mm guns or better.

Recognizing that our needs for new equipment far exceed available funds, especially in tank procurement, the Army has pursued a very conservative M60A1 Product Improvement Program. This program will phase product improvements of fire control, mobility, maintainability, and realiability into our current M60A1 fleet at a rate consistent with our rebuild and new production schedule. Funds to continue development and testing of these improvements at a low risk level are included in the FY 1973 budget.

With over a year of experience with the TOW antitank missile system in the field, the Army is extremely satisfied with its performance. In over 2,000 firings, reliability requirements have been met and accuracy requirements exceeded. This versatile system, in successfully completing the arctic, desert, and tropic environmental tests, has demonstrated that it can be employed any place in the world. The FY 1973 budget request will provide funds to continue equipping our forces and replacing the outmoded 106mm recoilless rifle.

Our Medium Antitank Weapon, the DRAGON, has proved to be an excellent weapon, and we have budgeted for our first quantity production procurement in FY 1973. The weapons will be used to equip a small training base and to initiate equipping our forces in Europe. The

DRAGON system, designed to be carried by one man, is complementary to the TOW system, and will serve as the primary antitank assault weapon for the Infantry Platoon.

Missile Systems

The procurement of the LANCE missile system moves into its third year in FY 1973. LANCE is replacing the obsolescent HONEST JOHN and SERGEANT systems, giving the ground commander a highly responsive, mobile, all-weather missile capability with fewer personnel and less annual operating costs. Plans are being formulated to replace the remaining active HONEST JOHN and SERGEANT battalions located outside of Europe with LANCE.

Procurement of PERSHING missiles to replenish the inventory is continued this year from the FY 1972 procurement. Progress continues in our program to increase and improve battlefield air defense. We have now trained and equipped about 70 percent of the programed CHAPARRAL/VULCAN units. Our FY 1973 budget request includes funds to continue testing and evaluation of the improvements to CHAPARRAL/VULCAN. If currently planned improvements meet our expectations the effectiveness of the CHAPARRAL will almost double.

We are continuing the program to improve the HAWK system which is

designed to defend against high-speed aircraft at low and medium altitudes. Recent successful missile tests allowed us to classify the Improved HAWK Standard A in December 1971. Our 1973 request provides for Improved HAWK missiles and related support equipment. This request is the fourth of seven procurement increments in our Improved HAWK program.

The Army requires a modernized, highly reliable and significantly more effective air defense weapon system to replace HERCULES and HAWK. The Surface-to-Air Missile Development (SAM-D) fire unit with a multi-function phased array radar, high speed computer, and hypersonic missile provides the required modernization. SAM-D will have the capability of multiple simultaneous engagements, will possess a greater target handling capability, and will permit a reduction in manpower and maintenance requirements.

The SAM-D weapon system is nearing completion of the advanced development program with no fundamental technical problems. An advanced development phased array radar model has been built and is tracking multiple live targets. Engineering development is planned to start in March 1972. This program will begin with the design and fabrication of tactical prototype hardware of the SAM-D system and will be funded, in part, by the FY 1973 budget.

Aircraft

The Army has learned a great deal in Southeast Asia concerning the

value and employment of airmobile concepts -- the widespread application of aerial vehicles to all phases of ground combat. Drawing from these lessons and reviewing our on-going technological advancements in the helicopter field, the Army is confident that helicopters will prove equally valuable in a mid-intensity conflict. Consequently, the aviation structure within the Army is being tailored considering new threats and environments and is oriented worldwide with emphasis on NATO requirements.

Smaller forces, if they are to be effective, must have the greater mobility and firepower which aircraft can provide. Integration of attack helicopters into the division structure will enrich the overall potential of these units, as well as air cavalry squadrons in each infantry and airborne division. At the same time, our antitank capability will be significantly increased. For Reserve Components, combat effectiveness is being enhanced by an increased fleet of modern aircraft. By the end of FY 1973, the Reserve Components will have 99 percent of their required aircraft, of which 80 percent will be the preferred type.

The CHEYENNE advanced attack helicopter continues to be one of the Army's highest priority development programs. It is a key element in the total spectrum of firepower for future use of ground commanders. Armies have sometimes been accused of fighting tomorrow's wars with

yesterday's weapons. Such is not the case with the CHEYENNE. Our Army of the 1980s is destined to be airmobile -- able to respond quickly and forcefully at any given point on the battlefield. The CHEYENNE -- as a vital member of that inseparable team of fire and maneuver -- will play an indispensable role in the airmobile Army.

During the past year, several significant milestones were achieved in the CHEYENNE development program. The aircraft began Army flight and firing tests in January, a restructured development contract was signed in August, and in September night firing tests were initiated with the TOW antitank missile. In these latest tests, Army gunners have demonstrated the CHEYENNE's unique ability to detect and kill tanks at night out to a maximum effective range of 3,000 meters. This same capability exists in low visibility conditions such as smoke and light fog.

During last year's Congressional review of the special reprograming action to settle the litigation of the terminated production contract and to fund the restructured CHEYENNE development contract, $17 million of the reprogramed funds were identified as an FY 1973 requirement which should be included in the new budget request. Accordingly, the FY 1973 budget includes $17 million to complete CHEYENNE development plus $36.5 million to upgrade two CHEYENNE prototypes into a preproduction configuration and to complete the fabrication of one CHEYENNE that was started under the original production contract prior to its cancellation. These aircraft will permit the Army to conduct expanded Service and operational type tests.

It is anticipated that a production decision on the CHEYENNE will be made prior to the Fiscal Year 1974 budget submission. This decision will be based on the results of the Army's evaluation of the Advanced Helicopter Requirement; the final results of R&D acceptance testing, which to date have been highly satisfactory; the completion of comparative effectiveness studies which include investigation of two industry-sponsored helicopters in the advanced aerial fire support role; and the results of instrumented testing designed to support the efforts of the Department of Defense Close Air Support Study Group.

The Utility Tactical Transport Aircraft System, referred to as UTTAS will be the Army's first true squad carrier. It is designed specifically to provide tactical air transport of troops, equipment, and supplies in combat operations, and will replace the UH-1 in this role. The UTTAS development is a low risk program that will draw heavily on new technology to develop a helicopter with significant improvements over existing helicopters. Emphasis will be placed on proven components and improving maintainability and reliability. These advancements will result in reduced operational costs and manpower requirements. The UTTAS program is presently in the contract definition phase of development. The engine competition was concluded last December when General Electric was selected competitively to develop the UTTAS engine. Request for quotations on the airframe were released to industry in January. Responses are expected on or before 31 March 1972. Our plans are to conduct a prototype fly-off between two competing contractors with government competitive testing completed in the first quarter of FY 1977.

AIR AND WATER POLLUTION ABATEMENT PROGRAM
(In Thousands of Dollars)

APPROPRIATION	FY 1972 AIR	FY 1972 WATER	FY 1973 AIR	FY 1973 WATER
Operations and Maintenance, Army	$ 1,758	$ 276	$ 4,178	$ 3,100
Procurement Appropriations	2,096	3,138	10,932	6,461
Military Construction, Army	35,304	33,421	31,723	40,059
Reserve Components	33	60		73
Subtotal	$39,191	$36,895	$46,833	$49,693
Total	$76,086		$96,526	

The Department of Defense Heavy Lift Helicopter (HLH) program will provide a new capability to transport loads up to 22½ tons, a significant increase over the present ten ton capability. The HLH is being designed to meet the heavy lift requirements of all Services. During the past year a contract was signed with Boeing Vertol to develop the critical components in order to reduce technical risks and to obtain valid cost estimates prior to entering engineering development. A prototype program will be initiated in FY 1973 with the first flight scheduled for FY 1975.

C. AIR AND WATER POLLUTION ABATEMENT PROGRAMS

In compliance with Executive Order Number 11507 dated 4 February 1970, which directed that actions necessary to abate or minimize air and water pollution at existing Federal installations are to be completed or underway no later than 31 December 1972, the Army has programed $76.1 million in FY 1972 and $96.5 million in FY 1973 for air and water pollution abatement programs. The chart on the opposite page shows the distribution of funds by appropriation.

Air pollution programs provide for various types of devices such as fly-ash separation, fume abatement systems, stack gas monitors and alarms, fuel conversion and construction and modernization of incinerators. Water pollution programs provide for construction, expansion and modernizing of existing sanitary and industrial waste systems, construction of dikes around fuel storage tanks, construction of drainage lagoons, installation of flood gates and installation of oil and grease traps.

Research and Development

In addition to the programs previously mentioned, the Army's Research and Development funding for pollution abatement is $6.3 million in FY 1972 and $21.0 million in FY 1973. Research and Development accomplishments include the development of a sewage disposal system for cold areas, a method for degradation of nitrocellulose wastes and disposal of deteriorated explosives, reduction of smoke levels in propellants, development of a stratified-charge internal combustion engine that accomplishes a higher percentage of fuel combustion and reduces polluting emissions to near 1976 emissions criteria.

D. INFLATION AND THE ARMY BUDGET

Over the past year, the Department of the Army has made a concerted effort to identify its cost growth or inflation experience relative to specific prices in the private economy. In the non-compensation areas, the FY 1973 Army Budget reflects this actual inflation experience over the past year by appropriation as follows:

	Percent Cost Growth
Procurement-Other than SAFEGUARD & Ammunition	4.56
Procurement -SAFEGUARD	5.12
Procurement Ammunition	.72
RDT&E	5.69
MCA, MCAR, MCARNG	11.10
O&MA	5.35
OMARNG	6.45
MPA	3.27
NGPA	.85
RPA	.63

The FY 1973 Army Budget was prepared in terms of prices prevailing

COST GROWTH IN FY 1973 BUDGET
(In Millions of Dollars)

APPROPRIATION	COST GROWTH
Military Personnel, Army	$ 32.7
Operations and Maintenance, Army	194.2
Procurement Appropriations	134.9
Military Construction, Army	76.5
Reserve Components	7.1
Total	$445.4

as of August and September 1971. For the operating appropriations, the Budget submission merely reflects the actual inflation over the past year and does not anticipate any inflation beyond September 1971. The President's 15 August 1971 announcement, therefore, should result in the Army having to absorb a lower level of inflation over the past experience. The President's announcement also resulted in a floating of the dollar exchange rates relative to foreign currencies. The effect of higher foreign currency costs on local operating requirements through early December 1971 (e.g. 11.7 percent for the Deutschemark) is included in the FY 1973 Budget.

The chart on the opposite page reflects those additional funds by appropriation that were included in the FY 1973 Army Budget for cost growth and foreign currency revaluation in non-compensation areas.

E. ITEMS OF CONGRESSIONAL INTEREST

Senior Advisor Family Leave Program

On 29 November 1971 proposed legislation which provides statutory authority for continuation of the special family leave incentive was introduced in the House of Representatives by Mr. Hebert as H. R. Bill 11936. In the conference report on the Department of Defense Appropriations Act which was adopted by Congress on 15 December 1971, the general provision authorizing the family leave incentive was continued, but with a termination date of 31 March 1972. In recognition of the

importance of the province and district senior advisor programs and the contribution these individuals are making in the Vietnamization Program, it is imperative that every possible effort be made to have the above legislation enacted by 31 March 1972.

Proficiency Flying

The Office of the Assistant Secretary of Defense (Manpower and Reserve Affairs) has dispatched a Memorandum to the Service Secretaries directing that the provisions contained in Section 715, PL 92-204, Proficiency Flying, be implemented. Army implementing instructions are presently being staffed within the Department of the Army. While curtailment of proficiency flying will be substantial, a final assessment as to the magnitude of the impact on the Army Proficiency Flying Program can not be determined at this time.

Concurrency in the Development and Production of Weapons Systems.

The Army plans to the maximum extent possible to delay the decision to enter full-scale production until completion of operational tests. Changes within program planning policies have been initiated to insure that the decision to enter full-scale production is not made prematurely. The principal changes initiated have been to intensify operational test and evaluation practices so that the decision to enter full-scale production can be based on the results of these tests.

Army Regulation 70-10, entitled "Test and Evaluation During Development and Acquisition of Materiel," requires that prior to making a production decision, equipment will be tested, insofar as possible, in a realistic tactical environment to include simulated combat conditions when appropriate. The results of these tests and the supporting data for the Army's decision to enter full-scale production will be presented for approval to the OSD Phase III Defense System Acquisition Review Council (DSARC) in line with present OSD policy.

Leased Sedans

Preliminary investigation indicates that leasing from the General Services Administration is the least costly method of obtaining sedans for support of the expanded recruiting effort. However, it has not yet been determined that GSA can be fully responsive to Army needs as to number and availability of vehicles. The OASD(M&RA) is consolidating the Service requirements and will make a single DoD request to GSA to determine if GSA can meet the DoD requirements at the lowest cost. Pending this determination, the FY 1973 budget estimate reflects GSA rates. The source and method meeting DoD requirements will be used to obtain vehicles for recruiters.

Size of Headquarters Staffs

The Army has programed an end FY 1972 reduction of 227 military spaces in headquarters staffs for a savings of $1 million in military

Personnel, Army and a reduction of 425 civilian spaces in headquarters activities Army-wide for a savings of approximately $2.5 million in Operations and Maintenance, Army. An additional $1.4 million in OMA will be assessed against headquarters costs such as travel and the purchase of supplies, equipment and services. Between end FY 1965 and end FY 1972, the Army will achieve a 1,190 reduction in military spaces and an end strength reduction of 867 direct hire civilian personnel.

However, it was not possible to reduce FY 1972 by the amount initially estimated in the FY 1972 budget. Heavy workloads due to Army withdrawals from Vietnam, reductions in total Army strength and many new Army programs impacted heavily upon the Department of Army as well as our field headquarters. Accordingly, it was necessary to restore 407 military personnel to the FY 1972 end strength, including 283 in the departmental area. An offsetting reduction was made in other administrative areas.

Public Affairs

Action has been initiated to reduce funding for military and civilian personnel in public affairs, public relations and public information. The FY 1973 request of $8.4 million for these activities includes a reduction of 26 military and 11 civilian spaces and $533,000 from the FY 1972 level. This complies with Congressional action taken on the FY 1972 Appropriation Bill. The revised FY 1972 estimate of $8 million is $600,000 higher than the initial FY 1972 estimate due to civilian and military pay raises and the inclusion of public affairs activities in four

commands not previously included in this estimate. Beginning in FY 1972, the Army established a separate program element in Operation and Maintenance, Army to maintain centralized control of public affairs activities worldwide. This action will enable the Army to monitor public information activities and insure compliance with existing directives.

Leasing of Administrative Support Aircraft

On 4 January 1972, the Army provided comments on a draft DoD Instruction which will provide DoD policy to the military departments on the use of administrative airlift support. The world-wide Army requirement for administrative aircraft support is being determined at the present time.

Maintenance Cost Accounting System

The Army has designed and is staffing a uniform accounting and reporting system for depot maintenance. The system will enable more effective management and financial control and more efficient operation including improved manpower utilization. Data will be provided managers at all levels for meaningful cost and effectiveness analysis of organic activities and comparison with those operated by contractors. World-wide implementation of the system is planned for FY 1973.

Mandatory Mental Group Quota System

The Assistant Secretary of Defense (Manpower and Reserve Affairs) be memorandum dated 14 January 1972 cancelled Mental Group IV quotas. The Army's quota was 20 percent of new accessions. ASD(M&RA) emphasized

that elimination of the quota was not intended to be a cessation of acceptance of Mental Category IV personnel. The Army's policy is to continue to accept a fair share of men who meet the current enlistment standards provided there are jobs where they can be used.

Other Congressional Interest Items

The CHEYENNE advanced attack helicopter and Pollution Control are discussed separately in this statement.

III. RESOURCE MANAGEMENT

The Army continuously seeks ways to reduce expenditures and economize on resources. There are at the present time several related activities whose mission is to achieve savings of manpower and dollars and obtain the greatest return for the resources available. The following actions reflect the Army's desire to improve efficiency and reduce resource requirements.

Management Analyses.

Analyses of major command world-wide and multi-command analyses within specific geographical areas have been conducted in order to identify organizations, functions and activities that are susceptible to relocation, consolidation, reduction or elimination.

These analyses have been conducted at Continental Army Command, United States Army, Europe, United States Army Strategic Communications Command, Office of the Surgeon General and the Philadelphia and San Francisco geographic areas. These analyses have resulted in a savings of $61 million and these savings have served to reduce this budget. A command analysis

of United States Army, Pacific and a regional analysis of the New York Metropolitan area is scheduled for the future.

Management Practices

Management practices are currently being taught to first line managers in company and battalion size units in the Army structure who work in administration, supply and maintenance areas. The training program includes subjects such as work measurement, improvement of methods of operation, quality assurance, soldier motivation and the management process. All divisions in the United States have received the training and divisions in US Army, Europe are currently undergoing the training.

Reduction of Reports

As a result of a study to assess and validate essential reports, the Army was able to rescind or revise 294 reports and generate $26 million in savings. Further, cost avoidance savings such as reducing requirements on contractors came to $4.7 million and an additional $4.4 million will be saved if the Department of Defense and other Federal Agencies take our recommendations to revise or rescind reports. Although the government-wide study is complete, the Army is continuing its efforts to prevent the proliferation of reports and to review current reports in order to recommend revision or elimination as appropriate.

Cost Reduction Program

The objective of the Army's Cost Reduction Program is to improve management and operating practices at all levels and to stimulate positive management improvement actions that will insure the achievement of our required objectives at the most economical cost. Major commanders are

responsible for carrying out the program and Department of Army Staff supervision has recently been transferred from the Deputy Chief of Staff for Logistics to the Comptroller of the Army. In Fiscal Year 1971 the Army achieved $638 million in savings against a $346 million goal. Examples of cost reduction efforts are:

a. Artillery Testing Procedures. Watervliet Arsenal developed a new method for testing breech pressure of the 175mm and 8" howitzers. The new method simulates firing pressures and eliminates the need for actual firing. Savings approximated $223,000 in FY 1971.

b. Rebuild of Assemblies. Anniston Army Depot developed a technique for reclaiming tank turret race ring assemblies. Prior to the development of this technique, approximately 50% of the assemblies were being discarded as unserviceable during rebuild of tanks. This action produced savings of more than $350,000 in FY 1971.

c. Direct Purchase of Rocket Motors. Picatinny Arsenal determined that substantial savings would result by purchasing certain component parts of rocket motors directly from the manufacturer and supplying them to the prime contractor as Government furnished material. Savings of approximately $230,000 were realized during FY 1971.

d. New Method for Loading Helicopters. A new "side saddle" method of loading helicopters on C-141 aircraft saved approximately $733,000 in the retrograde of damaged helicopters from Vietnam during FY 1971. The new procedure involves the placing of tail booms on the sides of the helicopter rather than on top and increases the carrying capacity of the aircraft from two to three helicopters.

Logistics Offensive Program

In his statement to you at the FY 1972 hearings, the Secretary of the Army briefly discussed the progress that the Army had made in the logistics area through the Logistics Offensive Program. Since that time, the benefits from the Logistics Offensive Program have continued to increase at a rapid rate. I would like to describe some of the more striking results.

While good progress toward streamlining our logistics system is being made in all major commands, the success of the program in the Pacific - completed in November 1971 - deserves a special mention. Various types of supplies maintained as depot stocks in Thailand, Korea, and Japan have been reduced by approximately 300,000 short tons. Cumulative dollar benefits were $8.7 million in the Operation and Maintenance, Army appropriation; $54.3 million in the Army Stock Fund; $164 million in Army procurement appropriations; and $13.1 million in the Military Personnel, Army appropriation.

Emphasis is being placed on the proper disposition of serviceable materiel, repairables, excesses, and unserviceable materiel to property disposal activities. The importance of this activity is obvious since the value of materiel processed under this program reached $5.6 billion in FY 1971 with an additional $700 million from July through September 1971.

In further efforts to economize, the Army is overhauling unserviceable engines and components and furnishing them to contractors to be installed

in new production aircraft in lieu of installing new engines and components. The first deliveries of new aircraft with these rebuilt items began in January 1971. At the end of September 1971, the dollar benefits through procurement costs in this area stood at $32.2 million. The total benefits expected by the end of FY 1974 are $114.8 million, including $40.3 million for the Air Force in its UH-1 program. These dollar figures are net costs after deduction of overhaul costs.

We initiated a program in 1970 to modernize the ammunition production facilities which were constructed during the early years of World War II. These facilities have supported our effort during WWII, Korea, and most recently in Southeast Asia. Due to their antiquated technology, extensive usage, and lack of automation, the facilities are costly to operate, unsafe, and not fully responsive to mobilization requirements. The program to modernize these old facilities and increase our overall readiness is critical to our defense needs, and is covered again in our FY 1973 program.

Completed this year was an extensive review of the requirements for overseas stockages in support of operational projects and war reserves. This review caused worldwide stockage requirements to be reduced by an amount valued at $697.4 million and reduced our future year procurement requirement.

The economic benefits resulting from the Logistics Offensive Program are significant. The Army has been able to reduce its budget requests

by $1.7 billion over the past three years and to satisfy other higher priority requirements that would have required approximately $2.8 billion. However, of greater importance is the fact that the logistical readiness of the Army has increased markedly during the same time. From June of 1969 to June of 1971, the worldwide logistics readiness rates for equipment on hand increased from 74 percent to 93 percent and for equipment deployability from 60 percent to 74 percent.

Army Internal Audit Activities

The US Army Audit Agency, in keeping with its objective of providing management at all levels with an independent evaluation of their implementation of the Army's management system to include economy of operations, identified the following areas as examples in which their objective was achieved.

An evaluation of the Facilities Engineering Program at selected locations in the United States resulted in the deletion of $3.7 million for fuel conversion projects from the Military Construction, Army Appropriation and the reduction in scope of certain other projects by $1.3 million.

The Chief of Research and Development concurred in an audit recommendation that the Office of the Project Manager, Night Vision be abolished and initiated the action which resulted in a one-time savings of approximately $1 million.

Improved Budget Techniques

The following are some of the steps taken to improve the formulation of the Army Budget and justification of its requirements: For internal Army management purposes a separate program for base operations was established on 1 July 1971 with the Deputy Chief of Staff for Logistics as Program Director. Under this program, base operations requirements are separately identified throughout the budget formulation and review process. Improved visibility of funding is maintained by the separate identification of mission and base operations dollars.

Program and Budget Guidance issued by the Department of Army to all commands and agencies for the preparation of the budget was recently reviewed for adequacy and timeliness. Based on this review, procedures have been developed to insure that guidance to Army commands and agencies will provide a more relevant basis for preparation of the Command Budget Estimate, Budget Execution Review, and the Command Operating Budget. These documents are used by Army commands and agencies to participate in the development and execution of the budget. Emphasis will be placed on the Operation and Maintenance, Army and Reserve Personnel, Army appropriations, as well as the operation and maintenance portion of the Family Housing Management Account. Manpower resources will be emphasized throughout. The objective is the issuance of complete and timely guidance to the field for the preparation of budget estimates.

A schedule of detailed analyses of problems surfaced during the budget formulation and review process has been established in order to gain an insight for possible resolution. Some of the budgetary areas to

be studied are:

The depot maintenance backlog and criteria for overhaul.

The relationship between readiness and funding levels of the Operation and Maintenance, Army and Military Personnel, Army appropriations.

The rising costs of medical service and alternative means of staffing and support.

Forecasting average civilian salaries.

Use of Automatic Data Processing Equipment

Finally, I would like to touch upon the subject of automatic data processing equipment in the Army. The Army must maintain positive control over the allocation of resources to accomplish its mission in the most economic manner. We must insure that each person in the Army is properly assigned, equipped and trained, that each is treated fairly, paid according to his entitlements, and so forth. We must answer to our board of directors, the Congress, to confirm the acceptability of our plans and to renew our financial authority. All of this has meant the increasing use of automation to perform the ordinary and time-consuming tasks of record keeping, transaction processing and the projection of requirements which are vital to the performance of management actions in large organizations. For example, an Army division with 16,500 men processes over 20,000 promotions and demotions a year, 50,000 leave requests and 70,000 requisitions for supplies each year. It must keep records on $256 million worth of equipment and there are 114,000 items of equipment

that may require maintenance. Division units order 550,000 repair parts each year. The total magnitude of the administrative requirement to handle this workload is staggering. Much of what we do today would not or could not be done without automation. Automation has become a necessity. The Army's annual Automatic Data Processing expenditures amount to approximately 2% of our annual budget. About two thirds of this cost is for people to program and operate this equipment. As the size of the Army's workforce decreases, Automatic Data Processing systems will play a large part in multiplying the effectiveness of a smaller force.

Several years ago, with the advent of third generation ADP systems, the Army was afforded the opportunity to capitalize on a very significant technological breakthrough. A number of large, multifunctional systems initiated to standardize ADP within various organizational aggregations. The decision to make systems multifunctional, i.e., supply, personnel and financial, was an economic one. The sharing of a single computer is less costly than the proliferation of multiple small computers. However, due to the size of these efforts, intervening statutory and regulatory changes, the desire to field perfect systems and incorporate the latest technology, development continued for many years and investment costs increased without reaching a decision point which would achieve the inherent benefits. We can no longer afford to pursue theoretical perfection, therefore decisions are now being made to field workable systems offering incremental benefits and add improvements as they are

available.

The Army is now replacing its wholesale supply ADP system, both at the national inventory control and depot levels. These systems will provide a more effective means of managing the Army's enormous supply function.

We have successfully developed and are implementing the Joint Uniform Military Pay System - Army (JUMPS-Army) a centralized automated military pay system which fundamentally is presently paying all active Army soldiers worldwide from a central site.

Not only was the Army the first service to implement JUMPS, but the system was developed and implemented eighteen months ahead of the Army's own ambitious schedule. It is also noteworthy to point out that during the period of implementation this ADP system successfully handled the provisions of the Wage/Price Freeze and the first middle of the month military pay raise from the central site, proving the responsiveness of the system to immediate and unanticipated changes.

When this system is fully operational and all pay actions processed by field finance offices are current, the Military Pay Appropriation Director will have more timely data available on strengths and expenditures for budget formulation and forecasting requirements.

The replacement of obsolete non-standard systems at Fort Benning, Fort Myer, Fort Polk and Fort Sheridan with a standard multifunctional non-tactical system called BASOPS, is continuing with the approval

of Congress. Extension of BASOPS beyond those four stations has been deferred until the recommendations by the General Accounting Office have been implemented and a copy of the action taken furnished to the Committee.

The Committee's comments and recommendations pertaining to the Combat Service Support System (CS_3), which is designed to give the Army a single, integrated, worldwide automated system for supply, personnel and financial management, has been given full consideration and the future status of CS_3 is currently under review by the Army Secretariat.

I shall now describe the individual appropriations contained within the FY 1973 budget request, with a brief mention of the construction and family housing accounts.

IV. ARMY APPROPRIATIONS SUMMARIES

A. MILITARY PERSONNEL, ARMY

The FY 1973 budget request of $7.703 billion for Military Personnel, Army is $469 million lower than the revised FY 1972 program of $8.172 billion. Funding requirements reflect the average active duty military personnel strength in FY 1973 of 869,932, a net decrease of 104,377 from the 974,309 revised FY 1972 average strength.

The number of active duty military personnel to be financed by this appropriation request is indicated in the following table:

ACTIVE DUTY MILITARY PERSONNEL

	End Year FY 1971	Manyears FY 1971	End Year FY 1972	Manyears FY 1972	End Year FY 1973	Manyears FY 1973
Officers	148,623	159,940	122,518	138,207	117,136	119,595
Enlisted	971,871	1,073,764	734,810	832,164	720,054	746,182
Cadets	2,988	3,800	3,900	3,938	4,000	4,155
Total	1,123,482	1,237,504	861,228	974,309	841,190	869,932

Development of Military Manpower Requirements

The Army's military manpower requirements worldwide are developed on the basis of strategic planning and strategic requirements established by the Joint Chiefs of Staff. These strategic requirements are translated into Army force requirements which are converted into authorizations for units of various types. After the types of units have been determined, the associated skills and grades become the basis upon which the Army develops the requirement for trained military personnel.

The requirement for trained military personnel is the basis for development of the Army military manpower program. This program includes a determination of monthly gains and losses and the distribution of Army personnel to each of the Commands around the world. This results in the authorized end strengths for each officer and enlisted grade. The average strengths and worldwide distribution of Army personnel are then used to determine the Military Personnel, Army appropriation fund requirements including pay and allowances, subsistence and permanent change of station travel movements.

MILITARY PERSONNEL, ARMY
Total Obligational Authority
(In Millions of Dollars)

ACTIVITY	FY 1971	FY 1972	FY 1973
Pay and Allowances of Officers	$2,113	$2,048	$1,876
Pay and Allowances of Enlisted	5,258	5,020	4,919
Pay and Allowances of Cadets	13	15	17
Subsistence of Enlisted Personnel	656	525	453
Travel, Permanent Change of Station	586	537	418
Other Military Personnel Costs	61	27	20
TOTAL	$8,687	$8,172	$7,703
SAFEGUARD	(13)	(14)	(18)

Funding Requirements

With the decrease in military manyears of 104,377 from FY 1972 to FY 1973, there is a corresponding decrease in funding requirements. The pay and allowances of officers and enlisted men is reduced $273 million. The subsistence of enlisted men is reduced $72 million and funds for permanent change of station travel are reduced $119 million. The chart on the opposite page summarizes the appropriation by budget activity.

B. RESERVE COMPONENTS

The Army National Guard and the Army Reserve appropriations reflect the impact of the recent policy decisions to place increased reliance on Reserve Component readiness in the National Defense strategy. The FY 1973 estimates provide training, equipment and construction support under the new, modernized G/H series Tables to Organization and Equipment to which Reserve Component units are converting in FY 1972. These estimates also reflect intensified readiness training activities to include additional training preparation periods for early deployment units and those required to maintain deployable strength and additional special training tours of duty for personnel directly involved with recruiting and retention activities. In addition, support is provided to test activities derived from an OSD study to evaluate alternatives for accelerated mobilization and improved deployment capabilities of the total Army force. To support the intensified training programs, the FY 1973 request provides for additional technicians to maintain and administer a larger and more modern inventory of equipment and the associated

RESERVE COMPONENT APPROPRIATIONS
Total Obligational Authority
(In Millions of Dollars)

APPROPRIATIONS	FY 1971	FY 1972	FY 1973
Reserve Personnel, Army	$ 370	$ 476	$ 530
Program 5, OMA	141	167	209
MILCON, Army Reserve	10	34	38
Total Army Reserve	$ 521	$ 676	$ 777
National Guard Personnel, Army	443	597	616
Operation and Maintenance, Army National Guard	315	380	469
MILCON, Army National Guard	15	29	40
Total National Guard	$ 773	$1,006	$1,125
Total Reserve Components	$1,294	$1,683	$1,901

additional operation and maintenance funds. The Reserve Component appropriations are shown in the chart on the opposite page. OMA Program 5 - Reserve Forces is included. Military Construction accounts are included but will be discussed separately.

RESERVE PERSONNEL, ARMY

The FY 1973 budget request of $530 million for Reserve Personnel, Army is $54 million higher than the revised FY 1972 program of $476 million. The increase results primarily from additional readiness training, full application in FY 1973 of the 14 November 1971 (PL 92-129) and the 1 January 1972 (Executive Order 11638) pay raises, increased ROTC scholarships and subsistence (PL 92-166 and 92-171), and implementation of Project Volunteer and recruiting activities. Of the FY 1973 estimate, $501.8 million is for the Army Reserve program and $27.7 million for the Army Reserve Officers Training Corps (ROTC) program.

Paid Drill Training

The number of reserve personnel in paid drill status to be financed with these funds is reflected in the following table:

	End Year FY 1971	Average FY 1972	End Year FY 1972	Average FY 1973	End Year FY 1973
Officers	35,584	35,922	36,200	36,350	36,500
Enlisted	227,715	224,127	223,800	224,950	226,000
Total	263,299	260,049	260,000	261,300	262,500

The active duty and inactive duty training prescribed by law is provided for the above Selected Reserve strength. Both Selected Reserve and Individual Ready Reserve personnel are provided additional required professional and technical training.

Army ROTC

For Army ROTC, the FY 1973 budget will support an opening enrollment of 56,400 cadets in the Senior Division ROTC, of which 15,400 are advanced course students. The advanced camp of the Senior Division will train 8,000. The program is estimated to produce approximately 6,200 commissioned graduates at end FY 1973. The Junior Division enrollment is budgeted at 120,000 students.

NATIONAL GUARD PERSONNEL, ARMY

The FY 1973 budget request of $616 million for National Guard Personnel, Army is $19 million higher than the revised FY 1972 program of $597 million. The increase results primarily from the larger number of men programed in Pay Group A for attendance at drills and annual training ($34 million); full application of the 1 January 1972 pay raise (Executive Order 11638) $15 million; implementation of Project Volunteer retention and recruiting activities of $3 million; and additional readiness training of $3 million under the OSD Reserve Components Study recommendations. These increased costs are partially offset by decreases in Reserve Enlistment Program (REP) training of $33 million and clothing acquisition of $2 million.

NATIONAL GUARD PERSONNEL, ARMY - PAID
DRILL TRAINING

	End Year FY 1971	Average FY 1972	End Year FY 1972	Average FY 1973	End Year FY 1973
Officers	30,263	30,639	30,413	30,716	30,413
Enlisted	371,912	370,182	368,042	371,617	372,042
	402,175	400,821	398,455	402,333	402,455

Reserve Enlistment Program

This appropriation also supports a Reserve Enlistment Program (REP) input into active duty of 56,000 and will result in approximately 13,939 non-prior service personnel awaiting training at end of FY 1973.

OPERATION AND MAINTENANCE, ARMY NATIONAL GUARD

The FY 1973 budget request of $469 million for Operation and Maintenance, Army National Guard is $89 million higher than the revised FY 1972 program of $380 million. The increase results primarily from pay and benefits for the additional technicians authorized (PL 92 -119) and the 1 January 1972 pay raise for classified civilian employees (Executive Order 11637) of $45 million; increased base operations and logistical support facilities for additional readiness training under the OSD Reserve Components Study recommendations of $15 million; $8 million

for organizational clothing and equipment to enhance unit readiness; $9 million for additional repair parts maintenance; $5 million for POL to support increased densities in aircraft and other equipment; and additional transportation and postage of $7 million.

C. OPERATION AND MAINTENANCE, ARMY

The FY 1973 request of $6.9 billion is slightly lower than the revised FY 1972 program. It provides for the training and operational support of an active Army of 13 divisions and an average of 261,300 Army Reserve personnel as well as 49,153 individual reservists on active duty for two weeks annual training only. In addition to the active duty installations, this request will support six reserve installations, three reserve field maintenance shops, and 1,019 USAR Centers. The OMA budget includes funds to support a direct hire civilian end strength of 250,651 in FY 1973 which is a reduction of 1,353 from the revised FY 1972 level of 252,004.

Formulation Process

The request is formulated and reviewed in terms of functions, such as Strategic Forces and General Purpose Forces, mission and base operations activities within each function, and finally the details within each activity in terms of civilian personnel, supplies and services. Included in the process is a careful consideration of

resource requirements developed by commanders in the field. This request reflects the results of the effort by the Army to improve the welfare of the soldier, fully support the remainder of our forces in Southeast Asia, and continue to increase the combat readiness of the Army.

Soldier Oriented Programs

The OMA budget contains $1.4 billion in support of Soldier Oriented Programs. These programs are designed to enhance professionalism, to improve Army life for soldiers and their dependents and to modernize the accession system in order to increase the number of Army volunteers. We are continuing our evaluation of the FY 1971 and FY 1972 tests and experiments and have structured the FY 1973 program to expand selected successful results Army-wide. Later evaluation results will be used to adjust the FY 1973 program as necessary.

Base Operations

Base operations costs, the part of the OMA budget that finances the operation and maintenance of our installations, amounts to approximately $1.8 billion of the OMA estimate for FY 1973. This is an increase of about $200 million over the revised FY 1972 estimate. This increase is caused by our continuation of the FY 1972 level of effort to improve real property maintenance, the expansion of soldier oriented programs, and civilian pay raises. In this area the FY 1972 - 1973 Federal Republic of Germany (FRG) Offset Agreement will result in

OPERATION AND MAINTENANCE, ARMY
Total Obligational Authority
(In Millions of Dollars)

PROGRAM	FY 1971	FY 1972	FY 1973
Strategic Forces	$ 91	$ 113	$ 133
General Purpose Forces	1,957	1,880	1,767
Intelligence, Communications and Other	385	386	418
Airlift and Sealift	45	41	42
Reserve Forces	141	167	209
Central Supply and Maintenance	2,132	2,112	1,984
Training, Medical and Other Activities	1,246	1,361	1,475
Administration and Associated Activities	337	382	382
Support to Other Nations	470	463	494
Total	$6,804	$6,905	$6,904
Base Operations	(1,497)	(1,625)	(1,833)
SAFEGUARD	(44)	(75)	(93)

significant improvements to US Army troop installations in Germany without additional cost to the Army. We plan on spending $325 million of the base operations total for maintenance of real property facilities.

I am pleased to report that the Army does not expect the serious problem in our FY 1973 CHAMPUS funding that we described in our FY 1972 hearing before this committee. Based upon data presently available the estimated FY 1973 requirements for this program are fully supported in this request.

The OMA budget is adequate to support improvements in the welfare of the soldier, our projected activity in Southeast Asia and improve the readiness of other forces. It should result in some decrease in the backlog of maintenance and repair of real property. The chart on the opposite page shows the appropriation by primary program.

D. NATIONAL BOARD FOR THE PROMOTION OF RIFLE PRACTICE

The FY 1973 appropriation request of $122 thousand for the National Board for the Promotion of Rifle Practice will permit essentially the same level of effort as in FY 1972.

E. PROCUREMENT APPROPRIATIONS

The FY 1968 to FY 1972 procurement appropriations were primarily consumption oriented to support losses in SEA. The FY 1973 budget

PROCUREMENT APPROPRIATIONS
Total Obligational Authority
(In Millions of Dollars)

APPROPRIATIONS	FY 1971	FY 1972	FY 1973
Aircraft Procurement, Army	220	107	135
Missile Procurement, Army	956	1,033	1,153
Procurement of Weapons and Tracked Combat Vehicles, Army	287	146	259
Procurement of Ammunition, Army	1,365	1,718	1,129
Other Procurement, Army	734	499	649
Total	$3,561	$3,503	$3,325
SAFEGUARD	(651)	(640)	(754)

is primarily readiness oriented. Although some losses still continue in SEA, funds are needed in FY 1973 and the next several years to buy adequate quantities of approved Standard A materiel; to replace over aged or Standard B materiel; to modify assets to meet new technical requirements; and to produce critically needed newly developed weapons systems.

The Procurement appropriations are displayed on the opposite page.

AIRCRAFT PROCUREMENT, ARMY

The Aircraft Procurement, Army appropriation request for $134.5 million represents an increase over the FY 1972 revised request of $106.6 million. This is due primarily to increased emphasis on aircraft modification programs. Major programs contributing to the increase are the AH-1G TOW/COBRA modification and a modification to update OV-1 surveillance airplanes.

The only funds for procurement of aircraft requested are $8.1 million for six (6) VH-1N helicopters with an associated $3.5 million for initial supporting spares and $12.7 million for 20 U-21 airplanes. The VH-1N helicopters will be used by the Presidental Flight Detachment to support the White House and the U-21 twin engine utility airplanes will be used for command and staff transport.

MISSILE PROCUREMENT, ARMY

The FY 1973 budget request of $1.153 billion is $120 million higher than the revised FY 1972 program of $1.033 billion. This increased funding is required to support increases in SAFEGUARD, DRAGON, HAWK and LANCE. The FY 1973 program for SAFEGUARD provides for the continuing procurement for the two sites previously authorized at Grand Forks Air Force Base, North Dakota and Malmstrom Air Force Base, Montana. It also includes the procurement of SPARTAN missiles and a portion of the SPRINT missiles at the Whiteman Air Force Base, Missouri site and the Missile Site Radar and Missile Site Data Processor for the Warren Air Force Base, Wyoming site and other ground support equipment for the 4-site program. The FY 1973 buy of the DRAGON missile will be the first quantity production of the Army's medium anti-tank/assault weapon which will replace the 90mm recoilless rifle. HAWK procurement is continued for the acquisition and fielding of the Improved HAWK Air Defense Missile System which replaces the older HAWK System and LANCE procurement is continued for replacement of the HONEST JOHN and SERGEANT Missile Systems in Europe. PERSHING missile procurement is continued from the FY 1972 program. In addition, the missile appropriation will fund continued acquisition of the TOW which is being phased into the inventory as a replacement for the 106mm recoilless rifle, the heavy anti-tank/assault weapon.

PROCUREMENT OF WEAPONS AND TRACKED COMBAT VEHICLES

The FY 1973 budget request of $259.5 million is $114 million higher than the revised FY 1972 program of $145.5 million. The requested funding level provides for an increase in the inventory of medium tanks and an increase in the Army's combat effectiveness with the procurement of VULCAN anti-aircraft guns, grenade launchers and laser rangefinders. A major share of the $114 million increase is attributed to modification costs. Most of the increased modification costs are attributed to the retrofit of the M60A2 tank, which is equipped with the 152mm Gun, for which a total of $102.5 million is requested. This provides for production/retrofit of the tanks to correct deficiencies in turret stability and system reliability. This is the final program year for retrofit of the M60A2. The dollar increase over FY 1972 for procurement of M60A1 tanks is $24.1 million. Production of the M60A1 tanks, together with production/retrofit of the M60A2 152mm gun tanks enables the Army to continue its program of converting the tank inventory to those types mounting the 105mm gun or better.

PROCUREMENT OF AMMUNITION, ARMY

The Fiscal Year 1973 request for Procurement of Ammunition, Army amounts to $1.129 billion. This represents a decrease of 34% or $589.1 million from the approved FY 1972 Program.

This request includes $899.5 million for hardware procurement, a decrease of $588.5 million from the approved FY 1972 program. The FY 1973 program essentially provides Southeast Asia consumption and training requirement while maintaining an active production base for key rounds of ammunition.

Of the $229.7 million included for Ammunition Production Base Support, the most significant effort, $133 million, is being directed toward modernization of the ammunition production base. We are proceeding in the fourth year of a 12-year $3.2 billion plan to modernize the base. Our modernization effort through FY 1973 totals $615 million.

OTHER PROCUREMENT, ARMY

The FY 1973 Budget request of $648.8 million is $150.0 million higher than the revised FY 1972 program of $498.8 million. There are increased funding requirements in Tactical and Support Vehicles of $27.2 million, Communications and Electronics Equipment of $40.4 million and in Other Support Equipment of $82.4 million. The increase in Tactical and Support Vehicles reflects increased programs for commercial vehicles and for pollution control. The funding level for Tactical and Support Vehicles has been restricted by the Army in order that, where possible, vehicles will be procured to meet Federal Emission Control Standards. There are increases in Communications and Electronics

RESEARCH AND DEVELOPMENT
New Initiatives and Prototypes

New Initiatives

R&D Support of Dynamic Unit Training
Meteorological Satellite Applications
Battlefield Electromagnetic Cover and Deception
Innovation in High Energy Lasers
Improved PERSHING

Prototypes

Electronic Warfare Equipment
Thermal Night Sight for M60A1
Air Defense Suppression Missile
Remotely Piloted Aerial Observer
Improved Fire Control for Low Altitude Air Defense Systems
Forward Area Tactical Surveillance System
Heavy Lift Helicopter Prototype
Tilt Rotor Prop Aircraft

System Equipment, Communications Security (COMSEC) Equipment, Multi-Channel Transmission and Termination Equipment (AACOMS), Radio Set, AN/GRC-106, Automatic Data Processing Equipment, SEA Operational Sensor Systems, and Advanced Production Engineering for the Forward Area Tactical Teletype (FATT).

The increase in other support equipment is for procurement of such items as Float-Ribbon Bridges, CB Shelter Collective Protective System, Cranes, Floating Equipment, Materials Handling Equipment and Generators. In addition, this appropriation includes $16.5 million for Medical Support Equipment which was formerly funded by the O&MA appropriation.

F. RESEARCH, DEVELOPMENT, TEST AND EVALUATION, ARMY

The FY 1973 budget request of $2.069 billion for Research, Development, Test and Evaluation, Army is $190 million higher than the revised FY 1972 program of $1.879 billion. This increase is due primarily to funding for new initiatives and prototypes and increased funding for the following programs: SAM-D ($56 million); Heavy Lift Helicopter ($23 million); UTTAS ($34 million); and CHEYENNE ($44 million).

The RDT&E Budget is developed by determination of changes in specific programs from one year to the next. These considerations include cost increases and such programs as New Initiatives and Prototypes which are listed on the opposite page.

RESEARCH, DEVELOPMENT, TEST AND EVALUATION, ARMY
Total Obligational Authority
(In Millions of Dollars)

ACTIVITY	FY 1971	FY 1972	FY 1973
Military Defense	$ 166	$ 186	$ 206
Aircraft and Related Equipment	178	176	247
Missiles and Related Equipment	849	896	964
Military Astronautics and Related Equipment	6	11	19
Ordnance, Combat Vehicles and Related Equipment	143	187	189
Other Equipment	297	361	385
Programwide Management and Support	58	62	59
Total	$1,695	$1,879 1/	$2,069
SAFEGUARD	(364)	(358)	(341)

1/ Includes $28.0 mil for FY 1972 Program Supplemental.

The chart on the opposite page summarizes the RDT&E appropriation by budget activity.

G. MILITARY CONSTRUCTION AND FAMILY HOUSING

The FY 1973 budget request of $1,019 million for Military Construction, Army is $480 million higher than the revised FY 1972 program of $539 million. The budget includes $48 million for NATO Infrastructure; $390 million is requested to support the SAFEGUARD deployment, including $361 million for construction, $26 million for community impact assistance, $2 million for access roads and $1 million for planning; for Site Defense of MINUTEMAN R&D construction at Kwajalein Missile Range $20.4 million is requested, including $1.4 million for planning; $41 million is included for minor construction and planning for other than SAFEGUARD and Site Defense of MINUTEMAN. This leaves a balance of about $520 million for all other construction requirements. Almost two-thirds of this amount, $335 million, is allocated to soldier-oriented projects to provide bachelor housing, medical and community facilities which will enhance service attractiveness and thus further our efforts to achieve a zero draft. The bulk of this amount is for a major thrust by the Army in its housing adequacy program to replace the temporary barracks with new construction and to modernize existing permanent barracks. Also included is $72 million for air and water pollution abatement projects to bring Army facilities into compliance with the Executive

MILITARY CONSTRUCTION, ARMY
Total Obligational Authority
(In Millions of Dollars)

ACTIVITY	FY 1971	FY 1972	FY 1973
Major Construction	580	473	926
Planning	39	37	31
NATO Infrastructure	65	14	48
Supporting Activities	5	5	2
Minor Construction	6	10	12
TOTAL	$694	$539	$1,019
SAFEGUARD	(357)	(119)	(390)

Order in this important area. Only $113 million is allocated for all other facilities construction requirements worldwide. Included in the above is $12 million in Europe for operational and training, maintenance and supply, community facilities, and utilities projects. Approximately $316 million of the total program is for replacement and modernization of average facilities.

The chart on the opposite page summarizes the appropriation by budget activity.

Military Construction, Reserve Components

The FY 1973 budget request of $78 million for the Reserve Component (Military Construction, Army Reserve and Military Construction, Army National Guard) is $15 million higher than the revised FY 1972 program of $63 million. The FY 1973 request will provide funds for the construction of 49 Armories, 62 non-Armory facilities for the National Guard as well as 21 new centers, the expansion and rehabilitation of 17 existing centers and five special purpose projects for the Army Reserve. This program will provide the second increment of funds for the OSD approved 10-year completion program for provision of adequate training facilities.

FAMILY HOUSING
Total Obligational Authority
(In Millions of Dollars)

ACTIVITY	FY 1971	FY 1972	FY 1973
Debt Payment	$ 22	$ 22	$ 20
Construction	46	68	140
Operation and Maintenance	154	180	239
Total	$222	$270	$399
SAFEGUARD	(9)	(11)	(12)

Army Family Housing

The Army portion of the FY 1973 Family Housing, Defense Budget request of $399 million is $129 million higher than the revised FY 1972 program of $270 million. The Army has developed a greatly expanded and accelerated housing program during the next five years to provide suitable family housing for married military personnel. It is a balanced program which, in addition to reducing the housing deficit, will accomplish urgently needed improvements and repairs to the existing housing inventory. In addition to the increase in construction and leases, the backlog of deferred maintenance will be reduced by $16 million and $22 million will be devoted to improving existing units.

The chart on the opposite page summarizes the Army portion of the Defense Family Housing appropriation by budget activity.

V. CONCLUSION

The FY 1973 Budget provides for the support of the approved force structure, the continued support of US and Free World Forces in Southeast Asia and the improvement of the Army's Combat readiness posture worldwide. Considerable emphasis has been placed on the achievement of a zero draft by providing funds to enhance professionalism, improve the standard of living of the individual soldier and to modernize the recruiting system. In addition, the budget provides for an adequate level of funding for base operations to provide for essential base services.

Mr. Chairman, this concludes my statement.

OFFSET AGREEMENT WITH GERMANY

Chairman ELLENDER. On page 9 of your statement, you refer to the offset agreement with the Federal Republic of Germany by which you hope to accomplish barracks rehabilitation in Germany. Would you describe this agreement a little more fully?

General KJELLSTROM. Offset agreements are negotiated at 2-year intervals whereby the Federal Republic of Germany (FRG) agrees to help defray some of the costs of maintaining U.S. NATO-oriented forces in Germany. Under the terms of the fiscal year 1972 and 1973 agreement, the FRG will provide 600 million deutsche marks (DM), equivalent to about $186 million (Army $176 million, and Air Force $10 million) for modernization and improvement of barracks and troop facilities for the U.S. forces in Germany. The Army portion will be used for Army facilities in the stem-to-stern renovation program. It is expected that the contracts for accomplishment of the program will have been awarded by the end of fiscal year 1973 and that renovation will extend through 1975. As a result of the agreement for participation by the FRG in this program, the Army's fiscal year 1973 U.S. dollar requirements for maintenance of real property and construction in Europe were reduced by $89 million.

AIR AND WATER POLLUTION ABATEMENT PROGRAM

Senator YOUNG. On page 19 you refer to the Army's air and water pollution abatement program for which $96.5 million is estimated for fiscal year 1973. You have a paragraph describing the types of attack to this problem. Could you be more specific and give a good example in each area as to what is being done at specific installations?

General KJELLSTROM. One air pollution control project is for the control of the particulate emissions from the existing coal-fired powerplant at Iowa Army Ammunition Plant which exceed Federal and State air pollution control regulations. This project is to convert the coal-fired boilers to oil fired to meet the pollution control criteria. One water pollution control project is for the treatment of sewage from Fort Shafter and Tripler Army Hospital, Hawaii, which is presently pumped into the Pacific Ocean in violation of Federal and State water pollution control regulations. This project will provide funds for the Army's fair share for participation with the city and county of Honolulu in the construction of joint use adequate sewage collection and treatment facilities.

LOGISTICS OFFENSIVE PROGRAM

Chairman ELLENDER. In reference to your logistics offensive program, I note that in speaking of the disposal of materiel you refer to a figure of $5.6 billion by fiscal year 1971 and an additional $700 million in the following 3 months. Please describe just what this $5.6 billion represents.

General KJELLSTROM. The wording in the paragraph on this subject may have been misleading in its reference to property disposal activities. The figure of $5.6 billion represents the value of (*a*) materiel that was excess to a geographical area or to a specific segment of the supply pipeline; (*b*) the value of materiel that was consigned

to PDO by reason of unserviceability and not economically repairable or excess to total Army requirements.

Only $1.1 billion of the $5.6 billion went into the property disposal activity. The remainder of the material was redistributed within the Army, to other services, or to the Republic of Vietnam. The $1.1 billion that went to property disposal was disposed of as follows:

	Millions
Utilized (within DA and DOD or other Federal agencies)	$187
Donated (State agencies or other authorized recipients)	55
Sold as usables	347
Downgraded to scrap	462
Abandoned	22
Total	1,100

Of the materiel downgraded to scrap, the majority represents arms, ammunition, and implements of war that were demilitarized before being sold.

CRITICAL PROCUREMENT NEEDS

Chairman ELLENDER. On page 100 you refer to a reduction in world-wide stockage requirements in value by $697.4 million. Are critical procurement items needed in an emergency included in this program?

General KJELLSTROM. Reductions in oversea stockage requirements for operational projects and war reserves (reflected on p. 100) do not include critical procurement items needed in an emergency. Reductions cited are a result of Project "Strat Requirement" actions to refine pre-D-Day materiel distribution requirements so that only "mission essential" items are prepositioned overseas. Items and/or quantities of items reduced were determined not essential for oversea prepositioning.

SUBCOMMITTEE RECESS

Chairman ELLENDER. We will recess until 10 o'clock tomorrow morning.

(Whereupon, at 3:25 p.m., Tuesday, March 7, the subcommittee was recessed, to reconvene at 10 a.m., Wednesday, March 8.)

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1973

THURSDAY, MARCH 9, 1972

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 10 a.m., in room S–126, the Capitol, Hon. Allen J. Ellender (chairman) presiding.

Present: Senators Ellender and Young.

DEPARTMENT OF DEFENSE

DEPARTMENT OF THE ARMY

MILITARY PERSONNEL

STATEMENT OF LT. GEN. WALTER T. KERWIN, JR., DEPUTY CHIEF OF STAFF FOR PERSONNEL

ACCOMPANIED BY:

MAJ. GEN. J. A. KJELLSTROM, DIRECTOR OF ARMY BUDGET, OFFICE OF THE COMPTROLLER OF THE ARMY

COL. J. R. BRINKERHOFF, CHIEF, PROGRAM DEVELOPMENT DIVISION, OFFICE, ASSISTANT CHIEF OF STAFF FOR FORCE DEVELOPMENT

B. M. HUTCHISON, CHIEF, MILITARY PERSONNEL ACTIVITIES BRANCH, BUDGET DIVISION, OFFICE, DEPUTY CHIEF OF STAFF FOR PERSONNEL

BUDGET REQUEST AND 1972 APPROPRIATION

Chairman ELLENDER. The subcommittee will come to order.

The next appropriation to be considered is "Military Personnel, Army," for which the fiscal 1973 request is for $7,703,063,000, as compared with the fiscal year 1972 appropriation of $8,077,375,000, of which $380,563,000 is for the pay increase effective January 1972.

PROGRAM AND FINANCING

At this point in the record there will appear certain programing and financing information.

(The information follows:)

MILITARY PERSONNEL, ARMY

PROGRAM AND FINANCING (IN THOUSANDS OF DOLLARS)

	1971 actual	1972 estimate	1973 estimate
Program, by activities:			
Direct program:			
1. Strategic forces	66,843	63,871	71,964
2. General-purpose forces	4,124,875	3,909,261	3,838,514
3. Intelligence and communications	401,844	424,035	397,032
4. Airlift and sealift	12,806	11,164	10,083
5. Guard and reserve	46,213	47,734	50,571
6. Research and development	65,276	80,913	85,835
7. Central supply and maintenance	104,859	124,316	126,945
8. Training, medical, and other general personnel activities	3,429,549	3,067,844	2,746,475
9. Administration and associated activities	132,411	130,458	120,988
10. Support of other nations	302,274	312,779	254,656
Total direct program	8,686,950	8,172,375	7,703,063
Reimbursable (total)	190,539	121,205	104,553
Total obligations	8,877,489	8,293,580	7,807,616
Financing:			
Receipts and reimbursements from—			
Federal funds	−125,890	−63,174	−48,580
Non-Federal sources [1]	−64,649	−58,031	−55,973
Unobligated balance transferred from other accounts		−95,000	
Budget authority	8,686,950	8,077,375	7,703,063
Budget authority:			
Appropriation	8,502,450	7,315,637	7,322,500
Transferred from other accounts	184,500		
Appropriation (adjusted)	8,686,950	7,315,637	7,322,500
Proposed supplemental for military pay act increases		560,163	
January 1972 pay increase supplemental/amendment [2]		201,575	380,563

[1] Reimbursements are derived from sale of meals and clothing to service members (10 U.S.C. 4621).
[2] The amounts shown as January 1972 pay increase supplemental/amendment are not distributed to each individual appropriation in the fiscal year 1973 President's budget, but are reflected as a 1-line defense-wide contingency amount. The amounts shown above are estimates, pending final determination of the amounts to be requested when supplemental and amended estimates are formally transmitted.

PRESENTATION FORMAT

Chairman ELLENDER. The principal witness will be Lt. Gen. Walter T. Kerwin, Jr., Deputy Chief of Staff for Personnel.

You may proceed, General.

General KERWIN. Mr. Chairman and members of the committee: It is a privilege for me to make my third annual appearance before your committee to present the Army Military Personnel appropriation request and highlights of our manpower program for the coming fiscal year.

ITEMS CONCERNING WHICH CONGRESS HAS EXPRESSED INTEREST

Initially, I intend to address those specific areas in which you have expressed interest during the past year.

These items include staffing of headquarters, public affairs, and intelligence; the quality of accessions; administrative separation without prejudice, permanent change of station travel; and the combat/support ratio.

I have chosen to address those items at the outset so as to assure the committee that we have taken positive action in these matters.

Army Purpose, Goals, Progress and Problems

In preparing the remainder of my remarks, I have been guided by the need to establish our purpose; define our goals; report our progress along with the problems encountered; and seek your support.

Professional Volunteer Force

The purpose of the personnel programs financed by this appropriation can be stated simply "to form a tailored, fully professional, volunteer force as soon as possible".

There are four fundamental goals that best describe the course to be followed: These are: the implementation of a manpower program that moves us to the baseline force in an orderly manner; second, procurement and retention of quality personnel; third, improvement of morale, welfare, discipline and human relations; and, fourth, establishment and maintenance of an atmosphere of professionalism satisfying to the high caliber officer and NCO that we retain in the service.

I will cover both the progress made and the problems encountered in pursuit of these goals.

SUBJECTS OF SPECIAL CONGRESSIONAL INTEREST

Military Personnel Staffing

In the areas of headquarters activities, public affairs and intelligence, the Army has reduced fiscal year 1972 military strength from a total of 37,774 requested last year, to 33,452.

In our fiscal year 1973 budget, an additional 5,862 military personnel are reduced in these areas. This represents a cumulative reduction of 10,184, or 27 percent, over a 2-year period.

Military personnel assigned to headquarters activities in fiscal year 1973 are 11.5 percent below the number requested in the fiscal year 1972 budget.

In public affairs activities, our military personnel requirements have been reduced to 403, a 35 percent reduction from the fiscal year 1971 level. The Army will continue to monitor carefully its information activities to insure compliance with congressional directives.

The Army's revised fiscal year 1972 Intelligence military manpower requirements are 14.5 percent below the level originally requested in fiscal year 1972 and our fiscal year 1973 requirements are 30.8 percent below the level originally requested in fiscal year 1972.

Mandatory Quota for Mental Group Accessions

The requirement for the Army to accept at least 8 percent of its nonprior service accessions under the new mental standards program (Project One Hundred Thousand) was terminated in December 1971. Following the passage of Public Law 92–204, all quotas for mental category IV personnel were removed by OSD.

To assure that all new men possess qualifying aptitudes for initial skill training and for retraining in at least one other occupational area, mental standards for accessions into the Army were recently raised.

We are continuing to accept mental category IV personnel who meet

the higher standards provided there are jobs where their abilities can be used.

We estimate that between 15 and 20 percent of the men entering the Army will come from this group, which represents a fair share of these personnel in the Nation's youth.

Administrative Separations Without Prejudice

Last year, this committee questioned the absence of a separation policy wherein, shortly after entering active duty, personnel found to be unsatisfactory for continued service may be routinely separated without prejudice.

A policy was implemented on 24 September 1971 which is designed to enable commanders to immediately separate from the service, with either an honorable or general discharge, those enlisted personnel whose performance of duty, acceptability for the service, and potential for continued effective service fall below the standards required for enlisted personnel in the U.S. Army.

Application of this policy is limited to:

(1) Personnel who fail to be advanced to the grade of E–2 after 4 months in service.

(2) Personnel who fail to be advanced to the grade of E–3, after 4 months time in grade as an E–2.

(3) Personnel reduced to grade E–1 or E–2 who are subsequently not promoted to E–2 or E–3 within the above time frames following reduction.

However, commanders may elect to withhold promotion and not separate those individuals who appear to be deliberately attempting to use the provisions of this policy as a means for avoiding service.

The commander must advise such personnel that they are demonstrating traits which, if continued, could lead to board action for separation as unfit or unsuitable.

Permanent Change of Station Travel

I know Congress is concerned, as I am, about the frequency and cost of PCS travel. I want to take this opportunity to assure you that the Army is doing everything possible to reduce PCS travel to the minimum consistent with:

(1) Maintaining Vietnam at its authorized strength.

(2) Sustaining other oversea areas at prescribed levels of readiness, and

(3) Realigning our force structure to comply with strength ceilings.

Continental United States

As short tour requirements decrease, we are reimplementing established rotation and stabilization policies. In CONUS, our objective is to stabilize assignments to a minimum of 24 months for enlisted personnel and 36 months for officers.

EUROPE AND OTHER AREAS

In Europe, we project average tour lengths for enlisted personnel to increase from 15.6 months in fiscal year 1971 to 16.5 months in fiscal year 1972 and 21 months in fiscal year 1973. For officers, the projected average tour length increases from 22.4 months in fiscal year 1971 to 28 months in fiscal year 1973.

Similar increases have been projected in other overseas areas.

PROGRAM MOVES REDUCTION: STRENGTH REDUCTION AND REDEPLOYMENT IN VIETNAM

Consequently, this budget estimate reflects a 32 percent reduction to total PCS moves from 1972.

Chairman ELLENDER. To what extent has that sum been reduced because of the reduction in strength of the Army? Has it been proportional?

General KERWIN. Sir, there has been a reduction. I can't give you the exact figure as to the reduction in the Army, but the total reduction has been 32 percent. As we bring in less people, naturally, the number of moves of permanent change of station will be reduced.

Chairman ELLENDER. For fiscal year 1971, $586 million was required for permanent change of station travel. The current estimate in fiscal year 1972 is $537.1 million. There is only a difference here of about $50 million in round figures. How many actual moves did you have during fiscal year 1971 and what is your current estimate for fiscal 1972?

General KERWIN. I will ask Mr. Hutchison to answer that question.

Mr. HUTCHISON. In 1971, we had 1,978,000 PCS moves in the Army. This year, we are projecting we will have 1,577,000 moves, so we reduced our moves some 400,000 due to the decreasing strength of the Army and redeployment in Vietnam.

TRANSPORTATION RATE INCREASE

Chairman ELLENDER. Wouldn't a decrease of some 400,000 moves result in a saving in excess of $50 million? I guess you have the problems of cost increases involved.

Mr. HUTCHISON. That is correct. Offsetting the decreases in moves, we have had increases in prices. The Military Airlift Command, who moves our people with airplanes, have increased their rates 20 percent, effective July 1 which costs us more money.

Chairman ELLENDER. Was that 20-percent increase because of salary raises?

Mr. HUTCHISON. It could be salary raises or because of the cost of leasing commercial aircraft. They lease commercial aircraft. The Military Airlift Command is financed by a revolving fund which must break even, so they, in theory, pass the charges on to the using appropriation for what it costs them.

MILEAGES AND TRUCK TARIFF RATE INCREASES

Then we have an increase in the truck tariff rates approved by the Interstate Commerce Commission that we must finance. We have had an increase in the mileage the people move.

TRANSPORTATION OF DEPENDENTS

As our percentage of the deployed personnel decreases in those areas where they cannot take their dependents, our average cost rates go up because more people are moving their dependents with them. In our original 1972 budget, we projected that 43 percent of our deployed strength would be in areas where they could take their dependents. Now, our current estimate is that 51 percent of our strength will be in areas where they can take their dependents, which, of course, costs us more PCS money.

Chairman ELLENDER. I assume this total includes the cost of moving dependents?

General KERWIN. It is a part of the whole thing, a part of the move, the man plus his family.

1971–1973 PERSONS MOVED AND COSTS

Chairman ELLENDER. In 1971, as just indicated, you required $586 million. Then for 1972, $537 million. And for 1973, it is $418 million.

What is the difference in the number of people you moved in 1971 compared to the number you contemplate moving in 1973?

Mr. HUTCHISON. It would be 903,000 people. We will have 903,000 less moves in 1973 then we did in 1971, sir. That is one of the primary reasons for the decrease in costs between the $586 million to the $418 million.

General KJELLSTROM. If I may, Mr. Chairman, comparing 1970, we had 2,423,000 moves within the Army excluding those relating to USMA cadets, unit movements and paid-not made moves associated with reenlistment, allowance payments. In 1971, we had 1,925,000 moves in the Army, a 500,000 drop from 1970 to 1971. From 1971 to 1972, we went from 1,925,000 to 1,512,000, a 400,000 drop. And from 1972 to 1973, from 1,500,000 to 1,022,000, a half a million less PCS.

NONCOMMENSURATE COST REDUCTION

Now, the cost reduction is not commensurate with the reduction in the number of moves because of the difference in types of moves and, also, cost increases, which are beyond our control, rate increases which have been granted to carriers, the pay increases for personnel, and the like, which contribute to increased costs per move.

1972 REPROGRAMING OF FUNDS

We have very carefully reviewed the overall requirement. As you know, for fiscal 1972, we have been required to come in with a reprograming request in accordance with your direction in the committee's report last year on the appropriation bill. You suggested we use the authority of section 736 of the appropriation bill and you increased the authority of the Department of Defense for appropriation transfers to make up for certain deficits.

Chairman ELLENDER. Does the fact that we are reducing greatly the number of combat troops in Southeast Asia contribute to this reduction?

General KJELLSTROM. Yes sir; significantly.

HIGHER QUALITY ACCESSIONS

Senator YOUNG. Mr. Chairman. A little earlier in your statement, you mentioned higher qualifications of men being accepted in the Army. Would you elaborate on that a little more? For example, what are some of the major changes in accepting personnel?

General KERWIN. There are several major changes.

Senator YOUNG. What are the main ones?

General KERWIN. The first and primary one is the fact that we are not required now by quota to take in a specified number in category IV. Those are the individuals, of course, who are in the lower percentile, from 30 down to zero. Rather, we can adjust this at the present time to our needs. Also, as a result of the DOD discontinuing quotas, we are no longer required to take in men under Project One Hundred Thousand.

Senator YOUNG. Is the difference in qualifications or intelligence?

General KERWIN. The fact that we don't have to take in a quota of these individuals in the lower category is, of course, increasing the quality.

In addition, we have established new mental standards for enlistments for individuals who do come in category IV. They must have two area aptitude scores of 90 or above which means they are trainable in two areas. So, the mental standards for enlistees coming in have been raised.

STANDARDS PRIOR TO VIETNAM WAR

Senator YOUNG. For the period prior to the Vietnam war, what standards did you have?

General KERWIN. Under our standards during the period of the Vietnam war we took in an unusual amount of category IVs. We were required to take in a percentage of Project One Hundred Thousand, which is the lower half of category IV.

In addition, we took in quite a few people who had waivers for civil offenses, felonies and juvenile misdemeanors.

We have since tightened the standards to take only those that have not had a long string of convictions.

PERSONNEL CAUSING TROUBLE IN GERMANY

Senator YOUNG. Are you still having difficulty removing those who are causing trouble in Germany and elsewhere?

General KERWIN. When we introduce these new standards, it will take time for those new standards to take hold. We do have a problem at the present time of ridding ourselves of those individuals who don't meet today's standards. This has been one of the problems we have had in the Army.

EVIDENCES OF DISSENT

Senator YOUNG. What has been the history in the past year as to dissent in the service?

General KERWIN. During calendar year 1971, dissent of an antiwar or antimilitary nature continued to be manifested in various forms and Army members continued to be involved. Antiwar and antimilitary coffeehouses, underground newspapers and dissident soldier organizations were used as techniques to incite and exploit soldiers dissidence.

(*a*) During the year, four new coffeehouses were identified. A total of seven were in operation at the end of the year.

(*b*) Twenty nine new underground newspapers were identified during 1971. A total of 32 were active at the end of the year.

(*c*) Seven new dissident soldier organizations were formed during the year. 17 were known to be active at the end of the year.

Dissenting activity during 1971 did not impact significantly on the Army's capability to accomplish its mission.

Anticipated Effect of New Criteria: Removal of Personnel Not Amenable to Self-Discipline

I think the major step that we have taken is the new criteria we have established upon entrance, that is, when the man comes in, if he doesn't get promoted from E–1 to E–2 in the first 4 months, then we put the man out. He may go out with an honorable discharge or general discharge. But he is not the type of man who is suitable. He has done nothing wrong, but probably he will be in trouble at some point in his career.

Then there is another step as he moves from E–2 to E–3. If he is not picked up in 4 months again for promotion, then again the commander has the capability of discharging that individual. In that way, we hope to rid ourselves of the individuals who are just not amenable to the self-discipline which is necessary in the military service.

Screening Prior to Enlistment and Upon Indication For Drug Use

Senator Young. Do you screen individuals prior to enlistment as to their use of drugs?

General Kerwin. Yes, sir; we do. We screen everybody coming in. The first screening is at the Armed Forces entrance and examining station. There, as a part of the medical examination, the doctor and psychiatrist take a look at this individual. If he says he uses no drugs, are there indications that he does use drugs, are there needle marks in his arm, and are there other medical indications he is addicted? He may not show any at that particular time.

The next step is when he reports for duty at the reception station, when he is actually inducted; at this point in time, he is given a urinalysis test. A urinalysis test mainly detects the hard drugs, opiates, amphetamines, barbituates. It does not, of course, pick up hashish, marihuana, and such things as that.

If that individual, by means of his urinalysis, is indicated to be a drug addict, then after a short period of treatment he is discharged.

So, we have two screenings at the present time to keep out of the military those individuals who are addicted to drugs.

Senator Young. Thank you.

Chairman Ellender. Proceed.

Permanent Change of Station: 1972 Reduction

General Kerwin. Our fiscal year 1972 reduction is not as great as we anticipated when we submitted our fiscal year 1972 budget. The principal reason for this is the expanded early release program which was necessary to avoid exceeding the average strength authorized in

fiscal year 1972. The strength reductions reduced the total manpower costs both in fiscal year 1972 and fiscal year 1973 but they also increased PCS moves and costs in fiscal year 1972.

Noncommensurate Cost Reduction

I would be remiss if I did not point out that while the number of PCS moves have been reduced significantly, the PCS costs have not been reduced in direct proportion. There are two main reasons for this:

First, I am sure you realize that inflation and rising costs affect our PCS travel account. Since submission of the fiscal year 1972 budget to Congress, there have been several travel rate increases and increased quarters allowance, which affects the travel dislocation allowance and new entitlements, all of which raise the average cost of a PCS move.

Also, as the force in Vietnam becomes smaller, the proportion of personnel overseas serving accompanied tours naturally increases. Therefore, a greater portion of personnel moving are accompanied by dependents, household goods, and privately-owned vehicles.

Reprograming of Funds

For these reasons, our estimated requirement for fiscal year 1972 is $537.1 million, $100.0 million higher than we originally requested last year. To support this added requirement, we are requesting transfer authority for $71.5 million and submitting a reprograming action for $21.9 million to be transferred from other accounts within the MPA appropriation.

Our fiscal year 1973 request is a realistic estimate of our requirements based on current rates and the number of moves we have programed.

Chairman Ellender. As is customary, would you provide a summary of all reprograming of funds for the past year?

General Kerwin. I will be happy to.

(The information follows:)

FISCAL YEAR 1971

[In thousands of dollars]

	Report of programs Dec. 31, 1971	Reprograming action 71-4 (OSD 71-88 PA)	Reprograming action 71-5 (OSD 71-119 PA)	Base for reprograming 2d supplemental appropriations act, 1971	Internal reprograming June 30, 1971	Final report of programs June 30, 1971
Pay and allowances:						
Officers	1,904,105		+14,425	+189,885	+4,600	2,113,015
Enlisted	4,787,519	(1)	+2,813	+467,727	+188	5,258,247
Cadets	12,230			+1,204	−388	13,046
Subsistence of enlisted personnel	666,413				−10,300	656,113
Permanent change of station travel	527,691		+53,401		+4,900	585,992
Other military personnel costs	53,992		+4,361	+1,184	+1,000	60,537
Subtotal, direct program	7,951,950		[2] +75,000	+660,000	0	8,686,950
Reimbursable program	152,088					190,539
Total program	8,104,038					8,877,489

[1] Proposed sec. 836 transfer from procurement of equipment and missiles, Army in the amount of $25,000 disapproved by the committee.

[2] Transfer (sec. 836) from procurement of equipment and missiles, Army.

FISCAL YEAR 1972

	Base for reprograming	Reprograming action 72-1 PA (OSD 72-18 PA)	Reprograming action 72-2 (OSD 72-39)	Report of programs Dec. 31, 1971
Pay and allowances:				
Officers	1,897,604	+23,500	+28,820	1,949,924
Enlisted	4,422,436	----------	−57,181	4,365,255
Cadets	15,316	----------	−1,339	13,977
Subsistence of enlisted personnel	518,214	----------	+6,803	525,017
Permanent change of station travel	437,060	+71,500	+21,968	530,528
Other military personnel costs	25,007	----------	+929	25,936
Total direct program	7,315,637	[1] +95,000	0	7,410,637
Reimbursable program	121,224	----------	----------	120,497
Total program	7,436,861	----------	----------	7,531,134

[1] Transfer from Army stock fund (sec. 736 transfer).

Ratio of Combat to Support Troops

General Kerwin. Much attention has been devoted to a convenient means of expressing the relative combat potential of a given size Army. The measurement most often employed is to relate the numbers of combat soldiers to the numbers of other soldiers used to support the fighters. This is commonly termed the combat-to-support ratio.

Unfortunately, a great many observers arbitrarily associate a lower number of combat soldiers with something that is bad, wasteful, and to be avoided. Too often this criticism is based solely on the numerical relationship without further examination.

Due to the committee's past interest in this ratio, I would like to discuss the methods used to determine it and, even more important, what it should mean in analyzing a military force.

It has not been possible to develop a single method of determining this ratio that is meaningful for all purposes.

Basically, there are two ways to classify a force. We can limit consideration to an individual soldier and his primary duty position or look at organizational units and their normal mission.

Deployments in Western Europe

Chairman Ellender. Before you go to the next paragraph, I have here a memorandum indicating the geographical distribution of Army strength.

For the European Command area the end-strengths are as follows: fiscal year 1971, 194,700; fiscal year 1972, 199,400; and the plan for fiscal year 1973 is 198,400. Are these figures correct?

General Kerwin. Yes, sir.

Chairman Ellender. I think the record shows that we have four and a third divisions there; is that correct?

General Kerwin. That is correct.

Divisional Forces

Chairman Ellender. If you divide that into 198,000, each division will have in excess of 40,000.

General Kerwin. Sir, there are various methods to evaluate the combat-to-combat support ratio. You can do this in several ways.

Chairman ELLENDER. When one speaks of a division, I have always understood its strength was between 15,000 and 16,000 personnel.

General KERWIN. That is approximately right, sir; roughly 15,000 people.

Chairman ELLENDER. But in Europe, where you have four and a third divisions, it is over 40,000 per division.

General KERWIN. No, sir.

Actually, the division strength, itself, sir, is 64,700. The divisional support is about 89,100. So the total in the divisional forces is 153,800.

MISSION FORCES

Chairman ELLENDER. How do you account for the rest of the personnel?

General KERWIN. The rest of them are divided into special mission forces.

The Berlin Brigade is about 3,800. The missile forces are 21,000. There is intelligence, communications, DOD and joint activities, and a small portion for free world support.

GENERAL SUPPORT FORCES

On top of that you also have general support forces, equaling about 2,900. Then in Europe you have other commands and agencies which are a part of that 198,000. This is Military Traffic Management and Terminal Service, Army Materiel Command, Army Security Agency, Strategic Communications Command, DA field activities, and DOD and joint activities. That accounts for about 14,700.

TOTAL FORCES

So, in summary, you have your division forces of 153,800; you have your special mission forces of 26,900. You have your general support forces of 2,900. So, the total forces in U.S. Army in Europe is 183,700, plus another 14,700 which are outside of U.S. Army Europe but a part of the European command.

Chairman ELLENDER. Are all of those necessary to support the fighting soldier?

General KERWIN. Yes, sir; we believe they are necessary to support the fighting soldier.

COMBAT AND SUPPORT PERSONNEL

Chairman ELLENDER. How many combat personnel do you have in Europe and how many men does it require to support each combat soldier?

General KERWIN. Roughly, sir, we figure it takes about two military individuals to support a fighting soldier, plus about one and a half civilians. So, if you take it on the ratio of one soldier, one fighting soldier, on a broad basis, it takes about three and a half individuals to support that man.

RATIO COMPUTATIONS

Now, what I would like to do, is to take a look at the ways you can compute the combat to support in Europe. If you take the divisional forces of 64,700 and divide that by the total Army in Europe, 198,400, your combat-to-support ratio is 33 percent to 67 percent.

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If you take the divisional forces of 64,700 and divide that by the total Army, that is, the U.S. Army in Europe, that is 184,400, then your combat-to-support ratio is 35 percent to 65 per cent.

If you take your divisions, on the other hand, and divide those by the divisional forces, 153,800, then your combat-to-support ratio, rises to 42 percent to 58 percent.

Finally, if you take your divisions, plus the nondivisional combat units, 89,000 total, and divide that by the division forces in Europe, your ratio goes up to 58 percent combat, 42 percent support.

On the other hand, if you take the divisions, the nondivisional combat units, and the special mission combat units, for instance, the Berlin Brigade and the missile forces, which would total 105,000, and divide that by U.S. Army in Europe, minus the general support for a 176,000 total, the ratio then is 60 percent combat to 40 percent support.

Civil War

If you go back to the Civil War, you had your massed firepower and you measured your combat strength by individuals. More people were on the frontline, every man with a rifle, to include artillery men close to the frontline.

As we have gone down through the wars over a period of time, the combat-to-support ratio has decreased. For instance, in the Civil War, it was 93 percent combat and 7 percent support. That is because you had everybody up on the front line.

I would point out that your battle casualties were 121 per thousand and your battle deaths were 43 per thousand.

World War II

If you come down to World War II, now you are down to combat which is the 36 percent versus combat support which is 64 percent.

So the ratio is getting smaller on the combat, larger on the support, but your battle casualities and battle deaths are going down. For instance, your battle casualties are now down to 31 per thousand and your battle deaths down to nine per thousand.

Vietnam War

Finally, we come to Vietnam. Your support is 78 percent and your combat is 22 percent. almost the reverse of the Civil War.

But your battle casualties are now down to 20 per thousand and your deaths are down to 3.6 per thousand.

Personnel Cost Percentage of Total Budget: Strength Decrease and Cost Increase

Chairman Ellender. In earlier wars, such as the Civil War, the combat soldier required a minimum of support. I realize we cannot return to those standards, but a comparison would be interesting.

The reason I am asking all of these questions is this: Pay raises have increased costs to such a degree that even though substantial decreases in the number of military personnel have taken place, the total costs have increased.

If this committee is to respond to the many requests to reduce appropriations, I don't see any way by which that can be done unless the force is reduced, because 56 percent of total defense outlays go for manpower-related costs.

Support Personnel for Sophisticated Weapons Systems: Combat Effectiveness

General Kerwin. As we progress, sir, the sophisticated weapons systems we have enable us to have less people in the immediate combat area and immediate combat contact. It then requires more people back on support. For instance, if you have a helicopter gunship company, it has 213 people involved in it, but it requires 308 people to support that unit in maintenance and repairs and things of that type. But the point is that a helicopter gunship is an extremely sophisticated weapon with a tremendous amount of firepower, and you probably only have two people riding in the helicopter.

So, if you look at it in terms of combat and combat support, the people in combat are pilots in the helicopter. The people maintaining it back at the base somewhere are the combat support.

But it is a lot more powerful and a lot more sophisticated than anything in the Civil War. In the Civil War, it would have been the other way around—many more people out here firing the individual rifles and cannons versus the people back in support. However, our effectiveness in combat and the reduction of the number of individuals exposed is much better now.

Combat and Support Assignments

Senator Young. Is an individual firing an artillery weapon well behind the lines considered in combat?

General Kerwin. Yes, sir. The infantry and armor and artillery are the combat.

Senator Young. And is the individual supplying aircraft support so considered?

General Kerwin. Yes, sir; a helicopter attack company and a helicopter lift company would be combat.

Chairman Ellender. How could you classify those who unload the boats and ammunition?

General Kerwin. They would be back in combat support, sir. However, if you are down in the delta in Vietnam, you might have the small boats up in the Mekong River, and some of these individuals unloading the ammunition from the boats might be combat infantrymen.

Chairman Ellender. I know that. I am not talking about Vietnam. I am talking about Europe, wherein you have 198,400 people in four and a third divisions. It strikes me that is out of proportion.

Southeast Asia Combat Personnel

Chairman Ellender. As I recall at the end of fiscal year 1969 there were about 360,000 Army personnel in Southeast Asia. How many of those were assigned to combat forces?

General Kerwin. Sir, I will have to furnish that for the record.

Chairman ELLENDER. Very well.
(The information follows:)

The U.S. Army forces in Vietnam at the end of fiscal year 1969 were authorized 361,000 military manpower spaces. Of these, 222,000 spaces, or 61 percent, were in units classified as combat and 139,000 spaces, or 39 percent, were in units classified as support.

SCHEDULE OF COMBAT AND NONCOMBAT FORCES

Chairman ELLENDER. At this point in the record there will appear from the justifications the schedule of combat and noncombat forces.
(The information follows:)

SCHEDULE OF COMBAT AND NONCOMBAT FORCES (END STRENGTHS)

(End strengths to the nearest 100)

	Fiscal year—		
	1971	1972	1973
1. Force mission: [1]			
European Command Area (Western Europe)	166.6	[deleted]	[deleted]
Pacific Command Area (Western Pacific)	39.4	[deleted]	[deleted]
United States, territories, and SEA	363.9	237.5	242.7
2. Other mission: [2]			
European Command Area (Western Europe)	9.0	[deleted]	[deleted]
Pacific Command Area (Western Pacific)	3.3	[deleted]	[deleted]
Other foreign countries	1.9	1.5	1.5
United States, territories, and SEA	57.9	41.7	36.7
3. Training: [3]			
European Command Area (Western Europe)	1.1	[deleted]	[deleted]
United States, territories, and SEA	260.5	183.4	174.2
4. General support: [4]			
European Command Area (Western Europe)	18.0	[deleted]	[deleted]
Pacific Command Area (Western Pacific)	8.3	[deleted]	[deleted]
Other foreign countries	.1	.1	.1
United States, territories, and SEA	193.5	148.5	144.8
Total	1,123.5	861.2	841.2

[1] Units include air defense, Safeguard, general purpose forces (divisions, brigades, regiments, separate artillery and infantry battalions), and aviation units.
[2] Units include intelligence/security, strategic communications, military assistance group and missions, and selected research and development units.
[3] Units include all continental United States and overseas training activities with the Reserve Officer Training Corps and the U.S. Military Academy.
[4] Units include all those in base operations and command/headquarters facilities worldwide, and selected logistical facilities.

EUROPEAN THEATER

Chairman ELLENDER. Please provide for the record the size of our forces in Europe for fiscal year 1973 and any significant changes in these from fiscal year 1972.

General KERWIN. I would be happy to.
(The information follows:)

The European force structure is divided into one major command and elements of six other commands or activities. The major command is United States Army Europe, which includes Division Forces, Special Mission Forces and General Support Forces. The authorized strength of Division Forces is 153,881 and includes four and one third divisions, two armored cavalry regiments and combat support units. The combat support units include air defense artillery, field artillery, aviation, maintenance, transportation, signal, ordnance, medical, military police, engineer and military intelligence. The major headquarters are a combined Headquarters, United States Army Europe and 7th Army, two Corps Headquarters and a Theater Army Support Command. The authorized strength of Special Mission Forces is 26,931 and includes the Berlin Brigade, missile forces, special forces, other service support and Department of Defense and Joint Activities. The authorized strength of General Support Forces is 2,901 and

includes support districts, engineer districts, a combat support training center, an armed forces recreation center, reserve affairs and dependent schools. The total authorized strength of United States Army Europe for end fiscal year 1973 is 183,713. The elements of the other six commands or activities are included in the Army Materiel Command, Army Security Agency, Strategic Communications Command, Office of Secretary of Defense and Joint Activities, Military Transport Service Command and Department of Army Field Activities. The authorized strength of these elements is 14,678. The total authorized military manpower for the European Command area for end fiscal year 1973 is 198,391. The end fiscal year 1973 authorized strength is [deleted] less than fiscal year 1972 primarily because of [deleted].

COMPUTATION OF COMBAT-SUPPORT RATIO ON INDIVIDUAL BASIS

Chairman ELLENDER. Proceed.

General KERWIN. In computing the combat support ratio on an individual basis, we disregard the organizational structure and its assigned mission. For instance, a soldier whose normal duty is to fire a rifle, load an artillery round or drive a tank, would be classified as combat.

Those soldiers whose job it is to repair the rifle, transport the ammunition or provide fuel for the tank are classified as support troops.

Using this technique, it can be said that 23 percent of the Army's strength is combat troops.

COMPUTATION ON UNIT BASIS

When using a unit basis in computing this ratio, we must decide what organization level to consider. We have found it useful to aggregate combat units at two different levels, the battalion and the division.

In the first instance, we examine the battalion level and seek to identify those units whose primary mission is to engage the enemy. Using this method, it is proper to classify 30 percent of the Army as combat troops.

COMPUTATION ON DIVISION BASIS

If we choose to focus on a higher level of aggregation, we disregard the smaller unit and seek to identify combat divisions, separate brigades and/or regiments. The personnel strength of these combat formations is then used to express the ratio. Using this method, it is proper to classify 42 percent of the Army as combat troops.

ADMINISTRATIVE ASSIGNMENT OF TROOPS IN EUROPE AND VIETNAM

Chairman ELLENDER. What is the percentage of the troops that you have, let us say, in Vietnam or in Western Europe engaged in purely administrative work?

General KERWIN. I would have to provide that for the record.

(The information follows:)

At the end of the peak year (fiscal year 1969) the U.S. Army Forces in Vietnam had 139,000 spaces, or 39 percent, in units classified as support and 222,000 spaces, or 61 percent, in units classified as combat. A corresponding distribution for U.S. Army Europe at the end of fiscal year 1972 will be 77,000 spaces, or 42 percent, in units classified as support and 107,000 spaces, or 58 percent, in units classified as combat.

Chairman ELLENDER. What categories of personnel are found in the general support area of activity?

General Support Manpower

General Kjellstrom. Sir, if I may, our general support category in manpower, which is the area that I believe you are interested in, includes the training establishment, the medical establishment, our base operations, our headquarters and field activities, our logistics establishment, our support of the research and development, our support of Reserve components, our field headquarters, and our Combat Developments Command.

Now, in 1961, when the strength of our Army was 859,000, we had 185,000 in our general support area. In 1965, at the start of the Vietnam war, we had 969,000 in the Army, of which 194,000 were in the general support establishment.

In 1969, which was about the peak of the development of the Vietnam war—and we had about 1,600,000 men in the Army—our support establishment was up to 227,000.

Now, in 1972, when we have an end strength of 861,000, our support establishment is down to 179,600.

In 1973, with the budget under consideration, with an Army of 841,000, we are down to 173,900.

This 173,900, sir, compares with the 1961 level of comparable strength in the Army of 185,000.

So, we have reduced our general support area by 11,100 in comparison to 1961 and have come down from the peak of Vietnam by approximately 53,100.

We have made great efforts in the Army to reduce the very area that you are questioning us about.

Research Personnel

Chairman Ellender. In the support figures you have just mentioned, you include research and development.

General Kjellstrom. Yes, sir.

Chairman Ellender. The other day when Dr. Foster appeared in support of the $8.6 billion requested for the various R. & D. appropriations, it was developed that at the end of fiscal year 1973 we will have approximately 34,300 military personnel assigned to R. & D. activities and of this total approximately 10,800 are officers. The estimated cost of these individuals is $368 million which is paid from the military personnel appropriations and not from the R. & D. appropriations.

General, how many Army military personnel do you have assigned to R. & D. activities?

General Kjellstrom. Within the Army in fiscal year 1973 we will have 8,500 in the research and development.

Chairman Ellender. How many of those are officers?

General Kerwin. I have the figure; 2,422.

Suggested Substitution of Civilian Personnel for Military Personnel: Resultant Savings in Fringe Benefits

Chairman Ellender. As I see the picture, as supply lines become extended and weapons become more sophisticated, a larger number of support personnel are required. However, it would appear that

many of the jobs now occupied by military personnel could be handled by civilians, thus freeing the military men for combat duty when required. In addition, costly fringe benefits would be limited to those necessary military personnel.

General KERWIN. Sir, when we take a look at the category of R. & D., there are a tremendous number of civilians involved in the Army's total research and development effort. The military portion, of course, are individuals who are educated within the Army; they provide the expertise and know-how when it comes to the direction of the R. & D. development process.

The enlisted personnel, many of whom are technicians, some with degrees, also, are involved in the testing and evaluation program, which could be done better by individuals who have the know-how within the Army.

So, these individuals are necessary to the program. In most cases they could not be replaced by civilians. As a matter of fact, the civilians already in the program in many cases have been replaced by military.

STRENGTH REDUCTION IMPERATIVE

Chairman ELLENDER. I do not intend to tell the Army that it must limit itself to x number of military personnel. Nevertheless, with 56 percent of the DOD budget going into pay-related items, with only 22 percent of the Army's military personnel classified as combat personnel, and with a zero draft situation as a goal, I believe that by the very nature of the problem, you will be forced to make changes, if you wish to maintain a strong combat force.

VIETNAM COMBAT-SUPPORT RATIO

General KERWIN. Senator, I am pointing out, in attempting to make a comparison of what are the ratios of combat to support in the Civil War, World War I, World War II, and Vietnam, that the ratio has evolved to 22 percent combat to 78 percent support. That specifically was during Vietnam.

Chairman ELLENDER. I assume that in combat-related areas anywhere in the world, the percentage of actual combat personnel would increase.

General KERWIN. This depends on how you compute the combat to combat support. In Vietnam, it was 22 to 78 percent, based on military occupational specialties.

Again, as I pointed out, as we move to more sophisticated weapons and systems, generally over a period of time we expose less people to combat and become more effective in combat.

INORDINATE PERSONNEL PERCENTAGE COST

Chairman ELLENDER. I would be the last one to advocate a debilitating reduction in the Army's military strength. By and large, we members of the committee must accept the opinions of military experts as to manpower requirements insofar as they relate to the defense of our country. At the same time, it is a fact that about 58 percent of the DOD budget flows into pay-related costs, leaving only 42 percent for

hardware procurement, research, and operation and maintenance items not connected with pay.

General KERWIN. The actual MPA for the Army budget is about 32 to 33 percent of the total Army budget. If you take into account the Reserve pay and civilian pay and retired pay, the total portion of the budget, it would go up to 58 or 60 percent. But, we are talking about this budget here, and in this budget here it is about 33 percent.

ENLISTMENT PLACEMENT OPTIONS

Senator YOUNG. Does a young man enlisting in the Army today have a choice as to whether he will be placed in the combat forces of the Army or in the support forces of the Army?

General KERWIN. Senator, when a young man enters the Army nowadays, he has the choice of many enlistment options.

Senator YOUNG. More options than previously?

General KERWIN. Yes. At the present time, he can enlist for the unit of his choice. He might enlist for Europe or he might enlist for the 3d Armored Division in Europe; he can enlist for Korea; he can enlist for Vietnam; and he can enlist specifically for the combat arms.

HARD-SKILLED REQUIREMENT

On the other hand, as you know, we have a requirement for the hard skilled. So, as a consequence, a man can enlist specifically for one of those hard skills, go to school for a period of anywhere from 15, 20, and 40 weeks, and be trained for that hard skill and perhaps go into the Signal Corps or communications or something of that type.

So, if he wants to come in for 3 years, he has the option of going to the combat arms or hard skill, providing he meets the mental and physical qualifications.

COMBAT ASSIGNMENTS AND RECRUITS

There are many people who come in today for just a 2-year tour, who don't enlist for a hard skill or have the mental standards for a hard skill, who become what we call a Regular Army Unassigned, and these people will be assigned to the combat arms.

On the other hand, we have had a tremendous success in recruiting individuals for combat arms. Previously, we would take in about 365 individuals a month that would enlist for the combat arms. With the new incentives we have, with the stabilization policy, and the unit of choice or an area of choice, we have been taking in recently about 3,500 to 3,600 per month, or almost about 10 times as many.

COMBAT INCENTIVES

Senator YOUNG. What incentive is there to enlist in a ocmbat arm? Does he receive better pay?

General KERWIN. I think at the present time the incentives are, first, we are coming out of Vietnam and there is less possibility of going into combat.

No. 2, by enlisting in the combat arms, a man is assured of a 16-month initial stabilization after he completes his advanced and indi-

vidual training and can choose the unit. As a consequence, he can choose the general area where he wants to go. So, if he is interested in the combat arms, he can go to the 3d Armored Division in Frankfurt, Germany.

Combat Assignments

Senator Young. If you don't have a sufficient number of men for combat service, when and who makes the decision as to where this young man goes?

General Kerwin. If he specifically enlists for the combat arms——

Senator Young. No. I mean the man drafted into the service.

General Kerwin. Any man who comes in and doesn't make a specific choice or can't meet the mental standards for a hard skill, can be placed any place we need him. In this case, he will probably be placed within the combat arms.

Senator Young. Who makes that decision?

General Kerwin. That decision is made down at the reception center.

Senator Young. Before recruit training?

General Kerwin. The reception station makes it according to the requirements we place upon the station.

Senator Young. Before recruit training?

General Kerwin. Yes, sir. He starts out right then to be either in one of the skills or in the direction in which he wants to go.

Assignments to Activities Outside Army

Chairman Ellender. I have figures here to indicate that at the end of fiscal year 1973 approximately 4,800 Army personnel will be assigned to activities outside of the Army, and of this total 2,500 are officers. The majority of these individuals will be assigned to other Department of Defense activities for which the Army is not reimbursed. They are as follows:

Secretary of Defense, 308; Joint Chiefs of Staff, 430; Defense Communications Agency, 729; Defense Intelligence Agency, 858; [deleted] Defense Nuclear Agency, 291; Defense Supply Agency, 428.

I think this committee should consider in the near future as to the advisability of an investigation as to the composition of the personnel in the Army, Navy and Air Force, to see if more of the work cannot be performed by civilians.

General Kerwin. I ask Colonel Brinkerhoff to answer that.

Colonel Brinkerhoff. Sir, your numbers are perfect.

In addition, of course, we have 648 military spaces in other agencies for which we are reimbursed and 438 which are not paid out of this appropriation but are from the civil works appropriation.

Chairman Ellender. Proceed.

Validity of Combat-Support Ratio Computations

General Kerwin. I do not consider the product of one of these computations more valid than the others. Each serves a useful purpose and can be employed as an indicator for a more detailed analysis.

Some observers tend to immediately perceive a direct relationship between the number of combat troops and the amount of combat power contained within a given military force. Technology, in the

form of new weapons and equipment, may invalidate such a conclusion.

The danger of such logic becomes apparent if we were to conclude that our agriculture industry must have less "feeding power" today since our Nation has far less farmers than in the past. Most observers are quick to recognize that the mechanization of agriculture has resulted in greater output with fewer farmers actually tilling the soil.

Yet, the number of people and variety of skills needed to support our farmers has increased dramatically. Those who manufacture, distribute, sell and repair farm machinery, along with many others, constitute the farmer's support.

Combat Force Reduction and Support Force Increase Resulting From Improved Firepower and Mobility

Using such analogy, it is not difficult to realize the Army merely reflects what has happened throughout our society. Advance technology in the form of improved firepower and mobility reduces our need for as many soldiers to close with the enemy.

As a general rule, in combat we would prefer to expend technology and materiel instead of the lives of American soldiers. However, the number of support troops needed to insure maximum effectiveness of the combat soldier has increased.

Senator Young. General, either you, or whoever wrote this, has a good knowledge of farming.

Chairman Ellender. Before you go to the next item, this is a fairly good illustration of what has happened to agriculture. I am cognizant of that. When I first came to Washington in January of 1937, as I recall, 23 percent of our population was engaged in producing food for themselves and the rest of our population. Today, it is about 5 percent.

Of course, all of that is due to mechanization.

Research and Development Military Personnel

But in the Department of Defense much of mechanization and technical advances you refer to is handled by military personnel. In research and development alone there are 34,000 military personnel assigned to this work, of whom about 10,000 are officers. I believe much of this work could be as readily done by civilians.

General Kerwin. As I pointed out, sir, we have reduced the number of individuals involved in the research and development. As brought out by General Kjellstrom, generally speaking as we came down in the total number of troops in combat support, many of the jobs have been taken over by civilians.

Expenditure Reduction Imperative

Chairman Ellender. I believe that I have stated my case. I hope you will study the points I have made. Some method must be found to curtail expenditures.

Proceed.

General Kerwin. So far, we have discussed our actions to reduce military personnel staffing, to improve the quality of enlisted accessions, to provide for administrative separation of unsuitable enlisted

personnel, to reduce our PCS travel, and a discussion of the combat to support ratio.

At this point, I will turn to our four fundamental goals.

ACCOMPLISHING MILITARY PERSONNEL GOALS

Our initial goal of moving to baseline force levels in an orderly manner has two distinct aspects. We must first develop a manpower program within established constraints and then execute the program in a manner which will attain the balanced force needed.

Prior to discussing the manpower programs for fiscal year 1972 and 1973, I would like to briefly describe the development process, itself.

DEVELOPMENT OF MANPOWER PROGRAM

The requirement for trained military strength is based on the number of spaces to be filled. The Secretary of Defense in coordination with the Joint Chiefs of Staff, and the worldwide unified commands, determine requirements for Army forces needed to satisfy the national military strategy.

These requirements dictate the number and types of Army units to be maintained and specify the units to be deployed in the oversea theaters.

In addition, the Department of Defense directs and controls the requirements for Army forces engaged in special mission activities, such as Continental Air Defense and Strategic Communications.

The Department of the Army staff, principally the Assistant Chief of Staff for Force Development, then translates these basic requirements into a total troop list of Army forces which will provide a balanced structure of combat and supporting units capable of conducting sustained operations to meet the requirements of strategic plans and special missions. This total troop list determines specifically and individually the trained strength requirements of the Army, identifying the unique skills and the grade structure of the individual soldiers needed to man and operate the structure.

Trainee strength requirements are a direct function of the number of new accessions into the Army who must be trained to meet our trained strength requirements. When actual personnel losses exceed our planned losses, we must increase our accessions to avoid a greater reduction in trained strength than we anticipated.

Likewise, when actual losses are less than our planned losses, we must reduce our accessions.

Sometimes, as during the current fiscal year, a simple reduction in accessions is not sufficient to reduce the overall strength of the Army to the planned level. In these cases, we must take positive actions—such as early release and involuntary separation—to reduce strength.

In taking these actions, we attempt to insure that reductions take place in a way that minimizes imbalances in grade structure and skills.

Our manpower program is based on a monthly projection of losses and gains or accessions we must obtain to reach authorized strength. Gains, losses, and the average monthly strength are the primary basis for the computation of dollar requirements. Budget cost rates are based on entitlement prescribed by law, such as pay and allowances,

and on experience cost factors used in the computation of subsistence and PCS travel.

Application of these cost rates/factors results in dollar requirements for pay and allowances, subsistence, PCS travel, and other military personnel costs such as servicemen's group life insurance and interest on savings deposits.

Over the past year, this development process has been heavily influenced by two major considerations—the need to reduce the personnel strength of the Army and to reduce reliance on the draft as a source of personnel procurement.

1972 Manpower Program

With this in mind, I would now like to discuss changes in the fiscal year 1972 manpower program which have occurred since submission of the fiscal year 1972 President's budget.

At the time the Army began the buildup in 1965 and the decision was made that the Reserve forces would not be mobilized to fight in the Vietnam war, certain problems were recognized and planning for phase down began. For example: During the buildup, the Army reduced the percent of fill, that is, placed personnel in positions of higher grades without concurrent promotion, to minimize the personnel impact during phase down.

The technique used was to develop a baseline force for 1973 and plan a glidepath to be followed during phase down.

In the President's fiscal year 1972 budget, the Army's strength was projected to decline in relatively even increments from a beginning strength of 1.107 million to an end strength of 942,000.

Token utilization of reserve components in Vietnam

Chairman Ellender. As I pointed out last year, we have been spending in the neighborhood of $4 billion annually to maintain the Reserves and the National Guard of the three services. Some of the Reserves have been used in Vietnam, but others—such as the Marines Reserve—have not been called to active duty for other than training purposes. Secretary Laird has indicated that he intends to correct this situation somewhat. But here is another area that should be studied in order to utilize personnel to the best purposes and at the same time reduce costs.

General Kerwin. As you are well aware, Senator, we do have plans for reinforcement of Europe, both by M plus 60 and M plus 90, plus the Reserves. I agree that the Reserves should be used more.

Chairman Ellender. Proceed.

1972 manpower changes

General Kerwin. Monthly losses were expected to exceed gains by 13,700 in fiscal year 1972 allowing an orderly reduction to a 13-division baseline force in fiscal year 1973.

Statutory Average Strength Reduction

Enactment on September 28, 1971, of legislation extending the draft (Public Law 92–129) however, reduced the Army's average fiscal year

1972 strength by 50,000 man-years from the President's budget and established a fiscal year 1972 ceiling of 974,309 man-years.

It has been necessary to reduce Army total end fiscal year 1972 strength by 81,000 below the position contained in the President's budget of last year. We had planned a strength reduction of approximately 262,000 over a period of 2 years; however, we had to achieve the planned 2-year reduction in 1 year.

Management Problems

The management problems encountered are perhaps best described by the magnitude of the task which confronts the Army.

From our June 30, 1971, strength, we must remove from our rolls 480,000 soldiers during a 12-month period. During this same period, we are bringing 218,000 soldiers into our ranks in such manner as to have them trained in the necessary skills to match those of our departing soldiers. There are about 262,000 of our fiscal year 1972 personnel losses who will not be replaced.

These losses must be time phased to insure that our average strength remains within the mandated ceilings. The inherent turbulence created by the sheer number of people affected cannot be avoided. Also, control of when a gain or a loss must occur compounds our problems.

Imprudent, Timely, and Costly Policies

The end product has resulted in personnel policies that were less prudent, timely, and economical than we would desire. Difficult decisions—many of which adversely affect our personnel—have been necessary to insure the required strength reductions are made. It is to be hoped that precipitous strength reductions will not be necessary in the future.

Early Release Policy

Ways to reduce Army strength in fiscal year 1972 were examined by the Army Staff beginning in May 1971 when the 50,000 man-year reduction was first mentioned in Congress. An early release program was instigated in August 1971 to achieve an average strength within the proposed ceilings. This was a minimum early release designed to reduce the number of nondeployable personnel in continental United States with a minimum impact on personnel readiness of Army units.

Our actual strengths in September and October failed to decline as rapidly as projected. This required a second early release to place the Army back on the man-year glidepath.

Rapid Vietnam Phasedown and Zero Draft

Reports received in September, October, and November revealed that strength projections had not been adjusted sufficiently to reflect the changing environment brought about by the rapid phasedown in Vietnam and the zero draft situation.

Expanded Early Release Programs

Essentially fewer men left the Army and more new men enlisted than historical rates anticipated. Revised projections made it appar-

ent that a large early release would be required to remain within the average strength ceiling.

In December 1971, expanded early release programs were implemented which included:

(1) 179-day early release of draftees and first-term enlistees personnel worldwide. (Except for Europe and the Republic of Vietnam.) In Europe, early release of draftees and first-term enlistees is set at 150 days.

(2) Draftees and first-term enlistee personnel returning from RVN with more than 6, but less than 12 months, until their expiration of term of service are voluntarily released at a CONUS port. Those with less than 179 days are automatically separated at the port.

(3) Three-year, first-term enlistees are released 12 to 18 months early provided they agree to serve the remainder of their enlistment period in a Reserve component unit.

Under the expanded early release programs, 86,500 personnel who would have been separated in the first half of fiscal year 1973 will be separated during the last half of fiscal year 1972.

Officer Losses

Although the early release programs primarily affect enlisted men, officer losses are necessary for a balanced Army. Current programs will result in an estimated 11,000 officers being separated during fiscal year 1972 who would otherwise have remained on active duty.

Other Program Results

The early release program for fiscal year 1972 is bringing about the following:

(1) Personnel readiness degradation.

(2) Personnel turbulence during the last half of fiscal year 1972 as a result of priority personnel fill requirements.

(3) A MOS skill imbalance as a result of the rapid drawdown.

(4) Lower accessions as a result of the man-year constraint which will cause temporary under-utilization of the training base, and increased MOS shortages. Accessions lower than programmed also will reduce the number of new soldiers with civilian acquired skills entering the Army.

Since this revision of our strength projections, estimates have been very close to the reported data for the months of November, December and January.

Involuntary Releases of Career Personnel

Voluntary losses were insufficient to achieve the necessary reduction in strength while maintaining a balanced force. We must also impose involuntary releases of career personnel.

Three considerations govern any forced reduction: Quality; balanced structure; promotion opportunity.

Also, in terms of man year savings, the earlier the losses begin, the fewer the number of personnel who must be released. However, consideration must be given to the individual. Currently, we are giving them a minimum of 90 days notification.

Specific actions involving involuntary releases of career personnel to achieve the 50,000 man-year decrement include:

A Department of the Army board will select 4,000—5,000 surplus officers, primarily company grade, for release during fiscal year 1972.

Retirement eligible enlisted personnel who have passed the mandatory separation point of the next higher grade will be given an involuntary release.

GRADE SEPARATIONS

Chairman ELLENDER. From what grade do you start reducing?

General KERWIN. For separation, sir?

Chairman ELLENDER. Yes.

General KERWIN. We are separating lieutenants, captains, majors and lieutenant colonels.

Chairman ELLENDER. How about generals?

General KERWIN. No, sir; we are not separating generals. The normal attrition in generals keeps the rotation going. Normally, in every year we lose about 100 generals through attrition.

As a part of that, if a general officer, say he is a brigadier general, who is not picked up as permanent brigadier general in 5 years but is a temporary, will leave after 30 years of service. The person who has not been picked up, if he happens to be a major general, will be separated after 30 years of service.

So, we have a normal turnover attrition happening among the general officers.

REENLISTMENT STANDARDS ELEVATION

Reenlistment standards will be raised as both a method to reduce end strength and to maintain the quality of the Army enlisted corps.

1973 MANPOWER PROGRAM

The expanded early release program in fiscal year 1972 results in a dramatic dip in the Army strength profile below the planned glidepath between fiscal year 1972 and fiscal year 1973. Fiscal year 1972 end strength is now projected to be 861,000 as compared to the 942,000 forecast in last year's budget submission.

Beginning in fiscal year 1973, gains will exceed losses because 86,500 soldiers who would have departed the first half of fiscal year 1973 will have already been separated; thus, the strength of the Army will increase during the first half of fiscal year 1973.

The inflow of new soldiers into the Army must be at the monthly level of 15,000–20,000 to provide replacements and to fill the units being reconstituted in CONUS. During the last half of fiscal year 1973 losses will return to normal and will again exceed gains.

By November 1972, the Army program returns to the normal glidepath of strength reduction which, although lower, roughly parallels the rate of declining strength that was envisioned when the fiscal year 1972 President's budget was submitted. This desirable rate of strength reduction beginning in November 1972 will place the Army back "on track".

The number of untrained accessions required to support the planned manpower program for fiscal year 1973 is 208,600 compared with 195,900 in fiscal year 1972.

We will enlist as many men as we can and use the draft when enlistments do not meet requirements. If the recent pay raises. combat arms bonus, and other incentives are as effective as we hope, the number drafted will be small.

PROCUREMENT AND RETENTION OF BEST QUALIFIED PERSONNEL

Our second goal is the procurement and retention of personnel who are best qualified professionally. In meeting this goal, we want to improve the quality of the career force, improve the promotion opportunity for high quality personnel, and contribute to an atmosphere conducive to a highly professional Army.

I will first discuss our efforts with respect to officer personnel.

In fiscal year 1972, we will gain approximately 14,100 new officers. In fiscal year 1973, we expect to gain approximately 13,100. We project officer losses in fiscal year 1972 at 40,200 and in fiscal year 1973 at 18,500. The Army's fiscal year 1973 authorization for officers is 116,602, a net decrease of approximately 5,400 from fiscal year 1972.

Officer Content

When one examines the officer content of the Army, there are several statistical tools by which comparisons can be drawn. In past years, we have tended to focus on the Army's composition on a given day of the year. That is to say, we have accepted the total strength on June 30, of each year and expressed the percentage of officers within this total as the Army's officer content for the entire fiscal year.

More recently, we have endeavored to manage our man-programs in terms of average strength throughout the entire year. It would, therefore, seem more appropriate to derive officer content ratios on a similar basis. In doing this, we find that the officer content of the active Army shows a decline from 14.2 percent in fiscal year 1972 down to 13.7 percent in fiscal year 1973.

Conditions Militating Against Officer Reduction

This downward trend in relative officer content is achieved in spite of conditions which militate against an officer reduction. These conditions are:

A higher proportion of aviation units in the Army. These units require about 25 percent officers compared to 4 to 12 percent officers for nonaviation units.

Advisor units with a higher officer content than combat units make up a larger proportion of our remaining force in Vietnam.

Reorganization of other units to take advantage of new, more sophisticated equipment and modern concepts requires a higher percentage of officer personnel.

OFFICER PROCUREMENT SOURCES

Next, I would like to talk about our three main sources for procuring officers: ROTC, OCS and USMA.

ROTC

I am pleased to report today that Army ROTC is healthy. We believe it has emerged from the past 3 years of attack as a stronger and more viable program.

The attention focused on ROTC has caused students, faculties, college administrators and the public to realize more fully the importance to the Army and to the Nation of this college-based program.

NEW, DISCONTINUED, AND REINSTATED PROGRAMS

Anti-ROTC incidents have dropped to almost imperceptible levels as reason is replacing emotion. We seldom hear talk these days of abolishing ROTC. In fact, we established new units at 11 colleges this school year and plan to begin enrolling students at nine additional colleges this coming fall.

Senator YOUNG. You discontinued ROTC at how many colleges and universities?

General KERWIN. At 12 universities and colleges.

Senator YOUNG. Has ROTC been reinstated in any of these?

General KERWIN. Yes, sir; it has been reinstated at Princeton just recently, sir.

Senator YOUNG. But there are still 11 remaining?

General KERWIN. Yes, sir; there are still 11.

PROGRAM ENROLLMENTS AND CONVERSIONS FROM MANDATORY TO VOLUNTARY

Although ROTC enrollments dropped about 32 percent from last year, this decrease can be attributed in large measure to 16 institutions that converted ROTC from mandatory to voluntary status. These conversions have been taking place at a fairly steady rate for several years and are considered part of the evolution of ROTC to meet changes in modern education.

Reports from the field indicate the decline in enrollments has most likely run its course and we can expect a modest increase in enrollments next year.

COLLEGES WHERE PROGRAMS HAVE NOT BEEN REINSTATED

Senator YOUNG. I think we should have a list of the colleges where ROTC is still discontinued. Do you have the names of those universities?

General KERWIN. Sir, as you know, for those universities who have dropped the ROTC, we do send some officers to those for courses which are necessary.

Senator YOUNG. I would like to know which they are, because I am not interested in them receiving millions of dollars of research funds to help them out in other ways.

General KERWIN. I will provide the names for the record.

Senator YOUNG. And I wish you would send me a copy.

General KERWIN. Yes, sir.

Senator YOUNG. Most of them are still interested in receiving millions of dollars for other purposes.

General KERWIN. I noticed in the paper this morning that the president of Stanford University is going to allow recruiting on the campus, which is a change from what we had before.

Chairman ELLENDER. Are there any of the discontinued colleges that are land-grant colleges? I am informed under the act which created the land-grant college program that it is obligatory.

General KERWIN. There are no land-grant colleges among them.

(The information follows:)

Eleven of the Army's ROTC units have been approved for disestablishment. These schools and the effective date of their disestablishment are:

Institution:	*Effective date*
Harvard University	30 Jun 70
Dartmouth College	30 Jun 70
Boston University	30 Jun 70
Allen Military Academy [1]	31 Aug 70
Yale University	30 Jun 71
New York University	30 Jun 71
Pratt Institute	30 Jun 71
Boston College	30 Jun 71
City College of New York [1]	30 Jun 72
Stanford University	30 Jun 73
Oklahoma Military Academy [1]	30 Jun 73

[1] Allen Military Academy, Oklahoma Military Academy, and City College of New York are terminating their programs for reasons other than disenchantment with the program.

NOTE.—Princeton University originally requested disestablishment on 30 June 1971 but subsequently reconsidered and signed a new contract on 19 January 1972.

SUBSISTENCE INCREASE AND ANTICIPATED REVERSAL OF ENROLLMENT TREND

General KERWIN. Excellent legislative support in increasing subsistence and scholarships will help us reverse the enrollment trend.

We are particularly encouraged by the results of our minority recruiting effort. Since last school year, black participation in ROTC has increased from 7.7 percent to 10.8 percent. These figures compare quite favorably to the 6.7 percent of blacks in the American college population and 11.2 percent in the national population.

PROGRAM OFFICER PRODUCTION REQUIREMENTS

Officer production from ROTC met requirements for the Active Army last year and projections indicate a continuation of this situation through fiscal year 1976. However, by fiscal year 1977, a shortfall in meeting active duty requirements may occur.

In addition, the Reserve components will need about 10,000 officers from ROTC each year. These projections for the active Army and the Reserve components are based on some additional scholarships which we will ask the Congress to authorize in the future.

ROTC PROGRAM

Senator YOUNG. What is the situation in regard to ROTC graduates?

General KERWIN. In fiscal year 1972 approximately 2,500 ROTC graduates who requested active duty were assigned to active duty for training. In fiscal year 1973 less than 300 ROTC graduates who requested active duty will be assigned to active duty for training.

The fiscal year 1973 selections which were completed in early February were made on a qualitative basis. This is, the best officers as

ranked in the profession of military science order of merit list are being brought to active duty provided they volunteer.

Not affected by active duty/active duty for training program are those ROTC graduates obligated to service on active duty as a result of scholarship assistance and those whose applications for Regular Army commission have been approved.

On balance, there is growing optimism over the program and I am confident that ROTC will continue to provide the high caliber officers needed to lead our soldiers, both in Reserve forces and in the Active Army.

Officer Candidate School

Officer candidate program has been the Army's prime program for officer procurement during periods of rapid expansion. With the decline of officer requirements, the OCS program has been adjusted accordingly. Over the past 3 years, OCS production has been reduced 86 percent. The program now produces approximately 1,000 officers per year. This is about the minimum level that is cost-effective while maintaining an essential expansion capability.

Approximately 80 percent of the OCS entrants are recruited under the college option enlistment program which permits college graduates who have not taken ROTC to enter the officer ranks through OCS. Two schools are currently in operation: one at Fort Benning, Ga., and one at Fort Sill, Okla.

U.S. Military Academy

The Department of the Army is continuing its policy of providing support on a priority basis to the Military Academy. As you may recall, the USMA expansion program was first presented to the Congress in 1964.

This expansion program at the U.S. Military Academy, based on increasing the Corps of Cadets from 2,400 cadets to 4,417 cadets, is progressing in a satisfactory manner. The current strength of the corps is 3,980. It is planned to reach the 4,417 mark by July 1972 with the entry of the class of 1976.

OFFICER RETENTION

We remain concerned with the retention of quality junior officers beyond their initial obligation; notwithstanding success in this area over the past 3 years. This success, coupled with a reduction in total authorization, has necessitated the voluntary and involuntary release of almost 8,500 officers of the nonprofessional branches.

In our move toward reduced baseline authorizations, however, procurement of junior officers has been drastically reduced beginning in fiscal year 1972. We have been able in the past to meet our sustainment requirements because of the relatively large number of officers from which to draw. This will no longer be true.

We will have to increase the percentage of young officers staying in the Army to maintain a proper balance between rank, age, and years of service.

Even though we presently cannot accommodate all the young officers desiring to remain beyond their initial period of obligated service,

an upswing in economic conditions will most likely result in reducing the number of those who want to stay in the Army.

Retention of Medical and Legal Officers

We are still experiencing difficulty in retaining doctors, dentists, and lawyers. There remains a wide pay gap between professionally trained military officers and their civilian counterparts in these professions despite the recent pay increases.

The likelihood of a no-draft environment in 1973 will add to the problem.

As a partial solution, we are undertaking to train a number of physician assistants and nurse clinicians to reduce medical officer requirements. Likewise, we will begin training dental auxiliaries to increase the productivity of dental officers.

However, these partial measures do not address the core of the problem for we must maintain a flow of fresh talent through medical ranks as well as retain priceless expertise and experience if our medical capability is to remain undiminished.

To meet the critical need for military medical officers, the Secretary of Defense has recommended increasing the support of medical school students through medical scholarships. Under this proposal, we would subsidize the individual's medical education in exchange for a specified period of military service.

Drafting of Medical Officers

Senator Young. Are you drafting medical doctors now?

General Kerwin. Yes, sir.

Senator Young. When did you start? You weren't for a period of time were you?

General Kerwin. No, sir. There was a period in there. I don't have that, sir. I will have to provide it for the record.

(The information follows:)

With the exception of fiscal year 1971, there has been a draft call for physicians placed each year since fiscal year 1962. Currently, physicians ordered for induction under Special Call Number 46, announced in February 1971, are being processed for appointment and active duty. Delay in processing of this group of physicians was due to the delay in the enactment of the draft legislation last year. Special Call Number 46 was for 827 for the Army, 531 for the Navy and 250 for the Air Force, a total of 1,608 physicians.

Medical Officer Separations

General Kerwin. While we hope to retain many physicians in military service beyond their initial obligation, those who do not choose a military career will ultimately help to reduce the nationwide shortage of medical personnel.

We also need to provide increased funding for continuing education to maintain proficiency and competence.

Measures To Reduce Military Doctor Requirements

Other possible measures to reduce military doctor requirements are—

First, removal of restrictions of the dual compensation law. We support proposals that would allow us to employ retired medical officers without restriction; and

Second, contracting selectively for supplementary services with civilian hospitals, clinics and practitioners. We are now actively exploring this measure as a means of supporting our requirements; and

Third, shifting dependents and military retirees to civilian facilities under the Champus program. We are not now doing this, but we may be forced to make this shift if we do not have a doctor draft.

Medical Officers

Chairman Ellender. Please comment on the situation of gains and losses insofar as it relates to providing a sufficient number of medical officers.

General Kerwin. The Army's procurement objective for medical officers in fiscal year 1973 is 1,602. A shortfall of between 250 and 300 medical officers is now anticipated unless new programs are established or existing programs strengthened in forms of new incentives.

Berry Medical Plan

Chairman Ellender. Describe the Berry medical plan.

General Kerwin. Participants must be graduates of approved school of medicine and osteopathy, or possess an Educational Council for Foreign Medical Graduates standard certificate; must be a graduate of the year in which applying; be liable for 2 years' active duty; be willing to accept a Medical Corps Reserve commission, if tendered and found qualified; be pursuing or planning to pursue residency training in a specialty required by the U.S. Army. Application is made to Department of Defense. Participants are allocated to the services to the extent that the applicant's choice matches the requirements of that service.

Retention of Legal Officers

The retention problem for legal officers is similar to that of medical officers. In fact, the Judge Advocate General's Corps has the lowest officer retention rate in the Army.

To assist us in solving the lawyer retention problem, the Secretary of Defense has submitted legislation to provide professional pay and continuation pay for lawyers. We support this legislation. It is necessary if we are to approach pay comparability with other Government agencies and the civilian sector.

New recruiting efforts are underway to include a special program aimed at minority officers. The success of these programs in a "no-draft era" also rests to a large degree on the passage of the legislation authorizing professional and continuation pay for lawyers.

Also, to reduce legal officer requirements, the Judge Advocate General's School has scheduled courses which will train enlisted and civilian legal assistants in specialized areas.

Gains and Losses by Type of Personnel

Chairman Ellender. At this point there will appear a tabulation of gains and losses of officers, enlisted personnel and cadets by type.

(The information follows:)

MILITARY PERSONNEL, ARMY (FISCAL YEAR) 1973

Gains and losses by type of officer	Fiscal year— 1971	1972	1973
Beginning strength	166,431	148,623	122,518
Gains:			
Regulars from Academies	701	830	945
Officer training school, education and commissioning program [1]	17,591	8,882	8,860
Call to active duty [2]	4,358	4,036	3,176
Gain adjustment [3]	338	352	167
Total gains	22,988	14,100	13,148
Losses:			
Separation of medical officers [4]	4,719	4,841	3,359
Contract and obligation termination	18,596	12,364	3,916
ANG and Reserve call-up	14		
Early release [5]	5,014	4,136	
Separation of career reserves	2,780	3,438	1,674
Retirements (over 20 years)	3,607	3,722	3,641
Normal attrition [6]	2,914	2,764	1,770
Promotion passovers	41	401	530
Berry medical plan [7]	1,423	1,700	1,448
Loss adjustment [8]	1,688	6,839	2,192
Total losses	40,796	40,205	18,530
End year strength	148,623	122,518	117,136

[1] Includes ROTC, OCS, nurses, Army medical specialists, warrant officer, and Women's Army Corps gains.
[2] Includes volunteer active duty, chaplain, judge advocate general, MSC, MC, DC, and VC gains.
[3] Miscellaneous gains.
[4] Includes all losses to MC, VC, DC, MSC, ANC, SP.
[5] Includes 617 WO aviators who have accepted a direct commission in 1971 only.
[6] Includes losses from disabilities, deaths, eliminations.
[7] Included in separation of medical officers.
[8] Manageable losses (DAADB, waiver of VI's, curtailment of short term extensions).

GAINS AND LOSSES BY TYPE OF ENLISTED AND CADETS

	Fiscal year—		
	1971	1972	1973
Enlisted:			
Beginning strength (includes reimbursables)	1,153,013	971,871	734,810
Gains:			
Prior service (reenlistments)	97,862	74,300	65,000
Nonprior service, male	307,484	189,100	201,600
WAC	5,193	5,700	6,000
Officer training school program	1,025	1,100	1,000
National Guard and Reserves	2,585	2,700	2,400
Returned from dropped from rolls	68,427	48,500	27,600
Gain adjustment	4,735	6,300	3,000
Total gains	487,311	327,700	306,600
Losses:			
Separation of expiration of term of service or normal early release	355,296	188,100	215,600
Programed early release	203,036	305,300	61,100
To commissioned officers	3,288	1,700	1,200
Retirement (over 20 years)	12,003	10,000	7,000
Attrition	90,633	57,200	34,000
National Guard and Reserve	3,647	2,400	2,400
Loss adjustments	610	61	56
Total losses	668,453	564,761	321,356
End year strength	971,871	734,810	720,054
Academy cadets:			
Beginning strength	2,814	2,988	3,900
Gains: Input	1,375	1,339	1,360
Losses:			
Graduates	729	830	950
Attrition	472	462	464
Total losses	1,201	1,292	1,414
End year strength	2,988	[1] 3,900	[1] 4,000
Grand total, end strength	1,123,482	861,228	841,190

[1] Includes the annual graduating class since graduation and the arrival of the new cadet input occur within 15 to 20 days of each other. For accounting purposes these transactions are recorded in July for future projections in order to maintain the authorized level for the cadet account.

OFFICER PROCUREMENT AND RETENTION

Senator YOUNG. Are there any other areas in which there is a problem maintaining an adequate number of officers?

General KERWIN. Other than medical and dental corps officers, the Judge Advocate Generals Corps presents the greatest problem for procurement and retention of qualified officers. I will insert for the record the JAG authorized and actual strength, procurement, and retention statistics.

(The information follows:)

JAG STRENGTH AS OF JAN 30, 1972

Grade	Authorized	Actual	
Colonel	129	108	(−21)
Lieutenant Colonel	228	110	(−118)
Major	393	170	(−223)
Captain	904	1,274	(+370)

PROCUREMENT DATA

Fiscal year	Applied	Selected	Appointed
1967	1,140	600	342
1968	1,180	330	206
1969	1,275	850	333
1970	1,212	660	360
1971	670	314	222
1972	379	[1] 267	[2] 151
1973 [2]	254	Open	Open

[1] Some selected opted for active duty for training in their basic branch.
[2] As of Feb. 29, 1972.

RETENTION DATA

Number of officers processed in respective years [1]	Number and percent of original group still present	Number of years since groups entered (as of November 1971)	
		Years	Months
1956 (92)	6 (6.5)	15	11
1957 (176)	11 (6.3)	14	11
1958 (124)	12 (9.7)	13	11
1959 (106)	21 (19.8)	12	11
1960 (149)	26 (17.4)	11	11
1961 (138)	17 (13.0)	10	11
1962 (248)	22 (8.8)	9	11
1963 (197)	15 (7.6)	8	11
1964 (145)	12 (8.2)	7	11
1965 (133)	8 (6.0)	6	11
1966 (264)	16 (6.0)	5	11
1967 (208)	14 (6.7)	4	11
1980	180 (9.0)		

[1] Officers in year group 1968–72 excluded as they are presently serving their obligated periods of service.

With regard to procurement, applications from 1967 through 1969 exceeded appointments by 4 to 1, and are currently running on a ratio of 1.26 to 1. Of the approximately 1700 judge advocates stationed throughout the world, approximately 1250 are junior officers serving 4-year periods of obligated service. If the number of applicants continues to decline at the rate experienced during the last few years, there will not be sufficient applicants available to fill the vacancies created by officers leaving after their obligated periods of service.

Retention has been an increasingly critical problem for several years. There are approximately 470 officers who have completed their obligated service and have at least 4 years' experience. Many of these officers will leave the service before they are eligible to retire. During the past three years there has been an alarming increase of resignations from Regular Army judge advocates in the grade of major. One such officer resigned in fiscal year 1967, 8 in fiscal year 1968, 15 left in fiscal year 1969, 24 in fiscal year 1970 and 21 in fiscal year 1971. Thus far in fiscal year 1972, 32 have resigned and 8 more have approved resignations for this fiscal year. When you consider that there are only 170 majors in the Judge Advocate General's Corps to fill 393 authorized positions, it becomes apparent how serious these losses are.

The most meaningful solution to the critical retention and recruitment problem is speedy enactment of the lawyer retention pay bill (H.R. 4606, the Pirnie Bill) and S. 704 (the Inouye Bill). The Pirnie Bill unanimously passed the House in July 1971. It is presently pending before the Senate Armed Services Committee. Pay is not only critical to JAGC officer procurement and retention, but is extremely critical for minority lawyer procurement and retention.

There are some officer strength imbalances experienced among the various other branches of the Army as a result of differing retention experience. However, at this time there is little problem in procuring the necessary numbers of officers for the other branches.

Officer Losses

Chairman Ellender. For fiscal year 1972 as I recall, there was a problem associated with a more than adequate supply of officers in certain grades. Would you address yourself to that, indicating how the problem was resolved for fiscal year 1972 and what the situation is, as you see it, for fiscal year 1973?

General Kerwin. When the original reduction plans were formulated early in fiscal year 1972, the surplus areas were company grade and warrant officers. This excess will be reduced by special voluntary and involuntary release programs. The involuntary release program will affect approximately 5,000 officers.

Original fiscal year 1972 strength projections did not indicate any problems in the field grade area. This was due in large part to earlier measures taken in anticipation of a strength reduction. As early as August 1969, promotion to major was slowed down by not promoting to full capacity. June 1970, selective retention of Reserve officers beyond 20 years' active Federal service was terminated. Eight hundred retirement-eligible Reserve officers were released from active duty 1 to 12 months early. In November 1970, the promotion selection rates were made more restrictive. Qualitative screening in fiscal year 1971 resulted in the involuntary release of 148 Reserve majors. To date in fiscal year 1972, 261 Reserve majors have been selected for involuntary release from active duty. When the latest strength projections indicated overage of 400 majors in excess of the Officer Grade Limitation Act (OGLA) authorization, promotion to major was suspended in December 1971 for the remainder of the fiscal year. This projected overage was reported to Congress in the annual report of the Department of the Army pertaining to the grade distribution of active duty commissioned officer personnel. The letter of transmittal indicated the Army position—that the Army had honestly and forthrightly done everything practical to meet the OGLA end strength constraints and that a further involuntary release of Reserve majors would not be in the Army's best interest. To preclude such a reduction, I have asked the Secretary of the Army to approve a proposal that legislation be requested authorizing the Army to exceed OGLA by no more than 400 majors in fiscal year 1972. In the event this fails, either a reduction in force or a reduction in grade of majors will be required. Either of these actions will have tremendous adverse impact upon officer morale.

With regard to fiscal year 1973, we foresee no particular problem in meeting the officer strength objectives of the fiscal year 1973 budget. However, should additional reductions be imposed during fiscal year 1973, serious problems will arise in this area. Having utilized voluntary releases to the maximum extent during fiscal year 1972, any additional losses in fiscal year 1973 will have to be involuntary. By law, only Reserve officers can be released to meet budgetary limitations. As the number of released officers rises, the overall quality of the released officers also rises. Therefore, any additional reduction would affect officers with excellent records and performance.

Chairman ELLENDER. Is there any other comment you may wish to make in describing the officer loss program?

General KERWIN. I would like to add that voluntary loss programs have been used extensively to meet the yearend strength. Unfortunately, these losses were insufficient and involuntary release programs had to be initiated.

STRENGTH REDUCTION

Chairman ELLENDER. If you have not done so elsewhere, please describe major areas of strength reduction in fiscal year 1972 and those contemplated for fiscal year 1973.

General KERWIN. I will be glad to do so.

(The information follows:)

The FY 72 President's Budget contained a military strength of 941,600. The FY 72 column of the FY 73 President's Budget shows a strength of 860,600. Of the total 81,000 reduction, the majority was dictated by the 50,000 man-year reduction directed by Congress. To achieve that reduction total Army active divisions were reduced from [deleted].The remainder of the reduction is a scaling down of the Special Mission Category of Land Forces in consequence of our SEA withdrawal, other Congressionally directed reductions, and a reduction in the number of trainees required to support the smaller Army.

The FY 72 column of the FY 73 President's Budget reflects a military end strength of 860,600. The FY 73 Manpower Program shows an end strength of 840,600. The reduction (20,000) is primarily in Special Mission and General Support. It reflects reductions in intelligence, communications, training, headquarters activities, and base operations occasioned by the lower end strength. Note: All strengths exclude reimbursables.

GRADE STRUCTURE

Chairman ELLENDER. At this point in the record there will appear a tabulation from the justifications showing the grade structure, as well as the beginning, end, and man-year strengths for officers and enlisted personnel of the Army for fiscal years 1971, 1972, and estimated for 1973.

(The information follows:)

GRADE STRUCTURE, BEGINNING, END, AND MAN-YEAR STRENGTHS BY IDENTITY

	June 30, 1971	June 30, 1972	June 30, 1973	Man-years fiscal year 1972	Man-years fiscal year 1973
Commissioned officers:					
General of the Army	1	1	1	1	1
General	15	16	15	14	16
Lieutenant general	45	49	49	47	49
Major general	189	183	180	188	183
Brigadier general	248	248	244	248	247
Colonel	5,947	5,694	5,779	5,858	5,736
Lieutenant colonel	14,577	13,009	12,573	13,795	12,785
Major	22,266	19,862	18,549	20,872	19,202
Captain	49,073	38,071	38,002	43,571	38,035
1st lieutenant	23,907	20,614	18,061	24,091	19,076
2d lieutenant	13,666	8,500	8,000	11,821	8,248
Subtotal	129,934	106,247	101,453	120,506	103,578
Warrent officers:					
CWO W-4	1,626	1,465	1,491	1,580	1,478
CWO W-3	3,218	3,254	3,528	3,244	3,391
CWO W-2	11,073	10,252	9,264	10,739	9,759
WO W-1	2,772	1,300	1,400	2,138	1,389
Subtotal	18,689	16,271	15,683	17,701	16,017
Total officer personnel	148,623	122,518	117,136	138,207	119,595
Enlisted personnel:					
E-9	4,546	4,289	4,214	4,280	4,251
E-8	15,687	14,696	13,955	14,825	14,325
E-7	58,392	52,402	50,372	55,111	51,385
E-6	94,725	81,798	72,951	89,414	77,373
E-5	181,068	154,285	138,715	161,843	146,498
E-4	266,825	234,641	224,898	250,279	229,772
E-3	129,899	62,280	69,466	98,236	71,945
E-2	74,958	57,653	64,313	66,816	66,604
E-1	145,771	72,766	81,170	91,360	84 029
Total enlisted personnel	971,871	734,810	720,054	832,164	746,182
Total	1,120,494	857,328	837,190	970,371	865,777
Cadets, U.S. Military Academy	2,988	3,900	4,000	3,938	4,155
Grand total	1,123,482	861,228	841,190	974,309	869,932

Reduction by Grade

Chairman Ellender. In the tabulation on page 25 of the justifications, the reductions from fiscal year 1972 to 1973 are spelled out by grade. The overall reduction is about 10.7 percent. Enlisted personnel are reduced by about 10.4 percent. The planned reduction in warrant officers is about 13.5 percent. The reduction in officers through the grades from lieutenant to colonel is about 13.6 percent. But the grades from brigadier general through general of the Army the reduction is less than one-half of 1 percent. Please comment.

General KERWIN. The overall reduction in Army general officer strength by the end of fiscal year 1973 is now projected to be 1.6 percent under the total authorized for fiscal year 1972 under the Officer Grade Limitation Act (OGLA). General officer strengths are computed in accordance with the OGLA and increases and decreases in total Army strength are related to increases and decreases in general officer strengths. These changes, however, are not directly proportional to overall strength changes, either in total strengths or in officer strengths. For example, under the OGLA a 10 percent reduction in the total commissioned officer strength of the Army results in a 7.8-percent reduction in field grade officers and a 4-percent reduction in general officers. To put the apparently small decrease in the number of general officers in better perspective, one must be aware that since 1961 when the strength of the Army was 858,000 to 1967 the number of general officers remained constant at 475. During the Vietnam buildup (1966 to 1969), the actual commissioned officer strength of the Army rose by 47 percent and the general officer authorization increased by 10.5 percent. However, the actual general officer strength increased by only 2.9 percent. Because of a strength ceiling imposed by the Senate Armed Services Committee, the Army was allowed to increase in general officer strength by only 14 officers while the Army was increasing from 969,000 to 1,570,000 total strength. This was 58 general officers below its OGLA authorization at the peak of the Vietnam buildup. Projected as of June 30, 1972, the Army will be governed by the OGLA since the total authorization under the law will be lower than the Senate ceiling.

Chairman ELLENDER. The number of officers with the rank of general actually is being increased by two over the 14 man-years of such personnel in fiscal year 1972. What is the requirement for this increase?

General KERWIN. We had projected 16 generals for the end of fiscal year 1972 although we now find that not more than 14 will be assigned. Man-year computation took this projection into account and resulted in a 16 man-year projection for fiscal year 1973. We do not expect to have more than 14 generals during the fiscal year.

Chairman ELLENDER. Proceed.

ENLISTED PERSONNEL

General KERWIN. Based on the President's guidance, measures were taken which would reduce the Army's reliance on the draft for the procurement of enlisted personnel so that by July 1, 1973, the Army's manpower requirements could be met without relying on the Selective Service System.

To achieve this goal, three principal steps were taken:

The size of the recruiting force was increased.

New and better enlistment options were developed.

The advertising program was expanded.

These actions were initiated late in fiscal year 1971.

Despite reduced draft pressure, our first half fiscal year 1972 enlistments exceeded first half fiscal year 1971 enlistments by 4,500 men.

Additionally, we have made considerable gains in quality. We intend to continue our emphasis on quality because in a smaller, more professional Army, our soldiers must be highly skilled and trained and most must be capable of being trained in more than one job.

RECRUITING FORCE INCREASE

I would now like to address, in more detail, those measures we have taken in regard to the size of our recruiting force.

First, we felt that it was imperative to increase the size of our present recruiting force from 3,500 to a total of 6,100 by the end of this fiscal year. We are on schedule regarding this buildup.

OFFICER-ENLISTEE RATIO

Chairman ELLENDER. Are these 6,100 enlisted personnel?

General KERWIN. Yes, sir; mainly enlisted personnel.

Chairman ELLENDER. How many of those 6,100 will be officers?

General KERWIN. There are 276 officers and 6,080 enlisted personnel. Additionally, we are opening more than 500 new recruiting stations throughout the country to support these new recruiters. This increase in the recruiting force will enable us to personally contact a much larger number of potential enlistees than we could contact in the past.

COOPERATION AMONG SERVICES

Chairman ELLENDER. Do you know whether or not the same situation applies to the Navy?

General KERWIN. Yes, sir; all services. Each one of us has different objectives to meet our requirements, but all services are recruiting.

Chairman ELLENDER. To what extent is there cooperation among the services in establishing recruiting offices? Are these separate from one another?

General KERWIN. In most cases, you will find that the recruiting stations are joint recruiting stations with all services being present. There is a tremendous amount of cooperation between the recruiters at the recruiting stations in assisting each other.

In addition, at the DOD level, the Deputy Chief of Staff for Personnel and the Assistant Secretaries of the Services for Manpower and Reserve Affairs meet almost on a weekly basis to review the enlistment requirements, the objectives, the various techniques used by the various services in order to increase enlistments. Also we review the plans and programs that we should be looking forward to and implementing in order to assure that we meet the objectives that we have to get down to a zero draft by July 1, 1973.

Chairman ELLENDER. Is it correct to assume that if an individual goes to any of the recruiting stations, whether it be the Navy, Air Force or Army, that he can ask to be recruited in any service he chooses?

General KERWIN. Yes, sir. Most of the stations are joint already. There are a few which are individual stations, depending on the section of the country. But if you go to any one of the stations, and if I am the Army recruiter and I cannot satisfy you as to what you want, I will refer you to the Navy or Air Force recruiter, because these people work together on a daily basis.

Chairman ELLENDER. Proceed.

PAY INCREASE AND COMBAT ARMS BONUS

General KERWIN. Now that the pay raises have been approved, we are hopeful that a larger recruiting force aided by increased advertising will significantly increase the number of young men electing to

enlist in the Army. Also, we are looking forward to testing the effects of the combat arms bonus.

New Enlistment Options for Enlistees

However, I do not want to mislead you. We do have problems in procuring sufficient enlistees. We are by no means certain we can obtain the numbers of volunteers we need without the draft.

Also, we know that enlistments for sophisticated and technical skills were primarily driven by the threat of the draft. We must now devise programs and incentives to obtain these high aptitude soldiers in a zero draft environment.

Twelve new enlistment options, designed to attract young men in all fields, have been added since January 1, 1971. There are now 33 such options available.

These options offer a variety of choices to appeal to the diverse interests of prospective Army volunteers. Those featuring the selection of an area or unit by the enlistee have proven to be highly effective in attracting volunteers into the combat arms.

Advertising

Our recruiting program has been assisted by an increased advertising program. During the last quarter of fiscal year 1971, we undertook an advertising campaign which was unique in that, for the first time, we advertised on prime radio and TV time. This was a test case which appears to have been reasonably successful.

We remain hopeful that we will be able to advertise on prime time radio and TV at some point in the future.

Senator Young. What rates do you pay for that advertising?

General Kerwin. The company handling this for us in bulk tries to get the best rates they can, depending on the section of the country and programs.

Senator Young. Do they give better than commercial rates?

General Kerwin. In some cases during the last test we did get better rates.

Senator Young. How much have you in this budget for advertising?

General Kerwin. Nothing. Nothing for prime time radio and TV.

Actions To Obtain Support of Broadcasting Industry

In the meantime, actions to obtain the support of the broadcast industry have been taken. Our recruiters have personally contacted the majority of radio and television stations in the country in an effort to obtain prime time advertising as a public service. So far, the response has been insignificant.

The recently passed military pay raise was a significant step toward competing with industry for manpower. Using nationwide newspaper ads during November and December, we were successful in getting information on the pay raise to a large portion of our target audience. However, the response indicated that we were not as successful as we might have been with maximum use of the broadcast station.

We are planning to continue using available media during the remainder of fiscal year 1972 and into fiscal year 1973 to advertise the many opportunities available in the Army. This, we feel, is needed to obtain volunteers and reduce reliance upon the draft.

Success of Advertising

Senator Young. In the past year or so there has been a stepped up campaign on the part of the services to point out the advantages of the military life to potential recruits. What, in your opinion, has been the success of the campaign to date?

General Kerwin. Increased enlistments are, of course, the object of the Army's recruiting and advertising program. During the period of the paid broadcast campaign, March–June 1971, and in the months following when the impact of the campaign was still fresh, male enlistments showed a notable increase. Combat arms volunteers increased even more dramatically—although even they never reached the full level required. This was especially significant in view of the Calley trial, the May Day demonstrations and the general antimilitary climate.

As the effect of the prime-time campaign has faded, our success in recruiting has deteriorated. In spite of the pay raise, a larger recruiting force, and more intensive use of other advertising media, recent enlistment results are not encouraging.

Chairman Ellender. How much will be spent on this advertising in fiscal years 1972 and 1973?

General Kerwin. The active Army recruiting program is $26.7 million in fiscal year 1972 and fiscal year 1973.

Projections for the perennially poor recruiting months of March, April, and May indicate that we will fall short of our accession requirements for this period. Likewise, unless we can get our message across to this year's high school graduates, it is highly questionable whether enlistments will match the higher accession requirements of June, July, August, and September. Our requirements during the summer will average approximately 20,000 per month. Only by conducting a total media campaign including paid television and radio advertising can we hope to communicate, effectively with our target audience—and thereby obtain the enlistments we require.

Enlisted Personnel Gains and Losses

Chairman Ellender. Please describe the most significant changes in the tabulation entitled: "Gains and Losses by Type of Enlisted and Cadets".

General Kerwin. Yes, sir. By far the most significant change in the tabulation is the number of enlisted losses in fiscal year 1973 as compared to fiscal year 1972. To achieve the average strength of 974,309 in fiscal year 1972 we were required to accelerate losses planned for the last half of fiscal year 1972. Some 86,500 soldiers programed for separation in the first half of fiscal year 1973 are being separated during the last half of fiscal year 1972. This acceleration of programed fiscal year 1973 losses, into fiscal year 1972 results in the large number of losses shown in fiscal year 1972. In addition, this action causes unusually low losses in fiscal year 1973. Male-non-prior service gains in fiscal year 1973 have increased over the fiscal year 1972 level. The

input of new soldiers into the Army in fiscal year 1972 has been constrained as part of the management actions imposed to remain within the average strength ceiling. Therefore, beginning in fiscal year 1973 it is necessary to have accessions of new soldiers at a level which will overcome the deficit from fiscal year 1972 and considering training lead time of 5 months, replace normal losses the last half of fiscal year 1973.

Chairman ELLENDER. I notice that you estimate that 27,600 enlisted personnel will, in fiscal year 1973, be "returned from dropped from rolls." Please describe what is meant by that.

General KERWIN. The category returned from dropped from rolls refers to those enlisted personnel who have returned to duty after being dropped from rolls due to desertion.

Senator YOUNG. What does "attrition" include?

General KERWIN. The category "attrition" refers to losses resulting from death, dropped from rolls, physical disqualification, unfitness, and misconduct.

Chairman ELLENDER. Do you have any further comment on enlisted gains and losses in relation to either the fiscal year 1972 or the fiscal year 1973 program?

General KERWIN. Yes, sir. During fiscal year 1972 the Army is being required to accomplish a 23-percent reduction in its total strength. To accomplish this reduction we have been forced to implement undesirable and costly policies. Early release programs initiated in fiscal year 1972—voluntary or forced—reaped less than the full benefits from the training dollars invested. In addition, these early release programs increased the turbulence within the Army, adversely affecting personnel readiness, and morale. The Army requires a period of stabilization to recover from the turbulence of fiscal year 1972. I am confident that the stabilization contained in the present manpower program will put the Army back on track toward an all-volunteer Army in fiscal year 1973.

ENLISTED ASSIGNMENT AND UTILIZATION: CIVILIAN ACQUIRED SKILLS

The Army attempts to use the greatest possible number of civilian trained personnel in military positions that are commensurate with their qualifications. This enables the Army to reduce training costs and increase the motivation and performance of personnel who are selected for these positions.

The civilian acquired skills enlistment program offers enlistees direct assignment and utilization in over 30 military occupational specialties and accelerated advancement to pay grade E–4 or E–5 following completion of basic training.

Planned expansion of the program provides for evaluation of an applicant's skill and skill level to perform in any civilian occupational specialty which has a military counterpart. This expanded program continues to provide for recognition of usable skills by direct assignment and accelerated promotion.

Incoming personnel are interviewed at the reception station to determine their educational level, special qualifications, civilian acquired skills, and personal desires. This information is reported to the Department of the Army and qualified individuals are awarded appropriate specialties if the Army has a valid requirement for their skills.

A program, initiated January 1, 1971, allows these individuals to take a specialty evaluation test at the reception station. The results of this test, combined with scholastic degrees and civil licenses, provide the interviewer with objective information on which to judge the individual's qualifications.

Those individuals only partially qualified are considered for training in related Army courses. They can receive advanced training or be accelerated through existing courses.

During fiscal year 1971, approximately 24,500 new accessions were awarded a specialty without advanced training based on a civilian acquired skill. Use of men in their chosen occupations should increase retention and reduce reliance on the draft.

Reenlistment

Reenlistment rates have declined since fiscal year 1965, and in fiscal year 1969 reached the lowest levels in 15 years. In fiscal year 1971, there was an upturn in reenlistment rates in all grades.

The fiscal year 1971 upturn can be attributed to several factors: Implementation of the numerical reenlistment objective system, increased reenlistment incentives, increased pay, the higher ratio of career-motivated (RA) first-term personnel in the Army, and a relatively high level of civilian unemployment.

As the Army continues to phase down to baseline force levels, the number of personnel we need to reenlist will continue to decrease. However, it is anticipated that retention in combat MOS (INF, ARM, ARTY), and hard skills (MOS which require technical skill and long training time) will continue to challenge us.

Program Control

The decrease in reenlistment requirements have made it necessary that we control reenlistments. Trend indicators show that phasedown requirements, coupled with increased numbers reenlisted, are causing skill imbalances, grade inversions, and a surplus in the career content.

If uncontrolled, there will be more career personnel than positions available in the force structure. Such conditions create promotion stagnation, low morale, and increased assignment problems.

Reenlistment controls are essential in managing an orderly phasedown in the strength of the Army. Controls have been implemented to minimize the impact of phasedown by insuring that personnel with desired quality and professional attributes are retained.

The Army's goal is to arrive at the baseline strength levels with a proper balance of career soldiers and first-termers possessing the highest quality attainable.

Actions taken to attain this goal include qualitative management, reclassification controls and higher reenlistment eligibility standards. These actions will enable the Army to offer an attractive career for personnel with ability and potential.

Reenlistment can no longer be considered an automatic entitlement. The Army must insure qualitative as well as quantitative objectives are met to achieve a truly professional and viable career force.

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Top Six Enlisted Content

As we continue to phase down toward our fiscal year 1973 baseline goal, we have concurrently refined our management of the reduced assets. During this year, we have implemented a long-range management program which we refer to as the Army integrated management system (AIMS).

This is a dynamic system designed to measure such variables as Army requirements and career management policies.

These measurements provide a basis for establishing policies which will shape and define the enlisted force.

We require procurement, attrition, promotion, distribution, and utilization programs which can be sustained and are predictable both to the Army and to the individual. A central theme of our management policies has been the preservation of the "Top six content" of the enlisted force.

As we progress toward achieving our baseline goal of 70 percent in the top six grades in fiscal year 1973, we must maintain an environment which will create a predictable and sustainable promotion flow, provide a highly trained cadre for an expansion capability, and promote continued progress toward a volunteer force.

Enlisted Promotion System

The enlisted promotion system of the U.S. Army has undergone several major changes and improvements in the last 3 years.

In 1968, promotion to grades E–8 and E–9 were centralized at Headquarters, Department of the Army. The procedures used are similar to those employed in the field grade officer selection process.

Increased equity has been provided in that a local position vacancy is no longer a requirement in the selection process and selections are made on a best-qualified basis Army-wide.

To date, three boards have been convened for grades E–8 and E–9.

On June 1, 1970, Department of the Army added grade E–7 to the centralized system. The first E–7 board adjourned in September 1970. To provide consideration for promoting outstanding individuals early in their careers, secondary zones are established for each promotion board.

Early in 1970, promotion of enlisted personnel missing, captured, or hospitalized for extended periods, was made more equitable. All individuals carried in such status may now be considered for promotion to each enlisted grade as they meet the eligibility requirements.

Under previous policies, promotion consideration was provided to only one grade and then only if the individual held recommended status to that grade and entered a missing, captured or hospitalized status from a hostile fire area.

On November 1, 1970, the Army eliminated the local position vacancy requirement in the promotion process to grade E–6 and established a form of centralized control over promotions to that grade.

On June 1, 1971, this program was expanded to E–5. Eligible E–4s and E–5s compete Army-wide with those performing similar duties and their qualitative standing is determined on an Army-wide basis. Qualitative standards were also increased by raising the MOS test waiver score from 70 to 100.

Noncommissioned Officer Education System

The phase down in Southeast Asia provides the Army with an opportunity to develop a truly professional corps of noncommissioned officers and specialists.

You may recall that I mentioned the cornerstone of this effort to you last year—the Noncommissioned Officer Education System—which is a two and possible three-level formal education program for enlisted careerists that is comparable to our officer education program.

We began implementing this program at its basic level during the fourth quarter of fiscal year 1971 and further implementation of the basic and advanced level is on-going. When fully implemented during fiscal year 1973, the program will return the enlisted careerist periodically to an academic training environment to prepare him for the next higher plateau of supervisory responsibility.

This endeavor is one of the Army's major personnel programs designed to enhance professionalism and ultimately provide the catalyst which will revitalize the NCO corps.

Drill Sergeant Program

You may recall that during my report last year, we were in the process of conducting an extensive study of the entire drill sergeant program with a view toward enhancing the attractiveness of the program and increasing the overall staffing level.

As a result of that study, a new improvement plan was developed and has been implemented. The major categories of the new improvement plan include lengthening the stabilization of 24 months from the former 18, with an option for an additional 12 months; increasing proficiency pay from $50 to $75; and centralized assignments by Department of the Army to insure high quality individuals in the training base and to provide a more personalized approach to drill sergeant assignments.

We are encouraged by indicators that our upgrading efforts have been successful.

For example, since September 1971, our drill sergeant acquisitions have been 100 percent voluntary, whereas prior to this time, 75 percent of the NCO's serving as drill sergeants were nonvolunteers.

As a result of our intensified management efforts, the staffing level as of 31 December 1971 was at 96 percent of authorized strength in drill sergeants compared to a 5-year average of 70–75 percent which prevailed in January 1971. It is anticipated that we will achieve 100 percent staffing by early calender year 1972.

Enlisted Incentive Pay

The Army continues its program of using incentive pay to retain and encourage retention of critical skill and age groups and encourage and reward skills and exceptional performance.

The Army has increased its reliance on the variable reenlistment bonus (VRB) since its inception in 1966 to retain soldiers with critical skills. Reenlistment of trained soldiers adds personnel to the career enlisted force and saves training funds.

An important feature of the VRB is that it can be adjusted to meet changing manpower requirements without withdrawal of funds from the soldier. Two recent changes in the program are:

(1) Payment of the highest VRB multiplier (V–4) in the combat arms MOS in order to increase retention in these skills.

(2) Increasing the number of lump sum payments from 30 percent to 50 percent of the reenlistees. This will allow delegation of authority to field commanders and provide an improved reenlistment tool for the career counselor.

Chairman ELLENDER. Do you have similar benefits relative to the retention of officers?

General KERWIN. No, sir. The reenlistment bonus in this type of percentage applies only to the enlisted personnel.

SPECIAL DUTY ASSIGNMENT

The Army has supported the establishment of a new category of proficiency pay called special duty assignment. This type of proficiency payment helps us to reward and encourage personnel who serve in unique jobs requiring volunteer status and special skills such as recruiters, drill sergeants, and career counselors.

SHORTAGE SPECIALTY PAY

Shortage specialty pay continues to serve as a backup retention tool to the VRB. With increased use of bonus payments, this pay will be utilized only in the skills most critically short.

SUPERIOR PERFORMANCE PAY GROUP

All MOS not in special duty assignment or shortage specialty categories are placed in the superior performance pay group. This program serves to increase professionalism through competition to be in the top of an MOS group.

COMBAT AND COMBAT SUPPORT AWARDS

A recent decision was obtained to increase the percentage of awards in combat support MOS from 5 percent to 10 percent. A 20 percent award rate is still used for combat arms MOS.

An increase in the monthly rate will be required in future years if this program is to achieve its goal of increasing professionalism.

Last year Congress approved a test program for payment of an enlistment bonus of not more than $3,000 for enlistment in a combat element for at least 3 years. This program will complement other enlistment incentives and may allow the monthly accession requirements in combat arms skills to be met with volunteers.

The Department of Defense is attempting to evaluate the impact on enlistments of the recently enacted pay raises prior to initiating use of this bonus.

IMPROVE MORALE, WELFARE, DISCIPLINE, AND HUMAN RELATIONS

Our third personnel goal is to improve morale, welfare, discipline and human relations in the Army. Many of the problems we face in this area are not unique to the Army or military life. These are problems that we share with society in general.

DISCIPLINE

The conflict in Vietnam extracted a price in morale, discipline, and leadership throughout the Army. Data indicate that, in general, indiscipline increased during the period 1965 through 1970, reaching and in some cases, even exceeding the level experienced during the Korean war.

The trend now, however, indicates a change in direction as the drawdown in Vietnam permits greater personnel stability. But that action alone, we know, will not restore the Army to its traditional and essential high levels of discipline and professionalism.

We recognized the need for specific improvements in personnel management, leadership training, and environmental areas.

Several of these programs have already been discussed.

But I want to emphasize that efforts designed to enhance the integrity and competence of our officers and noncommissioned officers and the caliber of our soldiers are fundamental to building a better Army—an Army based on an attitude of willing self-discipline and a determination to do one's job to the utmost of his ability.

Other steps being taken to improve Army life include the reduction of sources of dissatisfaction. These actions must not be construed as encouraging lower standards of discipline. The two generally distinct categories of actions—strengthening professionalism and eliminating unnecessary inconveniences—are compatible goals which mutually reinforce our commanders' ability to achieve and sustain heightened levels of discipline.

ALCOHOL AND DRUG ABUSE

Drug abuse, to include alcohol, continues to be one of the Army's most serious social and human problems. Responding rapidly to the President's June 17, 1971, pronouncement of a national counteroffensive against drug abuse, the Army immediately instituted urinalysis screening for heroin use among soldiers in Vietnam, and expanded the program within the next few months to cover all oversea areas as well as CONUS.

During 1971, the Army accomplished the following major tasks in the area of alcohol and drug abuse.

A new directorate at Headquarters, Department of the Army, headed by a general officer, was established to develop, coordinate, and monitor a comprehensive program to minimize alcohol and drug abuse and to provide treatment and rehabilitation for soldiers with alcohol and drug problems.

Chairman ELLENDER. I know that at most of your camps and stations you operate liquor stores. Is this a part of the commissary operation or your club operation?

General KERWIN. It is a part of the club operation, Mr. Chairman. The commissaries do not sell liquor. We call them class 6 stores.

Chairman ELLENDER. Who can purchase liquor at these class 6 stores?

General KERWIN. Officers and noncommissioned officers.

Chairman ELLENDER. Do you have any located in Vietnam?

General KERWIN. Yes, sir. As a matter of fact, we have them worldwide, in Vietnam and Europe.

Chairman ELLENDER. Proceed.

Reporting System To Gather Drug Information on and Evaluate Program

General Kerwin. A reporting system was instituted to develop information on the size of the drug problem and generate indicators of the effectiveness of the program.

Alcohol and Drug Abuse Prevention and Control Plan

A comprehensive alcohol and drug abuse prevention and control plan was issued which addressed in detail the four functional areas of the Army's overall program: Prevention, identification, treatment, and rehabilitation. It also outlined the supporting areas of evaluation and research and development.

A systematic urinalysis screening program for drug abuse among soldiers was initiated. Soldiers will be tested at various points during their Army tours.

Decentralized treatment and rehabilitation programs for identified drug abusers were instituted on a worldwide basis. Insofar as permitted by current statutes, no drug-dependent soldier is separated from the Army without a minimum of 30 days treatment for his drug problem.

Alcohol and drug-dependent soldiers about to be separated from the Army may extend their service tours a minimum of 30 days to receive treatment in military facilities. Soldiers not electing this alternative, may be transferred to Veterans' Administration facilities for continuity of care and followup on inservice treatment.

Worldwide Alcohol and Drug Abuse Conference

A worldwide U.S. Army alcohol and drug abuse conference was held during which all aspects of the Army's program were discussed, and new and different approaches to the problem analyzed.

A variety of educational activities were conducted, both independently and in cooperation with other governmental agencies and civilian institutions, to qualify soldiers to work effectively in all facets of the Army's program. Although considerable progress has been made, the Army recognizes that more must be done in this extremely complex but difficult area.

Drug Abuse

Senator Young. In addition to what you have already said, I wish you would provide a detailed statement on the situation at the present time in regard to drug use in the service, including an indication as to whether it is increasing or decreasing, the measures that have been taken to combat it, and the effectiveness of those measures. Please indicate in your discussion any differences of a marked nature among troops in Vietnam, Europe, and the United States in this respect.

General Kerwin. I will do that.

(The information follows:)

In June 1971 we started a campaign to curb drug abuse among soldiers in conjunction with the President's national drug abuse counteroffensive. Progress has been made in the areas of prevention, identification, treatment and rehabilitation of drug users as evidenced by our wide-ranging program covering all aspects of the problem, such as:

(a) Identification of prior users through urinalysis screening and medical evaluation at reception stations. As of 15 February 1972 we had tested over 107

thousand individuals coming into the service, for drug abuse, finding 1448 confirmed positive drug users or 1.3 per cent.

(*b*) Expansion world-wide, of a systematic, unannounced unit testing program.

(*c*) Establishment of treatment and rehabilitation centers world-wide to provide care to identified drug users.

(*d*) Establishment of a policy, that no soldier identified as drug dependent would be separated from the Army, insofar as permitted by current statutes, without a minimum of 30 days treatment. Care to be provided in military facilities and/or Veterans Administration activities.

(*e*) Improved relationships with local community leaders, civic associations and private organizations (Kiwanis, Alcoholics Anonymous). Rapport has been enhanced throughout the military/civilian sector providing a smoother transition for the drug involved soldier to his civilian community.

(*f*) Improved investigative capability, coupled with increased efforts to control drug traffic. Law enforcement programs to suppress the sale and distribution of drugs on or near Army installations are developed and conducted in close cooperation with local authorities.

(*g*) Establishment of tighter controls and institution of more frequent unannounced inspections of rehabilitation operations at treatment centers.

(*h*) An intense education program with the objective of providing facts concerning drugs and changing attitudes toward the drugs and the users/abusers. Major Army commands, installations and small units are participating in this extensive educational effort.

All statistical indicators, such as urinalysis screening results, apprehensions for drug use, deaths attributed to drug use and participants in voluntary treatment and rehabilitation programs under non-punitive exemption policy point to a decrease in drug use. Urinalysis screening results during early October 1971 indicated that 3.23 percent of all soldiers tested had used drugs. Results of urinalysis screening during early January 1972 revealed that 2.69 percent had used drugs.

The major areas of difference in drug abuse among troops in Vietnam, Europe and the United States is in types of drugs used based upon availability. In Vietnam, heroin is the drug most seriously abused. In Europe, hashish is the drug most frequently abused and in the United States it is a combination of many dangerous drugs which are abused.

Race Relations

General Kerwin. Racial tensions within the Army, while probably less publicized in the past few months, continue to be a matter of major concern and emphasis at every echelon of command.

We are attempting to establish better understanding and communication between racial groups and to eliminate those practices which lead to friction. To this end, Department of the Army has initiated many significant programs during the past year.

At departmental level, the Office of Equal Opportunity programs has been established and other additional resources made available. Special efforts are being made to attract greater numbers of qualified minority group junior officers into the Army.

A program to provide a more equitable distribution of minority group members in hard and critical occupational specialities is underway, and classification tests and screening standards are being reviewed to determine their validity when applied to persons from differing sociocultural backgrounds.

A truly innovative course of instruction, "Leadership Aspects of Race Relations," is being given to all basic trainees and throughout the Army service school system. Significant improvements have been made in the administration of nonjudicial punishment.

These programs are a part of the Army's effort to insure that all soldiers have an equal opportunity to serve their country honor-

ably. Such efforts, while benefiting the minority group soldier, benefit others as well, and, therefore, the Army, as a whole.

Chairman ELLENDER. Do you feel you have made progress?

General KERWIN. I feel we have made substantial progress. This does not mean we will not have problems in race relations. It will not eliminate incidents such as we had at Fort McClellan.

I think the Army is more aware of and sensitive to the problems in this area. The programs which have been initiated and which are being used at the present time will begin to show results.

Chairman ELLENDER. Proceed.

TRANSITION

General KERWIN. Next I would like to speak about Project Transition.

Our program is directed toward insuring that every veteran has an opportunity to obtain a marketable skill which will permit employment immediately upon departure from the service. Until recently, this program was administered only in the continental United States. However, we are now expanding it to our overseas theaters.

The early release program initiated in December 1971, downgraded our earlier efforts to expand the training under "Transition." However, we are taking rapid action to reconstitute the program and are reorienting our efforts to increase participation during the period March 1 to June 30, 1972.

Ten job skill centers were established by the Army in January of this year to provide meaningful skill training. These efforts are in direct response to both Presidential and congressional concern for assisting the Vietnam era veteran in making a productive reentry to civilian life.

For enlisted men who plan to make the Army a career, we provide educational opportunities to reach minimal goals of high school completion. Under provisions of the expanded GI bill, we can use services of local community high schools and colleges. Soldiers will be able to earn a high school diploma from an accredited school while on active duty. In Europe alone, nearly 1,000 soldiers, at more than 30 locations, are enrolled in high school instruction.

Preparatory education program (PREP) is a Veterans' Administration funded activity which is providing an educational opportunity for many of our soldiers at installations throughout the Army.

These efforts are in direct response to the President's concern for assisting the Vietnam veteran and in developing a better and more effective modern volunteer Army.

Chairman ELLENDER. Please indicate any significant changes that have taken place in Project Transition during the year.

General KERWIN. Department of the Army issued a new Project Transition policy and guidance message on July 26, 1971, that has resulted in a gradual change from a transition project to a transition program. This evolving program has three significant differences from the Project Transition of fiscal year 1971.

First, the Army has hired 102 full-time Department of the Army civilian counselors to service overseas commands in Europe and the

Pacific and, has authorized 225 positions in CONARC which are now being filled. These counselors make up the heart of the transition program because program participation is completely voluntary. The Army counselors are supplemented in overseas areas by interagency briefing teams made up of representatives from the Department of Labor, the Veterans' Administration, and the Department of Health, Education, and Welfare.

Second, in mid-January 1972 the Army began operation of 10 vocational skill centers in United States. Soldiers returning from overseas areas as well as those stationed in United States have the opportunity to take training in any of the 23 six-week courses offered completely during duty hours. As of February 14, 1972, 863 soldiers had begun training at these skill centers. The objective of the centers is to provide an entry-level job ability in skills for which there is a ready civilian market. The curriculum for these programs is a joint effort between the Department of the Army, Department of Labor, and Department of Health, Education, and Welfare. Funding for instruction is through the resources provided by the Manpower Development and Training Act. The Army expects to meet the goal of 6,000 men trained in these centers prior to the end of fiscal year 1972. Department of Labor has assigned an employment counselor to each location having a skill center. The counselors assist soldiers in locating employment after discharge.

The third major development in transition is occurring in the area of contracts with civilian institutions. The University of Hawaii, again using funds from the Manpower Development and Training Act, has contracted to provide transition training for 1,080 servicemen in four vocational courses held at Okinawa, Korea, and Thailand. Europe is studying a similar contracting arrangement for vocational-technical courses.

Overall during fiscal year 1972 the Army expects to train approximately 30,000 men in the transition program and will provide valuable counseling and job placement services to over 160,000 servicemen.

Atmosphere of Professionalism

Our last personnel goal is to establish and maintain an Army atmosphere of professionalism satisfying to the high-caliber officers and NCO we are trying to retain in the service.

The modern volunteer Army programs now underway have focused primarily on improving the environment and life styles of junior enlisted personnel. Of course, equal priority must be given to improving professionalism and career development of the junior officer and NCO.

These efforts are limited only by the degree of commander's dedication to the established principles of leadership. These leaders want authority to accomplish tasks with minimum supervision.

We must be willing, to a degree, to permit mistakes in the interest of better training and development. The real key to retention of junior officers and high-grade noncommissioned officers is the commander who instills pride and a sense of job satisfaction in them.

CONGRESSIONAL SUPPORT

We now seek your support for the resources which will permit us to continue our effort to form a tailored, fully professional, volunteer force as soon as possible.

Our purpose seems clear, our goals closer than when we last met; yet, much remains to be done.

1973 MANPOWER PROGRAM COST

The fiscal year 1973 manpower program we have presented today will help us accomplish our task. This program will cost $7,703 million—a decrease of $469 million from our fiscal year 1972 estimate. These funds will fully support an average military personnel strength of 869,300, an end strength of 840,600.

1972 MANPOWER PROGRAM FUNDING

To complete the execution of our fiscal year 1972 manpower program, we have a total requirement of $8.172 billion. We propose to meet this requirement from the $7.316 billion appropriated last year, an additional $761 million required for military pay increases and $95 million of fund transfers necessary to support increased PCS travel costs and the cost of the temporary overstrength of personnel in the grade of captain.

This concludes my statement.

Thank you, Mr. Chairman.

REIMBURSABLE OBLIGATIONS

Chairman ELLENDER. Please describe the four items listed under "Reimbursable obligations" found on page 3 of the justifications.

General KERWIN. Personnel compensation and personnel benefits covers pay and allowances of Army personnel authorized for activities outside the Army on a reimbursable basis. Travel and transportation of persons includes deduction from pay of military personnel for amounts paid by the Army to civil officers or citizens as rewards for the apprehension and delivery of soldiers absent without leave, deserters, and escaped military prisoners. Supplies and materials include receipts from sales of military clothing to authorized individuals and collections from authorized patrons for sale of meals.

ACTIVE DUTY MILITARY PERSONNEL MANPOWER BY BUDGET ACTIVITY

Chairman ELLENDER. At this point in the record there will appear the tabulation from the justifications showing the active duty military personnel manpower by budget activity.

ACTIVE DUTY MILITARY PERSONNEL MANPOWER BY BUDGET ACTIVITY (FYDP PROGRAM) AND BY OPERATING PROGRAM

[Dollars in thousands; end strengths in whole numbers]

Budget activity/operating program	Fiscal year 1971 actual	Fiscal year 1972 estimate	Fiscal year 1973 estimate
DIRECT PROGRAM			
1. Strategic forces:			
Operation of the Army:			
Costs	$66,843	$63,871	$71,964
End strengths:			
Officer	1,646	1,841	1,889
Enlisted	5,704	5,650	5,689
Total	7,350	7,491	7,578
2. General purpose forces:			
Operation of the Army:			
Costs	$4,124,239	$3,908,543	$3,838,082
End strengths:			
Officer	58,557	44,128	43,034
Enlisted	532,762	416,044	422,235
Total	591,319	460,172	465,269
Operation of Defense agencies:			
Costs	$636	$718	$432
End strengths:			
Officer	31	42	0
Enlisted	23	27	0
Total	54	69	0
Total, general purpose forces:			
Costs	$4,124,875	$3,909,261	$3,838,514
End strengths:			
Officer	58,588	44,170	43,034
Enlisted	532,785	416,071	422,235
Total	591,373	460,241	465,269
3. Intelligence and communications:			
Operation of the Army:			
Costs	$372,098	$391,815	$365,430
End strengths:			
Officer	7,060	6,576	5,980
Enlisted	47,863	39,582	34,032
Total	54,923	46,158	40,012
Operation of Defense agencies:			
Costs	$29,746	$32,220	$31,602
End strengths:			
Officer	1,180	1,152	1,063
Enlisted	2,384	2,029	1,921
Total	3,564	3,181	2,984
Total, intelligence and communications:			
Costs	$401,844	$424,035	$397,032
End strengths:			
Officer	8,240	7,728	7,043
Enlisted	50,274	41,611	35,953
Total	58,487	49,339	42,996
4. Airlift and sealift:			
Operation of the Army:			
Costs	$12,806	$11,164	$10,083
End strengths:			
Officer	362	332	322
Enlisted	1,114	677	637
Total	1,476	1,009	959

ACTIVE DUTY MILITARY PERSONNEL MANPOWER BY BUDGET ACTIVITY (FYDP PROGRAM) AND BY OPERATING PROGRAM—Continued

[Dollars in thousands; end strengths in whole numbers]

Budget activity/operating program	Fiscal year 1971 actual	Fiscal year 1972 estimate	Fiscal year 1973 estimate
5. Guard and Reserve:			
Operations of the Army:			
Costs	$46,213	$47,734	$50,571
End strengths:			
Officer	1,811	1,863	1,773
Enlisted	3,013	3,022	2,826
Total	4,824	4,885	4,599
6. Research and development:			
Research and development, Army:			
Costs	$63,522	$79,175	$83,892
End strengths:			
Officer	2,422	2,378	2,328
Enlisted	6,475	6,504	5,967
Total	8,897	8,882	8,295
Research and development, Defense agencies:			
Costs	$1,754	$1,738	$1,943
End strengths:			
Officer	84	92	94
Enlisted	59	64	64
Total	143	156	158
Total, research and development:			
Costs	$65,276	$80,913	$85,835
End strengths:			
Officer	2,506	2,470	2,422
Enlisted	6,534	6,568	6,031
Total	9,040	9,038	8,453
7. Central supply and maintenance:			
Operation of the Army:			
Costs	$104,859	$124,316	$126,945
End strengths:			
Officer	3,723	3,523	3,467
Enlisted	10,977	10,069	9,076
Total	14,700	13,592	12,543
8. Training, medical, and other general personnel activities:			
Operation of the Army:			
Costs	$3,428,331	$3,067,564	$2,746,144
End strengths:			
Officer	58,765	49,698	46,727
Enlisted	346,260	241,355	228,279
Cadets	2,988	3,900	4,000
Total	408,013	294,953	279,006
Operation of Defense agencies:			
Costs	$1,218	$280	$331
End strengths:			
Officer	11	12	12
Enlisted	13	19	19
Total	24	31	31
Total, training, medical, and other general personnel activities:			
Costs	$3,429,549	$3,067,844	$2,746,475
End strengths:			
Officer	58,776	49,710	46,739
Enlisted	346,273	241,374	228,298
Cadets	2,988	3,900	4,000
Total	408,037	294,984	279,037

ACTIVE DUTY MILITARY PERSONNEL MANPOWER BY BUDGET ACTIVITY (FYDP PROGRAM) AND BY OPERATING PROGRAM—Continued

[Dollars in thousands; end strengths in whole numbers]

Budget activity/operating program	Fiscal year 1971 actual	Fiscal year 1972 estimate	Fiscal year 1973 estimate
9. Administration and associated activities:			
Operation of the Army:			
Costs	$121,131	$118,153	$107,629
End strengths:			
Officer	6,196	5,360	5,087
Enlisted	5,597	3,692	3,095
Total	11,793	9,052	8,182
Operation of the Defense agencies:			
Costs	$11,280	$12,305	$13,359
End strengths:			
Officer	691	748	748
Enlisted	214	213	213
Total	905	961	961
Total, administration and associated activities:			
Costs	$132,411	$130,458	$120,988
End strengths:			
Officer	6,887	6,108	5,835
Enlisted	5,811	3,905	3,308
Total	12,698	10,013	9,143
10. Support of other nations:			
Operation of the Army:			
Costs	$302,237	$312,664	$254,499
End strengths:			
Officer	5,690	4,214	4,069
Enlisted	9,355	5,740	5,885
Total	15,045	9,954	9,954
Operation of Defense agencies:			
Costs	$37	$115	$157
End strengths:			
Officer	5	9	9
Enlisted	1	2	2
Total	6	11	11
Total, support of other nations:			
Costs	$302,274	$312,779	$254,656
End strengths:			
Officer	5,695	4,223	4,078
Enlisted	9,356	5,742	5,887
Total	15,051	9,965	9,965
DIRECT PROGRAM SUMMARY			
Operation of the Army:			
Costs	$8,578,757	$8,045,824	$7,571,347
End strengths:			
Officer	143,810	117,535	112,348
Enlisted	962,645	725,831	711,754
Cadets	2,988	3,900	4,000
Total	1,109,443	847,266	828,102
Operation of Defense agencies:			
Costs	$42,917	$45,638	$45,881
End strengths:			
Officer	1,918	1,963	1,832
Enlisted	2,635	2,290	2,155
Total	4,553	4,253	3,987

ACTIVE DUTY MILITARY PERSONNEL MANPOWER BY BUDGET ACTIVITY (FYDP PROGRAM)

AND BY OPERATING PROGRAM—Continued

[Dollars in thousands; end strengths in whole numbers]

Budget activity/operating program	Fiscal year 1971 actual	Fiscal year 1972 estimate	Fiscal yea 1973 estimate
Research and development, Army:			
Costs	$63, 522	$79, 175	$83, 892
End strengths:			
Officer	2, 422	2, 378	2, 328
Enlisted	6, 475	6, 504	5, 967
Total	8, 897	8, 882	8, 295
Research and development, Defense agencies:			
Costs	$1, 754	$1, 738	$1, 943
End strengths:			
Officer	84	92	94
Enlisted	59	64	64
Total	143	156	158
Total, direct program:			
Costs	$8, 686, 950	$8, 172, 375	$7, 703, 063
End strengths:			
Officer	148, 234	121, 968	116, 602
Enlisted	971, 814	734, 689	719, 940
Cadets	2, 988	3, 900	4, 000
Total	1, 123, 036	860, 557	840, 542
Reimbursable program:			
Costs	$190, 539	$121, 205	$104, 553
End strengths:			
Officer	389	550	534
Enlisted	57	121	114
Total	446	671	648
Total, Army:			
Costs	$8, 877, 489	$8, 293, 580	$7, 807, 616
End strengths:			
Officer	148, 623	122, 518	117, 136
Enlisted	971, 871	734, 810	720, 054
Cadets	2, 988	3, 900	4, 000
Total	1, 123, 482	861, 228	841, 190

SUPPORT OF OTHER NATIONS

Chairman ELLENDER. For "Support of other nations," the fiscal year 1973 request is $254,656,000. For fiscal year 1972, the amount provided was $312,779,000. For fiscal years 1972 and 1973, the number of military personnel budgeted for is 9,965. Please describe this activity.

General KERWIN. This activity consists of military personnel assigned to international military headquarters and agencies such as the Central Treaty Organization, Southeast Asia Treaty Organization, North Atlantic Treaty Organization, and military assistance commands and advisory groups, missions and military groups. It also includes funding support for free world military assistance forces.

Chairman ELLENDER. Why is it that the same number of military personnel will be employed although the funding request is reduced?

General KERWIN. Sir, there is no change in the missions of this activity so that no reduction in military spaces have been programed for fiscal year 1973. The funding request has been reduced by the net amount of $58,123,000 from the fiscal year 1972 level of support. This

includes a reduction of $42,181,000 in support of free world military assistance forces and a $20,924,000 decrease in funds for a lesser average number of military personnel in fiscal year 1973 than in fiscal year 1972. Also included is an increase of $4,982,000 in fiscal year 1973 for the military pay increases provided under Public Law 92–129 and Public Law 92–210.

Chairman ELLENDER. Included in this is $157,000 for "Operation of defense agencies," an increase over the $115,000 provided for fiscal year 1972. What is the reason for that increase?

General KERWIN. Sir, the increase is for military pay increases over fiscal year 1972 amounting to $7,000 and $35,000 to provide for the increase in average strength in fiscal year 1973.

Senator YOUNG. Is there any difference between the terms "Support of other nations" and "Support of free world forces"?

General KERWIN. Yes; "Support of other nations" is a budget term used for the support provided by funds in the U.S. budget earmarked to aid, complement and assist in sustaining different nations worldwide, considered allies of the United States. The term "Support of free world forces" is commonly associated with the assistance rendered to allied forces supporting the U.S. efforts in Southeast Asia. The term "Support of free world forces" is encompassed in the overall definition of "Support of other nations."

STRATEGIC FORCES

Chairman ELLENDER. The budget activity "Strategic forces" indicates an increase on the tabulation from $63,871,000 in fiscal year 1972 to $71,964,000 in fiscal year 1973. End strengths also show a gradual increase over the past 2 years. Please indicate the nature and justification of both of these.

General KERWIN. Sir, the increase of $5,416,000 in military pay and allowances is attributable to pay increases and $2,677,000 is due to strength increases. Increases in strength are related to SAFEGUARD activities and provides for the orderly buildup of military personnel required for site activation and support activities at the Grand Forks and Malmstrom SAFEGUARD sites; the buildup of ARADCOM SAFEGUARD manning; and the buildup of the staff and faculty at the SAFEGUARD central training facility at Fort Bliss, Tex.

GENERAL PURPOSE FORCES

Chairman ELLENDER. For "General purpose forces" the fiscal year 1973 request is $3,838,514,000 as compared with $3,909,261,000 for fiscal year 1972. Officer and enlisted personnel end strengths indicate that you will go from 460,241 in fiscal year 1972 to 465,269 in fiscal year 1973. Please explain.

General KERWIN. The increase in end strength is due to additional enlisted personnel programed to bring the Army combat units to full strength by the end of fiscal year 1973. The net decrease of $70,747,000 between fiscal years 1972 and 1973 results from a decrease of $355,020,000 for the reduced average strength in fiscal year 1973 offset by an increase of $284,273,000 for military pay increases provided under Public Law 92–129 and Public Law 92–210.

DEFENSE SPECIAL PROJECTS GROUP

Senator YOUNG. I also note that you plan to phase out the 69 officers and enlisted personnel provided under "Operation of defense agencies" in fiscal year 1972. Please explain this.

General KERWIN. This phaseout is associated with the phasedown in Southeast Asia and is specifically related to the inactivation of the Defense Special Projects Group which was recommended for termination by Congress in House of Representative Report Nos. 92–754 and 92–666.

INTELLIGENCE AND COMMUNICATIONS

Chairman ELLENDER. Under "Intelligence and communications," funds provided for fiscal year 1972 came to $424,035,000. For fiscal year 1973 the request is $397,032,000. The military personnel end strength is estimated to total 42,996 for fiscal year 1973 and 49,339 for fiscal year 1972. Can you provide a breakout between intelligence and communications?

General KERWIN. I will be glad to do so.

(The information follows:)

	Fiscal year—	
	1972 estimate	1973 estimate
Intelligence	25,239	20,434
Communications	16,256	14,917
Other[1]	4,663	4,661
Defense agencies	3,181	2,984
Total	49,339	42,996

[1] Consists of combat development activities.

Chairman ELLENDER. The justifications indicate that you estimate that $31,602,000 involving 2,984 officers and enlisted personnel are budgeted under "Operation of defense agencies." Please describe the utilization of these personnel.

General KERWIN. I will be happy to do so.

(The information follows:)

U.S. Army element:	*Fiscal year 1973 estimate*
Defense Intelligence Agency	856
Defense Communications Agency	717
Joint Chiefs of Staff	124
[Deleted.]	
Defense Nuclear Agency	209
Total	2,984

AIRLIFT AND SEALIFT

Senator YOUNG. For "Airlift and sealift" the fiscal year 1973 estimate is $10,083,000 and involves 959 personnel, for fiscal year 1972, the funds required amounted to $11,164,000 and involved 1,009 personnel. Describe the activities involving these personnel.

General KERWIN. The military personnel in activity 4, "Airlift and sealift," are assigned to the Military Traffic Management and Terminal Services—MTMTS—and to the oversea command water ports. They

are used to manage and supervise the operations of the MTMTS which provides traffic management services for Department of Defense cargo and passengers and operates the continental U.S. water terminals and ports. In the oversea commands, they operate the water ports and supervise the transshipment of cargo and passengers through the ports.

GUARD AND RESERVE

Chairman ELLENDER. For "Guard and Reserve" the fiscal year 1973 request is $50,571,000. For fiscal year 1972 the funds required amounted to $47,734,000. Military personnel employed under this activity show a decrease from the 4,885 for fiscal year 1972 to 4,599 in fiscal year 1973. For the coming year 1,773 officers and 2,826 enlisted personnel are indicated. What will be the functions of these personnel?

General KERWIN. These personnel provide advice and assistance to units of the Army National Guard and U.S. Army Reserve located in the United States, Puerto Rico, and the Virgin Islands. Advisers provide the active Army link between the Army commander and the Reserve component unit commander in areas pertaining to training progress, operating efficiency, and mobilization readiness of Reserve components units.

Chairman ELLENDER. Are the increases in costs attributable to pay increases?

General KERWIN. Yes, sir. The pay increase amounts to $3,216,000 offset by a decrease of $379,000 associated with the reduced strength in fiscal year 1973.

RESEARCH AND DEVELOPMENT

Chairman ELLENDER. For "Research and development" the fiscal year 1973 request is $85,835,000, an increase over the $80,913,000 provided for fiscal year 1972. I note that funds provided will include the costs of 8,453 military personnel in fiscal year 1973 as compared with 9,038 for fiscal year 1972. Please indicate the reasons for the proposed increase in funds.

General KERWIN. The increase for fiscal year 1973 is attributable to the military pay increases provided by Public Laws 92–129 and 92–210 amounting to $5,927,000, offset by a reduction of $1,005,000 for the lesser average number of personnel in fiscal year 1973.

Chairman ELLENDER. The Department of the Army plans to utilize 6,031 enlisted personnel in research and development work. Please indicate the need for these personnel.

General KERWIN. Some enlisted personnel are qualified as scientists and engineers and as such participate as technicians in portions of the research and development program. Enlisted personnel are required to provide other supporting skills necessary for the accomplishment of the research, development, test, and evaluation mission. These skills include, but are not limited to, serving as test subjects, drivers, mechanics, electricians, and other nonscientific skills. Tests are generally conducted using military personnel thoroughly experienced in user military operations with an additional qualification of testing experience. Such testing requires the technical appreciation, qualitative observations and the subjective judgment of professional military personnel familiar with employment in the operating environment and

possessing recent field experience with the type of materiel undergoing test.

Chairman ELLENDER. Included in the total request for fiscal year 1973 is $1,943,000 to support 158 military personnel in "Research and development, Defense agencies." Please explain their function.

General KERWIN. Army military personnel as well as military personnel from the other services are assigned to the Defense agencies to perform the joint R.D.T. & E. missions primarily assigned to these agencies by OSD and the Joint Chiefs of Staff. They provide an Army oriented capability of skills, knowledge and talent in both administrative and technical disciplines. The DOD agencies perform research and development that is (1) not identified with a specific military requirement, (2) relates to primary functions of two or more military services, or (3) which for a specific reason is best handled by an agency other than one of the military services. The 158 Army military personnel are assigned to Advanced Research Project Agency, 22; Weapons System Evaluation Group, 18; Defense Nuclear Agency, 80; National Security Agency, 23; Defense Communications Agency, 12; Defense Intelligence Agency, two; and Defense Supply Agency, one.

CENTRAL SUPPLY AND MAINTENANCE

Chairman ELLENDER. For "Central supply and maintenance," the request for fiscal year 1973 is $126,945,000. The amount provided for fiscal year 1972 was $124,316,000. End strengths for military personnel for fiscal years 1972 and 1973, respectively, are 13,592 and 12,543. Please indicate the nature of and justification for the funding increase.

General KERWIN. The net increase of $2,629,000 in fiscal year 1973 is related to the military pay increases provided under Public Laws 92–129 and 92–210 amounting to $8,593,000. This increase is offset by a decrease of $5,964,000 for the reduced strength in fiscal year 1973.

TRAINING, MEDICAL AND OTHER GENERAL PERSONNEL ACTIVITIES

Senator YOUNG. For "Training, medical and other general personnel activities" the fiscal year 1973 estimate is $2,746,475,000. For fiscal year 1972 the amount provided was $3,067,844,000. The end strength for officers, enlisted personnel, and cadets for fiscal year 1973 is estimated at 279,037, a reduction from the 294,984 budgeted for fiscal year 1972. Please indicate generally what these funds will be used for.

General KERWIN. Yes, sir. The funds are for the pay and allowances of the military personnel associated with this activity, and for the support of the permanent change of station travel of all Department of Army active military personnel. The funds are in support of military personnel associated wtih recruit training, flight training, training at Army service schools, senior service schools, ROTC, and the U.S. Military Academy. Support of medical activities include hospital operations, Army medical and dental laboratories, veterinary services, optical fabrication and repair facilities, patients, and the Armed Forces Institute of Pathology. Other general personnel activities support includes prisoners, transients, recruiting, and examining station activities, operation of the U.S. Army personnel centers, operation of the U.S. Army disciplinary barracks, the correctional training facility, and the U.S. Army Enlisted Evaluation Center.

Chairman ELLENDER. I note that $331,000 is earmarked for "Operation of defense agencies," entailing the use of 31 officers and enlisted personnel. Describe their utilization.

General KERWIN. Sir, these funds are for pay and allowances of Army personnel assigned to the Office of the Secretary of Defense, Information and Education.

ADMINISTRATION AND ASSOCIATED ACTIVITIES

Chairman ELLENDER. For "Administration and associated activities," the budget estimate for fiscal year 1973 is $120,988,000. This is a reduction from the $130,458,000 provided for fiscal year 1972. End strength for military personnel for fiscal year 1973 is estimated at 9,143 and that for fiscal year 1972 at 10,013. Please describe the various segments of this activity.

General KERWIN. Yes, sir. Included in this activity are departmental headquarters which provides for the operation of the executive office of the Department of the Army located in the Washington, D.C., area; major field headquarters which provides for the operation of the Continental Army Command, the Continental U.S. Armies, the Military District of Washington, and the Criminal Investigation Command; other field activities which provides for support of servicewide administrative and financial field activities and functions which are administered by Headquarters, Department of the Army; construction, planning, and design which support the planning and design of military construction, minor construction, and minor land acquisition; audiovisual activities which provide for the operation of the Audiovisual Agency; public affairs which provides for the operation of public affairs activities worldwide; and interdepartmental activities which provides the Department of the Army's contribubtion toward the support of interdepartmental activities is directed by the Office of Management and Budget.

Senator YOUNG. Included in this activity is $13,359,000 for "Operation of defense agencies," in which 961 military personnel will be utilized, the same number as that budgeted for fiscal year 1972. What will these funds and personnel be utilized for?

General KERWIN. Sir, these funds are for pay and allowances of Army personnel assigned to the Defense Supply Agency, Joint Chiefs of Staff, Defense Nuclear Agency, and Office of the Secretary of Defense.

IMPROVED PREFABRICATED BEEF

Chairman ELLENDER. In the "Schedule of increases and decreases," most of the increases seem to be more or less self-explanatory, or of a mandatory nature. But what is the item involving $3,007,000 for "Ration rate increase due to introduction of improved fabricated beef"?

General KERWIN. For the first time in history, beef utilization in menus will no longer be related to carcass beef yield factors. Old procedures dictated that boneless beef be procured, stored, and issued as one line item. That is, one stock number was used to control an item which consisted of specified percentages of grilled steaks, swiss steaks, oven roasts, pot roasts, diced and ground beef. The percentages of each category related to the yield from the beef carcass. Under the new procedures, each category of beef—grilled steak, swiss steaks, oven

roasts, and so forth—will be procured and handled in the supply system as separate entities, each with its own stock number. The introduction of the new beef program will permit greater flexibility in menu planning and procurement. Also, the new procedures will permit requisitioners to compute separate requirements for each beef component in accordance with menu utilization and the variances in troop strength. The beef procured under the above program is an improved product as compared to the old item. The improvement is due primarily to a revision in the allocation of beef cuts used in the processing of each category. The improved prefabricated beef will add approximately $0.03 to the daily ration costs of the military departments.

DISTRIBUTION OF MILITARY PERSONNEL BY GEOGRAPHIC AREA

Chairman ELLENDER. At this point there will appear a tabulation from the justifications indicating the distribution of military personnel by geographic area.

(The information follows:)

DISTRIBUTION OF MILITARY PERSONNEL BY GEOGRAPHICAL AREA (END STRENGTH)[1]

[End strengths to the nearest hundred]

Region and country	Fiscal years— 1971	1972	1973
European command area (Western Europe):			
West Germany	[Deleted]		
Other Europe area			
Total European command area	194.7		
Pacific command area (Western Pacific):		[Deleted]	[Deleted]
South Korea			
Ryukyus	[Deleted]		
Other Western Pacific area			
Total Western Pacific	51.0		
United States, territories, and SEA	875.8	611.1	598.4
Other foreign countries and areas	2.0	1.6	1.6
Total military	1,123.5	861.2	841.2

[1] Number of personnel distributed by region and by country if the authorization for a country exceeds 5,000.

SUMMARY OF MILITARY PERSONNEL STRENGTH

Chairman ELLENDER. A summary of military personnel strength will appear in the record at this point.

(The information follows:)

SUMMARY OF MILITARY PERSONNEL STRENGTH

	Fiscal year 1971 actual		Fiscal year 1972 planned		Fiscal year 1973 planned	
	Man-years	End strength June 30, 1971	Man-years	End strength June 30, 1972	Man-years	End strength June 30, 1973
Direct program:						
Officers	159,442	148,234	137,716	121,968	119,061	116,602
Enlisted	1,073,634	971,814	832,056	734,689	746,068	719,940
Academy cadets	3,800	2,988	3,938	3,900	4,155	4,000
Total direct program	1,236,876	1,123,036	973,710	860,557	869,284	840,542
Reimbursable program: [1]						
Officers	498	389	491	550	534	534
Enlisted	130	57	108	121	114	114
Total reimbursable program	628	446	599	671	648	648
Total program:						
Officers	159,940	148,623	138,207	122,518	119,595	117,136
Enlisted	1,073,764	971,871	832,164	734,810	746,182	720,054
Academy cadets	3,800	2,988	3,938	3,900	4,155	4,000
Total	1,237,504	1,123,482	974,309	861,228	869,932	841,190

[1] Military personnel assigned to agencies outside of Department of Defense on a reimbursable basis under the provisions of 10 U.S.C. 4621.

SCHEDULE OF INCREASES AND DECREASES

Chairman ELLENDER. At this point in the record there will also appear the schedule of increases and decreases in the fiscal year 1973 program as it appears in the justifications.

(The information follows:)

MILITARY PERSONNEL, ARMY

SCHEDULE OF INCREASES AND DECREASES

This schedule presents the major fund increases and decreases from fiscal year 1972 to fiscal year 1973. The net change from fiscal year 1972 amounts to a decrease of $485,964 thousand and is detailed in the following table.

(In thousands of dollars)

1. Pay and allowances of officers:	
Fiscal year 1972 program	$2,057,698
Increases:	
(a) Longevity (time in grade)—increase in basic pay and FICA	4,061
(b) Federal insurance contribution increase from 5.2 percent to 5.65 percent effective Jan. 1, 1973, and increase in base from $7,800 to $9,000 effective Jan. 1, 1972	1,598
(c) Military pay increases	65,476
Total increases	71,135
Decreases:	
(a) Manyear reduction of 18,612	189,529
(b) Reduced deployments	17,766
(c) Separation payments due to decreased losses	33,093
(d) Crew member and parachute pay due to decreased entitlements	1,355
(e) Uniform allowances resulting from reduced accessions	176
Total decreases	241,919
Fiscal year 1973 program	1,886,914
2. Pay and allowances of enlisted:	
Fiscal year 1972 program	5,024,845
Increases:	
(a) Longevity (time in grade)—increase in basic pay and FICA	50,440
(b) Variable reenlistment bonus—increase in lump sum and installment payments	8,993
(c) Federal insurance contribution increase from 5.2 percent to 5.6 percent effective Jan. 1, 1973, and increase in base from $7,800 to $9,000 effective Jan. 1, 1972	7,779
(d) Military pay increases	368,537
Total increases	435,749
Decreases:	
(a) Manyear reduction of 85,982	377,033
(b) Reduced deployments	96,885
(c) Decreased gains and losses	62,884
Total decreases	536,802
Fiscal year 1973 program	4,923,792

3. Pay and allowances of cadets:		
Fiscal year 1972 program		15,117
Increases:		
(a) Increase in Federal Insurance Contribution Act rate from 5.2 percent to 5.65 percent effective Jan. 1, 1973	23	
(b) Manyear increase of 217	767	
(c) Military pay increases	977	
Total increases		1,767
Decreases:		
Decrease in ration rate from $1.66 to $1.63 per day effective Jan. 1, 1972	30	
Total decreases		30
Fiscal year 1973 program		16,854
4. Subsistence of enlisted personnel:		
Fiscal year 1972 program		631,370
Increases:		
Ration rate increase due to introduction of improved fabricated beef	3,007	
Total increase		3,007
Decreases:		
(a) Reduction of 21,278 enlisted manyears in basic allowance for subsistence	12,757	
(b) Decrease in BAS rates from $1.52 to $1.46 effective Jan. 1, 1972	3,080	
(c) Decrease of 42,439 enlisted manyears subsisting in messes	23,045	
(d) Reduced operational ration program	5,840	
(e) Decreased support of other nations	28,353	
(f) Decreased reimbursable program	17,863	
(g) Other miscellaneous items	2,361	
Total decreases		93,299
Fiscal year 1973 program		541,078
5. Permanent change of station travel (PCS):		
Fiscal year 1972 program		537,115
Increases:		
Training travel requirements	1,097	
Total increases		1,097
Decreases:		
(a) Officer and enlisted gains and losses (decrease of 231,623 moves)	25,394	
(b) Operational, unit and rotational travel related to change in oversea strength and fewer PCS moves due to increase in average length of tours served (decrease of 100,058 moves)	94,280	
Total decreases		119,674
Fiscal year 1973 program		418,538

6. Other military personnel costs:

Fiscal year 1972 program	27,435
Increases:	
Military pay increases	30
Total increases	30
Decreases:	
(*a*) Group life insurance—reduced percentage due to reduced contribution rate	924
(*b*) Officer and enlisted manyears—decrease of 104,594 (apprehension of deserters and SGLI)	578
(*c*) Interest on deposits—decreased deployments	2,013
(*d*) Death gratuity payments—reduced deaths	3,510
Total decreases	7,025
Fiscal year 1973 program	20,440

DECREASES

Chairman ELLENDER. Do you have any comments on the significant items listed under "Decreases"?

General KERWIN. Mr. Chairman, the significant thing to point out related to increases and decreases is the amount this appropriation has decreased between fiscal year 1972 and fiscal year 1973 when you exclude the annualization of pay increases approved during fiscal year 1972. If pay increases effective in November 1971 and January 1972 are excluded from the budget estimate, the fiscal year 1972 requirement would be $7,411 million and the fiscal year 1973 requirement would be $6,507 million, a reduction of $904 million or a 12-percent decrease in fund requirements.

FOREIGN CIVILIAN EMPLOYEES

Chairman ELLENDER. Please provide for the record the number of foreign civilian employees paid by your department and designated by country.

General KERWIN. Yes, sir.

(The information follows:)

The breakdown of direct hire foreign nationals for fiscal year 1972 and 1973 by country, is as follows:

	Fiscal year—	
	1972	1973
Korea	10,699	7,906
Vietnam	16,682	7,723
Thailand	2,897	1,978
Panama Canal Zone	2,431	2,427
Italy	643	618
Other	1,874	1,705
Total	35,226	22,357

Note: Employees identified under other are located in approximately 35 different countries.

CHANGES IN PERSONNEL STRENGTH

Chairman ELLENDER. I wish you would also include for the record a tabulation on changes in personnel strength, detailed by gains and losses, similar to that which appears on page 795 of the hearings for fiscal year 1972.

General KERWIN. Yes, sir.

(The information follows:)

Military personnel strength,[1] Jan. 31, 1968	1,476,300
Gains, Feb. 1, 1968, to June 30, 1968	330,800
Losses, Feb. 1, 1968, to June 30, 1968	237,400
Military personnel strength,[1] June 30, 1968	1,569,700
Gains, July 1, 1968, to Dec. 31, 1968	264,300
Losses, July 1, 1968, to Dec. 31, 1968	371,900
Military personnel strength,[1] Dec. 31, 1968	1,462,100
Gains, Jan. 1, 1969, to June 30, 1969	348,600
Losses, Jan. 1, 1969, to June 30, 1969	299,400
Military personnel strength,[1] June 30, 1969	1,511,300
Gains, July 1, 1969, to Dec. 31, 1969	300,600
Losses, July 1, 1969, to Dec. 31, 1969	380,900
Military personnel strength,[1] Dec. 31, 1969	1,431,000
Gains, Jan. 1, 1970, to June 30, 1970	281,600
Losses, Jan. 1, 1970, to June 30, 1970	390,900
Military personnel strength,[1] June 30, 1970	1,321,700
Gains, July 1, 1970, to Dec. 31, 1970	251,500
Losses, July 1, 1970, to Dec. 31, 1970	340,400
Military personnel strength,[1] Dec. 31, 1970	1,232,800
Gains, Jan. 1, 1971, to June 30, 1971	260,200
Losses, Jan. 1, 1971, to June 30, 1971	370,000
Military personnel strength,[1] June 30, 1971	1,123,000
Gains, July 1, 1971, to Dec. 31, 1971	167,500
Losses, July 1, 1971, to Dec. 31, 1971	310,500
Military personnel strength,[1] Dec. 31, 1971	980,000
Gains, Jan. 1, 1972, to June 30, 1972	175,500
Losses, Jan. 1, 1972, to June 30, 1972	294,900
Military personnel strength,[1] June 30, 1972	860,600
Gains, July 1, 1972, to Dec. 31, 1972	165,600
Losses, July 1, 1972, to Dec. 31, 1972	144,500
Military personnel strength,[1] Dec. 31, 1972	881,700
Gains, Jan. 1, 1973, to June 30, 1973	155,500
Losses, Jan. 1, 1973, to June 30, 1973	196,700
Military personnel strength,[1] June 30, 1973	840,500

[1] Excludes reimbursables.

FORCE STRUCTURE CHANGES

Chairman ELLENDER. Provide for the record a table on force structure changes, including activations and inactivations.

General KERWIN. I will do that.

(The information follows:)

Significant force structure changes (brigade/brigade equivalent and higher level) for fiscal years 1972 and 1973 follow.

ACTIVATIONS

Unit	Location	Date
[Deleted.]		

INACTIVATIONS

1st brigade, 5th Infantry Division (mechanized)	Vietnam	August 1971.
23d Infantry Division (—)	do	January 1972.
173d Airborne Brigade	Fort Campbell, Ky	Do.
[Deleted.]		

REORGANIZATIONS

(Modernization under latest tables of organization and equipment.)
[Deleted.]

OTHER REORGANIZATIONS

[Deleted.]

PERSONNEL SUMMARY

Chairman ELLENDER. At this point in the record there will appear the table marked "Personnel summary" showing the direct program by fiscal year in thousands of dollars.

(The information follows:)

PERSONNEL SUMMARY (IN THOUSANDS OF DOLLARS)

	Fiscal year 1971 actual	Fiscal year 1972 estimate	Fiscal year 1973 estimate
Direct program:			
1. Pay and allowances of officers	2,113,015	2,048,304	1,876,400
2. Pay and allowances of enlisted	5,258,247	5,019,987	4,918,843
3. Pay and allowances of cadets	13,046	15,117	16,854
4. Subsistence of enlisted personnel	656,113	525,017	452,588
5. Permanent change of station travel	585,992	537,065	418,488
6. Other military personnel costs	60,537	26,885	19,890
Total direct program	8,686 950	8,172,375	7,703,063
Reimburseable program:			
1. Pay and allowances of officers	8,601	9,394	10,514
2. Pay and allowances of enlisted	4,893	4,858	4,949
4. Subsistence of enlisted personnel	176,495	106,353	88,490
5. Permanent change of station travel	50	50	50
6. Other military personnel costs	500	550	550
Total reimbursable program	190,539	121,205	104,553
Total obligations	8,877,489	8,293,580	7,807,616

SERVICE REQUEST FOR 1973

Chairman ELLENDER. Please provide the committee with a statement describing the original request made by the department for fiscal year 1973 for this appropriation together with any guidelines pre-imposed.

General KERWIN. The original Military Personnel, Army request for fiscal year 1973 to Office, Secretary of Defense was for $7,550,171,-

000 in direct funds. This request provided for an end strength of 829,-248 and 885,631 man-years.

The Office of Secretary of Defense guidance with respect to program and dollar outlay levels in the fiscal year 1973 budget was that Army estimates would be based upon the revised alternative program objective memorandum submitted in accordance with Deputy Secretary of Defense guidance of July 13, 1971 as adjusted by the program decision memorandums.

ROTATION TO SOUTHEAST ASIA

Senator YOUNG. Last year the rotation policy to Southeast Asia was described in some detail. Has there been any change in that policy in the interim?

General KERWIN. The rotation policy to Southeast Asia is essentially the same as reported last year. Reduced requirements in Vietnam have enabled us to discontinue the involuntary reassignment of personnel from long tour oversea areas such as Europe to Southeast Asia except as a last resort. Although there has been no change in the 12-month tour in Vietnam, the tours of some personnel have been curtailed by as much as 90–120 days in order to meet reduced strength ceilings as established by the President.

DEPLOYMENT CEILINGS

Chairman ELLENDER. Last year you furnished to the committee a tabulation on forces deployed to Southeast Asia entitled "Deployment Ceilings and Dates of Approval." Would you bring this tabulation up to date?

General KERWIN. I will be glad to do so.

(The information follows:)

Deployment ceilings and dates of approval

[Approved U.S. military strength (in thousands)]

Date approved/announced:	
July 31, 1965 [1]	190.1
Dec. 11, 1965	393.9
July 2, 1966	431.0
Nov. 18, 1966	470.0
Aug. 14, 1967	525.0
Apr. 4, 1968	549.5
June 8, 1969	[2] 524.5
Sept. 16, 1969	[3] 484.0
Dec. 15, 1969	[4] 434.0
Apr. 20, 1970	[5] 284.0
Apr. 7, 1971	[6] 184.0
Nov. 12, 1971	[7] 139.0
Jan. 13, 1972	[8] 69.0

[1] The first combat battalion arrived in South Vietnam in March 1965 and by the end of June 1965 9 were in-country.
[2] To be effective Aug. 31, 1969.
[3] To be effective Dec. 15, 1969.
[4] To be effective Apr. 15, 1970.
[5] To be effective May 1, 1971.
[6] To be effective Dec. 1, 1971.
[7] To be effective Feb. 1, 1972.
[8] To be effective May 1, 1972.

U.S. Military Strength in South Vietnam

[In thousands]

1965:	
June 30	59.9
Dec. 31	184.3
1966:	
June 30	267.5
Dec. 31	385.3
1967:	
June 30	448.8
Dec. 31	485.6
1968:	
June 30	534.7
Dec. 31	536.1
1969:	
June 30	538.7
Dec. 31	475.2
1970:	
June 30	414.9
Dec. 31	334.6
1971:	
June 30	239.2
Dec. 31 (preliminary)	157.0

CHANGES IN PERSONNEL STRENGTH

Chairman ELLENDER. As you have in the past, would you please provide the committee with a step-by-step tabulation of all major changes in personnel strength in the past year?

General KERWIN. Yes, sir.

(The information follows:)

Military personnel strength,[1] Dec. 31, 1970	1,232,800
Gains, Jan. 1, 1971, to June 30, 1971	260,200
Losses, Jan. 1, 1971, to June 30, 1971	370,000
Military personnel strength,[1] June 30, 1971	1,123,000
Gains, July 1, 1971, to Dec. 31, 1971	167,500
Losses, July 1, 1971, to Dec. 31, 1971	310,500
Military personnel strength,[1] Dec. 31, 1971	980,000
Gains, Jan. 1, 1972, to June 30, 1972	175,500
Losses, Jan. 1, 1972, to June 30, 1972	294,900
Military personnel strength,[1] June 30, 1972	860,600

[1] Excludes reimbursables.

DISTRIBUTION OF MILITARY PERSONNEL BY PRIMARY MISSION

Chairman ELLENDER. Please provide for the record a summary tabulation of military personnel by primary mission.

General KERWIN. I will be glad to do so.

(The information follows:)

DISTRIBUTION OF ARMY STRENGTH BY PRIMARY MISSION

[Manpower in thousands]

Force classification	Fiscal year 1972 number	Fiscal year 1973 number
Division forces	384.5	389.7
Special mission forces	137.9	128.9
General support forces	179.6	173.9
Training establishment	(67.1)	(66.0)
Support establishment	(68.6)	(65.3)
Other	(43.9)	(42.6)
Individuals	158.6	148.1
Transients	(40.6)	(38.9)
Trainees	(73.0)	(66.7)
Patients	(2.8)	(2.7)
Students	(36.8)	(34.2)
Cadets	(3.9)	(4.0)
Prisoners	(1.5)	(1.6)
Total military strength [1]	860.6	840.6

[1] Excludes reimbursables.

PAY AND ALLOWANCES OF OFFICERS

Chairman ELLENDER. At this point in the record there will appear a summary of requirements by project for "Pay and allowances of officers."

(The information follows:)

MILITARY PERSONNEL, ARMY—SEC. 4: PAY AND ALLOWANCES OF OFFICERS

[In thousands of dollars]

Budget project account	Title	Actual fiscal year 1971	Estimate	
			Fiscal year 1972	Fiscal year 1973
1-A	Basic pay	1,618,003	1,571,268	1,450,363
1-B	Incentive pay	56,033	54,471	53,116
1-C	Special pay	56,017	43,940	32,970
1-D	Basic allowance for quarters	156,795	158,448	173,739
1-E	Basic allowance for subsistence	91,895	79,408	68,715
1-F	Station allowances overseas	23,386	21,887	18,728
1-G	Uniform allowances	5,206	3,485	3,309
1-H	Family separation allowances	12,929	7,633	3,344
1-I	Separation payments	39,802	59,547	25,993
1-J	Social security tax—employer's contribution	61,550	57,611	56,637
	Total obligations	2,121,616	2,057,698	1,886,914

Note: Provides for pay and allowances as authorized by law to be paid to officers serving on active duty.

BASIC PAY

Chairman ELLENDER. For fiscal year 1973 the estimate for "Basic pay" of officers is $1,450,363,000. The funds for fiscal year 1972 were $1,571,268,000. Please describe any major changes in this budget project.

General KERWIN. Yes, sir; major changes result from a full year's cost of military pay increases effective November 14, 1971, and January 1, 1972, amounting to $45.9 million. These increases are offset by a decrease of $166.8 million due to a reduction of 18,612 man-years.

INCENTIVE PAY

Senator YOUNG. For "Incentive pay officers" for fiscal year 1973 the estimate is $53,116,000. This is a slight reduction from the $54,471,000 provided for fiscal year 1972. Please indicate for what purposes these funds will be utilized.

General KERWIN. Yes, sir; these funds are used for flying duty pay to crew members, and noncrew members; also for parachute jumping, for officers participating in thermal stress experiments, and for duty related to demolition of explosives.

SPECIAL PAY

Chairman ELLENDER. Under "Special pay," along with that for physicians, dentists, and veterinarians, there is an item, "Continuation pay for medical corps officers." Please define this.

General KERWIN. Yes, sir; continuation pay is an amount paid to retain medical officers in a critical specialty category who may otherwise be lost to the Army following completion of their service obligations or who are eligible for voluntary retirement. Payments range from one month's basic pay for each year of extension for a lieutenant general to 4 months basic pay for each year extended for colonels, lieutenant colonels and majors.

Chairman ELLENDER. Also, please define "Other," "Responsibility pay" and "Optometrist pay".

General KERWIN. Yes, sir; the "Other" category shown in the budget consists of hostile fire pay of $65 per month for personnel located in areas where this pay is authorized. "Responsibility pay" is a special payment of $50 per month made to senior advisers in Vietnam. "Optometrist pay" is a new entitlement of $100 per month authorized in Public Law 92-129 effective November 14, 1971 for an officer designated as an optometry officer.

Chairman ELLENDER. Would you please indicate how much more a medical officer receives, in total, than a line officer in the same grade?

General KERWIN. Yes, sir; the additional pay received by a medical officer is determined by years of active service as follows: $100 per month for less than 2 years active serivce; $150 per month for 2 to 5 years active service; $250 per month for 6 to 9 years active service; and $350 per month for 10 years and over active service

In addition those officers qualifying for continuation pay receive an additional payment of from one to 4 month's basic pay based on their grades.

BASIC ALLOWANCE FOR QUARTERS

Chairman ELLENDER. For "Basic allowance for quarters" the estimate for fiscal year 1973 is $173,739,000. Funds provided for fiscal year 1972 amount to $158,448,000. This is a substantial increase in the amount requested. Please justify the need for the additional funds, particularly as to whether it all relates to increased rates provided by law.

General KERWIN. Yes, sir; increased rates provided by Public Law 92–129 for basic allowances for quarters amount to $19.6 million. This increase is partially offset by a reduction of $4.3 million resulting from 18,612 less man-years in fiscal year 1973.

BASIC ALLOWANCE FOR SUBSISTENCE

Senator YOUNG. For fiscal year 1973 the estimate for "Basic allowance for subsistence" is $68,715,000, a reduction from the amount provided for fiscal year 1972 which came to $79,408,000. Please explain how this figure is arrived at.

General KERWIN. Yes, sir; this figure is arrived at by applying the statutory rate of $574.56 to total man-years, since the rate is the same for all officers.

Senator YOUNG. I notice that the rate of $574.56 has not changed in the past 3 years. Do you have any comment?

General KERWIN. Yes, sir. The rate of $574.56 is statutory, and has not changed since 1952.

STATION ALLOWANCE, OVERSEAS

Chairman ELLENDER. For "Station allowances, overseas" the amount requested for fiscal year 1973 is $18,728,000. The amount provided for fiscal year 1972 was $21,887,000. The cost of living allowances seem to have decreased much more markedly than those for housing and temporary lodging. Please explain.

General KERWIN. Yes, sir. The large decrease in the cost of living allowances results from decreased free world military assistance force requirements in fiscal year 1973.

UNIFORM ALLOWANCES

Chairman ELLENDER. For fiscal year 1973 the "Uniform allowances" for officers is $3,309,000. The fiscal year 1972 amount provided was $3,485,000. I presume this relates to the reduction in the number of officers for which uniform allowances are granted?

General KERWIN. Yes, sir. The reduced dollar amount results entirely from the reduction in the number of officers for which uniform allowances are granted. This amount is a straight arithmetic computation obtained by applying the applicable rate—$100 or $200—to the number of officer accessions from each source of procurement.

FAMILY SEPARATION ALLOWANCES

Senator YOUNG. For "Family separation allowances" the estimate for fiscal year 1973 is $3,344,000, considerably below the $7,633,000 appropriated for fiscal year 1972. The reduction is concentrated in the item "On permanent change of station for which dependents are not authorized." Please explain this.

General KERWIN. Yes, sir. This item includes officers serving in areas where dependents are not authorized, and the decreased numbers and dollars are due to the force reductions planned for fiscal year 1973. The rate of pay—$30 per month—is statutory.

Chairman ELLENDER. I notice that the rate for the item "On permanent change of station for which dependents are not authorized and quarters are not available" has increased almost 50 percent in the past 2 years, from $1,272.25 in 1971 to $1,885.35. Please justify this increase.

General KERWIN. Yes, sir. The rate of pay for this type of family separation allowance is, by statute, equal to the basic allowance for quarters payable to a member without dependents. The increases in fiscal years 1972 and 1973 result from Public Law 92-129 which increased all basic allowance for quarters rates effective November 14, 1971.

SEPARATION PAYMENTS

Senator YOUNG. For "Separation payments" the fiscal year 1973 request is $25,993,000. This is a considerable reduction from the $59,547,000 required for fiscal year 1972. Please describe this reduction.

General KERWIN. Yes, sir. The major reductions in this item are in lump sum terminal leave, $19,416,000 and lump sum readjustment payments, $14,698,000. The lump sum terminal leave decrease of $19.4 million is due to a reduction of 21,675 losses, from 40,205 in fiscal year 1972 to 18,530 in fiscal year 1973. This results in 19,184 fewer payments in fiscal year 1973. The $14.7 million decrease in lump sum readjustment payments is due to a reduction in the number of officers to be involuntarily separated in fiscal year 1973.

Senator YOUNG. Please describe each of the four types of separation payments.

General KERWIN. Yes, sir. The four types of separation payments are:

(1) Lump sum terminal leave payments. Payment is authorized for accrued leave, not to exceed 60 days. This payment is computed on the daily rate of basic pay, basic allowance for quarters, and basic allowance for subsistence.

(2) Lump sum readjustment payments are made to reservists involuntarily separated from the Army. Payment consists of 2 months basic pay for each year of service between 5 and 18 with a maximum of 24 months or $15,000 whichever is less.

(3) Severance pay—failure of promotion is paid to Regular Army personnel separated as the result of being passed over for promotion,

or substandard performance of duty. This payment consists of 2 months basic pay for each year, not to exceed 12, for those passed over for promotion and 1 month basic pay for each year of service, not to exceed 12, for those separated for substandard performance.

(4) Severance pay for disability is paid to an officer separated from the service for physical disability. This payment consists of 2 months basic pay for each year of service, not to exceed 12.

Chairman ELLENDER. The justifications indicate that for "Lump sum readjustment payments" the rate is $11,654 and for "Severance pay, failure of promotion" the rate is $13,378. Please describe how this is worked out.

General KERWIN. Yes, sir. These rates are average rates payable to personnel receiving each type of payment and are based on experience factors. The grade and average years of service of the personnel to be separated under each category results in the differences in average rates.

EMPLOYER'S CONTRIBUTION, SOCIAL SECURITY TAX

Chairman ELLENDER. For the "Social security tax, employer's contribution" the fiscal year 1973 request is $56,637,000. The amount provided for fiscal year 1972 was $57,611,000. In looking at the justifications it would appear that although the number of personnel involved has been reduced substantially, the rate increase has just about balanced it out. Would you care to comment?

General KERWIN. Yes, sir. The Army's contribution to social security tax is computed by applying the applicable percentage, as fixed by law, to the first $7,800 earned in the calendar year ending December 31, 1971, and the first $9,000 earned in the calendar year beginning January 1, 1972. The increase in average rate from $416.85 in fiscal year 1972 to $473.57 in fiscal year 1973 results primarily from three factors: (1) A full year's cost of raising the taxable base from $7,800 to $9,000; (2) The increase in rate of contribution from 5.2 percent to 5.65 percent effective January 1, 1973, and (3) The full year's cost of the increase of 7.2 percent in basic pay rates effective January 1, 1972. These increases are offset by the reduction in the number of personnel for a net decrease of $974,000.

RETENTION OF OFFICERS

Chairman ELLENDER. Please provide for the record a tabulation showing officer retention by type of accession.

General KERWIN. I will be glad to.

(The information follows:)

A tabulation of officer retention by the major procurement sources is shown below:

COMMISSIONED OFFICER RETENTION

Other than Regular Army (OTRA) officers.—Retention rate is based on the number of officers who, having fulfilled their active duty obligation, elect to extend their term of service and enter a voluntary indefinite category.

Fiscal year	ROTC—OCS (APL less JAGC)			ROTC			OCS		
	Elig	Ext	Rate (percent)	Elig	Ext	Rate (percent)	Elig	Ext	Rate (percent)
1960	5,933	1,694	28.6	5,395	1,308	24.2	538	386	71.7
1961	4,728	1,752	37.1	4,113	1,309	31.8	615	443	72.0
1962	5,844	1,974	33.8	5,224	1,550	29.7	620	424	68.4
1963	6,449	2,136	33.1	5,859	1,679	28.7	590	457	77.5
1964	9,207	2,092	22.7	8,565	1,638	19.1	642	454	70.7
1965	10,216	2,540	24.9	9,484	2,003	21.2	732	537	73.4
1966	11,342	2,894	25.5	9,568	1,898	19.8	1,774	996	56.1
1967	10,466	2,307	22.0	8,617	1,279	14.8	1,849	1,028	55.6
1968	11,620	2,813	24.2	7,995	1,077	13.5	3,625	1,736	47.9
1969	27,064	7,502	27.7	8,660	1,285	14.8	18,404	6,217	33.8
1970	30,260	5,628	18.6	10,006	1,116	11.2	20,254	4,512	22.3
1971	22,981	5,519	24.0	12,013	2,695	22.4	10,968	2,824	25.7
1972 [1]	20,798	4,804	23.1	12,155	2,602	21.4	8,643	2,202	25.5
1972 [2]	20,798	8,583	41.3	12,155	4,663	38.4	8,643	3,920	45.4

[1] Projected (excludes those officers who have been allowed to voluntarily withdraw their voluntary indefinite category and leave the service).
[2] Actual status as of Dec. 31, 1971.

Regular Army

USMA.—Retention rates are based on number USMA graduates continuing in service.

USMA class	Obligation years	Number commissioned	Retention rate (in percent)			
			3 years	4 years	5 years	10 years
1957	3	406	94.4	85.5	84.5	75.6
1958	3	427	93.5	87.8	82.2	73.8
1959	3	445	94.6	85.8	81.3	73.7
1960	3	487	91.6	82.1	76.4	69.4
1961	3	472	95.8	86.0	81.0	70.3
1962	4	526	99.8	98.7	97.0	----
1963	4	446	(1)	99.3	96.4	----
1964	4	492	(1)	99.4	98.0	----
1965	4	521	(1)	100.0	76.6	----
1966	4	554	(1)	88.6	71.7	----
1967	4	561	(1)	86.3	----	----

[1] Not applicable.

NOTE.—Beginning with class 1968, obligation is 5 years.

DMG—Retention rates based on number of DMG's continuing in service after 3, 4, and 5 years of service.

Obligation is 3 years. ROTC scholarship students entering Army have 4 year obligation.

Fiscal year of procurement	Number commissioned	Retention rate (in percent)		
		3 years	4 years	5 years
1961	1,075	94.8	81.8	76.5
1962	996	92.7	79.5	75.5
1963	1,050	95.4	89.0	77.9
1964	891	97.9	89.9	75.6
1965	1,316	97.9	89.9	72.6
1966	1,047	98.0	75.1	65.8
1967	1,305	86.4	75.8	----
1968	1,238	88.4	----	----

Other.—Retention rates are based on officers (other than DMG) integrated into RA and continuing in service after 3, 4, and 5 years of service. Period of probation 3 years.

Fiscal year of procurement	Number commissioned	Retention rate (in percent)		
		3 years	4 years	5 years
1961	1,061	97.2	95.0	93.6
1962	[1] 1,153	96.9	94.2	92.7
1963	[1] 984	98.7	96.5	94.0
1964	[1] 1,005	98.5	95.9	93.0
1965	[1] 1,416	98.5	96.0	93.3
1966	1,589	98.6	96.5	94.5
1967	1,496	98.8	97.5	
1968	1,681	99.4		

[1] Excludes a few officers from other academies.

NOTE.—Bulk of increased integration from career reservists with 3 to 19 years of service.

Army expects to integrate at least 1,000 officers into RA each year.

Retention rate of RA officers others than USMA/DMG graduates higher than USMA/DMG.—Attributed to fact that integrated "regular" has made decision to "go regular" at more mature age and after performing on active duty for period of time.

USMA/DMG graduates enter on active duty at less mature age and usually without any prior active service upon which to base commitment to Army career.

SOURCE OF OFFICERS

Chairman ELLENDER. Also at this point please provide a tabulation showing the number of officers by source of procurement for fiscal years 1971, 1972 and 1973.

General KERWIN. I will be glad to do so.

(The information follows:)

COMPARISON OF THE OFFICER PROCUREMENT AVERAGE OVER THE PAST 10 YEARS WITH THE FISCAL YEAR 1971 ACTUAL AND FISCAL YEAR 1972 AND FISCAL YEAR 1973 PROGRAMS

Source	10-year average [1]	Percent	Fiscal year 1971, actual	Percent	Fiscal year 1972 program	Percent	Fiscal year 1973 program	Percent
USMA	577	2.1	701	3.1	830	5.9	945	7.2
ROTC	11,159	41.2	10,482	45.6	5,445	38.6	5,435	41.3
OCS	6,464	23.8	2,809	12.2	1,020	7.2	1,000	7.6
VOL AD (Reserve)	1,097	4.1	1,024	4.5	656	4.6	233	1.8
Direct appointment (CHAP) JAG, MSC, WAC)	968	3.6	884	3.8	771	5.5	780	5.9
Direct appointment (MC, DC, VC)	2,558	9.4	2,434	10.6	2,843	20.2	2,347	17.9
Nurses and Army: Medical specialists	938	3.5	1,264	5.5	775	5.5	809	6.1
Warrant officers	3,117	11.5	3,034	13.2	1,408	10.0	1,432	10.9
Order (RA appointments and Miscellaneous)	206	.8	348	1.5	352	2.5	167	1.3
Involuntary active duty (Reserve)	[2] 809							
Total	27,084	100	22,969	100	14,100	100	13,148	100

[1] During the period fiscal year 1961 through fiscal year 1970:

Fiscal year:	
1961	11,507
1962	19,206
1963	17,054
1964	19,456
1965	17,371
1966	22,225
1967	44,086
1968	42,862
1969	37,536
1970	39,536

[2] Occurred only in fiscal year 1968, not included in the 10-year average.

WARRANT OFFICER PROGRAM

Senator YOUNG. Last year there was reference to the expansion of the warrant officer program. Please speak to your plans for fiscal year 1973.

General KERWIN. Warrant officers will continue to account for approximately 13.5 percent of the total officer strength in fiscal year 1973. We are presently reevaluating the need for and the nature of the warrant officer—everything from the validity of his current status as a master craftsman to the criteria for his utilization to his role in the modern volunteer army. One new specialty which we have added in the warrant officer field is the military physicians' assistant program. This program is designed to provide additional training to selected highly qualified Army enlisted medical specialists. As warrant officer physicians' assistants they will extend the Army physicians' ability to provide health care. The first class of 60 students began this 18-month intensive training program on February 28, 1972, at Fort Sam Houston, Tex. We anticipate appointing approximately 120 in fiscal year 1974 and 120 per year thereafter until we reach a tentative target of 400. This program should help alleviate the physician shortage. The physician's assistant will help fill the gap that has tended to develop between the patient and the highly skilled medical specialist who comprises a large proportion of Army physicians each year. He will extend the capabilities of the physician by removing him from the burden of routine examinations, tests and administration which do not require his level of expertise and allow the physician to spend more time performing those duties which only he can perform.

OVERSTRENGTH IN CAPTAINS

Chairman ELLENDER. Last year there was a fiscal problem related to a temporary overstrength in captains involving $23.5 million. What measures have been taken to alleviate this situation?

General KERWIN. During fiscal year 1972, 15,409 captains will be released from the active duty as the result of normal attrition and special release programs. A series of actions have been ongoing for several months to reduce captain strength.

Action taken to date to alleviate problems

	Number
Normal attrition	10,204
Voluntary early release	861
DAABD involuntary release	4,344
Extension of the promotion point to CPT (24 months service to 32 months service)	(1)
Suspension promotion to CPT (Dec.–Jun.)	(1,400)
More restrictive voluntary indefinite standards	(1)
More restrictive RA integrations standards	(1)

[1] Not available.

The Army has conducted an extremely successful effort to encourage qualified young officers to seek a full military career. We pursued such a program aggressively in the last few years and our success is demonstrated by what has been a growing decrease in the number of voluntary losses from this grade. In short, our past success is now hav-

ing an adverse affect on our ability to reduce our captain strength. It is important to note that the captain population to which we are referring is what remains after qualitative screening and attrition has occurred. In other words any officers who would now be riffed must meet or exceed the qualitative standards we require for the baseline force.

After careful review of this total area it has been concluded that a further involuntary RIF of captains is neither indicated nor necessary and in fact such a reduction would have both immediate and long term adverse effects on the Army. Accordingly, no further quantitative RIF is programed for fiscal year 1972. We will still continue to eliminate those officers including captains whose records indicate that they are not of the caliber we desire in the baseline force.

RELIEF FROM OFFICER GRADE LIMITATION ACT

Senator YOUNG. Last year there was reference to the Army's seeking relief from the Officer Grade Limitation Act. What is the present status?

General KERWIN. The proposed OGLA change is a joint Army/Air Force request. Authorizations proposed for the Army represent small decreases at baseline force levels in the grades of colonel and lieutenant colonel and an increase of 3,000 majors. These authorizations will not equal requirements but will make up a large part of the Army's shortage at the grade of major and give the Army increased managerial flexibility during buildups and phasedowns. The proposal is now being studied by the Office of Management and the Budget.

ARMY NURSE CORPS

Chairman ELLENDER. Last year there was some question as to whether the Army Nurse Corps would be able to provide its full complement of officers. Please bring the committee up-to-date on this matter and also supply a tabulation showing the numbers for fiscal years 1971, 1972, and 1973 by type of accession.

General KERWIN. The Army Nurse Corps, due to recent reductions in the strength of the Army, will have sufficient accessions to meet the reduced strength of the corps. This is due on the most part to the student programs. I will be glad to furnish a tabulation.

(The information follows:)

ACCESSIONS

Army Nurse Corps	Actual fiscal year 1971	Estimate fiscal year 1972	Estimate fiscal year 1973
1. Walter Reed Army Institute of Nursing	105	100	100
2. Army student nurse program	691	573	582
3. Registered nurse student program	50	5	10
4. Direct procurement	316	28	33
Total	1,162	706	725

Chairman ELLENDER. Please describe each of the programs referred to above.

General KERWIN. I will be glad to do so.

(The information follows:)

ARMY NURSE CORPS PROGRAM

WALTER REED ARMY INSTITUTE OF NURSING PROGRAM

This program consists of 4 years of training, study and clinical experience which fulfills the requirements for the baccalaureate degree in nursing by the University of Maryland. Participation is offered to selected high school graduates and Army enlisted personnel. The program is highly competitive. Applicants must not have passed their 23rd birthday; they are enlisted in the United States Army Reserve and serve as E–3 or higher grade for 4 years. Upon completion they are commissioned as first lieutenant, Army Nurse Corps—United States Army Reserve. Participants serve on active duty for 3 years.

ARMY STUDENT NURSE PROGRAM

This program provides up to 24 months of financial assistance for baccalaureate nursing students and up to 12 months of assistance for diploma nursing students. They must have completed the first 2 years of the nursing program and must not have passed their 25th birthday. They are enlisted in the United States Army Reserve and serve as E–3 until graduation for diploma students. Baccalaureate students are commissioned as second lieutenants, Army Nurse Corps—United States Army Reserve, 6 months prior to graduation. Participants serve on active duty 2 or 3 years, depending upon the period of participation.

The diploma program has been temporarily suspended.

REGISTERED NURSE STUDENT PROGRAM

This program provides up to 24 months of participation for completion of a baccalaureate or master's degree in nursing or diploma in anesthesiology nursing. The participants must not have passed their 32nd birthday and must be Regular Army eligible. They are commissioned in the Army Nurse Corps in grade as determined by education and experience. Participants serve on active duty 2 or 3 years, depending upon the period of financial assistance.

Diploma in anesthesiology nursing phase of this program has been temporarily suspended.

DIRECT APPOINTMENT AND ACTIVE DUTY IN THE ARMY NURSE CORPS

A variety of guaranteed options are offered to qualified applicants for appointment and active duty in the Army Nurse Corps, to include geographical assignment, service school and companion assignments. Applicants must be a graduate of an approval school of nursing and must hold state licensure. Must not have passed the 33d birthday. Options are available for 2 year or 14-month initial tours.

FLIGHT WAIVER PROVISION

Chairman ELLENDER. Please provide for the record the number of personnel receiving flight pay under the flight waiver provision for fiscal years 1971, 1972, 1973.

General KERWIN. I will be glad to do so.

(The information follows:)

The number of aviators under waiver on June 30, 1971, was 991. On June 30, 1972, our estimate is 1,507. By June 30, 1973, we will have 2,041 on waiver.

OFFICER TRAINING COSTS BY TYPE OF ACCESSION

Chairman ELLENDER. Please provide for the record a statement of officer training costs by type of accession, OCS, ROTC, and so forth, together with the numbers so acquired.

General KERWIN. I will be glad to provide that information.

(The information follows:)

OFFICER TRAINING COST AND NUMBER OF ACCESSION BY SOURCE—1971

USMA:	
USMA course	$56,829
Branch basic	5,671
Total cost	62,500
Number of accessions, 701.	

	Infantry	Engineer	Artillery
OCS:			
Basic combat training	$1,635	$1,635	$1,635
Advanced individual training	2,020	2,090	2,025
OCS course	11,795	10,175	15,810
Total cost	15,450	13,900	19,470
Number of accessions, 2,809.			

	Non-scholarship	2-year scholarship	4-year scholarship
ROTC, Nonaviation cadet:			
ROTC course	$5,824	$8,202	$13,637
Branch basic	5,671	5,671	5,671
Total cost	11,495	13,873	19,308
Number of accessions, 10,482.			

PAY AND ALLOWANCES OF ENLISTED PERSONNEL

Chairman ELLENDER. At this point in the record there will appear a summary of requirements by project for "Pay and allowances of enlisted personnel."

(The information follows:)

SEC. 4—PAY AND ALLOWANCES OF ENLISTED PERSONNEL

[In thousands of dollars]

Budget project account and title	Fiscal year— 1971 actual	1972 estimate	1973 estimate
2-A: Basic pay	$3,741,367	$3,707,860	$3,704,846
2-B: Incentive pay	33,560	27,461	25,879
2-C: Special pay	257,534	119,545	39,573
2-D: Proficiency pay	59,144	64,136	61,097
2-E: Reenlistment bonus	149,216	150,798	162,007
2-F: Combat arms enlistment bonus		12,400	55,000
2-G: Basic allowance for quarters	452,752	435,657	449,062
2-H: Station allowances overseas	58,874	54,657	45,802
2-I: Clothing allowances	166,946	115,876	97,996
2-J: Family separation allowances	21,695	14,225	6,589
2-K: Separation payments	136,085	131,240	76,352
2-L: Social security tax—employer's contribution	185,967	190,990	199,589
Total obligations	5,263,140	5,024,845	4,923,792

Justification: Provides for pay and allowances as authorized by law to be paid to enlisted personnel serving on active duty.

BASIC PAY OF ENLISTED PERSONNEL

Chairman ELLENDER. For fiscal year 1973 the estimate for "Basic pay" for enlisted personnel is $3,704,846,000. This is a very slight reduction from the appropriation for fiscal year 1972 of $3,707,860,000, although the average number involved has decreased from 832,056 to

746,068. Is this situation entirely the result of increases in the rate of pay or is some of it related to upgrading of personnel?

General KERWIN. Yes, sir. It is due to pay raises approved in fiscal year 1972 and results in increases of $261 million. These increases however are offset by the decrease of $264 million due to a reduction of 85,982 manyears in fiscal year 1973.

INCENTIVE PAY FOR HAZARDOUS DUTY

Senator YOUNG. For "Incentive pay for hazardous duty" of enlisted personnel in fiscal year 1973 the estimate is $25,879,000. For fiscal year 1972 the amount appropriated was $27,461,000. Please describe this item.

General KERWIN. Yes, sir. These funds are used for flying duty pay to crew members, and noncrew members; also for parachute jumping, for participation in thermal stress experiments, and for duty related to demolition of explosives.

Senator YOUNG. I notice you budget for 2,875 noncrew members on flying duty pay. Just who are these personnel?

General KERWIN. I will be happy to furnish this for the record.

(The information follows:)

Enlisted members assigned to the following positions receive flying pay as noncrew members:

Aircraft maintenance supervisor.
Nonflying crew chiefs, mechanic.
Maintenance, shop foreman.
Aerial photographer.
Visual air observer.
Aircraft technical inspector.
Aviation unit platoon/section sergeant.
Aircraft maintenance unit platoon/section sergeant.

SPECIAL PAY

Chairman ELLENDER. For "Special pay" for enlisted personnel for fiscal year 1973 the estimate is $39,573,000. The amount appropriated for fiscal year 1972 was $119,545,000. I assume that much of this reduction is related to a lower level of activity in Southeast Asia. Please describe what has happened.

General KERWIN. Yes, sir. The reduction in special pay is related to the lower level of activity in Southeast Asia. This has resulted in decreased requirements.

PROFICIENCY PAY

Chairman ELLENDER. For "Proficiency pay" for enlisted personnel the fiscal year 1973 request is $61,097,000. The appropriation for fiscal year 1972 was $64,136,000. There seems to be considerable turbulence in this budget project. Please explain what is programed and the reasons therefore.

General KERWIN. The decline in fiscal year 1973 from fiscal year 1972 is due to the smaller career force coupled with reductions made in the number of military occupational specialties designated for shortage specialty proficiency pay. We have programed 96 MOS in the shortage specialty category at a cost of $21,600,000. There are three skills designated for special duty assignment pay at a cost of

$9,500,000. All remaining MOS are in the superior performance pay category at a cost of $13,400,000. Termination pay from MOS deleted from shortage specialty pay is programed at $16,600,000.

REENLISTMENT BONUS

Senator YOUNG. For "Reenlistment bonus" for enlisted personnel the fiscal year 1973 estimate is $162,007,000. The appropriation for fiscal year 1972 was $150,798,000. Describe the difference between the reenlistment bonus and the variable reenlistment bonus.

General KERWIN. Yes, sir. The regular reenlistment bonus is paid to an enlisted member who enlists or reenlists in the regular component of the same service within 3 months from the date of discharge or separation after compulsory or voluntary active duty—except active duty for training. Bonuses are computed on the following amounts for each year in the reenlistment contract: First reenlistment, 1 month's basic pay; second reenlistment, two-thirds of 1 month's basic pay; third reenlistment, one-third of 1 month's basic pay; fourth and subsequent reenlistments, one-sixth of 1 month's basic pay. The cumulative amount of regular reenlistment bonus paid to a member may not exceed $2,000.

The variable reenlistment bonus is paid to enlisted members in pay grade E–3 or above possessing critical military skills as designated by the Army and who are entitled to a regular first reenlistment bonus. This is an additional amount of two to four times the amount of the regular bonus, based on the member's military occupational specialty.

Senator YOUNG. Please justify the increase in the request.

General KERWIN. Yes, sir. There is an increase of $14.5 million in variable reenlistment bonuses due to more lump sum payments in fiscal year 1973, as well as average rates resulting from the two pay increases enacted in fiscal year 1972.

There is a decrease however in regular reenlistment bonuses of $3.3 million. Due to the decreased structure requirements and career assets on hand, the reduced number is all the Army will need for fiscal year 1973. Any additional reenlistments in fiscal year 1973 would result in excesses to the Army's need. Assuming stability is reached at end of fiscal year 1973, the reenlistments for subsequent years will return to levels approximating fiscal year 1972. The savings resulting from fewer reenlistments is partially offset by increased average rates resulting from the pay increases authorized in Public Laws 92–129 and 92–210.

COMBAT ARMS ENLISTMENT BONUS

Chairman ELLENDER. For "Combat arms enlistment bonus" for fiscal year 1973 the estimate is $55 million. The appropriation for fiscal year 1972 was $12,400,000. This was a new project for fiscal year 1972. Please describe it again.

General KERWIN. This is a test program which provides for payment of a $3,000 bonus to individuals who enlist, qualify and serve in the designated combat arms; infantry, armor, and field artillery. Payment is to be made in equal annual installments following completion of required training. Provisions for payment of $1,000 for qualified in-

dividuals who agree to extend their initial period of service has also been provided. A starting date for the program has not been established.

Chairman ELLENDER. Please justify the need for this increase.

General KERWIN. The funds estimated for fiscal year 1972 in the amount of $12,400,000 were based upon a December 1, 1971 starting date for the program. It would be limited to enlistment of nonprior service enlistees only at a rate of 4,200 per month. Payments are made after military occupational specialty qualification, resulting in expenditures during April, May, and June for those who complete required training. Should this program be started this fiscal year, and include enlistment from civilian life of prior service personnel who are already trained in combat skills, we will require a portion of the $12,400,000. The $55 million estimate is based upon an April 1, 1972, starting date with 4,200 enlistments per month until July 1 at which time the accession rate was programed for 5,100 per month plus 100 extensions.

BASIC ALLOWANCE FOR QUARTERS

Senator YOUNG. For fiscal year 1973 for "Basic allowance for quarters" for enlisted personnel the request is for $449,062,000. The appropriation for fiscal year 1972 was $435,657,000. Please explain the interacting relationship between a reduced number and an increase in the rates.

General KERWIN. Yes, sir. Increased rates provided by Public Law 92–129 for basic allowance for quarters amount to $39.8 million. This increase is partially offset by a reduction of $26.4 million resulting from 85,982 less man-years in fiscal year 1973.

STATION ALLOWANCES, OVERSEAS

Chairman ELLENDER. For "Station allowances, overseas" for enlisted personnel the fiscal year 1973 request is for $45,802,000. For fiscal year 1972 the appropriation was $54,657,000. "Housing" and "Temporary lodging" have increased slightly but the "Cost of living allowance" has gone down. Please explain.

General KERWIN. Yes, sir. The large decrease in the cost of living allowance results from decreased Free World Military Assistance Force requirements in fiscal year 1973. The slight increases in housing and temporary lodging are due to small force increases in countries other than Vietnam where these allowances are paid.

CLOTHING ALLOWANCE

Chairman ELLENDER. For "Clothing allowance" for enlisted personnel for fiscal year 1973 the request is for $97,996,000. Funds provided for fiscal year 1972 amounted to $115,876,000. Please explain this reduction generally.

General KERWIN. This reduction is primarily attributable to the reduction in troop strengths in Vietnam which accounts for $17 million of the $17.9 million total reduction.

Senator YOUNG. What is the "Civilian life, men" item under "Initial clothing allowance"?

General KERWIN. Sir, this line reflects male personnel entering the Army from civilian life. It represents the number of personnel entitiled to the male initial clothing issue bag.

Chairman ELLENDER. Items 3 and 4 under the initial clothing allowance relate to the Army Reserve and the Army National Guard. Please explain.

General KERWIN. These two lines represent enlistments of National Guard or Reserve component personnel into the Active Army. These individuals bring with them those items issued to them as a guardsman or reservist. As a result, we budget for these individuals at a lesser amount than we do accessions direct from civil life.

Chairman ELLENDER. What is the negative request related to the Army stock fund?

General KERWIN. Sir, Army policy requires enlisted personnel deploying to Vietnam to turn in articles of outer clothing not needed in that country. This results in a credit allowance by the Army stock fund which is applied to reduce our initial issue dollar requirements?

Senator YOUNG. What are "Purchases less than standard"?

General KERWIN. This line reflects the savings incurred when the items previously turned in to the Army stock fund are renovated and reissued. As you will note, all our initial issue requirements are computed at full standard price. Items that are renovated and reissued are sold at 50 percent of full standard price. By this line we adjust our dollar requirement to actual need.

Chairman ELLENDER. What are "Withheld items"?

General KERWIN. Army policy, as a matter of economy, prescribes the withholding of one Army green uniform and when practical the Army green overcoat during the basic and advanced training cycles of new accessions. Upon completion of the advanced individual training cycle the individual's assignment is determined. Personnel assigned to Vietnam do not require the withheld items and the issue is not made. This policy reduces the generation of used clothing and results in substantial savings. It is to be noted that with reduced activity in Vietnam all of these savings will decrease commensurately.

Chairman ELLENDER. Under "Clothing issue" what is the reference to KATUSA?

General KERWIN. KATUSA personnel are members of the Republic of Korea Army assigned to augment U.S. Army Forces in Korea. The Republic of Korea Government continues to provide their pay in accordance with a 1950 agreement which also stipulated that the Army would provide clothing, food, and shelter for them. This item provides the necessary personal clothing.

Senator YOUNG. What is meant by "reentitlement"?

General KERWIN. Sir, personnel deploying to Vietnam do not take a full initial clothing bag with them because of climatic conditions. When they redeploy from Vietnam, it is necessary to provide the articles of clothing that were previously withdrawn or withheld. This we term "reentitlement". The item in question provides for the issue of one uniform, necessary for travel, for those individuals returning for separation. It also provides for the issue of items not in the individual's possession and necessary to reconstitute the complete initial issue for personnel returning for further duty.

FAMILY SEPARATION ALLOWANCE

Chairman ELLENDER. For "Family separation allowance" for fiscal year 1973 the estimate is $6,589,000. Funds provided for fiscal year 1972 amounted to $14,225,000. The average number involved, I note, has dropped from 38,108 to 17,062. Please comment.

General KERWIN. Yes, sir; the reduction in family separation allowance is primarily in the item, "on permanent change of station dependents not authorized." The decreased numbers of dollars are due to the force reductions planned for fiscal year 1973. The rate of pay—$30 per month—is statutory for all grades.

SEPARATION PAYMENTS

Chairman ELLENDER. For "Separation payments" for fiscal year 1973 the estimate is $76,352,000. The funds provided for fiscal year 1972 amounted to $131,240,000. Again, the number involved has dropped markedly, from an average of 409,656 in 1972 to 233,608 in 1973. Please speak to this project.

General KERWIN. Yes, sir; the number of separation payments is based on the losses projected for the fiscal year. The fiscal year 1973 payments are based on 321,356 losses, a reduction of 243,405 from the 564,761 losses projected for fiscal year 1972. This decrease in losses results in 175,248 fewer lump sum terminal leave payments and 800 less severance payments for disability.

EMPLOYER'S CONTRIBUTION, SOCIAL SECURITY TAX

Chairman ELLENDER. For fiscal year 1973 the "Employer's Contribution to the social security tax" is $199,589,000. For fiscal year 1972 the amount was $190,990,000. I notice that the rate has increased from $229.51 in 1972 to $267.48 in 1973. Thus, although the average number has been reduced from 832.164 in 1972 to 746,182 in 1973, the amount requested is greater. Would you comment on this?

General KERWIN. Yes, sir; the increase in average rate in fiscal year 1973 is due primarily to three factors: (1) a full years cost of the increase in taxable base from $7,800 to $9,000 effective January 1, 1972; (2) The increase in rate of contribution from 5.2 to 5.65 percent effective January 1, 1973, and (3) The increase in basic pay rates under Public Law 92–129 effective November 14, 1971, and the 7.2 percent increase in basic pay rates effective January 1, 1972. These increases offset the decrease due to 85,982 fewer man-years.

REENLISTMENTS

Senator YOUNG. I wish you would describe the present outlook in regard to reenlistments in the various grades.

General KERWIN. As you know we have inaugurated a number of controls designed to improve the quality content while at the same time bringing into balance the career content by grade and career field. Our goal is a career content of approximately 40 perecnt of the enlisted

force which will provide fill of authorized spaces at baseline. Our outlook in regard to reenlistments by grade, therefore, is optimistic at this time. Of course, any further reductions would cause additional action to meet new authorizations.

PROMOTION OF ENLISTED PERSONNEL

Senator YOUNG. I wish you would also provide a tabulation showing promotion of enlisted personnel for fiscal years 1971, 1972, and 1973.

General KERWIN. I will be glad to do so.

(The information follows:)

	Fiscal year—		
	1971	1972	[1] 1973
E–9	514	611	782
E–8	1,805	2,073	2,653
E–7	3,316	3,868	7,316
E–6	6,974	1,449	10,657
E–5	144,873	144,168	66,868
E–4	273,894	237,810	161,090
E–3	277,688	248,810	174,489
E–2	260,353	250,815	183,346

[1] Fiscal year 1973 figures are estimates based on projected gains and losses to each grade.

MAINTENANCE OF STANDARDS

Chairman ELLENDER. Would you please discuss the maintenance of standards as it related to the recruitment of personnel.

General KERWIN. Entrance standards are revised as required to meet the quality needs of the Army. In this regard, mental standards for accessions into the Army were recently raised to insure that all new enlistees possess high enough qualifying aptitudes for skill training. Further, the requirement for the Army to accept at least 8 percent of its total accessions under the new mental standards program (Project 100,000) was terminated in December 1971. The 20 percent mandatory quota for acceptance of category IV personnel was also terminated as a result of the Department of Defense Appropriations Act, fiscal year 1972, which prohibits induction or enlistment of any individual under a mandatory quota based on mental categories.

We are continuing to enlist men in the lowest category who meet the aptitude area qualifications. This permits us to accept some men with lower mental ability who can be used effectively in less demanding jobs.

In addition, we are focusing recruiter attention on higher quality enlistments by emphasing the need to enlist high school graduates and men in the higher mental categories.

PAY AND ALLOWANCES OF CADETS

Chairman ELLENDER. At this point in the record there will appear a summary of requirements by project for "Pay and allowances of cadets."

(The information follows:)

SEC. 4.—PAY AND ALLOWANCE OF CADETS

[In thousands of dollars]

Budget project account and title	Actual, fiscal year 1971	Estimate	
		Fiscal year 1972	Fiscal year 1973
3-B: Academy cadets	$13,046	$15,117	$16,854

JUSTIFICATION

Provides for statutory rate of pay; payments of commuted value of the ration, and the employer's contribution to social security. Increased funds for FY 1972 and FY 1973 are required to support the increased cadet strength authorized by P.L. 88-276, 3 March 1964.

B—ACADEMY CADETS

[In thousands of dollars]

	Actual, fiscal year 1971			Estimate, fiscal year 1972			Estimate, fiscal year 1973		
	Average number	Rate	Amount	Average number	Rate	Amount	Average number	Rate	Amount
(1) Basic pay	[1] 3,827	$2,604.60	$9,968	[1] 3,965	$2,977.20	$11,805	[1] 4,182	$3,184.20	$13,316
(2) Subsistence—commuted ration		594.86	2,277		602.10	2,387		594.95	2,488
(3) Social security tax, employer's contribution			496			610			718
(4) Clothing and equipment advance (Public Law 122, 82d Congress)			305			315			332
Total			13,046			15,117			16,854

[1] Includes 27 man-years nonreimbursable foreign national students.

ACADEMY CADET INCREASES

Chairman ELLENDER. For "Academy cadets" the fiscal year 1973 estimate is $16,854,000 as compared with the $15,117,000 provided in fiscal year 1972. The justifications indicate that the increase may be attributed to increases in the number of cadets, basic pay, social security and the clothing and equipment advances. Only the commuted ration rate decreases, although the total for that item is increased also. How is it that the commuted ration rate has been reduced?

General KERWIN. The commuted ration rate for cadets at the service academies is determined by Office of Secretary of Defense based on 109 percent of the value of the Navy Continental United States (Conus) ration rate for the January to June period preceding the budget preparation. From January to June 1970, to January to June 1971, the Navy Conus ration rate reduced from $1.52 to $1.49 with a corresponding reduction being reflected in the cadet commuted ration rate for the last 6 months of fiscal year 1972 and all of fiscal year 1973.

Senator YOUNG. In line with the planned expansion of the Cadet Corps, the number has increased for the past several years. Is it planned to level off after this year somewhere in the neighborhood of the 4,182 budgeted for in fiscal year 1973?

General KERWIN. Yes, sir; 4,182 is the average cadet load estimated for fiscal year 1973. This is expected to remain constant throughout the foreseeable future. There is no plan to increase the size of the corps of Cadets after fiscal year 1973.

Senator YOUNG. Have there been any major problems at the Academy in the past year?

General KERWIN. No, sir; there have been no major problems at the Academy during the past year.

SERVICE ACADEMY COSTS PER STUDENT

Chairman ELLENDER. As is customery each year, the committee would like to know the comparative costs of educating cadets and midshipmen in the three services. May I ask you to coordinate this request with the Department of the Navy and the Department of the Air Force and ascertain this information for inclusion in the record at this point? It is customary to provide a 3-year comparison by appropriation title, indicating the average number of cadets and midshipmen and the average cost.

General KERWIN. I would be happy to provide that information.

(The information follows:)

SERVICE COMPARISON

[Dollars in thousands, except as indicated by*]

	Fiscal year—		
	1971	1972	1973
Army:			
Operation and maintenance	$30,528	$32,298	$32,092
Military pay	15,739	17,989	17,721
Pay and allowance of cadets	13,046	15,117	16,854
Total	$59,313	$65,404	$66,667
Average number of cadets	3,827	3,965	4,182
Average cost per cadet*	$15,499	$16,495	$15,941
Navy:			
Operation and maintenance	$25,973	$27,647	$27,780
Military pay	12,764	14,653	16,418
Pay and allowances of midshipmen	14,314	15,843	16,769
Total	$53,051	$58,143	$60,967
Average number of midshipmen	4,315	4,251	4,243
Average cost per midshipmen *	$12,295	$13,677	$14,369
Air Force:			
Operation and maintenance	$25,417	$26,107	$27,067
Military pay	20,554	23,638	25,335
Pay and allowances of cadets	13,117	15,019	16,554
Total	$59,088	$64,764	$68,956
Average number of cadets	3,940	4,020	4,184
Average cost per cadet *	$14,977	$16,110	$16,481

FOREIGN STUDENTS AT WEST POINT

Charman ELLENDER. Please indicate the number of foreign cadets at the U.S. Military Academy.

General KERWIN. There are currently 26 foreign cadets at the U.S. Military Academy.

Chairman ELLENDER. From what countries do they come?

General KERWIN. Foreign students come from the following countries:

Bolivia	1	Korea	1
Columbia	1	Nicaragua	2
Costa Rica	2	Panama	3
El Salvador	2	Philippines	4
Guatemala	1	Uruguay	3
Guyana	3	Vietnam	1
Honduras	2		

SUBSISTENCE OF ENLISTED PERSONNEL

Chairman ELLENDER. At this point in the record there will appear a summary of requirements by project for "Subsistence of enlisted personnel."

(The information follows:)

MILITARY PERSONNEL, ARMY—SEC. 7: SUBSISTENCE OF ENLISTED PERSONNEL

[In thousands of dollars]

Budget project account	Title	Actual, fiscal year 1971	Estimate	
			Fiscal year 1972	Fiscal year 1973
4–A	Basic allowance for subsistence	212,308	166,656	150,819
4–B	Subsistence in kind	620,300	464,714	390,259
	Total obligations	832,608	631,370	541,078

JUSTIFICATION

Provides funds for the feeding of Army enlisted personnel. Includes payment of commuted value of the ration to enlisted personnel not in a travel status; when authorized to mess separately; when on leave; or whose duties require their absence from duty for one or more meals. Also, includes subsistence in messes, emergency and operational rations and payment for meals furnished under contract. Subsistence supplies are provided by procurement from military stock funds or by local purchase from commercial sources. Exclude cost of subsisting civilian personnel or officers, or subsistence while in a travel status.

BASIC ALLOWANCE FOR SUBSISTENCE

Chairman ELLENDER. For "Subsistence of enlisted personnel" for fiscal year 1973, the estimate is $541,078,000. This is divided into two project accounts, the first of these being "Basic allowance for subsistence" for which the estimate is $150,819,000. For fiscal year 1972 the amount provided was $166,656,000. Please comment on the reduction.

General KERWIN. The reduction of $16.1 million in fiscal year 1973 is due to a decrease in the average strength entitled "Basic allowance for subsistence" of approximately 21,700 man-years and a reduction in the daily commuted ration rate from $1.52 to $1.46.

SUBSISTENCE IN KIND

Chairman ELLENDER. For the second item, "Subsistence in kind" the fiscal year 1973 request is $390,259,000. This is a reduction from the $464,714,000 provided in fiscal year 1972. Please comment.

General KERWIN. Sir, if I may I would like to furnish that for the record.

(The information follows:)

The reduction of $74.4 million in fiscal year 1973 results from:

	Millions
Strength decrease	—$23.1
Absentee rate increase	—0.2
Ration rate increase	+3.0
Special food allowance decrease	—4.0
Other issues decrease	—2.4
Support of other nations	—28.3
Decrease in subsistence losses	—1.5
Decrease in reimbursements	—17.9
Total decreases	—74.4

Senator YOUNG. Please describe "Supplemented rations," "Special food allowance" and "Other issues."

General KERWIN. Supplemented rations reflect the additional food allowance authorized activities operating dining facilities in which 100 or fewer personnel subsist. This allowance can be as much as 15 percent of the regular food allowance, depending upon the size of the dining facility involved.

Special food allowances consist primarily of operational rations and other type meals which are not normally fed in dining facilities. Examples of items in the special food allowances category are such things as the meal, combat, individual; food packet, long range patrol; troop train rations; box lunch meals; steak meals for Vietnam returnees at first U.S. port; commercially contracted feeding operations as is presently being conducted at Fort Myer, Va.; rotational feeding of "B" ration components; and food packet, in flight used by aviators in Vietnam.

Included in the category "Other issues," are subsistence costs which do not logically fall within other areas of the budget. For example, the ration supplement, sundries pack consists of toiletry articles, confections and tobacco items for issue to troops in field that do not have access to post exchange facilities. Korean augmentation to the U.S. Army (KATUSA) rations are issued to South Korean military personnel which are assigned to the 8th U.S. Army in Korea. KATUSA kits consist primarily of toiletry articles and are issued on a monthly basis to Korean military personnel assigned to the 8th U.S. Army. Prisoner of war (POW) rations reflect the cost of feeding POW's taken by the U.S. Army until they can be transferred to Republic of Vietnam (RVN) military custody. Also included is the cost of feeding free world forces and RVN military personnel which are attached to the U.S. Army in RVN as trainees, liaison personnel, and interpreters. The new food items line reflects the cost of production testing new or improved foods which are being considered for introduction into the military feeding system. Another line under "Other issues" is the cost of feeding Republic of Korea (ROK) military personnel which are attached to 8th U.S. Army Headquarters in Korea, as liaison personnel and honor guards. Officer consumption of operational rations in Southeast Asia includes the net additional cost to the military personnel appropriation between the value of operational rations consumed by officers and the amount withheld from his subsistence allowance.

Chairman ELLENDER. The justifications indicate that $102,274,000 is requested for "Support of other nations." Please discuss this request, indicating just what this is for.

General KERWIN. Support of other nations embraces the cost of subsistence furnished to our allies in Southeast Asia. Specifically, support is furnished to the South Vietnamese; Republic of Korea, and Laos.

Chairman ELLENDER. You also have an item entitled "Subsistence Losses in RVN," amounting to an estimated $5,317,000 in fiscal year 1973. Comment on this.

General KERWIN. The U.S. Army has the responsibility for supplying subsistence to all friendly military forces in South Vietnam. Subsistence inventories necessary to sustain this support are financed with military personnel funds. It is estimated that during fiscal year 1973 losses due to unfavorable climactic conditions, pilferage, and sabotage

will amount to $5,317,000. The estimated loss is based on a factor of 5 percent for all subsistence issued in South Vietnam.

Senator YOUNG. What is the "reimbursable subsistence program" for which $88,490,000 is requested?

General KERWIN. The "reimbursable subsistence program" includes meals furnished OMA maintenance personnel; National Guard, Army enlisted personnel; Reserve personnel, Army enlisted personnel; reimbursement from the MAP appropriation for meals furnished U.N. forces in Korea and to foreign students attending CONUS schools; and to personnel of other Federal agencies. Also, includes sale of bulk subsistence to Air Force and Navy in RVN and Thailand; collections from individuals for meals furnished; commissary store sales in RVN and Thailand; and sales of bulk subsistence to nonappropriated funds and foreign governments.

Chairman ELLENDER. What are meant by KATUSA, and FWMAF?

General KERWIN. Both are acronyms. KATUSA is the term used for Korean augmentation to the U.S. Army which are members of the Republic of Korea Army assigned to augment U.S. forces in Korea. Under this assignment, the Republic of Korea Government continues to provide the pay of the personnel and the United States provides the necessary clothing, food and shelter. FWMAF is used for Free World Military Assistance Forces which in turn is the definition applied to the U.S. allies in Southeast Asia.

TYPICAL DAY'S MENU

Senator YOUNG. Please submit a typical day's menu.

General KERWIN. I will be glad to do so.

(The information follows:)

To provide the soldier with the foods he wants and likes, the Master Menu contains a short order menu in addition to the regular dinner menu. The short order menu is usually served from a separate serving line, or in some cases, in a separate dining facility which serves only short order foods. The following menu is prescribed in the Master Menu for March 16, 1972 and is considered to be typical:

Breakfast:

- Chilled oranges
- Chilled grape juice
- Ready to eat cereal
- Fresh milk
- Eggs to order
- Griddle cakes with hot maple syrup
- French toast with hot maple syrup
- Creamed ground beef on biscuits
- Baked bacon slices
- Cottage fried potatoes
- Toast—butter
- Jam or jelly
- Tea, coffee

Dinner:
- Minestrone soup with parmesan croutons
- Baked lasagna
- Breaded veal steaks
- O'brien potatoes
- Paprika buttered cauliflower
- Buttered green beans
- Tossed green salad with chiffonade dressing
- Perfection salad
- French bread, butter
- Strawberry sundae
- Chilled peaches
- Crisp toffee bars
- Coffee, tea, milk

Dinner short order meal:
- Minestrone soup with parmesan croutons
- Hamburgers/cheeseburgers
- Frankfurters
- Egg salad sandwiches
- Potato chips
- Hamburger buns
- French fried potatoes
- Frankfurter rolls
- Tossed green salad with chiffonade dressing
- Perfection salad
- Strawberry sundae
- Chilled peaches
- Crisp toffee bars
- Coffee, tea, milk

Supper:
- Barbecued spareribs
- Mashed potatoes
- Simmered sauerkraut
- Buttered peas
- Spring salad with french dressing
- Banana salad
- Sweet pickle slices
- Assorted sliced bread (rye, white, and whole wheat)
- Butter
- Chocolate cream cake
- Coffee, tea, milk

ARMY GARRISON FEEDING AT FORT LEWIS, WASH.

Chairman ELLENDER. It is my understanding that the Operations Research and Systems Analysis Office, located at the Natick Laboratories, has conducted several food service studies at Fort Lewis, Wash. When were these studies conducted?

General KERWIN. The actual feeding experiment at Fort Lewis was started on August 15, 1971, and was concluded on October 31, 1971, except for minor follow-on work which has just been completed. Preliminary work required to plan and design the experiment was started as early as November 1970.

Chairman ELLENDER. When will the final report be rendered?

General KERWIN. Interim reports concerning specific aspects of the study are in the process of being published. The first interim report titled "A System Evaluation of Army Garrison Feeding at Fort Lewis, Wash." was published in January 1972. The final and comprehensive report covering the entire study at Fort Lewis will be published in June 1972.

Chairman ELLENDER. What were the purposes of the studies?

General KERWIN. The purpose of the overall study activities was to increase customer satisfaction and reduce operating costs, in that order of importance.

Chairman ELLENDER. What were the reasons that generated the studies?

General KERWIN. In 1969 the DOD Food Service Facilities and Equipment Board accomplished an on-site survey of military garrison feeding facilities in the United States. As a result of the survey, this Board created, with DOD and Army approval, a project to study, define, and then implement a new modern feeding system at Fort Lewis, Wash. As documented in the approval for this project, the objectives were to improve performance and reduce costs. The new system would then serve as a model for all military services.

In 1970, the newly erected DOD research and development food program was inplemented at U.S. Army Natick Laboratories. Included within this program was an increased emphasis on garrison feeding systems and a new requirement to study military feeding systems from a total system concept. The new requirement was implemented by the Operations Research and Systems Analysis Office at Natick Laboratories, and resulted in a rather unique but logical merger of the DOD R.D.T. & E. systems study effort and the Army project to study and then build a modern feeding system at Fort Lewis.

Chairman ELLENDER. Would the Army entertain marked changes in procedure if they involved additional construction and more personnel in food preparation and handling?

General KERWIN. The Army will not entertain marked changes in procedures if the changes involved additional construction and more personnel in food preparation and handling unless there were offsetting decreased costs with overall improved efficiency. The new system currently being considered by the Army is one which entails the preparation of food in a central facility and the delivery of prepared food to satellite dining facilities. Its primary application would be at installations with large military populations. The central preparation of food provides a degree of control over product quality and uniformity not possible with the unit kitchen system currently in use. The installation of this system will require the availability at installation level of a facility or building suitable for the central preparation of food. New construction will be involved only at those installations which have no facility suitable for conversion, such as a central meat processing plant. The system will require fewer food service personnel in areas of food preparation and handling. Overall economies will also result in areas of food service equipment and maintenance.

Senator YOUNG. Please speak on the subject of satellite dining sites.

General KERWIN. The new feeding system being considered by the Army entails the preparation of food in a central facility and the delivery of the prepared food to satellite dining sites. The satellite

dining sites, as envisioned in this feeding concept, are facilities where the prepared food is heated and served. The feeding system under consideration has specific application to the Army with its large number of existing, small, out of date, poorly equipped dining facilities. Throughout the history of the Army, the predominant mode of garrison dining has been in company level groups of approximately 200 men. This mode of operation was based on the philosophy that the company was the basic tactical and administrative unit as well as the social unit. As a result of the company level feeding policy, the present garrison feeding system consists of hundreds of small dining facilities with serving capacities of 200 to 300 men. Many are World War II temporary buildings in need of complete modernization. From the standpoint of economies, facilities lend themselves to conversion to dining sites for use in conjunction with a central food preparation system. Their use also supports the continuation of the company level feeding policy, a policy that promotes unit integrity and esprit de corp.

Senator YOUNG. How much will this study cost?

General KERWIN. The studies made during fiscal year 1971 and fiscal year 1972 by the Operations Research and Systems Office, Natick Laboratories, titled "Systems Studies in Military Feeding," will cost approximately $950,000.

Chairman ELLENDER. At this point there will be included in the record an Army memorandum on the subject of the systems analysis study of Army garrison feeding at Fort Lewis, Wash.

(The information follows:)

SYSTEMS ANALYSIS STUDY OF ARMY GARRISON FEEDING AT FT. LEWIS, WASHINGTON

PURPOSE: To provide information to the Senate Appropriations Committee, on the Systems Analysis Study of Army Garrison Feeding at Ft. Lewis, Washington.

FACTS: The Operations Research and Systems Analysis Office, US Army Natick Laboratories (NLABS), has conducted several Food Service related studies at Ft. Lewis. These studies were initaited during October 1970 and were completed in November 1971 with conclusive type data made available to the Army Staff on an informal basis throughout this period. The final reports from NLABS are expected to be available during the third and fourth quarter of FY 72. The studies and/or surveys conducted at Ft. Lewis were as follows:

a. Feeding systems study.—This study will define the total cost and performance of the existing system at Ft. Lewis (including determination of the total cost of serving a meal); evaluate state-of-the-art feeding systems currently in operation at commercial establishments, Air Force and Navy installations and large universities; and total cost of a new modern feeding system which can be applied at Ft. Lewis and other similar Army installations. The specific objectives of this study are to increase customer attendance, improve quality and acceptability of food, reduce cost of food service operations, define new feeding systems, and develop a "Before and After" cost comparison of the old and new systems. The analysis in this study will provide the basis and guidance required by installations for use in the preparation of long-range food service feeding systems plans which it is anticipated will require the expenditure of MCA funds.

The feeding system developed to achieve the objectives outlined above appears to be one which includes a central food processing facility (CFPF) together with satellite dining sites. Within the CFPF there will be concentrated the best available food service specialists (e.g. pastry, meat, vegetable cooks and salad makers) at each installation. These specialists will cook/prepare the meals required by the satellite dining halls and then temporarily store the food prior to its transportation to the feeding site where it will be finished as necessary and served to the assigned diners. At the conclusion of each meal the soiled dinnerware will be returned to a central scullery for washing and reuse at subsequent meals.

The CFPF concept should result in more professionally prepared food which in turn will be more acceptable to the military diner. Further, the concept should offer economies in personnel, facilities, supplies and equipment.

The results of the feeding systems study have not been completely evaluated; therefore the optimum of CFPF-satellite dining sites per installation has not been determined.

b. Consumer study.—This study was conducted at Ft. Lewis to determine the likes and dislikes of today's soldier toward the present Army feeding system. Food preference surveys were also being conducted under this study to determine individual food item preferences. Data collected and analyzed at Ft. Lewis are being computerized to enable NLABS to evaluate sufficient numbers of samples to reduce bias conditions and maximize the creditability of information obtained. The consumer study specifically involves the selection of dining halls, collection of signature headcount sheets, definition of customer populations, selection of population samples, direct investigation and interviews, analyzation of data, and finally, system recommendations and projected attendances. Information obtained from this study will also be used in the Feeding Systems Study in the development of the new Army feeding system.

c. Automatic data processing study.—This study will develop a new automated ration control system which will also replace the signature headcount system. A longer-range goal of this study is to give the installation food service manager the ADP tools in order to automatically collect preference and consumption data, plan his own menus based on local preferences and local prices, and to automatically control his inventory system.

In addition to the foregoing proposed system as a replacement for the currently required signature headcount, the Department of the Army has under study three other alternatives for counting personnel subsisted. One alternative substitutes a "chit" book with individual chits for specific meals each day. Under this system the diner would surrender the required chit for the meal consumed. A second alternative is one which requires the recording of a meal card number on a register maintained to satisfy the audit requirement for each meal. Finally, there is under consideration an automated system which employs an embossed "credit" card to record personnel subsisted for each meal. Neither the automated ration control system developed by USNLABS nor the 3 alternatives enumerated above have been accepted to date as alternatives for the current signature headcount system.

PERMANENT CHANGE OF STATION TRAVEL

Chairman ELLENDER. At this point in the record there will appear a summary of requirements by project of "Permanent change of station travel."

(The information follows:)

MILITARY PERSONNEL, ARMY—SEC. 4: PERMANENT CHANGE OF STATION TRAVEL

[In thousands of dollars]

Budget project account	Title	Actual, fiscal year 1971	Estimate	
			Fiscal year 1972	Fiscal year 1973
5-A	Accession travel	35,352	22,920	24,381
5-B	Training travel	15,066	13,469	14,566
5-C	Operational travel, between stations (within Conus and within overseas)	55,976	44,106	42,071
5-D	Rotational travel to and from overseas	402,932	385,650	296,632
5-E	Separation travel	73,544	65,223	38,368
5-F	Travel of organized units	3,172	5,747	2,520
	Total obligations	586,042	537,115	418,538

JUSTIFICATION

Purpose and scope

This program provides for expenses incident to permanent change of station travel of military personnel, as individuals or as an organizational unit. It includes transportation by land, air, or water, whether by MAC, MSC, privately owned vehicle or commercial carrier; per diem allowances as prescribed while in a travel status; travel of dependents and transportation of household goods, port handling charges, dislocation allowances, non-temporary storage of household goods; expenses and allowances incident to separation travel, including payments of mileage upon reenlistment, discharge or release from active duty; authorized TDY directly related to PCS movements.

ACCESSION TRAVEL

Chairman ELLENDER. For "Permanent change of station travel" the fiscal year 1973 estimate is $418,538,000. The first budget project under this program is "Accession travel" for which $24,381,000 is requested. This is an increase over the $22,920,000 provided for fiscal year 1972. I notice that while the number of officers in this category will decrease, the number of enlisted personnel and cadets will increase. Please address yourself to this.

General KERWIN. Sir, enlisted accessions in fiscal year 1972 were curtailed in order to remain within manpower constraints. The 7,283 increase over fiscal year 1972 in the number of accesions projected for fiscal year 1973 are necessary in order to support the planned manpower program for that year. Cadet accessions increase 100 moves as part of the program to increase the size of the cadet corps to approximately 4,400 cadets by fiscal year 1974. This increase in moves in fiscal year 1973 accounts for $383,234.

The remaining amount of the increase is the resulting of annualizing rate increases which occurred during fiscal year 1972. These rate increases were the result of the dislocation allowance increase related to the pay raise effective November 14, 1971, the publication of a revised official table of distances and an increase in the household goods tariff rate.

TRAINING TRAVEL

Chairman ELLENDER. For "Training travel for fiscal year 1973" the estimate is $14,566,000. Funds provided for fiscal year 1972 amounted to $13,469,000. I note there is a contemplated decrease in training travel for both officers and enlisted personnel, although the total costs are up. Please speak to this increase.

General KERWIN. Sir, savings resulting from the decrease of 1,673 moves is offset by the annualization of price increases effective during fiscal year 1972 and a projected increase in the use of entitlements.

Price increases which have been annualized are the pay raise effective November 14, 1971, which raised the amount paid for dislocation allowance, a revised official table of distances effective February 1, 1972, and an increase in the household goods tariff rate.

The projected increased use of entitlements is caused by a change in the marital content of personnel receiving orders to a PCS school and an increase in the amount of personnel effects being shipped.

Senator YOUNG. Under what conditions are dependents paid for training travel expense?

General KERWIN. Sir, all eligible members are authorized transportation of dependents at Government expense in connection with a permanent change of station to and from a school of more than 20 weeks duration—training travel.

Members eligible for this type of travel are all officers, warrant officers, enlisted men in pay grade E–5 and above and enlisted men in pay grade E–4 with more than 4 years of service or more than 2 years but less than 4 years service with a 6-year commitment.

OPERATIONAL TRAVEL BETWEEN DUTY STATIONS

Chairman ELLENDER. For "Operational travel between duty stations" the fiscal year 1973 estimate is $42,071,000. For fiscal year 1972 the amount provided was $44,106,000. Please comment.

General KERWIN. Sir, this project covers the costs of permanent change of station travel performed between duty stations in the same command regardless of whether travel is performed within Conus and either within or between overseas command. These moves are performed in support of operational readiness or caused by activation, inactivation, and reorganization of Army units. The moves are necessary to maintain units at acceptable readiness conditions and to optimize the utilization of personnel skills.

We are currently projecting 122,000 operational moves for fiscal year 1972 and 110,500 for fiscal year 1973. Savings resulting from this decrease is partially offset by annualization of rate increases effective during fiscal year 1972.

ROTATIONAL TRAVEL TO AND FROM OVERSEAS

Chairman ELLENDER. For "Rotational travel to and from overseas" the fiscal year 1973 estimate is $296,632,000. Funds provided in fiscal year 1972 total $385,650,000. Please speak to this account, including the contemplated reduction.

General KERWIN. Sir, rotational travel requirements are generated by our overseas strength and the average length of time an individual serves in an overseas area. The expanded early release program increased these requirements in fiscal year 1972 by reducing the average time a soldier spent overseas.

In fiscal year 1973, our overseas strength is reduced and we are projecting an increase in the average length of time an individual will spend in an overseas area. The cumulative effect of these actions is to reduce the rotational travel requirements by 245,866 moves.

SEPARATION TRAVEL

Chairman ELLENDER. For "Separation travel" the fiscal year 1973 estimate is $38,368,000. Funds provided in fiscal year 1972 amounted to $65,223,000. Please comment on this reduction.

General KERWIN. Sir, under the expanded early release programs 86,500 personnel who would have been released in the first half of fiscal year 1973 are projected for separation in the last half of fiscal year 1972. This in effect transferred costs of this project from fiscal year 1973 to fiscal year 1972.

Additionally current programs will result in an estimated 11,000 officers being separated during fiscal year 1972 who would otherwise have remained on active duty.

Senator YOUNG. Is it believed that this project will level off more or less at the current rate?

General KERWIN. Sir, the number of separations are a function of the number of accessions in earlier years and the number of immediate reenlistments. The number of accessions is dictated by the trained strength requirements of the Army. To the extent that these trained strength requirements fluctuate, separations also will fluctuate although not necessarily in the same fiscal year.

TRAVEL OF ORGANIZED UNITS

Chairman ELLENDER. For fiscal year 1973 the estimate for "Travel of organized units," is $2,520,000. Funds provided for fiscal year 1972 amounted to $5,747,000. Please comment.

General KERWIN. Sir, costing of unit travel is done on a location-to-location basis and total project costs are a function of both the number of personnel and the distance being moved. Not only is there a decrease in the number of unit moves in fiscal year 1973 but also the average distance the units are projected to move is less than the average distance projected for fiscal year 1972 moves. Furthermore, no moves are programed over water in fiscal year 1973. Costs associated with this type of movement accounted for approximately $1.1 million in the fiscal year 1972 unit travel program.

EFFORT TO REDUCE TRAVEL EXPENSE

Chairman ELLENDER. I wish you would describe efforts made in the past year to reduce travel expense.

General KERWIN. Sir, various actions have been taken to reduce turbulence within the Army and the cost of the PCS travel program. I will furnish detailed information for the record.

(The information follows:)

The following actions have been taken to reduce travel expense:

1. Enlisted individuals who completed short tours with 150 days or less to expiration of their term of service (90 days for officers), were separated from the service upon arrival in CONUS. This policy eliminated a move to a CONUS unit for a short period of service. Soldiers are separated at the port of debarkation.

2. The major source of short tour replacements was shifted from units in the sustaining base to the training base output. This policy eliminated a move to a CONUS unit for a short period before deploying to a short-tour area.

3. Incentives, such as the 30-day leave program were offered to encourage personnel to extend tours of duty in Vietnam. Such extensions have reduced replacement requirements.

4. To reduce turbulence in certain critical skills, substitution of grades and skills were made, where possible. Because of these substitutions, personnel possessing critical skills were stabilized for longer periods of time. The skill development base trained middle managers in these critical skills, thus further reducing the potential turbulence.

As the Vietnam commitment began to decline, the Army began to reimplement established rotation and stabilization policies. The most recent actions have been:

1. Stabilized Army recruiters for a 36-month tour in CONUS. Army recruiters are in the focal point for attempting to achieve the modern volunteer Army. This stabilization action provides essential continuity for these recruiters and

prevents their reassignment before they complete this 3-year tour. In addition the moratorium on involuntary reassignment of recruiters is extended through 30 June 1973.

2. Stabilized drill sergeants for a 24-month tour in that duty. Drill sergeants are one of the keys to basic training. They are among the first soldiers with whom the new recruit comes in contact. The additional stability for drill sergeants increases the quality of training for recruits in addition to reducing turbulence for drill sergeants. The Army also developed a reenlistment option which incorporated the 24-month stabilized tour for drill sergeants.

3. Stabilized company battalion and brigade commanders in their assignments for specified minimum periods. This stabilized tour policy provides that company commanders will serve a minimum 12-month tour world-wide. Battalion and brigade commanders will serve a minimum 18-month tour world-wide. Exception to these tours are for short-tour areas only.

4. Stabilized command sergeants major and sergeants major for a minimum of 18 months and stabilized first sergeants for a minimum of 12 months', world-wide less short tour areas. As with the commanders, the basic principle of these stabilization policies is to insure continuity in the relationship of these key NCOs to their soldiers and to their organization.

5. Eligible prior service re-enlistees for long tour areas are guaranteed 12-months' service in the long tour areas. Previously, reenlistees for long tour areas were guaranteed only initial assignment in that area. The new guarantee restricts their eligibility for inter-theater transfer until they have served at least 12 months. Personnel will be withdrawn from long tour areas prior to tour completion only as a last resort.

6. Non-prior service combat arms enlistees are guaranteed a minimum of 16 months in their unit of choice. This enlistment inducement amortizes the PCS costs over a long period and yet provides that this soldier is available for assignment to a short tour area during his third year of service, if needed.

7. Overseas deployability criteria were amended for officers and senior enlisted personnel (grades E–7, E–8 and E–9) to require 12-months' service remaining. Lower grade personnel, with 6 months or more until expiration term of service (ETS), may be assigned overseas. On 1 July 72, the criteria for lower grades will also be changed to require 12-months' service remaining.

8. Personnel reassigned to CONUS from overseas will serve not less than one calendar year at the CONUS installation before being reassigned to another overseas tour.

9. Except for those situations for which a second fiscal year PCS is authorized (service schools, installations closures), personnel will not be assigned intra-CONUS until they have completed at least two calendar years at an installation/activity.

10. Reassignments are not authorized solely because a specified period of stabliity has been completed.

ROTATION REDUCTION

Senator YOUNG. To what degree has the Department of the Army slowed rotation?

General KERWIN. Sir, the number of PCS moves in fiscal year 1972 is projected to be 400,000 less than fiscal year 1971 results. An additional reduction of approximately 490,000 moves is projected for fiscal year 1973.

Another indication of the degree to which rotation has been slowed is the change in the average length of time that a soldier remains in an overseas assignment. I will furnish a tabulation of the change in the average tour lengths for selected long tour areas for the record.

(The tabulation follows:)

	Fiscal year 1971 (actual)		Fiscal year 1973 (estimate)	
	Officers	Enlisted men	Officers	Enlisted men
Europe	22.4	15.9	28.0	21.0
Hawaii	22.8	18.8	29.5	23.5
Alaska	22.0	19.5	25.5	22.0
Southern Command	22.5	16.7	31.0	22.5

NON-TEMPORARY STORAGE

Chairman ELLENDER. What are the regulations regarding non-temporary storage in commercial facilities?

General KERWIN. Sir, regulations regarding nontemporary storage of household goods in commercial facilities are set forth in Department of Defense Directive 4500.34R. These regulations provide that qualified commercial storage facilities will be used when they are available at less cost than government storage facilities. Department of Defense has arrangements—contracts—with approximately 2,400 storage warehouses in the United States which are approved for storage of household goods of military personnel. Before commercial warehouses are approved for government storage, they are inspected to assure that they will provide adequate protection against such hazards as theft and fire and that they have proper climatic controls against heat and cold. Once approved, storage facilities are visited quarterly to assure that protective measures are maintained.

Chairman ELLENDER. Have there been any recent studies as to economical procedures in the transportation of household goods and personal effects?

General KERWIN. Sir, to my knowledge there have been no studies conducted in this area. We feel our present methods and procedures are as economical as possible given location and timing problems involved in the movement of military personnel.

TURBULENCE IN TOURS

Senator YOUNG. Please indicate what efforts have been made in the past year, and what are contemplated in fiscal year 1973 to lessen the turbulence in tours of duty that have affected the Army for the past few years.

General KERWIN. Personnel stability is the basic guiding principle in all of the Department of the Army current personnel policies. The high priority previously accorded individual assignment equity has been shifted to individual stability. Recently announced policies for implementation in the last half of fiscal year 1972 strive to achieve this objective. One such policy permits individuals serving overseas to request a voluntary extension of their oversea tours up to a maximum of 5 years. Another establishes finite restrictions on personnel serving in long-tour oversea areas requiring that they serve at least 16 months of their oversea tour prior to volunteering and departing for Vietnam or Korea. Additionally, we have limited volunteers selected for duty in Vietnam to those who possess skills required in Vietnam. Officers and warrant officers serving in stabilized tours who volunteer for Vietnam are not reassigned to Vietnam until they complete the stabilized tour. These policies are directed toward career personnel; however, each of the unit of choice enlistment options implemented during the past year for non-prior service personnel has included a 16-month assignment stability guarantee which cannot be involuntarily terminated.

Three primary objectives for achievement as early as possible in fiscal year 1973 are receiving the highest emphasis. First is the re-

establishment of units, installations and activities in the continental United States as the sustaining base for all oversea requirements. Because of continuing reductions in Southeast Asia, involuntary reassignments from long-tour oversea areas to Vietnam already have been discontinued except as a last resort. Second, to the fullest extent possible, efforts are directed to insuring that new accessions to the Army serve the entire term of their first enlistment or induction at one location in the United States or overseas. Individuals initially assigned to a short-tour oversea area will serve the remainder of their term of service at one location in the United States or in a long-tour oversea area according to their preferences. Third, career personnel will not be sent overseas unless they have sufficient service remaining to complete the prescribed tours. An additional objective for implementation by the end of fiscal year 1973 is to eliminate reassignments within the continental United States for career officers and career enlisted personnel until they have completed at least 36 or 24 months respectively at one location. Exceptions to these policies will be made to accommodate compassionate requests or for other valid reasons.

OTHER MILITARY PERSONNEL COSTS

Chairman ELLENDER. At this point in the record there will appear a summary of requirements by project of "Other military personnel costs."

(The information follows:)

SEC. 4—OTHER MILITARY PERSONNEL COSTS

[In thousands of dollars]

Budget project account and title	Actual fiscal year 1971	Estimate	
		Fiscal year 1972	Fiscal year 1973
6-A: Apprehension of military deserters, absentees and escaped military prisoners	$4,808	$4,195	$3,917
6-B: Interest on uniformed services savings deposits	13,431	9,711	7,698
6-C: Death gratuities	15,794	10,763	7,283
6-D: Servicemen's group life insurance	27,004	2,766	1,542
Total obligations	61,037	27,435	20,440

JUSTIFICATION

Provides for payment of expenses incident to the apprehension of military deserters, absentees and escaped military prisoners; interest on enlisted personnel deposits; death gratuities; and extra hazard premium of servicemen's group life insurance.

[In thousands of dollars]

	Actual fiscal year 1971			Estimate fiscal year 1972			Estimate fiscal year 1973		
	Average number	Rate	Amount	Average number	Rate	Amount	Average number	Rate	Amount
(A) Apprehension of military deserters, absentees and escaped military prisoners			4,808			4,195			3,917
(B) Interest on uniformed services savings deposits			13,431			9,711			7,698
(C) Death gratuities:									
(1) Officers	1,208	$2,538.08	$3,066	769	$2,446.03	$1,881	520	$2,100.00	$1,092
(2) Enlisted	6,930	1,835.64	12,721	4,406	2,014.30	8,875	2,910	2,124.74	6,183
(3) Cadets	5	1,302.80	7	5	1,488.60	7	5	1,592.10	8
Total	8,143		15,794	5,180		10,763	3,435		7,283
(D) Servicemen's Group Life Insurance (extra hazard)			27,004			2,766			1,542
Total other military personnel cost			61,037			27,435			20,440
Less reimbursements			500			550			550
Total direct obligations			60,537			26,885			19,890

APPREHENSION OF MILITARY DESERTERS, ETC.

Chairman ELLENDER. For "Other military personnel costs" the fiscal year 1973 estimate is $20,440,000. The first budget project is "Apprehension of military deserters, absentees, and escaped military prisoners" for which $3,917,000 is requested for fiscal year 1973. Please describe this item.

General KERWIN. Yes, sir. This item covers expenses of apprehension and delivery of military deserters, absentees, and escaped military prisoners, including the payment for travel of guards, and payment of rewards or reimbursement of reasonable and actual expenses—not to exceed $25 in either case—to persons or agencies apprehending and detaining or delivering absentees or deserters to military control. Cost of the individual's travel and related expense is collected from the member as a reimbursement to the appropriation.

INTEREST ON UNIFORMED SERVICES SAVINGS DEPOSITS

Chairman ELLENDER. For "Interest on uniformed services savings deposits" the fiscal year 1973 estimate is $7,698,000. Funds provided for fiscal year 1972 amounted to $9,711,000. Please describe this project.

General KERWIN. Yes, sir. This project provides for payment of interest at the rate of 10 percent compounded quarterly for deposits, not in excess of $10,000 made by officers and enlisted personnel stationed outside the United States or its possessions after August 14, 1966. It also includes the payment of interest at the rate of 4 percent per annum on any sum of not less than $5 deposited by Army enlisted personnel prior to August 14, 1966. The lower amount in fiscal year 1973 is due to the planned reduction in strength.

DEATH GRATUITIES

Chairman ELLENDER. For "Death gratuities" the fiscal year 1973 estimate is $7,283,000. The amount required for fiscal year 1972 was $10,763,000, involving an estimated 3,435 personnel as opposed to 5,180 last year. Please describe these gratuities.

General KERWIN. Yes, sir. Death gratuities are payments to beneficiaries of deceased Army military personnel consisting of 6 months' basic pay, incentive pay and overseas pay with minimum payments of $800 and maximum payments of $3,000. The lower amount for fiscal year 1973 is a result of the projected decreased number of deaths based on force deployments.

Senator YOUNG. Can you estimate what the number would be in a normal peacetime year?

General KERWIN. Yes, sir. In a normal peacetime year, based on historical factors, the number of deaths would be approximately 2 per 1,000 average strength of the Army.

SERVICEMEN'S GROUP LIFE INSURANCE

Chairman ELLENDER. The last item is "Servicemen's group life insurance" for which $1,542,000 is estimated for fiscal year 1973. The amount for fiscal year 1972 was $2,766,000. Please describe this program.

General KERWIN. Yes, sir. In addition to the premiums paid by the serviceman for servicemen's group life insurance, the Army pays a percentage of the premium for extra hazard duty cost. The rate Army pays is established by the Veterans' Administration and is based on the number of claims received by the V.A. The current premium paid by the servicemen are $3 per month for a $15,000 policy; $2 per month for a $10,000 policy; and $1 per month for a $5,000 policy. The fiscal year 1973 estimate is based on 5 percent of the premium, compared with 8 percent in the fiscal year 1972 estimate.

SPECIAL ANALYSES

Chairman ELLENDER. The justifications also include a section entitled "Special analyses." The information contained in that section will be included in the record at this point.

(The information follows:)

SEC. 5: SPECIAL ANALYSES—MILITARY PERSONNEL, ARMY, FISCAL YEAR 1973

	Fiscal year—		
	1971	1972	1973
Military personnel assigned to communications activities (end strengths):			
Officer	3,068	3,075	2,812
Enlisted	41,723	43,209	37,845
Total	44,791	46,284	40,657
Military personnel assigned to ADP activities (end strengths):[1]			
Total	8,914	9,212	7,899
Military personnel assigned to intelligence activities (end strengths):			
Officer	4,008	3,462	2,889
Enlisted	28,513	21,777	17,545
Total	32,521	25,239	20,434

[1] The end strengths shown above are for those military personnel engaged in the development, management, and operation of automatic data processing management information systems within the Army. The decrease in end strength shown for fiscal year 1973 is consistent with the overall reduction in the Army strength and phaseout of ADP installations in South Vietnam.

Intelligence activities include the Consolidated Cryptologic Program (CCP) and other Intelligence and Security. The CCP is designed to provide the facilities and resources required for the accomplishment of the cryptologic mission of the Army as assigned by the Secretary of Defense. Other Intelligence and Security consists of activities covering human intelligence collection, imagery interpretation, electronic intelligence centers, intelligence production, scientific and technical intelligence, mapping, charting and geodesy, counterintelligence and investigative activities, intelligence data handling systems, intelligence management and support activities and special communications.

MILITARY PERSONNEL ASSIGNED TO HEADQUARTERS ACTIVITIES (END STRENGTHS)

	Fiscal year 1971				Fiscal year 1972				Fiscal year 1973			
	End strength			Civilian (ES total)	End strength			Civilian (ES total)	End strength			Civilian (ES total)
	Officers	Enlisted	Aggregate		Officers	Enlisted	Aggregate		Officers	Enlisted	Aggregate	
Departmental administration:												
Army Department Headquarters	2,495	566	3,061	4,992	2,430	378	2,808	4,973	2,045	280	2,325	4,983
Headquarters, USAMC	304	28	332	1,935	233	15	248	1,804	233	15	248	1,797
Headquarters, MTMTS	52	11	63	295	40	7	47	265	40	7	47	265
Total, military departments	2,851	605	3,456	7,222	2,703	400	3,103	7,042	2,318	302	2,620	7,045
OSD	195	60	255	.....	199	53	252	.....	198	53	251	.....
JCS	245	168	413	.....	259	170	429	.....	260	170	430	.....
Defense Agency Headquarters [1]	188	60	248	.....	189	47	236	.....	187	47	234	.....
Total, other	628	288	916	.....	647	270	917	.....	645	270	915	.....
Major commands:												
Headquarters, CONARC and CONUS armies	1,739	1,211	2,950	3,561	1,399	911	2,310	3,198	1,130	645	1,775	2,652
Headquarters, USAREUR	490	512	1,002	465	477	352	829	389	477	352	829	389
Headquarters, USARPAC	297	247	544	991	304	169	473	596	304	169	473	596
Headquarters, USARAL	102	226	328	88	102	146	248	84	91	94	185	84
Headquarters, USARSO	118	121	239	177	107	106	213	175	107	106	213	175
Headquarters, COC	315	122	437	236	256	52	308	215	256	52	308	215
Total, major commands	3,061	2,439	5,500	5,518	2,645	1,736	4,381	4,657	2,365	1,418	3,783	4,111
Unified commands:												
Headquarters, SOUTHCOM	46	21	67	40	49	44	93	37	49	44	93	37
Headquarters, USEUCOM	175	220	395	110	140	93	233	110	157	100	257	110
Total, unified commands	221	241	462	150	189	137	326	147	206	144	350	147
Total headquarters operation and administration	6,761	3,573	10,334	12,890	6,184	2,543	8,727	11,846	5,534	2,134	7,668	11,303

[1] Includes the headquarters elements of DNA, DCS, DASA, NSA, DIA.

MILITARY PERSONNEL ASSIGNED TO OTHER GOVERNMENTAL ACTIVITIES (END STRENGTHS)

	Fiscal year 1971			Fiscal year 1972			Fiscal year 1973		
	Officers	Enlisted men	Total	Officers	Enlisted men	Total	Officers	Enlisted men	Total
Other DOD activities:									
Secretary of Defense	250	102	352	273	105	378	230	78	308
Joint Chiefs of Staff	245	168	413	259	170	429	260	170	430
Defense Communications Agency	189	589	778	198	531	729	198	531	729
Defense Intelligence Agency	569	349	918	583	340	923	544	314	858
National Security Agency	[Deleted]								
Defense Nuclear Agency	231	492	723	193	228	421	145	146	291
Defense Supply Agency	311	67	378	353	75	428	353	75	428
Total	[Deleted]								
Other Government Agencies (reimbursables):									
U.S. Soldiers' Home	5	0	5	5	0	5	5	0	5
Federal Aviation Agency	5	0	5	5	0	5	5	0	5
American Battle Monument Commission	8	0	8	9	0	9	9	0	9
National Aeronautics and Space Administration	41	1	42	96	4	100	96	4	100
Selective Service	227	1	228	275	0	275	275	0	275
Arms Control and Disarmament	8	0	8	14	0	14	14	0	14
Office of Equal Opportunity	0	0	0	2	1	3	2	1	3
Atomic Energy Commission	1	0	1	2	0	2	2	0	2
Department of Transportation	2	0	2	2	0	2	2	0	2
Department of Labor	2	0	2	0	0	0	0	0	0
Health and Welfare	2	0	2	1	0	1	1	0	1
Office of Emergency Preparedness	1	0	1	1	0	1	1	0	1
Canal Zone Government	34	4	38	40	3	43	40	3	43
Agency for International Development	0	0	0	8	0	8	8	0	8
USCONARC (LEAA)	0	0	0	4	8	12	4	8	12
OCSA (NASA Spt)	0	0	0	4	0	4	4	0	4
OCSA (ACSI)	0	0	0	0	2	2	0	2	2
Classified activities	11	47	58	21	72	93	21	72	93
OCE (NASA Spt)	2	0	2	6	0	6	6	0	6
OCE (Post Office)	0	0	0	4	0	4	4	0	4
Spt Svcs (CEDA)	2	0	2	2	0	2	2	0	2
MDW (CEDA)	0	3	3	0	4	4	0	4	4
Civil Administration, Ryukyus Islands	12	1	13	16	7	23	0	0	0
OCE (Saudi Arabia)	26	----------	26	33	20	53	33	20	53
Total	389	57	446	550	121	671	534	114	648
Other Government Agencies (nonreimbursables):									
Department of State	2	1	3	2	1	3	2	1	3
Division of Mil Appl, USAEC	10	0	10	9	0	9	9	0	9
District of Columbia Engineer Commission	0	0	0	1	0	1	1	0	1
Total	12	1	13	12	1	13	12	1	13

f. MILITARY PERSONNEL ASSIGNED TO MODERN VOLUNTEER ARMY (MVA) ACTIVITIES

	Fiscal years		
	1971	1972	1973
Personnel assigned (end strengths)	0	3,536	4,407
Funds provided (in thousands)	883	40,786	101,324
Recruiting activities		25,568	42,676

The Army recruiting effort was substantially expanded in FY 1972. However there was not a corresponding increase of supervisory positions. The increase in FY 1973 is to provide:

a. Assistant area supervisors (256) to aid in supervising, motivating, training and guiding the recruiting field force. Responsible for five to eight recruiting stations and 20 to 60 field recruiters in either sparsely populated or densely populated areas.

b. Twenty-four additional Recruiting Main Stations (120 Officers, 216 EM) current span of control problem will be effectively reduced to a manageable level. It will also provide a central point of contact in twelve states which do not have Recruiting Main Stations to facilitate closer liaison with local and state organizations such as education associations and employment offices.

c. Operational support and administrative services (33 officers and 246 EM). Personnel will perform such functions as informal, sales type training to the individual recruiters. Executive Officers at Recruiting Main Stations will serve as coordinator of activities of the station. Career Counselors at the RMS to advise the young prospect on job qualifications, special assignments, waivers, availability of schools. Additional High School testers who will increase the USAREC ability to test approximately 18,100 student bodies using the Armed Services Vocational Aptitude Battery.

Proficiency Pay for Recruiters:

Fiscal year 1971	$883
Fiscal year 1972	2,818
Fiscal year 1973	3,648

This pay is an incentive to high performance. Additionally, this pay enables outstanding NCO's, who currently receive proficiency pay in their Military Occupational Specialties, to apply for recruiting duty and not suffer financial setback upon assignment to Army recruiting duty. The rate of pay is $50 per month for each individual.

Enlistment bonus for combat elements:

Fiscal year 1971	------
Fiscal year 1972	$12,400
Fiscal year 1973	55,000

Payment of a $3,000 bonus in three installments to individuals who enlist, qualify, and serve in infantry, armor, or field artillery MOS for a period of at least three years. Payment of $1,000 for a one year extension for qualified personnel in these MOS is authorized. Depending upon experience in FY 72 and FY 73 and if short skills can be identified, consideration will be given to expansion of the program to cover enlistments in short skills in other combat elements. Payment is made 4 months after enlistment.

DEFINITION OF HEADQUARTERS PERSONNEL

Chairman ELLENDER. Please define "headquarters personnel."

General KERWIN. The current definition of "headquarters personnel" would include military and civilian personnel employed in the office of the commander and all staff elements. All headquarters have the normal staff functions of personnel, operations, logistics, et cetera, but the special functions which make the specific headquarters unique vary from command to command.

The Army is aware of the control problems inherent with such a loose definition. Accordingly, the Army management structure for

fiscal year 1973 contains a new and more meaningful definition. The new definition which will be reflected in the budget tables next year is as follows:

"Headquarters staff activity: Includes command group, general and special staff sections of the headquarters which perform the analysis, management and directive functions required to fulfill the command mission."

Chairman ELLENDER. Has there been any change in this definition or any change in functions of personnel attributed to headquarters activities in the past year?

General KERWIN. No, sir. However, as noted earlier there is a change in the definition for fiscal year 1973.

There have been a number of changes in functions of personnel associated with major command headquarters in the past year. These normally involved transfer of functions between command headquarters or between headquarters and field activities such as the operational function for commercial vehicles transferred from the Army staff to Headquarters U.S. Army Materiel Command; transfer of spaces from Headquarters U.S. Army Southern Command to U.S. Army Strategic Communications Command for consolidation of communication centers and message centers, or transfer of a field activity of the Army staff, in this case the Deputy Chief of Staff, Personnel Special Review Board to Headquarters, Military District of Washington. Most of these types of change involve few personnel. The ones cited above range from four to eight.

Chairman ELLENDER. Please provide for the record the specific reductions made in headquarters personnel in fiscal year 1972 and those contemplated for fiscal year 1973 by category.

General KERWIN. Yes, sir.

HEADQUARTERS REDUCTIONS

	[1] Military	[2] Civilian	Total
Fiscal year:			
1972	−1,607	−956	−2,563
1973	−1,059	−543	−1,602
Total	−2,666	−1,499	−4,165

[1] These figures are derived from the display at TAB 1 page 56 of the Department of the Army justification of estimates for fiscal year 1973, Jan. 20, 1972.

[2] All appropriations, derived from display at TAB E (special analysis) pages 17-19, Department of the Army display of headquarters operations and administrations, the Department of the Army justification of estimates for fiscal year 1973, Jan. 24, 1972.

STATUS OF 1972 SPECIFIC REDUCTIONS

Chairman ELLENDER. For fiscal year 1972 the Congress directed the Department of the Army to make certain specific reductions in particular areas. Does the fiscal year 1973 request contemplate any increases in these areas?

General KERWIN. In the fiscal year 1973 President's budget there are no increases in staffing in those areas where a staffing reduction was directed by Congress in fiscal year 1972. Also, in those areas where a cost reduction was directed by Congress in fiscal year 1972, there are no increases in costs in the fiscal year 1973 President's budget.

U.S. SCHOOL OF THE AMERICAS STUDENTS

Senator YOUNG. Please provide for the record a tabulation similar to that made available last year indicating number of students trained or to be trained in the U.S. Army School of the Americas, by country.

General KERWIN. Yes, sir.

(The information follows:)

	Trained/in-training fiscal year 1972	To be trained fiscal year 1972	Total fiscal year 1972
Argentina	226	8	234
Bolivia	94	13	107
Brazil	13	8	21
Chile	139	35	174
Colombia	31	79	110
Dominican Republic	41	52	93
Ecuador	0	0	0
El Salvador	55	8	63
Guatemala	23	14	37
Honduras	57	109	166
Mexico	7	13	20
Nicaragua	43	58	101
Panama	84	35	119
Paraguay	56	5	61
Peru	251	11	262
Uruguay	48	9	57
Venezuela	69	40	109
Grand total	1,237	497	1,734

PROJECT 100,000

Chairman ELLENDER. Please address yourself to any changes that have taken place in Project 100,000 in the past year, including a description of what the project is attempting to accomplish and the effect, if any, that the introduction of the concept has had on the service.

General KERWIN. In October 1966 the Department of Defense began Project 100,000 (also known as the new standards program). Mental test standards were lowered to qualify men scoring in the bottom half of mental group IV. To manage the program the Department of Defense established quotas for each service. The Army quota for fiscal year 1972 was 8 percent of total nonprior service accessions.

On December 1, 1971, the Department of Defense cancelled the quotas for all services and raised mental standards for inductees. The change was required to meet the quality demands of a smaller professional force. The objective is to achieve a balance between the ability level of new personnel and the complexity level of the jobs they will fill.

The program accomplished several objectives. Voluntary enlistments were increased thereby reducing reliance on the draft; draft equality was improved by broadening the pool of men subject to the draft; and, as a byproduct of military service, these men are better prepared for more productive civilian lives.

The program had no significant adverse effect on the Army. All men had to meet normal performance standards for retention in the service. They did have higher attrition rates in training and their utilization was limited because of their low mental ability.

ALL-VOLUNTEER FORCE

Senator YOUNG. Please address the subject of an all-volunteer force, describing the actions that have been taken in the past year, the costs associated therewith, similar remarks in connection with fiscal year 1973, and your estimate of the success or failure of the program to date.

General KERWIN. The modern volunteer Army program is the Army's method for achieving an all-volunteer force in fiscal year 1972. The program's objectives are (1) to strengthen professionalism, (2) to improve the quality of Army life, and (3) to modernize the accession system which will attract the volunteers we need. Details of our efforts to attain these three broad goals have strongly influenced the management and leadership of the Army during the past year.

1. Army response to achieve all-volunteer force.—The Army's response to achieving an all-volunteer force is a deliberate and significant emphasis on "soldier-oriented programs." This emphasis is priced out at $2.4 or 11 percent of $22.5 billion for fiscal year 1972 Army budget and $3.3 billion or 15 percent of total $22.7 billion Army fiscal year 1973 budget.

2. Definition of soldier-oriented programs.—These soldier-oriented programs are defined as "those activities supported by Army funds that are most evident to the soldier population, and which have a distinct beneficial impact on the majority." These programs reflect the Army's attempts to create an environment most conducive to improved soldier attitudes and to achieve an all-volunteer force. The entire Project Volunteer/modern volunteer army program is included within the soldier-oriented programs.

3. Categories in objective terms.—The soldier oriented programs are categorized in terms of objectives such as to enhance professionalism, to improve Service life, and to modernize the accession system.

4. To enhance professionalism.—To enhance professionalism the Army has budgeted $33 million for fiscal year 1972 and $139 million for fiscal year 1973. Certain items are designed to improve training by reducing diversions from unit strength by completing the worldwide program to hire civilian mess attendants (fiscal year 1972 $28 million and fiscal year 1973 $99 million) and to replace soldiers performing base support functions with civilians (fiscal year 1972 $2 million and fiscal year 1973 $35 million). Closely allied to improved military training is the budget item for educational development of the noncommissioned officer (fiscal year 1972 $1 million and fiscal year 1973 $5 million).

5. To improve service life.—To improve service life has programed $1,504 million for fiscal year 1972 and $1,947 million is requested in the fiscal year 1973 budget. To improve soldier living conditions (fiscal year 1972 $365 million and fiscal year 1973 $541 million) and services to the soldier (fiscal year 1972 $749 million and fiscal year 1973 $890 million) and his dependents (fiscal year 1972 $391 million and fiscal year 1973 $516 million). Items for improving soldier living conditions include barracks and BOQ construction (fiscal year 1972 $58 million and fiscal year 1973 $125 million) and modernization (fiscal year 1972 $63 million and fiscal year 1973 $124 million) along with

furniture including washers and dryers (fiscal year 1972 $10 million and fiscal year 1973 $25 million). Items for improving services to the soldier and his dependents include community facilities (fiscal year 1972 $12 million and fiscal year 1973 $62 million), medical (fiscal year 1972 $529 million and fiscal year 1973 $546 million), and dental care (fiscal year 1972 $68 million and fiscal year 1973 $66 million) including CHAMPUS (fiscal year 1972 $142 million and fiscal year 1973 $157 million) and alcohol and drug abuse programs (fiscal year 1972 $36 million and fiscal year 1973 $44 million), expanded education development (fiscal year 1972 $30 million and fiscal year 1973 $45 million) and family housing construction (fiscal year 1972 $52 million and fiscal year 1973 $115 million) improvements (fiscal year 1972 $16 million and fiscal year 1973 $23 million), furniture (fiscal year 1972 $9 million and fiscal year 1973 $30 million) and leased units (fiscal year 1972 $10 million and fiscal year 1973 $13 million). Many of these improvements are expected to provide a "bonus effect" for potential members and members of the Reserve components while on active duty in more pleasant surroundings.

6. To modernize the accession system.—To modernize the accession system the Army has programed $164 million for fiscal year 1972 and budgeted $208 million for fiscal year 1973 to expand recruiting advertising (fiscal year 1972 $29 million and fiscal year 1973 $33 million) and other recruiting and examining (fiscal year 1972 $116 million and fiscal year 1973 $154 million) for Active and Reserve forces and for the ROTC program to include the 1,000 additional scholarships (fiscal year 1972 $19 million and fiscal year 1973 $21 million).

7. To improve military compensation.—To improve military compensation the Army has programed $702 million for fiscal year 1972 and requested $1,014 million ($1 billion) for fiscal year 1973. To raise military pay to comparable civilian salaries the Army has budgeted $690 million for fiscal year 1972 and for fiscal year 1973 $959 million (Active Army fiscal year 1972 $547 million and fiscal year 1973 $760 million; Reserve (fiscal year 1972 $51 million and fiscal year 1973 $79 million and NG fiscal year 1972 $92 million and fiscal year 1973 $120 million) for the Army and Reserve components pay raise which was enacted September 28, 1971, and made effective November 14, 1971, and for the combat arms enlistment bonus (fiscal year 1972 $12 million and fiscal year 1973 $55 million). The pay raise of January 1, 1972, is not considered to be specifically soldier oriented because of its specific annual relation to civilian Federal employee raises.

8. Concluding remarks.—The Army's fiscal year 1973 budget reflects a deliberate new approach by placing a major emphasis on its soldier oriented programs backed up by 15 percent or $3.3 billion of its total $22.7 billion budget. The fiscal year 1973 level for soldier-oriented programs represents an increase of $904 million of which $635 million is for other than increased military pay of $269 over the fiscal year 1972 level. These fiscal year 1973 soldier-oriented programs will significantly reduce the diversion of soldiers from their military duties, provide more private, safe, and comfortable living conditions, increase health care and other post service for the soldier and his dependents, offer better opportuniites and incentives to the target audience of eligible volunteers through recruiting and advertising efforts and more comparable compensation (see table 1).

While the results of our efforts have been encouraging so far, the long-term success of the modern volunteer Army program is difficult to judge at this point. Degree of effectiveness can best be estimated on the basis of a sustained rate of accessions and retention through time. We have not yet had an opportunity to adequately gage this. The best estimate of outside consultants, who have been working concurrently with us to measure effectiveness, is that current progress is insufficient to achieve an all-volunteer force of the required size and quality by July 1973 without taking major new initiatives.

Throughout the period of these efforts, we have maintained a dynamic approach to program management. We have continually made changes, checked their results, and made readjustments in policies concerning enlistment and reenlistment so as to obtain the best mix of factors which will yield the results desired without any degradation of quality or discipline in the Army.

TABLE 1.—SOLDIER ORIENTED PROGRAMS

[TOA dollars in millions]

	Fiscal year 1972	Increase	Fiscal year 1973
Strengthen professionalism	$33	$106	$139
Improve Army life	1,504	443	1,947
Soldier living conditions	(365)	(176)	(541)
Services to soldiers	(748)	(141)	(890)
Services to dependents	(391)	(126)	(516)
Modernize accession system	164	44	208
Military compensation	702	312	1,014
Total	2,403	904	3,308
Project volunteer funds included	(187)	(−13)	(174)

MILITARY MISSION PERSONNEL

Chairman Ellender. Please indicate the number of military mission personnel you are budgeting for in fiscal year 1973 and the total cost of such.

General Kerwin. Yes, sir. The total number of military personnel authorized is 6,827, and the military pay and allowances cost is $80,733,000. I will provide for the record a breakout of these personnel to include military missions, military assistance advisory groups, and military assistance groups.

(The information follows:)

	Authorized strengths	MPA costs
Military missions	213	$2,676,000
Military assistance advisory groups	6,439	75,749,000
Military assistance groups	175	2,308,000
Total	6,827	80,733,000

PAY ACT INCREASES

Chairman Ellender. Would you please provide a tabulation that will indicate the effective date and cost of all Pay Act increases in fiscal years 1971, 1972, and 1973?

General Kerwin. Yes, sir. I will be happy to furnish this for the record.

(The information follows:)

	Millions
Public Law 91-656 effective Jan. 1, 1971:	
Fiscal year 1971 cost	$231.1
Fiscal year 1972 cost	385.4
Public Law 92-129 effective Nov. 14, 1971:	
Fiscal year 1972 cost estimate	560.2
Fiscal year 1973 cost estimate	815.2
Public Law 92-210 effective Jan. 1, 1972:	
Fiscal year 1972 cost estimate	201.6
Fiscal year 1973 cost estimate	380.6

REIMBURSABLE PROGRAM

Chairman ELLENDER. Please provide for the record a tabulation of reimbursable items for fiscal year 1973.

General KERWIN. I will do that.

(The information follows:)

The fiscal year 1973 reimbursable program of $104.6 million is made up of the following:

[Amounts in thousands of dollars]

a. Pay and allowances of officers and enlisted personnel detailed to duty with other Federal agencies	$11,453
b. Operation and maintenance, Army (for meals furnished maintenance personnel)	620
c. National Guard personnel, Army (for meals furnished)	12,376
d. Reserve personnel, Army (for meals furnished)	10,807
e. Department of Air Force (for bulk subsistence furnished in RVN and Thailand)	8,350
f. Department of Navy (for bulk subsistence furnished in RVN)	4,383
g. MAP (Sec. 108 Res Appn Limit .002) (for clothing and meals furnished)	120
h. MAP—other (for meals furnished)	35
i. Other Federal sources (for PCS travel and meals furnished)	400
j. Non-Federal sources (collections from individuals for clothing, meals furnished, and apprehension of deserters; commissary store sales in RVN and Thailand; sales of bulk subsistence to nonappropriated funds and foreign governments)	56,009
Total reimbursable obligations	104,553

VIETNAM CASUALTIES

Chairman ELLENDER. For the record, would you please provide a listing on the Vietnam casualties since the inception of the conflict?

General KERWIN. I will be glad to do so.

(The information follows:)

Army casualties related to the Vietnam conflict sustained in all countries in Southeast Asia. (January 1, 1961 through February 26, 1972.)

Battle deaths	30,443
Nonbattle deaths	7,138
Wounded in action	
Hospital care required	96,616
Hospital care not required	104,451
Nonbattle seriously ill/injured	5,029

MISSING IN ACTION AND PRISONERS OF WAR

Chairman ELLENDER. For the record provide a tabulation of officers and enlisted personnel who are either missing in action or are prisoners of war.

General KERWIN. Yes, sir.

(The information follows:)

PERSONNEL MISSING, MISSING IN ACTION, AND PRISONERS OF WAR AS OF FEB. 26, 1972

	Officers	Enlisted	Total
Current missing (hostile)	55	188	243
Current missing (nonhostile)	58	57	115
Prisoners of war	21	52	73

TEMPORARY LODGING ALLOWANCE

Chairman ELLENDER. The General Accounting Office has issued a report dated January 13, 1972, critical of actions taken, or not taken, by the three services in connection with the temporary lodging allowance. Criticisms involving the Department of the Army result from a survey made in Frankfurt and Wurzburg, Germany. Please describe the nature of the criticism, the position of the Department of the Army, and any remedial action initiated.

General KERWIN. Yes, sir. The General Accounting Office survey concerning Temporary Lodging Allowance payments to Army personnel stationed at installations in Frankfurt and Wurzburg, Germany revealed certain inadequacies and weaknesses:

(1) U.S. Army, Europe has taken necessary steps to improve the administration of the temporary lodging allowance program. These steps include designating: (*a*) USAREUR housing offices with the responsibility for advising incoming personnel of their entitlements and obligations with respect to temporary lodging allowance; (*b*) Army housing referral service offices to provide assistance to the member in locating economy housing; and (*c*) establishing procedures to insure that housing officials inform the applicable activity of actions affecting a member's TLA entitlements.

(2) The Per Diem, Travel and Transportation Allowance Committee is revising the Joint Travel Regulations to provide: (*a*) principles to be observed in the administration of the temporary lodging allowance program; (*b*) detailed procedures for prescribing the authorization of temporary lodging allowance, including length of period of entitlement.

(3) Pending publication of an Army Regulation, Department of the Army transmitted a worldwide message to oversea commands requesting a review of current temporary lodging allowance procedures. In addition, specific guidelines were prescribed to eliminate the deficiencies and weaknesses noted by the General Accounting Office.

Chairman ELLENDER. Any further questions?

Thank you very much.

Reserve Personnel, Army

National Guard Personnel, Army

Operation and Maintenance, Army National Guard

STATEMENTS OF:
LT. GEN. HARRIS W. HOLLIS, CHIEF, OFFICE OF RESERVE COMPONENTS
MAJ. GEN. F. S. GREENLIEF, CHIEF, NATIONAL GUARD BUREAU
MAJ. GEN. J. MILNOR ROBERTS, CHIEF, ARMY RESERVE

ACCOMPANIED BY MAJ. GEN. J. A. KJELLSTROM, DIRECTOR OF ARMY BUDGET, OFFICE, COMPTROLLER OF THE ARMY

ADVANCES BY RESERVE COMPONENTS

Chairman Ellender. The next appropriations to be heard will be those for the Reserve and National Guard of the Department of the Army. Before we get down to the specific appropriations, Lt. Gen. Harris W. Hollis, Chief, Office of Reserve Components, will be heard.

You may proceed, General.

General Hollis. Mr. Chairman and members of the committee, the opportunity to appear before you to report on progress within the Army's Reserve components and to talk about the budgets directly supporting the Reserve Forces is one that I appreciate.

Since undertaking the assignment as Chief, Office of Reserve Components last October, I have been struck by the advances being made among the more than 6,000 Reserve component units and the more than 600,000 people in the force, by the business-like approach of the leadership, and by the support that this committee and your colleagues in the Congress have given to the Nation's citizen soldier.

There are important things afoot in this segment of our national strength, so pertinent to the interests of each of us here.

THIRD REPORT OF GEN. GEORGE C. MARSHALL OF HIS STEWARDSHIP IN WORLD WAR II

The other day I was reading Gen. George C. Marshall's third report of his stewardship in World War II and was intrigued, as always, by his reflections and by his foresight in calling eloquently for strong peacetime Reserves in addition to a hard-hitting Active Army—both segments critical to our survival as a world power and as a free people.

Let me quote him briefly:

> We finish each bloody war with a feeling of acute revulsion against this savage form of human behavior, and yet on each occasion we confuse military preparedness with the causes of war and then drift almost deliberately into another catastrophe . . . we must . . . correct . . . the tragic misunderstanding that a security policy is a war policy . . . The German Armies swept over Europe at the very moment we sought to avoid war by assuring ourselves that there could be no war.
>
> The security of the United States of America was saved by sea distances, and by the errors of a prepared enemy. For probably the last time in history those ocean distances were a vital factor in our defense. We may elect again to depend on others and the whim and error of potential enemies, but if we do we will be carrying the treasure and freedom of this great Nation in a paper bag . . . Peace can only be maintained by the strong.

WORLD POWERS REALITIES

In a society where many yearn for a new Walden pond and where some would have us dismantle our arms and turn inward, General Marshall's wisdom seem to be particularly relevant today.

I, for one, am glad that this committee has a wise appreciation of the realities of power in the world, and the potential for good that this power brings with it, and am grateful for this. Ours can truly be power for peace—if we keep it vital.

MODERN COMBAT-CAPABLE EQUIPMENT

Until a year ago, the most pressing problem facing the Army Reserve components was the shortage of modern combat-capable equipment. To help solve this problem, the Army reordered equipment allocation priorities to correspond to readjusted deployment schedules. The flow of equipment from active Army units, from depots, and from production lines totaled $300 million in fiscal year 1970; more than doubled to $727 million in fiscal year 1971; and is programed to exceed $900 million this fiscal year.

The impact of these increased issues on the morale of the units has been exciting. Training becomes more meaningful when soldiers can work with their modern equipment. The Guardsman and reservist, for the first time in years, can see tangible evidence that he is clearly regarded as an important element of our national security.

STRENGTH MAINTENANCE IN NO-DRAFT ENVIRONMENT

We do have a problem, not foreseen last year, that is now upon us. It arises in part from the kind of thing General Marshall called to our attention: that of maintaining Reserve component strengths in a no-draft environment.

During the first half of this fiscal year, losses in the Army National Guard and the U.S. Army Reserve exceeded new enlistments. Losses, which resulted from the expiration of the 6-year obligations incurred by the unusually heavy REP enlistments in fiscal year 1966, were greater than normal. The gains were less than losses in what was, in fact, a temporary, nonscheduled no-draft environment.

Conditioned to a steady flow of applicants for enlistments, and concentrating full effort to performing the training needed to attain the unprecedented readiness levels the Nation must have, we perhaps did not react quickly enough to meet the new situation.

RECRUITING AND RETENTION PROGRAMS

A program of increasing momentum is, however, well under way now. Reserve component commanders have established good recruiting and retention programs; they have trained a number of recruiting specialists; and have inaugurated a system of recruiting Active Army personnel planning to leave active duty for duty in a Reserve component unit, in some cases in exchange for early release from the Active Army.

This Active Army in-service recruiting program was first tested in 1971 and then expanded world-wide this January. Already the results are encouraging. During the 4-month test period, from mid-August to mid-December at only two locations, nearly 1,400 active duty soldiers were recruited for further duty with Reserve component units.

During the first 6 weeks in 1972, over 14,000 individuals have been recruited under the expanded program. It appears that the downward trend in strength may be abating and we believe that, with continued high levels of effort, increasing strengths may well occur before the end of the year.

As we move into the future, however, continuous efforts will be necessary to convince the youth of this Nation that service in a Reserve component unit is profitable, interesting, and adventurous, and an honorable and noteworthy contribution to the security of the country.

ABATING ANTIMILITARY ELEMENT

It is my personal belief that the antimilitary feeling is abating in our society. A minute, articulate minority has projected in the public mind a picture of their generation and of our contemporary citizenship that is proving largely untrue.

There are thousands of young men in this country with ambitions and patriotism which equal those of any generation or period in our past. We in the military must reach the youth, win their attention, confront them with the important issues of defense, and tell our story, which has been a glorious one through the years.

We cannot sit idly by wishing and waiting; we must do what is necessary to reach the individual and tell him, by our actions, as well as our words, that he can participate in a very worthwhile way in assuring the defense of his country and find much personal satisfaction in the process. He and the Nation will be the poorer if he does not. We welcome your leadership and support in this effort.

SPECIAL READINESS IMPROVEMENT PROGRAM

Readiness has been improved under some special programs. The mutual support concept, that is, the pairing of Reserve component units with similar active Army units, is producing dividends for all concerned.

The round-out concept, that is, designating certain Reserve component units upon mobilization as an integral part of an Active Army division, results in their peacetime activities being closely coordinated with those of their Active Army counterparts.

Another "plus" is the increased number of modern aircraft enabling many Reserve and Guard units to engage in air mobile training with increasing enthusiasm and interest of the unit personnel.

While striving to realize the greatest readiness under current organizational concepts, we are conducting a test program to measure the effectiveness of new ideas.

We also are seeking ways to make Reserve component duty more interesting and challenging to the individual; for, without such, our recruiting efforts will come to naught.

RESERVE FUNDING REVIEW

With regard to the budgets for fiscal year 1973, I will present a broad review of Reserve component funding to serve as a setting for your later detailed examination.

I will not limit my remarks to the budgets that Generals Greenlief and Roberts will address today in detail, but will include the Reserve component personnel, operation and maintenance, and military construction accounts.

DIRECT SUPPORT FROM ACTIVE ARMY

Not included in the funds I am discussing is the direct support that the Reserve components receive from the Active Army, such as the pay of military advisors or support at annual training sites; nor is the Army's depot overhaul and issue program dedicated for the Reserve components depicted.

The first chart compares the Reserve component direct funding accounts for fiscal years 1971, 1972 and 1973.

(Chart No. 1 follows:)

ARMY RESERVE COMPONENT BUDGETS DIRECT OBLIGATIONS

[In millions of dollars]

	Fiscal year		
	1971	1972	1973
NGPA	443	597	616
RPA	370	476	530
(ROTC)	(25)	(27)	(28)
OMARNG	315	380	469
PROG 5, OMA	141	167	209
Subtotal	1,269	1,620	1,823
MCARNG	15	29	40
MCAR	10	34	38
Total	1,294	1,683	1,902
Difference from previous year	+97	+389	+219

1972 FUNDING

General Hollis. Funding for fiscal year 1972 is $389 million above that of fiscal year 1971. This is due primarily to increased pay rates for military and civilian personnel, increased numbers of REP–63 training, increased technicians, increased ROTC graduates entering the Army Reserve components directly from ROTC, increased logistical readiness capacity in the "Operation and Maintenance" accounts,

and increased funds to implement the Reserve component 10-year completion program of military construction.

The construction of adequate armories, centers, and training facilities, which was largely deferred during the Vietnam conflict, is now needed to permit the attainment of the modernization and readiness goals set in support of our national security.

1972–73 FUNDING COMPARISON

The difference between fiscal year 1972 funding and the fiscal year 1973 request is $219 million and is explained by Chart No. 2.

(Chart No. 2 follows:)

Changes in Reserve component funding fiscal year 1972 to fiscal year 1973

	Millions
Fiscal year 1972 level	$1,683
Personnel accounts	+73
Training unit personnel	+88
Training REP	−19
Other	+4
O. & M. accounts	+131
Technicians	+56
Training operations	+16
Logistics	+47
Other	+11
Construction accounts	+15
Training site improvements	+8
Facility projects	+7
Fiscal year 1973 level	1,902

PERSONNEL FUNDING INCREASE

General HOLLIS. Personnel funding increases by $73 million. This is less than the $88 million in pay raises because the fiscal year 1973 programed losses are lower than those of fiscal year 1972, and the resulting REP training program is smaller.

OPERATION AND MAINTENANCE INCREASE

The O. & M. account increase of $131 million is due to pay raises, additional technicians, and the provision of an increased capability to receive, maintain, secure, and operate the modern, more sophisticated equipment being received.

CONSTRUCTION INCREASE

The "Construction" account increase of $15 million covers the requirement to keep the 10-year construction program on schedule, and the performance of some long overdue improvements in facilities at training sites. Our units use facilities with varying degrees of adequacy.

The accelerated construction program will permit the replacement of inadequate armories and centers in order to adequately house all units by 1981. In addition to replacing inadequate home station facilities, immediate concentrated efforts are being directed toward providing within the next 2 years:

(1) Sufficient capability to properly store and safeguard the large volume of equipment being provided the Reserve components;

(2) Added facilities to accommodate our aviation units with their growing aircraft inventory;

(3) More and better training areas and facilities to permit the attainment of unprecedented readiness goals; and

(4) Intrusion detection systems to improve the security of arms and ammunition.

RESERVE COMPONENTS PERSONNEL

Chart No. 3, indicates in broad terms what the two personnel appropriations that you are reviewing today will support.

(Chart No. 3 follows:)

ARMY RESERVE COMPONENT BUDGETS

[Dollar amounts in millions]

	Fiscal year		
	1971 actual	1972 estimate	1973 estimate
Military personnel appropriations:			
Training unit personnel	$557	$649	$737
Training individual reinforcements	18	19	22
Training REP	148	271	252
School training	45	77	71
Special training	15	23	31
Administration	6	5	5
ROTC	25	28	28
Total [1]	813	1,073	1,146
Reserve enlisted program (REP):			
Input	104,765	138,000	90,300
Man-years	47,832	56,557	45,215
Awaiting training end of year	24,117	28,573	23,704

[1] May not add due to rounding.

IMPACT OF PAY RAISES

General HOLLIS. If pay raises were excluded, the fiscal year 1973 request would have been about $15 million less than that for fiscal year 1972.

The costs of our increased readiness drills and special training would have been more than offset by the reduced REP training program.

REDUCED REP TRAINING PROGRAM

The last several years we have reported about our efforts to reduce the number of REP awaiting training. Last year, General Peers presented a program to reduce the number of REP awaiting training from over 52,000 at the beginning of fiscal year 1971, to less than 35,000 by the end of that year, and he expressed the hope of exceeding that program.

I am happy to be able to report today that the goal was exceeded and that the actual level at the end of fiscal year 1971 was 24,117. Because our losses will be so great in fiscal year 1972, and our REP program must be so large to offset these losses, there will be an increase to 28,500 in the number awaiting training.

However, the losses and REP program in fiscal year 1973 will be much lower than in fiscal year 1972, and we expect to end the year near the optimum level of 20,000.

Due to the time it takes for scheduling and processing new personnel into various training courses, the optimum objective is a waiting period of not to exceed 90 days, or a REP waiting list of about 20,000. Present practice is to count personnel who are awaiting initial individual training as part of the mandated paid drill strength, since they are paid and required to attend drills immediately after enlistment.

This means that we have a built-in level of untrained personnel that cannot be reduced below the 20,000 minimum. It also means that the mandated strength currently has this built-in drag on readiness.

1973 Program To Eliminate Untrained Personnel From Mandated Selected Strength

In order to remedy the situation at minimum cost, the Army will initiate a program in fiscal year 1973 that will permit by fiscal year 1975, the elimination of these untrained personnel from the mandated selected Reserve strength.

END AND AVERAGE STRENGTH INCREASES

General Hollis. The fiscal year 1973 budget request includes funds to increase the end strength by 5,000, that is, to a level of 665,000. The fiscal year 1974 budget request will include a further strength increase as a necessary part of this phased program.

Then, beginning on the first day of fiscal year 1975, personnel enlisting in the Army Reserve components, like those in other services, will not be paid until they report for initial individual training. They will be permitted and encouraged, but not required, to attend drills.

By the end of fiscal year 1975, the program provides for a paid drill strength of 660,000, all of whom will be trained or in training, and another 20,000 will be in a nonpaid status awaiting training.

This increase in training Selected Reserve strength will improve unit readiness directly by the added trained personnel present and, perhaps even more importantly, indirectly by its psychological impact on morale and esprit de corps of the soldiers involved.

The funds requested for fiscal year 1973 will support an average strength of 663,000; 402,000 in the Army National Guard and 261,000 in the U.S. Army Reserve. The end strength will be nearly 665,000.

In addition, training will be provided for approximately 49,000 reservists in the Individual Ready Reserve.

OPERATION AND MAINTENANCE

Chart No. 4 displays the activities supported by the operation and maintenance accounts.

(Chart No. 4 follows:)

ARMY RESERVE COMPONENTS—OPERATIONS AND MAINTENANCE ACCOUNTS

[Dollar amounts in millions]

	Fiscal year		
	1971 actual	1972 estimate	1973 estimate
Technicians [1]	$268	$315	$371
Training operations	40	44	60
Logistics	95	136	183
Air defense [2]	40	32	33
Administration	12	20	29
Total [3]	456	547	678
Provides support for:			
Technicians			
End strength	29,773	34,177	37,159
Man-years	29,818	31,610	36,088
Stock fund purchase	$22	$27	$36
Repair parts	$21	$41	$54

[1] Less air defense technicians.
[2] Includes technician costs.
[3] May not add due to rounding.

TECHNICIANS

General Hollis. Most of the money goes to pay the technicians who provide the daily maintenance, administration, and training support that are vital to the effectiveness of the weekly, monthly, and annual training of Guardsmen and reservists; permitting our units to receive, maintain, safeguard, and train with the increasing amounts of modern, sophisticated weapons and vehicles that are being issued.

Last year, Congress eased the constraint that the ceiling on National Guard technician strength was imposing upon readiness enhancement. The rate of issue of new equipment to the Reserve components will probably crest during fiscal year 1973 and the added technicians can be available when maintenance requirements greatly accelerate.

This increasing flow of equipment is being provided in accordance with the policy that equipment will be issued only when there is assurance that the receiving unit can properly maintain, store, operate, and safeguard it.

That is why the military construction program, technician strength, and the stock fund equipment and repair parts requirements must be adequately supported. Given this support, the Reserve components can maintain and safeguard the equipment provided to them.

FISCAL CONSTRAINTS AND HIGH PRIORITY REQUIREMENTS

The fiscal year 1973 proposed Reserve component operation and maintenance accounts were developed under firm fiscal constraints in competition with other high priority Army requirements, and they will support the training and modernization programs of the Army National Guard and Army Reserve.

MILITARY AND CIVILIAN PERSONNEL

The fifth chart displays the number of military and civilian personnel supporting the Reserve Components.

(Chart No. 5 follows:)

CIVILIAN AND ACTIVE ARMY SUPPORT OF ARMY RESERVE COMPONENTS (END STRENGTHS)

	Fiscal year		
	1971 actual	1972 estimate	1973 estimate
Active Army personnel	4,824	4,885	4,599
Civilain personnel:			
Technicians	29,769	34,177	37,159
Nontechnicians	3,984	4,353	4,606

ADVISORS AND TECHNICIANS

General Hollis. Most of the military personnel area advisors and most of the civilian personnel are technicians. The recommended personnel support included in the fiscal year 1973 budget is the minimum requirement to perform full-time advisor, administrative and maintenance activities that unit personnel are not able to accomplish during normal drill periods, as they receive greater quantities of more sophisticated equipment and progress toward increased readiness.

RESERVE COMPONENT ROLE INCREASE

As the Army readjusts its strength, structure, and planned strategy to provide for the Nation's security in the post-Vietnam conflict era, the Reserve components are being called upon to play a highly demanding and more significant role.

The efforts of many dedicated active and Reserve component Army personnel are being applied to assure that we will be ready to do our important part in the best tradition of the Army.

This, Mr. Chairman and members of the committee, concludes my statement.

I would be happy to attempt to answer any questions you may have or, if you wish, to be available to you after the presentations of General Greenlief and General Roberts, the two Appropriation Directors.

PROGRAM OFFICER AND ENLISTED ADVISERS

Chairman Ellender. I wonder if you could tell us how many Regular military personnel are necessary to train the Reserves.

General Hollis. We have in our system approximately 3,600 advisers.

Chairman Ellender. They are in the Regular Army?

General Hollis. Yes, sir.

Chairman Ellender. How many of those are officers?

General Hollis. I can give you those figures for the record, sir. I would say approximately one-third.

(The information follows:)

In FY 1973, we will be authorized 4,599 Regular Army personnel to support the Reserve Components. Of that number, 4,112 will be advisors and the remainder will be other support personnel.

As of 29 February 1972, 3,752 advisors were assigned; 1,554 of these were officers (41.4%).

1972 ACTIVE DUTY OF RESERVES

Chairman ELLENDER. To what extent have the Reserves been called to active duty this last year?

General HOLLIS. The last time the Reserves were mobilized was for the postal strike in New York. That was not last year but the year prior to it, 1970.

This does not, of course, take into account the calls which the State Governors have issued to deal with the potentiality of civil disturbances, although these have been greatly reduced, by 50 percent, I might add, and in the incidence of natural disasters, such as we had in Virginia.

Chairman ELLENDER. Isn't the National Guard called more often by the States than the Reserves?

General HOLLIS. Yes, sir. The National Guard, of course, is the primary resource of the Governor. The reserves themselves, are Federal forces. Unless the mission is comprehended as a Federal mission, they are normally not called, although they do assist in a cooperative effort.

RESERVE AND NATIONAL GUARD ADVISORS

Chairman ELLENDER. Are these 3600 military personnel from the Regular Army occupied exclusively in reserve work?

General HOLLIS. For both the Reserves and the Guard, sir.

NATIONAL GUARD AND RESERVES SHARING OF FACILITIES AND EQUIPMENT

Chairman ELLENDER. To what extent do the National Guard and Reserves use the same buildings and equipment?

General HOLLIS. There is naturally some competition in the attainment of the resources we have in the local areas. There has been under way for some time now since this modernization program started new thrusts toward cooperation. There is a good bit of joint usage going on now.

I am happy to report to you that the attitudes of the people in this area are, in large part, geared to the larger requirement as opposed to the narrower unit requirements of past years.

I would say that we have joint usage—this is a horseback estimate—in 15 percent of our facilities and areas.

Chairman ELLENDER. Fifteen percent?

General HOLLIS. Fifteen percent joint cooperative use. This, of course, excludes the large post camps and stations and reservations where we do our summer training.

Chairman ELLENDER. I understand. But I had reference to a particular area.

For instance, in my area, we have buildings, constructed at considerable expense, used exclusively by the Reserves, and another used exclusively by the National Guard. I have been contending that one facility could be utilized by both.

General HOLLIS. I am not, of course, as familiar with this particular situation, although I do understand that there was some shuffling around on this.

I would say that we ought certainly to consider this cooperative approach to the problem as we develop our construction requirements in the future.

Chairman ELLENDER. I hope it is done. Whenever it comes before this committee, I am going to try to be certain that it is done. There is no reason to have such a large duplicating expense.

General HOLLIS. We need to make the most of the facilities we provide, sir, because it becomes rather costly.

Chairman ELLENDER. Any further questions?

STATUS OF MANDATED STRENGTHS

Senator YOUNG. Are you up to strength?

General HOLLIS. The National Guard stands at 94.6 percent of its manning measured against the mandated strength of 400,000.

The Army Reserve is at 93.7, measured against the mandated strength of 260,000.

Senator YOUNG. Overall?

General HOLLIS. In total round figures, it is 38,000, down from 660.

1972 SEPARATIONS AND RESUMPTION OF DRAFT

Senator YOUNG. Are that many slots open?

General HOLLIS. Yes, sir.

Senator YOUNG. As the draft is resumed again, that will decrease, will it not?

General HOLLIS. We have a problem. Our situation is compounded by two trends. One is a manpower programing sequence that started back in 1965 when we took in a large number of people into the Reserves in anticipation of a possible callup for the Vietnam war. They are getting out this year.

The unexpected development was the moratorium in the Selective Service apparatus last year.

These two have had a coincidence here which has been unexpected. As a result of it, our losses are particularly more aggravated in the light of this released draft pressure.

I might say that next year our manpower programing will not anticipate the kind of losses that we had this year.

Senator YOUNG. The draft is being resumed, in a month or two?

General HOLLIS. The Secretary of Defense has issued a call of 15,000 for the last quarter of this fiscal year.

Senator YOUNG. Five thousand a month?

General HOLLIS. Yes, sir.

ARMY RESERVE

STATEMENT OF GENERAL ROBERTS

BUDGET REQUEST

Chairman ELLENDER. The committee will now consider the appropriation for "Reserve personnel, Army." The fiscal year 1973 request is $529,534,000. This compares with an appropriation for fiscal year 1972 of $447,310,000, which includes $27,334,000 for the January 1, 1972, pay increase.

PROGRAM AND FINANCING

At this point in the record there will appear certain program and financing information from the justifications.

(The information follows:)

DEPARTMENT OF DEFENSE—MILITARY RESERVE PERSONNEL, ARMY—PROGRAM AND FINANCING

[In thousands of dollars]

	1971 actual	1972 estimate	1973 estimate
Program by activities:			
Direct program:			
1. Reserve component personnel	344,462	447,701	501,812
2. Reserve officer candidates	25,164	28,267	27,722
Total direct program	369,626	475,968	529,534
Reimbursable (total)	694	1,000	1,800
Total obligations	370,320	476,968	531,334
Financing:			
Receipts and reimbursements from Federal funds	−53	−180	−955
Non-Federal sources [1]	−641	−820	−845
Unobligated balance transferred from other accounts		−28,658	
Unobligated balance lapsing	4,874		
Budget authority	374,500	447,310	529,534
Budget authority:			
Appropriation	360,600	385,084	502,200
Transferred from other accounts	13,900		
Appropriation (adjusted)	374,500	385,084	502,200
Proposed supplemental for Military Pay Act increases		50,258	
January 1972 pay increase supplemental/amendment		11,968	27,334

[1] Reimbursements are derived from sale of meals and clothing to service members (10 U.S.C. 4621).

Note: The amounts shown as January 1972 pay increase supplemental/amendment are not distributed to each individual appropriation in the fiscal year 1973 President's budget, but are reflected as a one-line Defense-wide contingency amount. The amounts shown above are estimates, pending final determination of the amounts to be requested when supplemental and amended estimates are formally transmitted.

OFFICE RESPONSIBILITIES

Chairman ELLENDER. General Roberts.

General ROBERTS. Mr. Chairman, I have an abbreviated statement. I believe you have a copy of it.

It is a privilege and pleasure to appear before you for the first time to present the Army Reserve and ROTC budget and to inform you of the current status of the programs and of our plans for fiscal year 1973.

I became Deputy Chief of Army Reserve in October 1970, and Chief of Army Reserve in June 1971, but long before then knew of your interest and knowledge of the Army Reserve, and your continuing efforts to improve our readiness.

My office is responsible for the implementation and execution of approved plans, policies, and programs pertaining to the U.S. Army Reserve, including the preparation, justification, and execution of the budgets that provide for our direct financial support.

RESERVE MISSION: RAPID MOBILIZATION EXPANSION AND DEPLOYMENT IN EVENT OF WAR OR NATIONAL EMERGENCY

Our established Army Reserve mission is to furnish, in the event of war or national emergency, and at such other times as national security may require, units effectively organized, trained, and equipped

in time of peace for rapid mobilization, expansion, and deployment; such units to be of the types and numbers to meet the requirement of the Army, and, also, additional qualified individual personnel for necessary replacement and expansion of the Army.

READINESS REQUIREMENT

All Army Reserve units are specific requirements in Army mobilization plans. Our objective is to bring our units and individuals to the highest state of readiness attainable—a state of readiness that will insure a minimum requirement of postmobilization training.

STATE OF READINESS

Chairman ELLENDER. I wish you would address yourself to the state of readiness of the Army Reserve, indicating any improvements or weaknesses that have become apparent to you.

General ROBERTS. During the past 2 years Army Reserve units have generally accomplished a steady and progressive increase in readiness. Annual training 1971 showed improved readiness throughout the Army Reserve. The increase was further confirmed by October 1971 readiness reports.

Unprecedented issues of equipment to the Army Reserve during the past 2 years have greatly increased our capabilities. This applies particularly to the replacement of older model equipment as well as the expanding training capabilities realized through additional quantities of mission-essential items. Also, the "total force" concept and mutual support programs are bringing us into closer association with the Active Army, resulting in better training and higher operational readiness for the entire Army establishment.

The Army Reserve is now completing the conversion to the G/H series tables of organization and equipment. In this conversion, as in any organizational change, there is some personnel turbulence. This conversion however, as differentiated from reorganizations that have taken place in the past, is having a minimum impact on units and personnel. However, the adjustments and relocations caused by the conversion will affect the readiness status in some units. The target date for completion of the conversion is March 15, 1972. Once completed, the conversion will be a decided advantage to the Army Reserve, as we will then be organized and functioning on the same tables of organization and equipment as like Active Army units.

Our most serious concern at this time is the strength. The maintenance of authorized unit strength is crucial to readiness. Without personnel in requisite numbers, the significant advances in other elements of readiness may be seriously compromised. Army Reserve strength at the end of fiscal year 1971 was 263,299. As of January 31, 1972, it was 247,160, down 16,139 from our actual begin year strength. Projected losses during this fiscal year are the heaviest in many years and is falling in a year of virtually no draft personnel. However, I assure you that the Army Reserve is working hard to reverse the current downward trend in strength.

ROTC SENIOR AND JUNIOR DIVISIONS

The other important program supported in this budget is Army ROTC with an enrollment of 56,400 students in the senior division and 120,000 students in the junior division.

READINESS INCREASE: EQUIPMENT, TRAINING, AND FACILITIES

Increased reliance has been placed on the Reserve components, and we are required to attain an unprecedented level of readiness.

This is resulting in the provision of significant quantities of modern equipment, increased readiness training, the start of a phased program to increase the percentage of trained strength in units, additional technician manpower support, and funding for accelerated provision of proper training facilities.

1972 APPROPRIATIONS AND STRENGTHS

An amount of $385.1 million was appropriated by the Congress for fiscal year 1972. The addition of a supplemental amount of $62.2 million for military compensation increases and $28.7 million to be transferred from the Defense stock fund account to provide the remainder of support for the ROTC active duty training program and to finance the ROTC increased scholarships and subsistence provided by recent law brings total fiscal year 1972 to $476 million.

This amount will provide for the support of an Army Reserve average strength of 260,049 and end strength of 260,000, and for ROTC senior division entering enrollment of 50,234.

INCREASE OVER 1972

The fiscal year 1973 budget request is for $529.5 million, of which $501.8 million is for the Army Reserve and $27.7 million is for the ROTC. The total is a net increase of $53.5 million over revised fiscal year 1972.

ROTC PROGRAM

Chairman ELLENDER. What does that sum of $27.7 million include?

General ROBERTS. That includes both the senior or college level ROTC, and the junior program of the ROTC conducted at high school level.

Chairman ELLENDER. What does the junior program cost?

General ROBERTS. We have it here. The junior program is a relatively small amount of that.

General KJELLSTROM. The junior program is $707,000 for the issuance of uniforms to the junior ROTC. That is the only support out of the "Reserve personnel" appropriation. There is some operation and maintenance support out of the "Operation and maintenance" appropriation for the junior ROTC program.

Chairman ELLENDER. What kind of training is given to those students?

General ROBERTS. They have regular meetings every week. They have an officer in uniform who is partially paid by the school district.

They get instruction in the basic training subjects normally given to trainees when they first come into the Army.

This program has been very valuable. It is around 100,000. They are programing for 120,000 in fiscal year 1973.

Chairman ELLENDER. Proceed.

APPROPRIATION COMPONENTS AND ALLOCATIONS

General ROBERTS. The overall figure of $529.5 million includes: Plus $45.1 million for compensation increases, plus $8.2 million for inactive duty readiness training, plus $4.2 million for increase in trained unit strength, plus $2.8 million for recruiting program under Project Volunteer, plus $0.8 million for mobilization test program, minus $8.8 million from decrease in ROTC active duty training program, plus $0.3 million for ROTC scholarships and subsistence, minus $0.6 million from lower ROTC advanced course enrollment, and plus $1.5 million net increase from other changes.

ORGANIZATION OF ARMY RESERVE

During fiscal year 1972, the Army Reserve began converting units to G–H series TOE and alinement to a new baseline structure. Conversion of all units will be completed by March 15, 1972, with the exception of civil affairs, special forces, psychological operations, military intelligence detachments, and special forces groups.

These will be converted after new TOE's are published early in fiscal year 1973.

There will be approximately 3,450 company-detachment size units in the Army Reserve after conversion, with authorized strengths ranging from 80 percent to 100 percent of TOE and with an average of approximately 95 percent of TOE.

STRENGTH

The strength of the Army Reserve as of December 31, 1971, was 1,666,000, consisting of 1,219,000 in the Ready Reserve and 447,000 in the Standby Reserve.

There were 320,000 in the Retired Reserve. The Ready Reserve consists of those units and individuals available for immediate employment in the expansion of the Active Forces in the event of mobilization.

Chairman ELLENDER. What percentage of these Reserves have been in the service?

General ROBERTS. In the individual Ready Reserve, virtually all of these people have been on active duty. The law requires 2 years of active service under the Draft Act and 3 years in the Ready Reserve, and 1 year in Standby Reserve. So, the bulk of this 1 million are in that category. The rest of the Ready Reserve is in a troop program structure. That is how it is made up.

So, you have a large pool of trained people who are not in the troop program units. Of those, about 49,000 are given training every summer, either officers or enlisted. The bulk of these are enlisted.

COMBAT SERVICE PERCENTAGE

Chairman ELLENDER. Do you have the exact percentage of those who have had prior service in the Army such as those who have been in the Vietnam war?

General ROBERTS. Yes, sir.

In this individual Ready Reserve, it fluctuates month by month. The enlisted strength is about 900,000 and over 99 percent of these have had service in the Army. Not all of them in Vietnam, necessarily, but the majority of them have been.

Chairman ELLENDER. But they have had training in the Army as recruits?

General ROBERTS. The people in the troop program structure, the 260,000 base, the majority of those have not been on extended duty. They have had their basic and advanced individual training, and then the rest of the service in the Reserve structure. But these people in the Individual Ready Reserve have had training in the Army. We provide MOS refresher training for about 5 percent of that group.

SELECTED RESERVE

For fiscal year 1970, Public Law 91–121 required that we program to attain an average strength of not less than 255,591. Our actual average strength was 257,490 for full compliance with the law. Fiscal year 1970 end strength was 260,654.

For fiscal year 1971, Public Law 91–441 required an average strength of not less than 260,000. Our actual average strength was 261,521, and the end strength was 263,299.

For fiscal year 1972, Public Law 92–156 requires that we program to attain an average strength of not less than 260,000. This we have done. However, our actual average strength through December 31 was 257,889, and the actual December 31 strength was 249,351.

We are falling below the fiscal year 1972 average strength program and have been making every effort to reverse the downward trend. Our intensive recruiting and retention campaigns are having some success, but our problem is severe in that draft pressure has almost disappeared during a fiscal year of unusually high REP–63 enlistment requirements.

This fiscal year 1973 budget is for a begin strength of 260,000, average strength of 261,300, and end strength of 262,500.

The change from past years' average and end strength programs to fiscal year 1973 average of 261,300 and end strength of 262,500, is the first year of a phased 3-year program to increase trained strength by excluding from the Selected Reserve strength count all enlisted personnel who have not yet entered REP–63 training.

Count of strength input would then be on actual entry into REP training instead of on enlistment as at present.

During fiscal year 1973 and also fiscal year 1974, the strength will increase above the basic 260,000 in order that there may be on hand at begin fiscal year 1975 sufficient trained and in-training strength to

permit fiscal year 1975 phase-in of this readiness program and also provide for an average strength of 260,000 for fiscal year 1975.

PAID DRILL STRENGTH BY MONTH

Chairman ELLENDER. On page 7 of the justifications it is indicated the paid drill strength by month will gradually increase from 260,000 at the start of the fiscal year to 262,500 at the end of the year, providing an average strength of 261,300. Please comment on this.

General ROBERTS. Fiscal year 1973 will be the first year of a 3-year phased program to increase the "trained" strength in units. The average and end strength will be increased above 260,000 during fiscal years 1973 and 1974 in order that sufficient strength above 260,000 will be available during fiscal year 1975 to offset the reduced average strength that will result during fiscal year 1975 when new enlistees will not be trained, paid, or carried in the Selected Reserve strength until they begin REP training. This will increase "trained" enlisted strength in units by approximately 4 percent and still provide an average strength of 260,000 during fiscal year 1975.

RESERVE ENLISTMENT PROGRAM TRAINING INPUT

The budget program for REP–63 input to training for fiscal year 1972 is 50,500, and for fiscal year 1973 is 34,300. The REP–63 input for any fiscal year is closely related to the number of personnel who enlisted 6 years earlier. The Army Reserve had only 4,800 enlisted personnel awaiting input into REP–63 training as of December 31, 1971.

INACTIVE DUTY READINESS TRAINING

Public Law 90–168 provides that members of the Selected Reserve shall be required to participate in at least 48 scheduled drills or training periods during each year.

This fiscal year 1973 budget includes an additional 458,640 inactive duty training periods to provide additional training assemblies to selected personnel and units for improvement of unit instruction, MOS training and retraining, maintenance of equipment, and planning and coordination of unit training and operations. This will be a great assist in our drive to increase unit readiness.

ROTC GRADUATE ACTIVE DUTY TRAINING

Public Law 87–378, October 4, 1961, requires that commissioned ROTC graduates not required to serve on active duty with the Army shall instead be ordered to active duty for training for a period of 3 to 6 months.

The decreasing active Army officer strength has reduced the number of junior officers required on extended active duty during fiscal year 1971 to fiscal year 1973. This has resulted in 5,613 new second lieutenants in fiscal year 1971, 10,165 in fiscal year 1972, and 7,400 in fiscal year 1973 being ordered to active duty for training for an average 3½-month basic officer course. They are paid from "Reserve personnel, Army" funds instead of from "Military personnel, Army."

PROGRAM DATA

The following are strength and significant active duty training programs for fiscal year 1973. For the Army Reserve, this estimate provides active duty and reserve duty training for a beginning strength of 260,000, including 28,369 enlisted personnel in the REP–63 active duty training program.

The end strength is budgeted to be 262,500, including 13,045 enlisted personnel in REP–63 training.

The budget provides for 34,300 non-prior-service enlistees to enter on a tour of active duty training under REP–63. Active duty for training is included for 3,000 nonunit officer students in USAR schools and 4,900 officer mobilization designees.

Individual reinforcement training is included for 3,628 officers and 37,625 enlisted personnel. This provides MOS refresher training for members of the Individual Ready Reserve who are subject to being ordered to active duty on mobilization.

School training will provide 11,575 officer and 8,362 enlisted tours of training, and includes Army service schools, Army area schools, recruiting, OCS, and basic officers course.

Special training will provide 64,804 officer and 31,214 enlisted tours of training, and includes special tours, seminars, command-post exercises, unit members in USAR schools, supervision of operation of units, precamp conferences, and recruiting.

RESERVE PERSONNEL IN PAID STATUS

Chairman ELLENDER. At this point in the record, there will appear a tabulation from the justifications entitled, "Reserve Personnel in Paid status."

(The information follows:)

RESERVE PERSONNEL IN PAID STATUS
RESERVE COMPONENT USAR

Pay Groups	Paid Drills	Paid Days of Active Duty for Training		FY 1971 (PAST YEAR) BEGIN	FY 1971 (PAST YEAR) AVERAGE	FY 1971 (PAST YEAR) END	FY 1972 (CURRENT YEAR) AVERAGE	FY 1972 (CURRENT YEAR) END	FY 1973 (BUDGET YEAR) AVERAGE	FY 1973 (BUDGET YEAR) END
A	48	15	Off	34,760	34,682	35,584	35,922	36,200	36,350	36,500
			Enl	205,727	210,772	214,942	205,674	195,431	206,323	212,955
			Off	0	0	0	0	0	0	0
F	0	90 - 180	Enl	20,167	16,067	12,773	18,453	28,369	18,627	13,045
Paid Drill Training		Sub Total	Off	34,760	34,682	35,584	35,922	36,200	36,350	36,500
			Enl	225,894	226,839	227,715	224,127	223,800	224,950	226,000
			Total	260,654	261,521	263,299	260,049	260,000	261,300	262,500
Paid Active Duty Training Only		Sub Total	Off	10,425	10,867	10,867	10,900	10,900	11,528	11,528
D	0	15	Enl	37,037	39,009	39,009	37,100	37,100	37,625	37,625
			Total	47,462	49,876	49,876	48,000	48,000	49,153	49,153
TOTAL PAID STATUS			Off	45,185	45,549	46,451	46,822	47,100	47,878	48,028
			Enl	262,931	265,848	266,724	261,227	260,900	262,575	263,625
			Total	308,116	311,397	313,175	308,049	308,000	310,453	311,653

Averages computed by doubling the end strengths of the months of July through May, adding 30 June strengths of the previous year and the year under consideration, and dividing the total by 24, except for Pay Group D. Pay Group D represents the the total number of personnel participating during the fiscal year, and average and end strengths are identical in any one year.

4-1/20/72

PROGRAM DRILL PAY STRENGTHS

Chairman ELLENDER. There will also appear at this point the tabulation on "Program Drill Pay Strengths."

(The information follows:)

DEPARTMENT OF THE ARMY, FISCAL YEAR 1973 BUDGET ESTIMATES

PROGRAM DRILL PAY STRENGTHS—RESERVE PERSONNEL, ARMY

	Fiscal year 1971			Fiscal year 1972			Fiscal year 1973		
	Begin	Average	End	Begin	Average	End	Begin	Average	End
Officer:									
Pay group A:									
TOE units	25,744	25,452	25,916	25,916	26,227	26,477	26,477	26,591	26,705
TDA units	5,446	5,565	5,711	5,711	5,755	5,800	5,800	5,850	5,900
Staff and faculty, USAR schools	3,215	3,316	3,614	3,614	3,614	3,614	3,614	3,614	3,614
Selective service (USAR augmentation)	355	349	343	343	326	309	309	295	281
Total, officers	34,760	34,682	35,584	35,584	35,922	36,200	36,200	36,350	36,500
Enlisted:									
Pay group A:									
TOE units	190,128	194,633	198,008	198,008	189,144	178,851	178,851	189,030	195,276
TDA units	13,152	13,705	14,050	14,050	13,638	13,680	13,680	14,393	14,779
Staff and faculty, USAR schools	2,447	2,623	2,884	2,884	2,892	2,900	2,900	2,900	2,900
Total, enlisted	205,727	210,961	214,942	214,942	205,674	195,431	195,431	206,323	212,955
Officer total	34,760	34,682	35,584	35,584	35,922	36,200	36,200	36,350	36,500
Enlisted total	205,727	210,961	214,942	214,942	205,674	195,431	195,431	206,323	212,955
Total drill pay	240,487	245,643	250,526	250,526	241,596	231,631	231,631	242,673	249,455

ENLISTED NONATTENDANCE

Chairman ELLENDER. I notice that in the tabulation on page 6 of the justifications you anticipate the nonattendance under enlisted personnel to more than double in fiscal year 1973, rising from 5,046 in 1972 to 10,326. Please explain.

General ROBERTS. A budgetary policy decision in effect and reflected in the "Reserve personnel, Army" budget for the past 2 years has been that REP–63 personnel will not be required to attend annual training with their unit until after completion of their REP–63 initial training. The basis for such exclusion is that annual unit training would not be productive and cost effective until a reservist has completed basic training. The table in the budget shows the estimated number of such newly enlisted personnel who would not attend the next period of annual training. The 5,046 in the budget was exclusion from annual training during first quarter fiscal year 1973, and 10,326 was exclusion during fourth quarter fiscal year 1973. However, the numbers should have been shown in budget as 8,058 for beginning fiscal year 1973 and 4,634 for end fiscal year 1973. The changes offset each other and do not affect budget request. The numbers are derived as follows:

Enlistments

May 1972	4,164	April 1973	2,317
June 1972	3,894	May 1973	2,317
Total	8,058	Total	4,634

RESERVE COMPONENT PERSONNEL

Chairman ELLENDER. At this point in the record there will appear the tabulation of "Reserve component personnel" by budget accounts.

(The information follows:)

RESERVE PERSONNEL, ARMY (3200 RESERVE COMPONENT PERSONNEL)

[In thousands of dollars]

Budget project account	Title	Actual fiscal year 1971	Estimate	
			Fiscal year 1972	Fiscal year 1973
3210	Training—pay group A	230,720	264,399	305,596
3220	Training—pay group D	17,741	19,256	21,783
3230	Training—REP—pay group F	55,209	87,338	99,907
3240	School training	26,814	55,850	49,979
3250	Special training	12,100	19,749	13,251
3260	Administration and support	1,878	1,109	1,296
	Total direct obligations	344,462	447,701	501,812

JUSTIFICATION

Budget Program 3200 provides funds for military personnel costs of pay and allowances, clothing, subsistence, and travel for members of the Army Reserve.

The programmed paid drill strength for FY 1972 is average 260,049 and end 260,000 and for FY 1973 is average 261,300 and end 262,500. This budget provides active duty and inactive duty training for the above, including REP–63 input of 50,500 in FY 1973.

Individual training is programmed as follows:

	Fiscal year 1972		Fiscal year 1973	
	Officers	Enlisted	Officers	Enlisted
Individual reinforcements	3,600	37,100	3,628	37,625
USAR schools	3,000	0	3,000	0
Mobilization designees	4,300	0	4,900	0
Service and Army area schools	12,021	4,118	11,575	8,362
Special training	49,569	33,097	64,804	31,214

TRAINING, PAY GROUP A

Chairman ELLENDER. For "Training, pay group A" the fiscal year 1973 request is $305,596,000. The amount provided for fiscal year 1972 was $264,399,000. Pay group A consists of those officers and enlisted personnel who engage in 48 paid drills and 15 paid days of active duty for training annually. I note that the average strength for this pay group will increase from 205,674 in fiscal year 1972 to 206,323 for fiscal year 1973. Please explain the reasons for the marked increase in the funding request.

General ROBERTS. The fund increase requested in fiscal year 1973 is due to full application in fiscal year 1973 of the November 14, 1971, and the January 1, 1972, military compensation increases.

TRAINING EXERCISES

Chairman ELLENDER. What Active Army exercises are programed for fiscal year 1973 and at what cost?

General ROBERTS. There are several Active Army exercises in the planning stage for fiscal year 1973 in which U.S. Army Reserve units are expected to participate. The troop lists for these exercises have not been finalized by Continental Army Command. However, Continental Army Command expects that numerous U.S. Army Reserve combat service support units will definitely participate. In addition, Continental Army Command is planning for command post exercises, such as Exercise Cabin Cruiser I, in which elements of Army Reserve combat units and combat support units will participate. U.S. Army Reserve units are also expected to participate in Exercise Exotic Dancer and mobilization exercise, Label Sticker. You recognize, of course, units that do not participate in Active Army exercises during the annual training period, will participate in normal Reserve component summer camp training. The fiscal year 1973 cost is estimated to be $257,000.

AIRLIFT EXERCISES

Senator YOUNG. What are the airlift exercises referred to?

General ROBERTS. These are exercises conducted to provide airlift training for selected U.S. Army Reserve units. The exercise is conducted in conjunction with the units' annual training when the unit is being airlifted to the training site. The exercise provides the selected unit additional mobilization training and practical experience in movement of personnel and equipment by aircraft.

Senator YOUNG. What is the cost of these?

General ROBERTS. The fiscal years 1973 cost is estimated to be $219,389.

Training, Pay Group A

Chairman Ellender. Please describe the unit enlisted flight crews.

General Roberts. The enlisted unit flight crews are those enlisted members of an aviation unit who are on flight status. These are personnel who perform duties in flight which are essential to the operation of the aircraft. Examples of these personnel are crew chiefs, crew engineers and assistant crew chiefs and flight engineers.

Per Diem for Officers

Chairman Ellender. Describe the per diem for officers authorized under Public Law 90–168.

General Roberts. Public Law 90–168 extended to Reserve component members the same entitlement to per diem for periods of active duty for training of less than 20 weeks which had been previously authorized Regular components members only. The basic per diem rate for officers (identical for enlisted members) is $25. This amount, of course, may be reduced by various factors, for example, when Government quarters or mess are available. I should add that, in keeping with the intent of Congress, no per diem is authorized for the period of annual training when quarters and mess are available.

Call to Active Duty

Chairman Ellender. Have any Army Reserve units been called to active duty in the past year?

General Roberts. No U.S. Army Reserve units were ordered to active duty during calendar year 1971.

Mobilization

Senator Young. What callups have there been since World War II?

General Roberts. The U.S. Army Reserve has had units mobilized four times and individuals three times since World War II as follows:

	Units CO/DET size	(Personnel in units)	Individuals not in units
1. Korea	969	35,857	204,643
2. Berlin	255	30,056	15,774
3. Vietnam	45	5,879	2,459
4. Postal Strike March 24–26, 1970	87	7,989	0

Training, Pay Group D

Chairman Ellender. Pay group D consists of those personnel who are engaged in 15 paid days of active duty for training annually. The average number in this category for fiscal year 1973 is estimated at 49,153, slightly higher than those estimated for 1972, which is 48,000. Funds requested for fiscal year 1973 amount to $21,783,000, an increase over the $19,256,000 provided for fiscal year 1972. Please justify this increase.

General Roberts. The fund increase requested in fiscal year 1973 in pay group D is due in small part to the increased number of person-

nel to be trained, and in large part to the full application in fiscal year 1973 of the November 14, 1971, and the January 1, 1972, military compensation increases.

Enlisted Input to 4-Month Training

Chairman Ellender. At this point in the record there will appear the tabulation from the justifications showing the enlisted input for the 4 months training program.

(The information follows:)

DEPARTMENT OF THE ARMY FISCAL YEAR 1973 BUDGET ESTIMATES

ENLISTED INPUT/MINIMUM 4 MONTHS TRAINING PROGRAM

	Enlistments	Input	Man-months mid-month average strength
Fiscal year 1969 actual	48,511	36,182	142,456
Fiscal year 1970 actual	44,459	50,042	279,596
Fiscal year 1971 actual	30,175	34,765	192,802
Fiscal year 1972 estimate	56,200	50,500	221,436
Fiscal year 1973 estimate:			
July 1972	3,117	3,931	28,093
August 1972	3,317	3,677	26,964
September 1972	3,517	2,943	24,891
October 1972	2,617	3,132	21,996
November 1972	2,817	3,320	19,120
December 1972	2,517	2,471	17,191
January 1973	2,017	2,659	15,952
February 1973	2,817	2,377	15,160
March 1973	3,217	1,903	14,262
April 1973	2,317	2,659	13,318
May 1973	2,317	3,041	13,272
June 1973	2,413	2,187	13,301
Total fiscal year 1973 estimate	33,000	34,300	223,520

Training, Pay Group F

Chairman Ellender. For "Pay group F training" the fiscal year 1973 request is $99,907,000. The amount provided for fiscal year 1972 was $87,338,000. Pay group F consists of enlisted personnel engaged in from 90 to 180 paid days of active duty for training. The average number of such personnel for fiscal year 1973 is estimated at 18,627 as compared with 18,453 for fiscal year 1972. Indicate the cause of the requested increase in appropriations.

General Roberts. The fiscal year 1973 fund increase is a direct result of full application in fiscal year 1973 of the November 14, 1971, and the January 1, 1972, military compensation increases.

Enlisted Input to 4-Month Training Period

Senator Young. The table on page 8 of the justifications describes the enlisted input to the 4-month training period. By month this shows a monthly decline from slightly over 28,000 at the beginning of the fiscal year to 13,301 at the end. Please explain this.

General Roberts. The Selected Reserve strength request is 260,000 for fiscal year 1972 and 262,500 for fiscal year 1973. This strength is comprised of unit personnel in both drill pay status (pay group A) and in REP–63 training status (pay group F). It is the enlistment

during a given year that relates to input into REP–63 initial training and, in turn, creates the change in end fiscal year strength in pay group F and the corresponding change in pay group A strength. The number of enlistments required results from personnel losses expected from actual enlistments 6 years prior as follows:

Fiscal year 1966 Enlistments	62,037
Fiscal year 1972 Enlistments	56,200
Fiscal year 1972 REP input	50,500
In REP–63 Training status end fiscal year 1972 (pay group F)	28,369
In drill pay status end fiscal year 1972 (pay group A)	231,631
Selected Reserve strength authorized for fiscal year 1972	260,000
Fiscal year 1967 Enlistments	28,400
Fiscal year 1973 Enlistments	33,000
Fiscal year 1973 REP input	34,300
In REP–63 training status end fiscal year 1973 (pay group F)	13,045
In drill pay status end fiscal year 1973 (pay group A)	249,455
Selected reserve strength authorized for fiscal year 1973	262,500

INPUT FLUCTUATION

Senator YOUNG. I also note that for alternate fiscal years, 1969, 1971, and 1973 the input is in the neighborhood of 35,000 while on the other years—1970 and 1972—the input exceeds 50,000. Why is that?

General ROBERTS. There is no significance to the similarity of alternate year REP–63 input shown in the budget. Each year of initial training input is primarily a direct result of the number of enlistments 6 years prior. Reorganizations and occasional smaller REP input training quotas than were required have caused fluctuations between years. For example, the input of 50,042 for fiscal year 1970 would have been smaller had input not been somewhat restricted during fiscal year 1969. Also, the fiscal year 1972 high input of 50,500 results from a major troop structure reorganization 6 years earlier during fiscal year 1966.

Senator YOUNG. What, in your opinion, is the outlook for the future?

General ROBERTS. The outlook for the future is continued fluctuation between years. For example, a reorganization, abnormal loss therefrom, and offsetting higher enlistment during a given fiscal year is cyclical and result in a high loss and high enlistment every 6 years thereafter.

SCHOOL TRAINING

Chairman ELLENDER. For school training, the fiscal year 1973 request is $49,979,000, a decrease from the $55,850,000 provided for fiscal year 1972. What is the reason for this reduction?

General ROBERTS. The school training account fund reduction is primarily the result of a decrease in the number of ROTC graduates not required for 2 years' active duty (fiscal year 1972—10,165; fiscal year 1973—7,400). Public Law 87–378 requires that such personnel be ordered to active duty for training of not less than 3 months or more than 6 months.

TYPES OF SCHOOL TRAINING

Chairman ELLENDER. Describe the types of school training provided under this item.

General ROBERTS. School training contemplated under this item includes Army service schools, Army area schools, officer candidate schools, and language training. School training included in the fiscal year 1973 budget is resident training which is required for branch qualification, MOS qualification, promotion, and refresher training. The types of schools are as follows:

(*a*) Two senior service colleges present the highest levels of career development courses. They are the Army War College and the Command and General Staff College.

(*b*) Eighteen Army branch service schools, conduct officer basic, advanced, and refresher courses.

(*c*) Specialist schools conduct courses for a particular specialty, such as: aviation, civil affairs, special warfare, logistics management, missile and munitions, etc.

(*d*) Army area schools are transitory in nature and are established by major commands to fulfill individual and unit training requirements which cannot be met effectively or in a lesser period of time by other means.

(*f*) Officer candidate schools—courses required to provide basic knowledge in order to qualify individuals to perform duties of a commissioned officer.

(*g*) Language schools provide resident instruction in foreign languages required by the unit mission. This training is essential to USAR civil affairs, special forces, and intelligence-type units and includes extensive study of the specific language and environmental factors of the country involved. Some individuals receive further training in the use of specialized equipment required for MOS proficiency and qualification, as a voice interceptor.

SPECIAL TRAINING

Chairman ELLENDER. For "Special training" the fiscal year 1973 estimate is $23,251,000. Funds provided for fiscal year 1972 amounted to $19,749,000. Please describe special tours, command post exercises, the type of seminars.

General ROBERTS. Special tours: The special tour program provides many essential short period training tours for reservists. It is through these tours of active duty for training that commanders at all levels are able to accomplish the many and varied tasks not otherwise provided. This program is vital to the support of the USAR program. Such tours of duty include training, recruiting, medical, and equipment maintenance support, and also evaluation, appointment, promotion, and survey boards.

Command post exercises: This program provides necessary training for key staff and line officers and enlisted personnel by means of simulated situations and conditions under which they can be expected to operate. This training enables Army Reserve personnel to practice solving command, combat, and logistical type problems under conditions that they would encounter on mobilization. Command post exer-

cise special training is an important vehicle for training unit and nonunit reserve personnel.

Seminars: The seminar program provides training for senior reservists attending special high level courses of instruction, such as defense strategy seminars, national security seminar, U.S. Army research and development seminars, defense strategy and national security seminars.

Increase in Special Training

Chairman Ellender. What is the reason for the increase requested for fiscal year 1973?

General Roberts. Our requirement is to accomplish a significant increase in materiel and unit readiness. The Army Reserve must provide for an increasing part of its own support and this requires additional man-days of support/training tours of duty. The increase in supervision of subordinate units will make possible closer and more effective supervision command and control by the Army Reserve under the conditions of increasing mobilization reliance on the Army Reserve. The virtual zero-draft situation during fiscal year 1973 will require an intensified recruiting program to maintain unit strength, and this amount includes a specific program for recruiting.

Forty-five-day tours

Senator Young. Describe the 45-day tours.

General Roberts. Forty-five-day tours are required by law—section 270, title 10, United States Code—for certain obligated reservists who do not participate satisfactorily in required training. This program is now used only for those individual reinforcement enlisted personnel who are involuntarily ordered to annual training with a Reserve component unit and who fail to comply with such orders without acceptable reason.

Transportation of dependents

Chairman Ellender. Please describe the circumstances under which personnel are paid for the transportation of dependents and household goods when ordered to active duty for training.

General Roberts. When orders place a member of the military on duty for more than 20 weeks, it is considered to be a permanent change of station. By law he can, if he desires, move his dependents and household goods.

Administration and support

Chairman Ellender. For "Administration and support" for fiscal year 1973 the estimate is $1,296,000, a slight increase over the $1,109,000 provided for fiscal year 1972. Please justify the reason for the increase.

General Roberts. In fiscal year 1972, 31 Army Reserve officers are assigned under the provisions of sections 265, 3019, and 3033 of title 10, United States Code. For fiscal year 1973, the number will increase to 38. The increased costs are due to the additional seven personnel and their related salaries and permanent change of station travel.

ACTIVE ARMY SUPPORT

Chairman ELLENDER. Indicate the number of personnel and the cost of Active Army support of the Reserve function.

General ROBERTS. Yes, sir. I will provide that for the record.

(The information follows:)

FISCAL YEAR 1973

USAR

38 Army Reserve officers on statutory 4-year tours in the Office, Secretary of Defense, Department of Army, and Army Commands. Cost: RPA $946,491. 23 officers (plus 9 statutory tour officers included above) and 41 civilian employees in the Office, Chief of Army Reserve, Department of the Army. 758 officers and 1,256 enlisted personnel of the Active Army as advisors to Army Reserve units.

Fiscal year 1972 employment of 7,142 civilian unit technicians.

Cost: Program 5, OMA, $69,545,000.

ROTC

9 officers and 3 civilian employees in the Office, Deputy Chief of Staff for Personnel, Department of the Army.

82 officers, 20 enlisted, and 152 civilian employees at field headquarters. 1,680 officers and 1,182 enlisted personnel of the Active Army as PMS for Senior Division, and 508 civilian employees for administrative support of PMS. 28 officers and 59 enlisted personnel of the Active Army for Junior Division. 540 retired officers and 707 retired enlisted on contractual employment as instructors at Junior Division units.

REPROGRAMING OF FUNDS

Chairman ELLENDER. Have there been any instances of reprograming of funds for the Army Reserve in the past year?

General ROBERTS. Yes, sir. There is currently pending for congressional approval a transfer of $28,658,000 from the "Defense stock fund account" to "Reserve personnel, Army" appropriations; $20,044,000 will provide for an increase in active duty for training for newly commissioned ROTC graduates not being called to active duty due to reductions in requirements for Active Army accessions; $8,614,000 will provide for the increase in ROTC subsistence allowance authorized in Public Law 92–171 and the subsistence associated with the increase in scholarships authorized in Public Law 92–166.

PAY ACT INCREASES

Chairman ELLENDER. Please indicate for the record all pay act increases for fiscal years 1971, 1972, and contemplated for 1973 together with the cost.

General ROBERTS. Yes, sir. I will provide that information for the record.

(The information follows:)

Fiscal year and date	Public law or Executive order	Appropriation requests (thousands)
1971:		
Jan. 1, 1970	Executive Order 11525	$17,550
Jan. 1, 1971	Executive Order 11577	8,300
1972:		
Jan. 1, 1971	Executive Order 11577	21,239
Nov. 14, 1971	Public Law 92–129	50,258
Jan. 1, 1972	Executive Order 11638	11,968
1973:		
Nov. 14, 1971	Public Law 92–129	79,277
Jan. 1, 1972	Executive Order 11638	27,334

CHANGES IN PERSONNEL STRENGTH

Chairman ELLENDER. As you have in the past, would you please provide the committee with a step-by-step tabulation of all major changes in personnel strength in the past year?

General ROBERTS. Yes, sir. I will provide that information for the record.

(The information follows:)

	Army Reserve Selected Reserve		
	Officer	Enlisted	Total
Fiscal year 1971:			
July 1, 1970	34,399	226,354	260,753
July 31, 1970	34,054	226,775	260,829
Aug. 31, 1970	34,144	226,946	261,090
Sep. 30, 1970	34,047	226,021	260,068
Oct. 31, 1970	34,148	225,790	259,938
Nov. 30, 1970	34,145	226,306	260,451
Dec. 31, 1970	34,746	227,031	261,777
Jan. 31, 1971	35,059	227,444	262,503
Feb. 28, 1971	35,118	227,204	262,322
Mar. 31, 1971	35,427	227,163	262,590
Apr. 30, 1971	35,721	228,228	263,949
May 31, 1971	35,584	227,715	263,299
June 30, 1971	36,029	228,303	264,332
Fiscal year 1972:	35,712	225,503	261,215
July 31, 1971	35,698	222,996	258,694
Aug. 31, 1971	36,183	218,751	254,934
Sep. 30, 1971	36,304	215,588	251,892
Oct. 31, 1971	36,551	212,800	249,351
Nov. 30, 1971	36,688	210,472	[1] 247,160
Dec. 31, 1971			
Jan. 31, 1972			

[1] Preliminary.

SERVICE REQUEST FOR 1973

Chairman ELLENDER. Please provide the committee with a statement describing the original request made by the department for fiscal year 1973 for this appropriation together with any guidelines preimposed.

General ROBERTS. The fiscal year 1973 Reserve personnel, Army request submitted to Office, Secretary of Defense was consistent with the approved fiscal year 1973 program. That guideline could be exceeded by authorized add-ons such as pay raise. Our original budget request was for $484,840,000. This amount was to support the USAR troop structure, a 260,000 strength, the REP–63 training program, additional readiness training, school and special training, and the ROTC. This amount included the November 14, 1971 military compensation increase; but excluded the January 1, 1972 pay raise and the recently enacted ROTC legislation for subsistence and scholarships.

CHANGES IN FORCE STRUCTURE

Senator YOUNG. Indicate for the record all major changes in force structure that have been programed for fiscal year 1973.

General ROBERTS. No major changes in force structure of the Army Reserve have been programed for fiscal year 1973.

REIMBURSABLE OBLIGATIONS

Chairman ELLENDER. Please describe the items marked "Reimbursable obligations" on page 3 of the justifications.

General ROBERTS. Reimbursable obligations include collections for meals served to officer personnel on active duty for training who subsist in the field with enlisted messes, cross service feeding for Army Reserve personnel and Reserve Officer Candidates (ROTC). In addition, in fiscal year 1973, the selective service augmentation units will be paid from the selective service budget on a reimbursable basis to RPA. The "Personnel benefits, military personnel" covers the base pay and allowances of these officers. The "Travel and transportation of persons" covers travel and per diem incident to their training. The "Supplies and materials" are appropriation reimbursements for sale of subsistence, sale of clothing, and collections representing food and operating costs for meals served to authorized personnel on a reimbursable basis.

Chairman ELLENDER. Proceed.

RESERVE OFFICERS' TRAINING CORPS

General ROBERTS. The Senior division of the ROTC produces junior officers for the Active Army and Reserve components. The program is operated at selected civilian and military colleges.

For the Senior division, the budget provides training for a fiscal year 1973 entering enrollment of 56,400. We expect to commission approximately 9,200 junior officers at end fiscal year 1972 and 6,200 at end fiscal year 1973. This compares with commissions of almost 17,000 during fiscal year 1968—fiscal 1970.

For the junior division, an enrollment of 120,000 is budgeted for fiscal year 1973.

RESERVE OFFICER CANDIDATES ENROLLMENT

Chairman ELLENDER. At this point in the record there will appear the tabulation from the justifications entitled, "Reserve Officer Candidates (ROTC) Enrollment."

(The information follows:)

DEPARTMENT OF THE ARMY FISCAL YEAR 1973 BUDGET ESTIMATES

RESERVE OFFICER CANDIDATES (ROTC) ENROLLMENT

	Fiscal year 1971			Fiscal year 1972			Fiscal year 1973		
	Actual ingoing	Average	Actual outgoing	Actual ingoing	Average	Estimated outgoing	Estimated ingoing	Average	Estimated outgoing
MS–I	31,703	27,726	23,748	21,998	19,249	16,500	25,000	21,900	18,800
MS–II	16,850	15,015	13,180	10,359	9,229	8,100	16,000	14,250	12,500
MS–III	11,014	10,726	10,438	7,800	7,600	7,400	8,500	8,275	8,050
MS–IV	14,396	13,707	13,018	10,077	9,938	9,800	6,900	6,600	6,300
Basic	48,553	42,741	36,928	32,357	28,478	24,600	41,000	36,150	31,300
Advanced	25,410	24,433	23,456	17,877	17,538	17,200	15,400	14,875	14,350
Total	73,963	67,174	60,384	50,234	46,016	41,800	56,400	51,025	45,650
Advanced camp	10,674	.....	10,018	8,500	.....	8,000	8,000	.....	7,500
Basic camp	1,736	.....	1,615	2,000	.....	1,850	1,500	.....	1,400
Junior division	99,113	.....	89,249	93,843	.....	85,000	120,000	.....	108,000
Commissioned	.....	.....	13,970	.....	.....	[2] 9,200	.....	.....	[2] 6,200

[1] Includes foreign students:

MS I	70
MS II	50
MS–III	20
MS IV	10
Total	150

[2] Estimated commissioned from outgoing MS–IV.

ENROLLMENT

Chairman ELLENDER. The tabulation indicates that you estimate an average number of 51,025 enrollees in fiscal year 1973, an increase over the 46,016 in fiscal year 1972. Please comment.

General TACKABERRY. The estimated modest average increase of approximately 5,000 enrollees in fiscal year 1973 can be attributed to several factors. The recent passage into law of the ROTC scholarship and subsistence legislation coupled with the establishment of nine new senior ROTC units to begin enrolling in school year 1972–73 will directly contribute to an increase in enrollments. I believe the steady conversion of ROTC from a mandatory to an elective program which has taken place in the past several years has run its course; thus the decline in enrollments is expected to stabilize next year. The entire climate has changed on the campuses. Incidents are down to almost imperceptible levels as reason is replacing emotion which will assist in our recruiting efforts thus contributing to an increase in enrollments.

QUALIFIED PERSONNEL

Senator YOUNG. Do you refuse to accept qualified individuals for ROTC?

General TACKABERRY. All qualified individuals desiring to participate in ROTC are accepted into the program.

UTILIZATION OF ROTC GRADUATES

Chairman ELLENDER. The table indicates that you expect to have 9,800 "outgoing" ROTC graduates in fiscal year 1972 and 6,300 in fiscal year 1973. What percentage of those do you anticipate immediate utilization?

General TACKABERRY. From the estimated "outgoing" ROTC graduates of 9,800 in fiscal year 1972 and 6,300 in fiscal year 1973 you will note at the bottom of the table we estimate that 9,200 ROTC officers will be commissioned from "outgoing" MS IV in fiscal year 1972 and 6,200 commissioned from "outgoing" MS IV in fiscal year 1973. With the exception of those ROTC graduates entering graduate delay, who will be utilized in subsequent years, there will be a 100 percent immediate utilization of ROTC officers by either the Active Army or Reserve components in fiscal years 1973 and 1974 subsequent to training at the branch basic officer courses. In fiscal year 1973, almost 50 percent of ROTC officers commissioned from "outgoing" MS IV in fiscal year 1972 will be ordered to active duty for their obligated period. The remainder will receive active duty for training for a period of 3 to 6 months as required by law and then released for duty with the Reserve components. In fiscal year 1974 approximately 65 percent of the ROTC officers commissioned from "outgoing" MS IV in fiscal year 1973 will be ordered to active duty for their obligated period while the remaining 35 percent will be ordered to active duty for training and released to the Reserve components.

RESERVE OFFICER CANDIDATES

Chairman ELLENDER. At this point there will appear a tabulation of Reserve officer candidates by budget project.

(The information follows:)

3300—RESERVE OFFICER CANDIDATES (ROTC)

[In thousands of dollars]

Budget project account No. and title	Fiscal year— 1971 actual	1972 estimate	1973 estimate
3310: Senior ROTC	19,767	20,534	18,970
3320: Scholarship program	3,629	7,251	8,045
3330: Junior ROTC	1,768	482	707
Total direct obligations	25,164	28,267	27,722

JUSTIFICATION

Budget Program 3300 provides funds for direct military personnel costs of subsistence allowance, clothing, pay and allowances for summer camp training, subsistence and travel for members of Reserve Officers' Training Corps, as authorized under the provisions of Public Law 88-647, dated October 13, 1964, and Public Law 89-51, dated June 28, 1965.

This estimate is based on an enrollment of 56,400 cadets in the Senior Division and 120,000 cadets in the Junior Division in fiscal year 1973. The program includes an attendance at advanced summer camp training of 8,000 in July 1972 and 7,500 in June 1973, and at basic summer camp training of 2,000 in July 1972 and 1,500 in June 1973.

It is estimated that 9,200 second lieutenants will be commissioned from the program at end of fiscal year 1972 and 6,200 will be commissioned at end of fiscal year 1973.

ROTC NEW UNITS

Chairman ELLENDER. Do you anticipate having any additional units in fiscal year 1973?

General TACKABERRY. We will begin enrolling cadets in fiscal year 1973, at the following new institutions:

Bishop College,[1] Dallas, Tex.; Carson-Newman College, Jefferson City, Tenn.; Columbus College, Columbus, Ga.; Fort Valley State College,[1] Fort Valley, Ga.; Indiana Institute of Technology, Fort Wayne, Ind.; Northwestern State College, Alva, Okla.; Pennsylvania State University, Delaware County Campus, Media, Pa.; Saint Augustine's College, Raleigh, N.C.; and Southern State College, Magnolia, Ark.

Additionally, 11 new ROTC units were established and began enrolling cadets in September 1971. Those schools established were:

Alabama A. & M. College,[1] Alcorn A. & M. College,[1] Austin Peay University, Campbell College, East Central State College, Missouri Western College, Southwestern State College, University of Wisconsin, Platteville, University of Tampa, Weber State College, and University of Wisconsin, LaCrosse.

ROTC CANCELLATIONS

Senator YOUNG. Indicate for the record those colleges and universities who have indicated any changes in their ROTC status for fiscal years 1972 and 1973, including cancellations, academic recognition, et cetera.

General TACKABERRY. I will be glad to do so.

(The information follows:)

Three SROTC units will terminate their programs in fiscal years 1972 and 1973. These are:

City College of New York	30 Jun 72
Stanford University	30 Jun 73
Oklahoma Military Academy	30 Jun 73

Princeton University withdrew its request to terminate its ROTC program which was schdeuled for June 30, 1971. A contract was signed in January and students will begin enrolling in September 1972.

A total of 16 SROTC units were converted from required to an elective basic program for school year 1971–72. The trend to elective programs has been continuing over the years. For example, in fiscal year 1962, 66 percent of all programs were required, while in fiscal year 1972, 10 percent were required. This is in keeping with the trends in modern education.

ROTC AT LAND-GRANT COLLEGES

Senator YOUNG. Have any land-grant colleges or universities changed their ROTC status or requested a change in that status in the past year?

General TACKABERRY. No.

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[1] Minority institutions.

SENIOR ROTC

Chairman ELLENDER. For "Senior ROTC" the fiscal year 1973 request is $18,970,000. For fiscal year 1972, the amount provided was $20,534,000. Please comment on the reductiton.

General ROBERTS. This is a net reduction resulting from the change between fiscal years 1972 and 1973, in the advanced course enrollment which utilizes the majority of funds in this account. For fiscal year 1972, there are 17,877 advanced course cadets enrolled, and the fiscal year 1973 enrollment is estimated to be 15,400. While the basic course enrollment should increase in fiscal year 1973, there are costs such as subsistence allowance and summer camp training that are associated only with the advanced course.

Chairman ELLENDER. Describe the emoluments provided these personnel.

General TACKABERRY. Cadets receive the following emoluments:

(*a*) Subsistence allowance if on scholarship or in the advanced course.

(*b*) Pay allowance and subsistence for cadets at the ROTC summer camps.

(*c*) Travel pay for cadets to and from ROTC summer camps.

(*d*) Travel pay incident to appointment and upon discharge as a scholarship cadet.

RANGER TRAINING

Senator YOUNG. To what degree do ROTC personnel actually participate in ranger training?

General TACKABERRY. Last year—summer 1971—220 selected ROTC cadets attended Ranger training in lieu of advanced camp. Of this number, 198 completed at least 6 weeks and received credit for completion of advanced camp; 140 graduated and were awarded the Ranger Tab. This training is leadership oriented and will provide highly motivated cadets to the college campus. Plans are to double the size of the program to allow 480 cadets to participate during the summer of 1972.

COOPERATIVE TRAINING

Chairman ELLENDER. What is meant by cooperative training?

General TACKABERRY. This is a program whereby ROTC cadets voluntarily train with Army Reserve and National Guard units. This training is conducted on weekends during the school year. The purpose of the instruction is to support university military science departments by providing essential resources for practical field training. Additionally, it provides quality training, motivation, and unique instructional experience for Army Reserve and National Guard instructor personnel. The subjects include mapreading, land navigation, rifle marksmanship, basic infantry tactics, evasion and escape, night patrolling, first aid, staff planning, and garrison living. Through this program we have added interest to the cadets' training; and we have removed an irritant, subjects dealing with purely military skills, from the college campus. This cooperative training has been enthusiastically accepted by all personnel involved.

ARMY ORIENTATION TRAINING (AOT)

Senator YOUNG. What does Army orientation training consist of?

General TACKABERRY. After completion of summer camp, each AOT participant is assigned to a company level combat arms unit where he will perform the duties of a junior officer under close supervision. Only one cadet will be assigned to each company. The cadet will gain practical experience in performing the duties of a platoon leader. He will participate in the command, training, and administrative functions at company level. Additionally, he is oriented in the daily professional and social life of the officers' corps. The AOT program is patterned from the AOT conducted by the U.S. Military Academy for its cadets. The purpose is to provide cadets firsthand knowledge of the duties, responsibilities, and living conditions of junior officers which they can share with their fellow cadets on the college campus. Plans are to allow one cadet from each senior ROTC unit to participate in this program during summer of 1972.

PARACHUTE TRAINING PROGRAM

Chairman ELLENDER. Describe the parachute training program.

General TACKABERRY. Approximately 600 cadets have completed this training on a voluntary, no-expense-to-the-Government basis since it was offered 2 years ago. The training is identical to that given to Active Army personnel and is conducted by the airborne school at Fort Benning, Ga. This training provides a highly motivated cadet to the professor of military science, with extra confidence and military experience, who can greatly assist in the ROTC recruiting effort.

SCHOLARSHIP PROGRAM

Chairman ELLENDER. For the "scholarship program," the fiscal year 1973 request is $8,045,000. The amount provided for fiscal year 1972 was $7,251,000. Explain the increase requested.

General TACKABERRY. On November 24, 1971, Congress authorized an increase in the total number of scholarships in effect from 5,500 to 6,500. On the same date, it authorized an increase in the amount of subsistence allowance paid to scholarship recipients from $50 per month to $100 per month. This necessitated the increased funding request.

Senator YOUNG. Describe the scholarship program, including the emoluments provided.

General TACKABERRY. The Army ROTC scholarship program is designed to offer financial assistance to outstanding young men in the senior ROTC program, who are interested in the Army as a career. The scholarships are awarded for 1, 2, 3, and 4 years on a competitive basis. The Army is currently authorized 6,500 scholarships. Scholarship recipients may attend any institution which hosts the ROTC program. The scholarship pays tuition, fees, books, and laboratory expenses required for the courses of instruction, $100 per month subsistence allowance, and initial travel to the institution. Scholarship cadets incur a 4-year active duty obligation.

ATTITUDES TOWARD ROTC

Chairman ELLENDER. Describe the attitude generally of the college students toward the ROTC program on campus.

General TACKABERRY. Campuses vary, but general attitudes throughout the Nation have improved greatly. A few hard-core dissidents try to incite anti-ROTC activity, but the number of dissident acts this year are negligible, and none has disrupted the program. The innovative steps taken by the Army to improve the ROTC program have made the program more acceptable to the college student.

ANTI-ROTC DISSIDENCE

Chairman ELLENDER. Indicate specific instances in which during the past year any disturbances have taken place in colleges or universities in connection with the ROTC program.

General TACKABERRY. Anti-ROTC dissidence has declined significantly the past 2 years. During school year 1970–71, the rate was about one-third that of school year 1969–70. For the current year, the rate has dropped even more sharply. Only 14 incidents have occurred, with no injuries and little property damage. Specific instances are listed below:

No. and date	Location	Incident
1 July 9, 1971	University of Texas, Arlington	Files in ROTC office thrown on floor during night.
2 Aug. 3, 1971	University of San Francisco	4 tires and 2 seatbelts cut on ROTC military vehicle; estimated damage, $150.
3 Sept. 10, 1971	University of Wisconsin	Unknown substance poured into fuel tank of ROTC military sedan.
4 Sept. 15, 1971	Ohio University, Athens	Janitor found 2 dynamite sticks wired outside window of ROTC building; fuzed but no blasting cap.
5 Sept. 15, 1971	Southeastern Louisiana University	2 windows broken in ROTC building during the night.
6 Oct. 3, 1971	University of Tampa, Fla	Window smashed by unignited firebomb thrown into ROTC administration office.
7 Oct. 10, 1971	Bowling Green State University, Ohio	Fire set in ROTC office 0200 hours by arsonist who gained entry through a window, damage of $500 to non-Federal property.
8 Oct. 11, 1971	University of Texas, Austin	Anti-ROTC slogans painted on buildings and vehicle.
9 Oct. 13, 1971	University of Oklahoma, Norman	Anti-ROTC demonstration in front of ROTC armory, approximately 100 persons.
10 Oct. 13, 1971	University of Wisconsin, Milwaukee	Anti-ROTC demonstration on lawn of ROTC detachment, approximately 30 persons.
11 Oct. 13, 1971	Clarkson College, Potsdam, N.Y.	Firebombing at approximately 2200 hours, superficial damage to rear of ROTC administration building.
12 Oct. 30, 1971	Florida State University, Tallahassee	Anti-ROTC slogans painted on ROTC and other buildings.
13 Nov. 19, 1971	North Carolina A. & T. State University, Greensboro.	3 rocks thrown through glass of ROTC front door.
14 Nov. 29, 1971	Polytechnic Institute of Brooklyn, N.Y.	Theft of field uniform and field equipment.

JUNIOR ROTC

Chairman ELLENDER. For "Junior ROTC" the fiscal year 1973 request is $707,000. This is an increase over the $482,000 provided for fiscal year 1972. Please justify the increase.

General ROBERTS. The fiscal year 1972 actual ingoing enrollment is 93,843 and the fiscal year 1973 projected enrollment is 120,000. This is an increase of 26,157 students who will require the initial issue of clothing.

NEW JUNIOR ROTC PROGRAMS

Chairman ELLENDER. Indicate the number of new Junior ROTC programs initiated in fiscal year 1972 and those contemplated for fiscal year 1973.

General TACKABERRY. There have been 41 Junior ROTC units established thus far in fiscal year 1972. We estimated that approximately 40 institutions will request the program in fiscal year 1973. The trend is toward greater interest in the program, so this may be a conservative figure.

DISCONTINUANCE OF JUNIOR ROTC PROGRAMS

Senator YOUNG. Have any junior programs been discontinued in the past year and are any contemplated in fiscal year 1973. If any, please provide the reason therefor.

General TACKABERRY. Yes, 21 institutions dropped the program and in each case it was at the request of the host institution. Most of these schools had problems with declining finances and low enrollments. A few schools had to drop the program because of restructuring of the school system. The enrollment picture has been influenced by anti-military feelings but this apparently is on the decline. We anticipate some institutions withdrawing from the program next year because of financial problems; however, we have no estimated number.

General ROBERTS. Mr. Chairman, this completes my opening statement.

We appreciate the opportunity of appearing before you to present our fiscal year 1973 budget.

I will be pleased to respond to any program or policy questions you may have after this statement or perhaps after General Greenlief has read his.

OFFICER AND ENLISTED ADVISORS: POSSIBLE JOINT TRAINING COMPONENTS

Chairman ELLENDER. A while ago, I asked the question about using the same facilities. I am now thinking of the possibility of joint training. You indicated that you have a certain number of Regulars training the Reserves.

General ROBERTS. Yes, sir. We have advisors, 785 officer advisors, in the Army Reserve now and about 1,200 enlisted personnel assigned to the Army Reserve.

Chairman ELLENDER. How many do we have for the National Guard?

General GREENLIEF. We have 1,900. Of that, 758 are officers and the balance are enlisted men. Their job, however, is not to train the Guard but to supervise the conduct of training by Guard officers.

SHARING OF COMPONENT FACILITIES

General ROBERTS. To answer the question on joint use of facilities, the Army Reserve has 1,019 Reserve centers. Of these centers, 18 percent are now joint utilization, but not all of these with the Guard. Some of them are with the Navy or Marine Reserve.

We have a new center under construction. It was just authorized the day before yesterday, and will be in joint usage with the Army Guard.

Where centers are considered for construction, they are presented to the State Board, consisting of Guard and Reserve personnel, who take a close look at this to see if maximum utilization is going to be achieved.

Of course, very frequently we will have a Reserve center in a town which will have no Guard armory and vice versa.

QUESTIONS BY SENATOR THURMOND

Chairman ELLENDER. Senator Thurmond was unable to be here today but has asked that responses to questions he has supplied will be answered for the record. Please be good enough to provide the requested answers.

(The questions and answers follow:)

ARMY RESERVE SHORTFALL

Senator THURMOND. General Roberts, while the Army Reserve enlisted strength shortfall is significant I note in general terms the Army is doing better than other reserve components. Why do you think this is the case?

General ROBERTS. Considering all circumstances, I think we are doing a good job and I credit this to the following reasons:

1. Our early recognition of the downward trend and a determined effort on the part of our unit commanders to recruit both prior and nonprior service personnel. Also, in anticipation of FY 1972 losses we entered the fiscal year at a good strength position.
2. Our wide diversity of specialties which offer attractive training opportunities in practically any field of interest.
3. The upgrading in both quantity and quality of equipment which provided for more meaningful training.
4. A concerted effort to attract both male and female members of all races.

G/H SERIES TOE IMPACT ON READINESS

Senator THURMOND. Has the conversion to the G/H series TOE impacted on readiness?

General ROBERTS. The conversion to the G/H series TOE's started in August 1971 and is scheduled to be largely completed by 15 March 1972. The adjustments caused by the conversion resulted in temporarily lower readiness from some units being newly activated to replace inactivated units no longer required in the force structure. However, the readiness status of the majority of our units is affected very little by the conversion. The conversion theoretically lowered the reported unit logistic readiness due to generally increased equipment authorizations without simultaneous corresponding increase in assets. However, the change has emphasized the need to increase equipment issues to USAR units and to relax requisitioning restrictions. Units designated for early deployment were assigned project codes to insure priority of issue and insure that their demands would remain on the Army Supply System until filled. Through intensive logistics management these units are being issued equipment to reach the higher equipment authorizations of the G/H series TOE.

MAINTENANCE OF NEW EQUIPMENT

Senator THURMOND. Does the Army have the capability to adequately maintain this new equipment?

General ROBERTS. Adequate space for our maintenance program is a problem in some locations. However, we have been able to meet maintenance requirements by leasing facilities, doubling-up in existing shops, and by locating some equipment away from the home station of the unit. To date, lack of maintenance space has not had any serious effect on equipment readiness.

ENLISTED RETENTION RATE

Senator THURMOND. What is the enlisted retention rate in the Army Reserve today as compared with past years?

General ROBERTS. Our immediate reenlistment rate of combined REP 63 and career personnel was about 9% during FY 1967–70 and rose to approximately 16% by mid FY 1972.

Senator THURMOND. What rate of retention is desired?

General ROBERTS. We strongly desire to retain our highly effective personnel, both officer and enlisted, until they become eligible for retirement. As a practical matter, our immediate goal is to reenlist at least 10% of our REP members during calendar year 1972, with an ultimate goal of up to 20%. Our reenlistment contracts may be for 1, 2, 3, 4, 5 or 6 years. Our goal for reenlistment of our "career reservists" is 95%.

TRAINING IMPROVEMENT

Senator THURMOND. What is being done to improve training in the Army Reserve?

General ROBERTS. There has been good improvement in training in the Army Reserve during the past eighteen months. Many of our equipment shortages are being eliminated and this is accelerating training. Many units are now training with their Active Army counterparts and benefitting from this training. Enrollment in our USAR Schools is at an alltime high. These schools are providing excellent MOS and professional instruction and the students appear to be highly motivated. Annual training was excellent last year and is expected to improve further this year.

In addition, the USAR is making good progress in improving training facilities and training sites. We have an approved program to provide completely adequate training facilities within the next nine years. Fourteen modern, highly functional facilities are under construction from Fiscal Year 1971 funds. In Fiscal Year 1972, 51 major projects are in process. These will be followed by 40 major projects in Fiscal Year 1973.

We plan to sustain this rate until the program is completed. Each completed project represents a completely integrated training complex with all home station requirements fully provided. These facilities must naturally be balanced against our need for local field training areas, ranges, and annual training installations. All elements of the program are included in our Long Range Facility Plan. Momentum has been achieved and the program is well under way with our highest priority units being accommodated during the initial years.

The acquisition and retention of local training areas is one of our objectives. We screen excess Federal Property Reports in the interest of filling our requirements. Many ideal training sites are also ideal park or recreation sites. In each case we are making major efforts to assure a joint use capability for our local Federally-owned training areas. Since much of our training in local areas occurs on weekends, a conflict may exist, but we are attempting to reduce these areas of conflict.

Our annual training installations are mostly inactive Army installations. These suffer from age, mostly being WW II or earlier; however, we are improving these training and logistic facilities with new construction and rehabilitation. Construction projects at these installations were initiated in Fiscal Year 1971 in the $350,000 range, expanded to $500,000 in Fiscal Year 1972, and we plan a program of about $1,000,000 in Fiscal Year 1973. We will continue to improve this part of the program in the future.

In summary, review of Training Reports, inspections, and periodic staff visits by the DA staff, Office, Chief Army Reserve staff, CONARC staff, CONUS Army staffs and ARCOM staffs, indicate considerable training progress and that USAR units are making a concerted effort to further improve their training.

NEW INCENTIVES

Senator THURMOND. If new incentives are needed which ones would the Army desire first?

General ROBERTS. In my personal opinion we need an enlistment and reenlistment bonus. The enlistment bonus should insure an adequate input of new recruits into the Army Reserve each year. The reenlistment bonus should reduce

the need for new recruits, reduce heavy REP training costs, and more importantly, greatly increase unit readiness through retention of trained personnel. Also needed is an earlier threshold for retirement and full-time SGLI coverage.

Geographical Effect of Recruit Retention

Senator Thurmond. Does recruit retention vary significantly from a geographical standpoint?

General Roberts. Yes, sir. Our reports show that immediate reenlistments of REP 63 personnel for October–December 1971 were First Army 6.6%, Third Army 10.3%, Fifth Army 4.4%, and Sixth Army 2.6%.

Recruiting at High School and Colleges

Senator Thurmond. What has been the success of Army recruiters in getting admitted to high school and college campuses?

General Roberts. To preclude interference of REP–63 training with high school education, Army policy has been that the Army Reserve not pursue the enlistment of high school seniors. Therefore, we have had no on-campus recruiting program. However, a policy change now being disseminated authorizes the enlistment of high school seniors who are within 120 days of graduation, and requires that such students recruited will not be ordered to REP–63 initial training prior to their graduation from high school. Our objective is to select as Army Reserve recruiters persons who have personal standing in the community and would be welcomed or admitted to the campus, and we do not anticipate any unusual problems in this respect. As to admittance to college campuses, the Army Reserve has no established on-campus college recruiting program.

Reenlistments of One Year

Senator Thurmond. Why are such a large number of the Army's reenlistments for only 1 year?

General Roberts. Many members choose the one year term because it currently gives them all of the advantages that a longer reenlistment contract offers, plus the opportunity to reconsider in 12 months. Within our immediate reenlistments, an increasing percentage are for one year only, having increased from about 42% in July 1970 to approximately 76% in January 1972. Army Reservists tell me that one reason for the increased percentage is the expectation of a reenlistment bonus. We would expect reenlistment for longer periods when reenlistment bonuses are authorized.

National Guard Personnel, Army

Statement of General Greenlief

BUDGET REQUESTS

Chairman Ellender. The next witness will testify on two appropriations: "National Guard Personnel, Army" and "Operation and Maintenance, Army National Guard."

For "National Guard Personnel," fiscal year 1973 request is for $616,250,000, as compared with $597,035,000 for fiscal year 1972, which includes $33,950,000 for the January 1, 1972, pay increase.

For "Operation and Maintenance, Army National Guard," the fiscal year 1973 request is for $468,510,000, as compared with $380,067,000 for fiscal year 1972, which includes $8,310,000 for the January 1, 1972 raise.

PROGRAM FINANCING

Chairman Ellender. At this point in the record there will appear certain program and financing information from the justifications.

(The information follows:)

DEPARTMENT OF DEFENSE, MILITARY—NATIONAL GUARD PERSONNEL, ARMY

PROGRAM AND FINANCING (IN THOUSANDS OF DOLLARS)

	1971 actual	1972 estimate	1973 estimate
Program by activities:			
Direct program:			
1. Reserve component personnel	442,634	597,035	616,250
Reimbursable (total)	797	900	2,393
Total obligations	443,431	597,935	618,643
Financing:			
Receipts and reimbursements from:			
Federal funds	−164		−1,493
Non-Federal sources [1]	−633	−900	−900
Unobligated balance lapsing	2,550		
Budget authority	445,184	597,035	616,250
Budget authority:			
Appropriation	426,584	485,954	582,300
Transferred from other accounts	18,600		
Appropriation (adjusted)	445,184	485,954	582,300
Proposed supplemental for Military Pay Act increases		91,946	
January 1972 pay increase supplemental/amendment		19,135	33,950

[1] Reimbursements are derived from sale of meals and clothing to service members (10 U.S.C. 4621).

Note: The amounts shown as January 1972 pay increase supplental/amendment are not distributed to each individual appropriation in the fiscal year 1973 President's budget, but are reflected as a 1-line defense-wide contingency amount. The amounts shown above are estimates, pending final determination of the amounts to be requested when supplemental and amended estimates are formally transmitted.

MILITARY PERSONNEL APPROPRIATION COMPONENTS

Chairman ELLENDER. The principal witness will be Maj. Gen. Francis S. Greenlief, Chief of the National Guard Bureau.

You may proceed, General Greenlief.

General GREENLIEF. Mr. Chairman and members of the committee: I welcome the opportunity to appear before you to report on the functions and activities of the Army National Guard.

We are here today to request funds to provide the necessary pay, allowances, subsistence, clothing, and travel for training and readiness of Army National Guard personnel during fiscal year 1973.

The fiscal year 1973 National Guard personnel, Army budget request is $616.2 million. This will support an average strength of 402,333, opening strength of 398,455, and ending at 402,455. Annualization of the military pay increase effective January 1, 1972, is included.

Before proceeding with the details of this budget, I should like to review certain accomplishments during fiscal year 1971, our major programs for fiscal year 1972, and to discuss program forecasts for fiscal year 1973.

STRENGTH

On June 30, 1971, the federally recognized strength of the Army National Guard was 402,175. The total number of officers and warrant officers was 30,263 and the number of enlisted personnel was 371,912. The average strength for the year was 400,842. The fiscal year 1972 program provides for an Army National Guard average strength of 400,821.

ENLISTMENT AND REP PROGRAM AND RECRUITING OF PRIOR SERVICE PERSONNEL

Authorized strength levels are maintained by Army National Guard units through enlistment of prior service personnel and the recruitment of nonprior service personnel who are required to take active duty training with the Army.

The active duty training required for all recruits under this program varies from a minimum of 4 months to that period required for military occupational specialty qualification. In fiscal year 1971, 70,000 recruits entered training. The average period of active duty training was approximately 5½ months.

The budget was based on an anticipated backlog of nonprior service personnel awaiting training at end of fiscal year 1972 of approximately 16,668, and 13,939 for fiscal year 1973.

FORCE STRUCTURE

Chairman ELLENDER. Please comment on any changes in force structure programed for fiscal year 1973.

General GREENLIEF. There are no changes in the force structure programed for fiscal year 1973.

In an effort to maintain the authorized ARNG strength, the National Guard Bureau and the States are continuing their drive to increase the numbers of prior service personnel in our units. In this drive we are also seeking to increase the number of personnel who will remain in the Army National Guard after their 6-year military service obligation has been completed.

The Army National Guard inaugurated a special recruiting and retention campaign called Try One in the Guard in February 1970. The "Try One" program is designed to provide prior service personnel with a 1-year enlistment option and the opportunity to look at the Guard from the inside without a lengthy commitment. This program is continuing through fiscal year 1972.

The program also provides guardsmen who are nearing ETS with the option of a 1-year extension at a critical time in their enlistment when they are trying to decide about becoming a career guardsman. This is particularly aimed at the guardsman who is completing his 6-year obligation.

The initiation of the Reserve Component Active Army in-service recruiting program in August 1971, and its worldwide expansion on January 3, 1972, has resulted in over 4,000 enlistments in the ARNG as of January 20, 1972. This program offers the active duty serviceman the option of an early out from active duty if he volunteers to join, and is accepted by, an ARNG unit.

Individuals taking advantage of this program must serve a minimum of 1 year with the Guard. Personnel coming in the ARNG under this program are included in the "Try One" campaign. Their experience will be sorely needed in the future in the face of the continued and accelerated loss of World War II and Korean war veterans and the Defense stated policy of placing increased reliance on the Army National Guard.

In fiscal year 1971, the ARNG had enlisted over 10,600 prior service personnel, and in fiscal year 1972, to date, prior service enlistments, as a result of the expanded in-service recruiting program alone are well above program.

Total prior service enlistments through November are over 8,600. It is anticipated that accelerated prior service enlistments will continue to increase through the remainder of fiscal year 1972.

A number of brochures and pamphlets aimed not only at prior service but non-prior-service personnel have been published. Spot radio and TV announcements have also been distributed to radio and TV stations throughout the Nation.

NATIONAL GUARD PERSONNEL BY BUDGET PROJECT

Chairman ELLENDER. At this point in the record there will appear a tabulation from the justifications entitled, "National Guard personnel" by budget project.

(The information follows:)

NATIONAL GUARD PERSONNEL, ARMY—3100 NATIONAL GUARD PERSONNEL

[In thousands of dollars]

Budget project account	Title	Actual fiscal year 1971	Estimate	
			Fiscal year 1972	Fiscal year 1973
	Direct obligations:			
1-A	Training, pay group A 3110	325,787	384,573	431,649
1-D	Training, REP, pay group F 3120	92,479	184,119	152,518
1-E	School training 3130	17,780	21,460	20,936
1-F	Special training 3140	2,598	3,322	7,435
1-G	Administration and support 3150	3,990	3,561	3,712
	Total direct obligations	442,634	597,035	616,250
	Reimbursable obligations	797	900	2,393
	Total obligations	443,431	597,935	618,643

NATIONAL GUARD PERSONNEL IN PAID STATUS

Chairman ELLENDER. Also at this point there will appear the table entitled, "National Guard Personnel In Paid Status."

(The information follows:)

NATIONAL GUARD PERSONNEL IN PAID STATUS

	Pay groups	Paid drills	Paid days of active duty for training	Fiscal year 1971			Fiscal year 1972		Fiscal year 1973	
				Begin	Average	End	Average	End	Average	End
Officers	A	48	15	29,391	29,590	30,263	30,639	30,413	30,716	30,413
Enlisted men	A	48	15	337,293	339,486	345,125	332,078	324,120	345,029	340,842
Paid drill training:										
Officers				(29,391)	(29,590)	(30,263)	(30,639)	(30,413)	(30,716)	(30,413)
Enlisted men				(337,293)	(339,486)	(345,125)	(332,078)	(324,120)	(345,029)	(340,842)
Total				366,684	369,076	375,388	362,717	354,533	375,745	371,255
Officers	F	0								
Enlisted men	F	0	[1] 4	42,508	31,766	26,787	38,104	43,922	26,588	31,200
Total paid status:										
Officers				29,391	29,590	30,263	30,639	30,413	30,716	30,413
Enlisted men				379,801	371,252	371,912	370,182	368,042	371,617	372,042
Total				409,192	400,842	402,175	400,821	398,455	402,333	402,455

[1] Months minimum.

MILITARY OCCUPATIONAL SPECIALTY (MOS) TESTS

General GREENLIEF. The Army National Guard continued MOS testing of personnel during fiscal year 1971 and fiscal year 1972 and during fiscal year 1971 attained an overall qualified rate of 91.6 percent.

PROJECT VOLUNTEERS

Senator YOUNG. Please comment on Project Volunteer insofar as it relates to your budget request.

General GREENLIEF. With the reduction in Active Army strength and the reducing of military spending in many areas, it is absolutely imperative that the Reserve Forces take on a larger share of the defense burden. This means we must attain greater readiness, which will be achieved primarily through new equipment and training improvement. But this alone is not enough. The Reserve components, as well as the Active Army, must have attractive incentives. We have revitalized recruiting and retention programs as a necessary first step, and again this is not enough. We are in need and are awaiting the decision of higher authorities on the most critical incentive items—enlistment/reenlistment bonuses, survivor benefits, and improved retirement. There are no funds included in this budget request for these incentives.

CHANGES IN PERSONNEL STRENGTH

Chairman ELLENDER. Please detail the major changes in personnel strength in the past year.

General GREENLIEF. Yes, sir. The Army National Guard strength as of June 30, 1971, was 402,175 officers and enlisted men. As of December 31, 1971, the strength was 380,742. This is a net loss of 21,433. The following chart further shows the trend:

Month:	*Strength*
(*a*) June 30, 1971	402,175
(*b*) July 31, 1971	398,324
(*c*) Aug. 31, 1971	394,790
(*d*) Sept. 30, 1971	391,178
(*e*) Oct. 31, 1971	387,795
(*f*) Nov. 30, 1971	383,711
(*g*) Dec. 31, 1971	380,742
(*h*) Jan. 31, 1972	378,361
(*i*) Feb. 29, 1972	378,338

AUTHORIZED STRENGTH

Chairman ELLENDER. Please include in the record at this point a summary of the authorized strength attainment for fiscal year 1972.

General GREENLIEF. The total Army National Guard strength at the end of fiscal year 1971 was 402,175. During the first 6 months of fiscal year 1972, which ended on December 31, 1971, the strength of the Army National Guard declined to 380,742, reflecting a net loss in strength of 21,433. On basis of first 6 months, it appears that average mandated strength of 400,000 may not be achieved, but we hope to achieve an end strength on June 30, 1972, of 398,455.

AUTHORIZED STRENGTH ATTAINMENT PROBLEMS

Senator YOUNG. Please indicate any major difficulties encountered in attaining the authorized strength.

General GREENLIEF. Since we are now close to attainment of a zero draft environment and the creation of all-volunteer Army, we in the Reserve components realize that this transition will be one of the hardest tasks that lies ahead in the crucial make-or-break year of 1972. Our requirements have increased, yet our incentive posture has shown little or no progress. In fact, the National Guard finds itself in the precise position it forecast 1 year ago, when they said repeatedly that strength levels could not be maintained through fiscal year 1972 without the introduction of some new financial incentives. Most encouraging, however, is the sense of urgency that has been developed throughout the National Guard, with commanders at every level initiating do-it-yourself programs and activities to overcome these difficulties. I am highly optimistic that we will not only overcome these difficulties, but that we will attain our authorized strength.

Senator YOUNG. Do you visualize problems in strength attainment in fiscal year 1973?

General GREENLIEF. No, sir. Current projected losses for fiscal year 1973 are 69,970 officers and enlisted men. With the current vigorous recruiting and retention program now in progress, we have a good chance to attain our strength. However, it is going to be a long, hard road. The requirements for new incentives for the National Guard such as enlistment and reenlistment bonuses, improved retirement programs and survivor benefits are definitely needed to attain and maintain our authorized strength.

PRIOR AND NON-PRIOR-SERVICE PERSONNEL STRENGTH

Chairman ELLENDER. At this point in the record please provide a tabulation of prior and non-prior-service personnel strengths for the past several years and the estimate for fiscal year 1973.

General GREENLIEF. I would be glad to do so.

(The information follows:)

Since fiscal year 1969, the Army Guard prior and non-prior-service personnel strength is as follows: (enlisted personnel only)

Date	Total strength	Prior service	Percent	Non-prior service	Percent
June 30, 1969	358,522	63,100	17.6	295,422	82.4
June 30, 1970	379,801	66,845	17.6	312,956	82.4
June 30, 1971	371,912	57,647	15.5	314,265	84.5
June 30, 1972 (projected)	368,042	67,720	18.4	300,322	81.6
June 30, 1973 (projected)	372,042	66,968	18.0	305,074	82.0

MANPOWER PROCUREMENT PROGRAM

Chairman ELLENDER. At this point in the record there will appear the Army National Guard manpower procurement program for fiscal year 1973.

(The information follows:)

ARMY NATIONAL GUARD MANPOWER PROCUREMENT PROGRAM, FISCAL YEAR 1973

(Opens 398,455. Closes 402,455)

[Opening strength 398,455; Officers, 30,413; Enlisted personnel, 368,042]

Month	NPS enlistments take ACDUTRA	Other EM gains	Total EM gains	EM losses	Officer gains	Officer losses	Officers	Enlisted	Total	ACDUTRA input
July	6,822	1,008	7,830	6,360	865	460	30,818	369,512	400,330	4,508
August	5,344	1,030	6,374	6,175	580	395	31,003	369,711	400,714	5,128
September	5,335	1,274	6,609	5,665	480	415	31,068	370,655	401,723	3,381
October	5,445	1,150	6,595	5,695	445	490	31,023	371,555	402,578	4,057
November	4,712	1,134	5,846	4,940	300	400	30,923	372,461	403,384	3,494
December	2,839	987	3,826	3,780	335	380	30,878	372,507	403,385	1,916
January	3,882	1,158	5,040	4,930	360	485	30,753	372,617	403,370	4,628
February	3,082	1,129	4,211	5,265	325	430	30,648	371,563	402,211	5,248
March	5,253	1,336	6,589	5,280	350	505	30,493	372,872	403,365	6,762
April	4,319	1,378	5,697	5,615	420	585	30,328	372,954	403,282	4,703
May	4,415	1,222	5,637	5,495	420	505	30,243	373,096	403,339	4,902
June	3,022	1,194	4,216	5,270	620	450	30,413	372,042	402,455	7,273
Total	54,470	14,000	68,470	64,470	5,500	5,500				56,000
Average							30,716	371,617	402,333	

TRAINING

General GREENLIEF. The fiscal year 1973 budget provides for the conduct of 48 training assemblies, for all units except airborne. Airborne units are authorized 54 training assemblies.

During fiscal year 1971, the conduct of multiple unit training assemblies, generally one weekend per month and a 2-week annual training period continues to provide improvement in the ARNG level of training and combat readiness.

Our current training objective for 1972, is the successful completion of company level training, culminating with company level Army training tests (ATTS).

In fiscal year 1971, the percentage of attendance at inactive duty training assemblies was 98.9 percent for officers and 96.3 percent for enlisted. The fiscal year 1973 programed attendance is 98.9 percent for officers and 96.3 percent for enlisted personnel.

Additional training assemblies are also provided for early deployment units, 12 staff training assemblies for staffs of battalions, to provide time for the planning and preparation of training and 12 assemblies at the company level for selected personnel to provide time for planning, preparation and rehearsal of instruction prior to the scheduled training assembly of the unit.

The budget also provides for six assemblies for jump proficiency for airborne personnel; two additional training assemblies for civil disturbance training of junior leaders in all company-size units. Students are those in leadership positions.

During fiscal year 1971, about 10,000 guardsmen attended courses of instruction conducted in Army service and Army area schools. Those courses vary in length from 1 week to 10 months. The current request supports approximately the same level.

The enrollment in the State OCS program during academic year 1971–72 was 3,966 which included 170 members of the Army Reserve. The fiscal year 1973 budget request supports an attendance of 5,000.

AVIATION

At end fiscal year 1971, the number of aviators on flying status increased to 2,826.

In fiscal year 1971, flying hours totaled 221,254. The program for fiscal year 1972, is 310,500 flying hours. The fiscal year 1973 program is 391,020.

For the past 18 months, we have directed our aviator recruiting efforts at officers and warrant officers being released from active duty. As of December 31, 1971, there were 3,163 aviators on flying status. Our current primary effort is in contacting and bringing in aviation warrant officers affected by the Army's early release program. The program objective for end fiscal year 1972, is 3,200 and for end fiscal year 1973, is 3,400.

Paralleling the upswing in assigned aviators is the receipt of new type aircraft into the ARNG inventory.

In addition to enhancing the readiness posture of the ARNG aviation units, this will permit more realistic integrated training and assist in the recruiting of prior service aviators.

EQUIPMENT

The Army National Guard equipment posture continues to improve with increasing allocations of standard A and B type equipment. This receipt of more adequate and modern equipment systems provides a base for improved training management, more effective utilization of available assets and, in many cases, the gradual purging of obsolete items from the ARNG inventory.

Issue of new equipment is being made to ARNG units in the order of DA established mobilization priority and greatly enhances the materiel readiness of the Army National Guard. Replacement of obsolete equipment with only marginal training value has eliminated or reduced the continued need for intensive maintenance efforts on nondeployable assets. Instead, the ARNG maintenance efforts are being more effectively directed toward increased training support and improved readiness.

The prospects for continuation of this trend toward equipment improvement and more effective utilization of assets for force training are most encouraging. Our budget estimates for fiscal year 1973 are designed to support both operation and maintenance of the growing equipment inventory.

Increased density of equipment includes larger and more modern aircraft systems as well as more sophisticated items of surface equipment. The maintenance of this equipment is accomplished by the Army Guard civilian technicians. Support of the technicians is included in the "Operation and maintenance," ARNG appropriation.

STATE DUTY

During calendar year 1971, the National Guard was called to State active duty by Governors for civil disturbance 43 times. They were actually committed to the streets 30 times.

Additionally, the National Guard was called to State duty 84 times to assist civil authorities during natural disasters and other emergencies all paid for by the States. So far in 1972, guardsmen have been utilized for civil disturbance operations one time.

Chairman ELLENDER. Last year there was provided for the record a list of National Guard involvement in domestic emergencies of various types. I wish you would provide the committee with a similar list of such emergencies for the year beginning January 1, 1971.

General GREENLIEF. Yes, sir. We will do that.

(The information follows:)

NATIONAL GUARD INVOLVEMENT IN DOMESTIC EMERGENCIES DURING THE PERIOD JAN. 1, 1971 TO DEC. 31, 1971

Date	Place	Nature of disturbance	Status of troops	Number of troops (average)
Jan. 1–Dec. 31, 1971	Oakman, Ala	Hauling water	State	6 called, 6 committed.
Jan. 3–4, 1971	Dodge/Pratt, Kans	Blizzard	do	25 called, 25 committed.
Jan. 3–8, 1971	Eastern part of State, Nebr	do	do	152 called, 152 committed.
Jan. 9, 1971	Mount Pleasant area, N.C	Search for missing person	do	60 called, 60 committed.
Jan. 12, 1971	Stevens Pass, Wash	Avalanche control	do	3 called, 3 committed.
Jan. 15, 1971	do	do	do	Do.
Jan. 22–23, 1971	do	do	do	2 called, 2 committed.
Jan. 24–27, 1971	do	do	do	Do.
Jan. 28, 1971	Island of Maui, Hawaii	Flooding	do	5 called, 5 committed.
Jan. 29, 1971	Lake Champlain, Vt	Search for downed aircraft	do	14 called, 14 committed.
Feb. 3–6, 1971	Des Moines, Iowa	Civil disturbance	do	30 called, 0 committed.
Feb. 7–12, 1971	Wilmington, N.C	Civil disturbance (racial)	do	778 called, 778 committed.
Feb. 9–11, 1971	Los Angeles, Calif	Earthquake	do	2,502 called, 0 committed.
Feb. 12, 1971	Lake Charles Area, La	Tornado	do	117 called, 117 committed.
Feb. 15–24, 1971	Los Angeles, Calif	Hauling water	do	63 called, 63 committed.
Feb. 16–24, 1971	Midway, Ala	do	do	12 called, 12 committed.
Feb. 19, 1971	Mobile, Ala	Possible civil disturbance	do	52 called, 0 committed.
Feb. 20–22, 1971	Northwestern part of State, Okla	Blizzard	do	78 called, 78 commited.
Feb. 21–23, 1971	Northern Texas	do	do	122 called, 122 committed.
Feb. 21–24, 1971	Delta region, Mississippi	Tornado	do	606 called, 606 committed.
Feb. 21–26, 1971	Statewide, Kansas	Blizzard	do	305 called, 305 committed.
Feb. 22, 1971	Mobile, Ala	Possible civil disturbance	do	52 called, 0 committed.
Feb. 22–Mar. 12, 1971	Eastern part of State, Nebraska	Blizzard/flooding	do	162 called, 162 committed.
Feb. 23, 1971	Mobile, Ala	Possible civil disturbance	do	52 called, 0 committed.
Feb. 23, 1971	Mandon, Iowa	Blizzard	do	3 called, 3 committed.
Feb. 4–27, 1971	Lipscomb, Ochiltree, and Gray Counties, Tex	do	do	22 called, 22 committed.
Feb. 25–26, 1971	Stevens Pass, Wash	Avalanche control	do	2 called, 2 committed.
Feb. 27–28, 1971	do	do	do	Do.
March 1971	Des Moines, Iowa	Possible civil disturbance (security during President's visit).	do	31 called, 31 committed.
Mar. 3–4, 1971	Stevens Pass, Wash	Avalanche control	do	2 called, 2 committed.
Mar. 4–5, 1971	Demopolis, Ala	Flooding	do	12 called, 12 committed.
Mar. 5–7, 1971	Grand Isle, Vt	Snowstorm	do	33 called, 33 committed.
Mar. 11–12, 1971	Stevens Pass, Wash	Avalanche control	do	2 called, 2 committed.
Mar. 12–13, 1971	South Central part of State, Okla	Tornados	do	33 called, 33 committed.
Mar. 18–19, 1971	Southern part of State, Nebr	Blizzard	do	57 called, 57 committed.
Mar. 18–19, 1971	Stevens Pass, Wash	Avalanche control	do	2 called, 2 committed.
Mar. 19–20, 1971	Central part of State, Nebr	Blizzard	do	23 called, 23 committed.
Mar. 22–24, 1971	Lanett, Ala	Civil disturbance (racial)	do	55 called, 20 committed.
Mar. 28–29, 1971	Stevens Pass, Wash	Avalanche control	do	2 called, 2 committed.
Mar. 29–Apr. 3, 1971	Fresno, Calif	Civil disturbance	do	38 called, 0 committed.
Apr. 3, 1971	San Francisco, Calif	Possible civil disturbance	do	45 called, 0 committed.
Apr. 7–9, 1971	Mississippi River, Iowa	Flood control	do	6 called, 6 committed.

NATIONAL GUARD INVOLVEMENT IN DOMESTIC EMERGENCIES DURING THE PERIOD JAN. 1, 1971 TO DEC. 31, 1971—Continued

Date	Place	Nature of disturbance	Status of troops	Number of troops (average)
Apr. 8–10, 1971	Paris, Ill	do	do	64 called, 64 committed.
Apr. 12–13, 1971	Mississippi River, Iowa	do	do	6 called, 6 committed.
Apr. 23–25, 1971	District of Columbia	Antiwar protest	MUTA	1,558 called, 1,558 committed.
Apr. 24–25, 1971	San Francisco, Calif	do	Volunteer	1 called, 1 committed.
Apr. 26–June 21, 1971	Hayden, Ala	Hauling water	State	3 called, 3 committed.
Apr. 30–June 19, 1971	Pie Town, N. Mex	do	do	2 called, 2 committed.
May 1, 1971	Lexington, Ky	Possible civil disturbance (security during Kentucky Derby).	do	332 called, 332 committed.
May 1–7, 1971	District of Columbia	Antiwar protest	MUTA/AT	1,919 called, 1,919 committed.
May 3–4, 1971	Davidson AFB, Va	Antiwar demonstration (support of Virginia State Police).	State	20 called, 20 committed.
May 4–5, 1971	Statewide, California	Possible civil disturbance (armory security)	do	42 called, 42 committed.
May 5–6, 1971	Joplin, Mo	Tornado	do	168 called, 168 committed.
May 5–17, 1971	College Park, Md	Civil disturbance (University of Maryland)	do	2,861 called, 1,000 committed.
May 5–19, 1971	Iowa City, Iowa	Civil disturbance (University of Iowa)	do	8 called, 8 committed.
May 8, 1971	District of Columbia	Victory rally (Dr. Carl McIntire)	MUTA	904 called, 0 committed.
May 8–13, 1971	Huntingdon, Tenn	Tornado	State	162 called, 162 committed.
May 5–25, 1971	Carbon County, Wyo	Flood control	do	10 called, 10 committed.
May 20–21, 1971	Marysville, Kans	Tornado	do	6 called, 6 committed.
May 23–28, 1971	Chattanooga, Tenn	Civil disturbance	do	1,545 called, 1,545 committed.
May 24, 1971	Torrington, Wyo	Flood control	do	10 called, 10 committed.
May 26–June 17, 1971	Rio Arriba County, N. Mex	Hauling water	do	5 called, 5 committed.
June 2–3, 1971	Enid, Okla	Wind storm	do	63 called, 63 committed.
June 6, 1971	Mt Rushmore, S. Dak	Civil disturbance (evacuation of Indians from National Park).	AT	50 called, 50 committed.
June 11–13, 1971	Loundon, N.H	Possible civil disturbance (motorcycle races)	State	165 called, 0 committed.
June 14–July 5, 1971	Albuquerque, N. Mex	Civil disturbance	do	667 called 667 committed.
June 16–27, 1971	Santa Fe, Portales, Springer, N. Mex	do	do	123 called, 123 committed.
June 18–20, 1971	Jacksonville, Fla	do	do	499 called, 0 committed.
June 21–22, 1971	McCrea, La	Possible civil disturbance	do	150 called.
June 24–25, 1971	Prairie du Chien, Wis	High winds	do	8 called, 8 committed.
June 25, 1971	Nashua, N.H	Possible civil disturbance (fire department strike)	do	113 called, 113 committed.
June 25–27, 1971	Stormlake, Iowa	Possible civil disturbance (motorcycle rally)	do	5 called, 5 committed.
June 26–27, 1971	Marysville, Ohio	Highwinds	do	130 called, 130 committed.
June 29–30, 1971	Laredo, Tex	Flooding control	do	9 called, 9 committed.
June 30–July 2, 1971	Weston, Colo	Forest fire	do	44 called, 44 committed.
July 1–6, 1971	Farragut State Park, Idaho	Possible civil disturbance (rock festival)	MUTA, AFTP	22 called, 22 committed.
July 2, 1971	Arizona	Forrest fire	State	20 called.
July 2–5, 1971	Stormlake, Iowa	Possible civil disturbance (motorcycle rally)	do	6 called, 6 committed.
July 2–6, 1971	Santa Fe, Los Vegas, N. Mex	Civil disturbance	do	612 called, 612 committed.
July 11–12, 1971	Sequioa National Park, Calif	Forest fire	do	42 called, 42 committed.
July 12, 1971	Gourdin/Williamsburg County, S.C	Search for missing person	do	2 called, 2 committed.
July 12–20, 1971	Red Oak, Tex	Hauling water	do	5 called, 5 committed.
July 12 Dec. 31, 1971	Hayden Ala	do	do	2 called, 2 committed.

July2, 21-23, 1971	Midway, Ala	do	do	Do.
July 30-31, 1971	Centerville, Ala	Security—Traffic control	do	21 called, 21 committed.
July 31, 1971	Greene County, N.C	Search for missing person	do	121 called, 121 committed.
Aug. 1-13, 1971	Buck Creek, Mont	Forest fire	do	16 called, 16 committed.
Aug. 10-12, 1971	Owyhee County, Idaho	do	Volunteer	68 called, 68 committed.
Aug. 13, 1971	Medinal County, Tex	Flooding	State	7 called, 7 committed.
Aug. 22-25, 1971	San Quentin, Calif	Civil disturbance	do	4 called, 4 committed.
Aug. 24, 1971	Monessen, Pa	do	do	Do.
Aug. 27-Sept. 1, 1971	Los Padres, Calif	Forest fire	do	40 called, 40 committed.
Aug. 29, 1971	Hendersonville, N.C	Civil disturbance (high school security)	do	45 called, 45 committed.
Sept. 1-2, 1971	Tucker County, W. Va	Search for missing person	do	56 called, 56 committed.
Sept. 1-4, 1971	Humboldt National Forest, Nev	Forest fire	Volunteer	9 called, 9 committed.
Sept. 3, 1971	Gray Eagle, Minn	Search for missing person	State	2 called, 2 committed.
Sept. 3-5, 1971	Bellevue, Idaho	Possible civil disturbance (rock festival)	do	12 called, 12 committed.
Sept. 4-5, 1971	Tulladega, Ala	Possible civil disturbance	do	23 called, 0 committed.
Sept. 4-6, 1971	Juneau, Alaska	Search and recovery of aircraft crash victims	do	60 called, 60 committed.
Sept. 6-7, 1971	Santa Fe, N. Mex	Civil disturbance	do	212 called, 212 committed.
Sept. 10, 1971	Matagorda/Brazoria and Galveston Counties, Tex.	Hurricane	do	373 called, 0 committed.
Sept. 10-16, 1971	Attica, N.Y	Prison disorder	do	642 called, 642 committed.
Sept. 11-18, 1971	Jim Wells/Aransas/Nueces and Hildago Counties, Tex.	Flooding	do	36 called, 36 committed.
Sept. 12-15, 1971	Butler, Ala	Civil disturbance	do	156 called, 0 committed.
Sept. 15-17, 1971	Davenport, Iowa	Possible civil disturbance (security of facilities)	do	2 called, 2 committed.
Sept. 17-18, 1971	Humboldt National Forest, Nev	Forest fire	do	3 called, 3 committed.
Sept. 18-26, 1971	Chester and environs, Pa	Flooding	do	670 called, 670 committed.
Sept. 19-20, 1971	Mercedes, Tex	do	do	4 called, 4 committed.
Oct. 1-3, 1971	Orange County, Fla	Traffic control (Disney World)	do	21 called, 21 committed.
Oct. 6, 1971	Kodiak, Alaska	Search for missing person	do	10 called, 10 committed.
Oct. 7-10, 1971	Los Padres, Calif	Forest fire	do	38 called, 38 committed.
Oct. 12, 1971	Orangeburg, S.C	Search for missing person	do	20 called, 20 committed.
Oct. 13-14, 1971	Abilene, Kans	Possible civil disturbance (rededication of Eisenhower Museum).	do	28 called, 11 committed.
Oct. 15, 1971	Berry, Ala	Hauling water	do	2 called, 2 committed.
Oct. 23-25, 1971	Orange County, Fla	Traffic control (Disney world)	do	21 called, 21 committed.
Oct. 25-26, 1971	District of Columbia	Civil disturbance	MUTA	2,145 called, 0 committed.
Oct. 29, 1971	Columbiana, Ala	Search for missing person	State	36 called, 36 committed.
Oct. 29, 1971	Wilmington, N.C	Hurricane	do	6 called.
Nov. 1, 1971	Napanoch, N.Y	Aid to Eastern New York correctional facility	do	2 called, 2 committed.
Nov. 2-3, 1971	Custer County, Idaho	Search for missing person	Tech, MUTA	3 called, 3 committed.
Nov. 3-4, 1971	Grand Marais, Minn	Search for lost aircraft	State	3 called, 3 committed.
Nov. 4, 1971	Napanoch, N.Y	Aid to Eastern New York correctional facility	do	35 called, 35 committed.
Nov. 6-8, 1971	Grand Marais, Minn	Search for lost aircraft	do	15 called, 15 committed.
Nov. 11-12, 1971	Alameda, Calif	Civil disturbance (Alameda Naval Base)	do	13 called, 0 committed.
Nov. 12, 1971	Green Bay, Wis	Civil disturbance (riot State penitentiary)	do	700 called, 0 committed.
Dec. 13-14, 1971	Texarkanna, Ark	Flood control	do	190 called, 190 committed.
Dec. 14-17, 1971	Southeast Okla	Flooding	do	20 called, 20 committed.
Dec. 27, 1971	Stevens Pass, Wash	Avalanche control	do	2 called, 2 committed.
Dec. 28, 1971	do	do	do	7 called, 7 committed.

CIVIL DISTURBANCE TRAINING

Senator YOUNG. Describe the general nature of civil disturbance training, the number of personnel involved, and the estimated costs.

General GREENLIEF. Yes, sir.

During fiscal year 1973, Army National Guard units will receive the following civil disturbance training:

(*a*) *Junior leadership training in civil disturbance control operations 8 hours.*—All units leaders in the grades of E–5 to captain, or those of lesser grade occupying leadership positions, receive 8 hours of leadership training in civil disturbance control operations annually. This leadership training is directed at improving command and control during civil disturbances control operations. Personnel are 18,578 officers and 78,791 enlisted personnel. Cost is estimated at $3.8 million.

(*b*) *Individual preparatory training.*—All newly assigned or recruited National Guardsmen receive 20 hours of individual civil disturbance training during their initial period of active duty. This training is presented by the Army training centers to all Reserve enlisted personnel (REP) following completion of their basic combat training phase. This program started in October 1971, and has been highly regarded by all concerned. Personnel are estimated at 43,825 enlisted men at a cost of $3.4 million.

(*c*) *Senior officer orientation course.*—This is a 1-week course for senior officers conducted at the Military Police School at Fort Gordon, Ga. Field grade officers from units with civil disturbance missions are scheduled to attend. During fiscal year 1973, 275 officers are scheduled to attend at a cost of $194,000.

(*d*) *Unit refresher training, 16 hours.*—Army National Guard units assigned a civil disturbance mission receive annual refresher training in civil disturbance operations. The purpose of this annual training is to maintain and improve unit and staff proficiency and to provide necessary orientation for each member of the unit. The type and the amount of annual refresher training each unit receives, within the framework of the 16 hours, is in accordance with the needs of each civil disturbance control unit as determined by the State adjutant general. This determination is normally based on the capabilities of the unit, personnel turbulence, and the civil disturbance situation in each State. These 16 hours are part of the basic 48 drills in fiscal year 1973. Personnel of units designated by States for civil disturbance duty estimated to participate in this training are 23,000 officers and 260,000 enlisted personnel with a cost of $17.5 million.

TROOP STRUCTURE

The Army National Guard structure now consists of eight combat divisions, 28 brigade level organizations, four armored cavalry regiments, 71 group headquarters, 145 battalions, 149 battalion headquarters units and 680 supporting units. Total units—3,234.

Senator YOUNG. How many people are there in each of these eight combat divisions?

General GREENLIEF. About 14,000.

SUPPORT PERSONNEL

Chairman ELLENDER. What do you do about support personnel? How many do you have for each division?

General GREENLIEF. A division is a combination of a division base which has headquarters as supporting use. But the maneuver elements are the fighting elements.

Now, a division needs supporting units outside. Generally, the initial supporting increment is about 14,000 to 15,000, almost the size of the division. There is a follow-on unit of a divisional supporting unit.

Within the Army Guard, our supporting units are not tailor-made to support just Army National Guard divisions. We also provide supporting units for Active Army divisions in other combat units.

To come up with a ratio of combat to support units, it is necessary to look at the total force structure of the Army, including Active Army, Army Guard and Army Reserve.

Chairman ELLENDER. The answer given this morning in the Regular Army was 2 to 1.

General GREENLIEF. Well, within both the Guard and Reserve we have supporting units that support Active Army units. Whether General Kerwin was addressing the total Army or just the Active Army elements, I don't know.

Within the Active Army, there are combat units that lack their supporting units because they are in either the Guard or Reserve.

Chairman ELLENDER. If a National Guard division is called up, I suppose you receive some of your support from the Regular Army, or would support be furnished entirely from the National Guard?

General GREENLIEF. If one of our National Guard divisions were to be mobilized, it would have to be supported by the initial support increment and the sustaining increment.

The units in those supporting forces would come from the Army National Guard and the Army Reserve.

Conceivably, a unit from the regular Army might be assigned to that, but very probably not, because the regular Army does not have, in its own structure, sufficient supporting units to support Regular Army divisions. We, rather, are providing that for them.

Chairman ELLENDER. I was trying to draw a comparison between the Regular Army and National Guard. As I understood the testimony this morning, the Regular Army had about a 2 to 1 ratio to support the troops in combat.

General GREENLIEF. That is essentially the same.

I mentioned "division." It is the initial support increment, and then it is the sustaining support increments. The two supporting increments each being roughly the size of a division, you come out to a 2 to 1 ratio.

That being the answer, if that is the context in which it was answered, then the part of the units to provide that 2 to 1 ratio is in fact in the Guard and Reserve rather than being on active duty in the Regular Army.

Chairman ELLENDER. Proceed.

1971 LOSS OF AIR DEFENSE UNITS

General GREENLIEF. During fiscal year 1971, we lost 11 air defense units which were replaced by other units in order to provide other units required by Army.

INCREASE OVER 1972

The fiscal year 1973 budget for "National Guard personnel, Army," totals $616.2 million, an increase of $19.2 million, compared to the fiscal year 1972 program of $597 million. A summary of the separate projects of this program follows.

TRAINING—PAY GROUP A

Chairman ELLENDER. At this point in the record there will appear the table marked "Training, Pay Group A."

(The information follows:)

NATIONAL GUARD PERSONNEL, ARMY—1-A TRAINING, PAY GROUP A 3110

[In thousands of dollars]

Budget project account	Title	Actual fiscal year 1971	Estimate	
			Fiscal year 1972	Fiscal year 1973
1-A-1	Pay and allowances, active duty for training, officers 3111	18,708	20,781	22,094
1-A-2	Pay and allowances, active duty for training, enlisted personnel 3112	63,845	83,714	99,950
1-A-3	Pay, inactive duty training, officers 3113	47,740	55,214	58,372
1-A-4	Pay, inactive duty training, enlisted personnel 3114	171,251	195,598	222,836
1-A-5	Individual clothing and uniform gratuities, officers 3115	702	970	970
1-A-6	Individual clothing and uniform gratuities, enlisted personnel 3116	7,212	6,777	5,217
1-A-7	Subsistence of enlisted personnel 3117	14,908	18,724	19,236
1-A-8	Travel, active duty for training, officers 3118	342	373	389
1-A-9	Travel, active duty for training, enlisted personnel 3119	1,079	2,422	2,585
	Total 1-A direct obligations 3110	325,787	384,573	431,649

JUSTIFICATION

This activity provides for pay and allowances (including longetivity and hazardous duty pay, administrative function pay), clothing and gratuities, subsistence, and travel for Army National Guard officers and enlisted personnel while in a training status as follows:

1. Pay and allowances and travel for personnel participating in annual tours (normally 15 days of annual training); pay and allowances for personnel participating in multiple drill assemblies and/or weekend training in a 48 paid drill status, additional drills to improve readiness and maintain jump proficiency and for civil disturbance training and additional drills for DOD Reserve Component Study Tests, and 24 additional flying-training assemblies for aviators required to maintain flight proficiency; administrative function pay for organization commanders; and payment of per diem authorized by P.L. 90-168.

2. Payment of uniform gratuities to officers as prescribed by law (Section 415, 416, 417 Title 37, U.S. Code), and purchase of individual items of clothing for enlisted personnel.

3. Purchase of subsistence supplies for issue as rations to enlisted personnel participating in annual tours and multiple drills or weekend assemblies.

General GREENLIEF. Provided within this project are the pay, allowances, clothing subsistence, travel for both unit training assemblies and annual training. There will be 29,586 officers and 311,950 enlisted personnel participating in 2 weeks annual field training, and 30,007 officers

and 331,685 enlisted personnel participating in unit training assemblies at home stations and at weekend training sites.

The fiscal year 1973 estimate of $431.6 million for this project is $47 million more than the fiscal year 1972 program of $384.6 million. The difference is attributable to an increase of $1.8 million for DOD Reserve component study tests; an increase in number attending annual training and inactive duty training drills as a result of the lower REP program, and annualization of the January 1, 1972, military pay increase.

Training Pay Group A

Chairman Ellender. Pay Group A consists of those officers and enlisted personnel attending 48 paid drills and engaging in 15 paid days of active duty for training annually. Describe the activities generally of these paid drills and the active duty training.

General Greenlief. During the 48 paid drills personnel in the units conduct various types of training. In past years most of this training was of the lecture or classroom type within the unit's armory. Today much of this training is conducted at training sites close to the armory and on weekends so that real "hands-on" type training can be accomplished. This training is oriented towards refresher training for individuals, squads, and platoons and, in many cases, progresses on to active live-fire exercises. Of course some training must be executed within the armory. Training time also is used to maintain and care for the equipment used in these local training sites.

During the 15 days of active duty for training, the effort is toward accomplishing the training goal of the unit in culmination of that year's training mission. This period is devoted mostly to completion of the company and battalion level of training. Many units take Army training tests during this period. These tests are designed to measure the unit's proficiency at the level of training prescribed. Our units spend much of this time in the field under tactical conditions. Realism is stressed.

Chairman Ellender. For fiscal year 1973 the request for this budget account is $431,649,000, as compared with $384,573,000 for fiscal year 1972. One of the items increased is "Pay and allowances, active duty for training, officers," for which $22,094,000 is requested for fiscal year 1973. Please indicate the reasons for this increase.

General Greenlief. This increase is due to the military pay raises which increased pay and allowances for officers. For example the daily rate was $35.93 compared to $42.88 in fiscal year 1973.

Enlisted Active Duty Pay

Chairman Ellender. Another item for which an increase is requested is "Pay and allowances, active duty for training, enlisted personnel." The amount requested for fiscal year 1973 is $99,950,000 while the amount provided for fiscal year 1972 was $83,714,000. Generally are the same reasons applicable to this account?

General Greenlief. Yes, sir. The increase is due to increased pay and allowances. The daily rate for enlisted personnel was $12.73 compared to $19.58 in fiscal year 1973.

ACTIVE AND INACTIVE DUTY TRAINING

Senator YOUNG. Describe the distinction between active duty for training and inactive duty for training.

General GREENLIEF. Active duty for training is fifteen consecutive days at a military facility other than home station. Inactive duty training is normally conducted at home station on a 4-hour drill night or on a weekend in daily increments of 8 or more hours.

INCREASES IN INACTIVE DUTY TRAINING

Chairman ELLENDER. Increases are indicated in inactive duty training for both officers and enlisted personnel. Please comment.

General GREENLIEF. This increase is due to the military pay raises which increased pay for both officers and enlisted personnel. The rate per man drill for officers was $30.23 compared to $35.34 for fiscal year 1973. The rates for enlisted personnel was $10.34 compared to $13.67 in fiscal year 1973. Also, in fiscal year 1973 we have scheduled 12 additional drills for selected personnel at company and battalion level of early deployment units for training preparation, six additional drills to maintain jump proficiency and additional drills required by the Department of Defense Reserve component study tests.

SUBSISTENCE INCREASE

Chairman ELLENDER. What is the reason for the projected increase for subsistence of enlisted personnel?

General GREENLIEF. This program provides troop rationing during both annual and weekend training. Prior to fiscal year 1972, weekend support was funded at only 75 percent of the authorized level. This was made possible by permitting some percentage of personnel on MUTA–4 status to return to their homes overnight, thereby reducing the Army ration requirements. However, current demands for improved readiness, increased field training activities, and general growth of Army National Guard training preclude further restrictions in this area. For both annual and weekend training the progression to higher levels of instructions and demands for improved personnel support within the no-draft environment generate a positive need for provision of authorized ration support.

TRAVEL INCREASES

Chairman ELLENDER. Also comment on the increases for travel for both officers and enlisted personnel.

General GREENLIEF. The fiscal year 1973 program increase over fiscal year 1972 provides for travel of personnel during preparation for and conduct of the DOD directed Reserve component test program. Program increase between fiscal year 1971 and fiscal year 1972 was necessitated by increased training requirements and force progress to higher levels of unit training which generated need for transport to and from larger training areas. Program increase was also required to

replace support provided earlier by the Air National Guard and Air Force without cost to Army National Guard. Reorganization of the Air National Guard in fiscal year 1972 greatly reduced their troop transport capability which had been furnished during preceding training periods.

TRAINING, REP, PAY GROUP F

Chairman ELLENDER. The table from the justifications marked "Training, REP, pay group F" will appear in the record at this point.

(The information follows:)

NATIONAL GUARD PERSONNEL, ARMY (1-D TRAINING—REP—PAY GROUP F 3120)

[In thousands of dollars]

Budget project account	Title	Actual, fiscal year 1971	Estimate	
			Fiscal year 1972	Fiscal year 1973
1-D-2	Pay and allowances, active duty for training, enlisted personnel 3121	58,105	137,996	120,645
1-D-4	Individual clothing and uniform gratuities, enlisted personnel 3122	12,830	15,771	10,093
1-D-5	Subsistence of enlisted personnel 3123	11,129	17,638	12,173
1-D-7	Travel, active duty for training, enlisted personnel 3124	10,415	12,714	9,607
	Total, 1-D direct obligations 3120	92,479	184,119	152,518

JUSTIFICATION

This activity provides for pay and allowances of Army National Guard enlisted personnel while on active duty for training in a Federal status. It also provides for clothing, travel, and subsistence.

	Actual, fiscal year 1971	Estimate	
		Fiscal year 1972	Fiscal year 1973
Pay and allowances:			
Basic pay, 319,056 (man-months)	$316.28	$100,911,032	
Basic allowance for quarters, 95,717 (man-months)	105.00	10,050,285	
Leave rations, 799,635 (man-days)	1.46	1,167,467	
Social security		5,474,423	$117,603,207
Subsistence, 8,070,856 (man-days)	1.46		11,783,450
Travel: Home station: input and intermediate, 160,113,144 (total miles)	[1].06		9,606,788
Clothing, 56,000 (input)	[2]180.24		10,093,440
Civil disturbance training			3,431,299
Total			152,518,184
Roundoff			184
Total, training—REP—Pay group F			152,518,000

[1] Per mile.
[2] Package cost.

REP TRAINING PROGRAM

Chairman ELLENDER. Also at this point there will appear the REP training program for fiscal year 1973.

(The information follows:)

REP TRAINING PROGRAM FISCAL YEAR 1973

	Input	Graduates and losses	End of month	Man-months
Fiscal year 1972 carryover:				
January	11,707			
February	10,264			
March	9,222			
April	9,099			
May	5,267			
June	4,217		43,922	
Fiscal year 1973 input:				
July	4,508	10,986	37,444	40,683
August	5,128	9,743	32,829	35,136
September	3,381	9,161	27,049	29,939
October	4,057	7,183	23,923	25,486
November	3,494	4,742	22,675	23,299
December	1,916	4,363	20,228	21,452
January	4,628	4,818	20,038	20,133
February	5,248	4,254	21,032	20,535
March	6,762	3,719	24,075	22,554
April	4,703	3,776	25,002	24,539
May	4,902	2,705	27,199	26,100
June	7,273	3,272	31,200	29,200
Total	56,000			319,056

General GREENLIEF. This provides the support for pay, travel, subsistance, and clothing for the training of non-prior-service personnel on active duty training of not less than 4 months at Army training centers. The intraining strength at the start of fiscal year 1973 is estimated to be 43,922 trainees, and support is provided for 56,000 nonprior service personnel to enter training in fiscal year 1973.

The fiscal year 1973 estimate of $152.5 million is a decrease of $31.6 million less than the fiscal year 1972 program of $184.1 million. It reflects a decrease caused by a reduced input of 56,000 in fiscal year 1973 compared to an estimated input of 87,500 in fiscal year 1972.

The 56,000 input will provide for a normal input into training of new enlistees commensurate with their fiscal year 1973 rate of enlistment as well as permit the reduction of the backlog of enlistees awaiting training to 13,939.

REP TRAINING, PAY GROUP F

Chairman ELLENDER. For "REP Training, Pay Group F," the fiscal year 1973 estimate is $152,518,000, as compared with $184,119,000 for fiscal year 1972. Pay Group F consists of those enlisted personnel who engage in a 4-months minimum of paid days of active duty for training. I note that the end strength for fiscal year 1971 was 26,787; for fiscal year 1972, 43,922; and for fiscal year 1973 an estimated 31,200. What is the cause of the marked turbulence in this account?

General GREENLIEF. The changes in this account are a direct result of the fluctuations in the numbers of nonprior service Guardsmen who leave the Guard at the end of their 6-year tour of duty. The majority of them are replaced by other nonprior servicemen who required this training. Since the number of losses vary each year, the input to REP training will vary each year and hence the end strength in training at the end of each fiscal year.

REP UNTRAINED BACKLOG

Senator YOUNG. Please indicate the untrained backlog of REP's for fiscal years 1971, 1972, and the estimate for 1973.

General GREENLIEF. At the end of fiscal year 1971, the actual number of REP's that were backlogged totaled 16,802. In fiscal year 1972, there were 11,697 backlogged at midyear. Our projected estimate for end fiscal year 1973 is 13,939.

SCHOOL TRAINING

Chairman ELLENDER. At this point there will appear the table marked "School training."

(The information follows:)

NATIONAL GUARD PERSONNEL, ARMY—1-E SCHOOL TRAINING 3130

[In thousands of dollars]

Budget project account	Title	Actual, fiscal year 1971	Estimate	
			Fiscal year 1972	Fiscal year 1973
1-E-1	Pay and allowances, active duty for training, officers 3131	10,102	9,283	9,710
1-E-2	Pay and allowances, active duty for training, enlisted personnel 3132.	2,471	5,030	3,868
1-E-3	Individual clothing and uniform gratuities, officers 3133	33	43	38
1-E-4	Individual clothing and uniform gratuities, enlisted personnel 3134.	9	91	77
1-E-5	Subsistence of enlisted personnel 3135	363	465	412
1-E-6	Travel, active duty for training, officers 3136	3,980	4,224	4,528
1-E-7	Travel, active duty for training, enlisted personnel 3137	822	2,324	2,303
	Total 1-E direct obligations 3130	17,780	21,460	20,936

JUSTIFICATION

This activity provides for pay and allowances, clothing, subsistence, travel and per diem of Army National Guard officers and enlisted personnel on active duty for training to attend the various courses conducted in Army service and Army area schools. It also includes subsistence requirements for State officer candidate schools.

	Officers		Enlisted		
	Number attending	Amount	Number attending	Amount	Total
Army service schools:					
Pay and allowances	5,010	$8,963,043	2,497	2,863,999	
Family separation allowance		33,465		33,170	
Clothing		36,500		41,075	
Subsistence				201,622	
Travel		4,137,928		1,818,132	
Subtotal (Cost)		13,170,936		4,957,998	$18,128,934
(Personnel)	5,010		2,497		7,507

General GREENLIEF. This program provides support for pay, allowances, travel, and subsistence for the attendance of 10,641 personnel at Army service and area schools. The fiscal year 1973 estimate of $20.9 million is about the same dollar level as fiscal year 1972. Adjustments were made in the various programs which resulted in a net decrease of $.6 million.

Chairman ELLENDER. What type of schools are these?

General GREENLIEF. These are schools conducted by the active Army for their personnel, to which we send people. They may range from a mechanic to training an aviator to fly aircraft. They are schools teaching all the skills required in the Active Army. Our personnel would not be going to a civilian college. They are military schools.

SCHOOL TRAINING COSTS

Chairman ELLENDER. For "School training" the estimate for fiscal year 1973 is $20,936,000, down slightly from the $21,460,000 for fiscal year 1972. Please describe generally the nature of this training for both officers and enlisted personnel.

General GREENLIEF. National Guardsmen attend the same courses as those prescribed for the Active Army. Enlisted personnel attend such courses as radio repair and automotive repair and officers attend basic and advanced courses for career development. The course lengths vary from 1 week to 10 months.

Chairman ELLENDER. Comment on any marked changes in the program for fiscal year 1973.

General GREENLIEF. The fiscal year 1973 budget is at approximately the same level as fiscal year 1972, except for minor adjustments in course inputs.

Senator YOUNG. Indicate for the record the number of officers and enlisted personnel scheduled for school training in fiscal year 1973.

General GREENLIEF. 5,953 officers and 4,688 enlisted men are programed to attend school under the funds provided in the fiscal year 1973 budget. In addition, 5,000 enlisted men are programed to participate in the State officer candidate school program.

SPECIAL TRAINING

Chairman ELLENDER. At this point in the record there will appear the tabulation from the justifications on "Special training."

(The information follows:)

NATIONAL GUARD PERSONNEL, ARMY (1-F SPECIAL TRAINING 3140)

[In thousands of dollars]

Budget project account	Title	Actual, fiscal year 1971	Estimate	
			Fiscal year 1972	Fiscal year 1973
1-F-1	Pay and allowances, active duty for training, officers 3141	1,450	1,982	2,724
1-F-2	Pay and allowances, active duty for training, enlisted personnel 3142	329	310	2,878
1-F-5	Subsistence of enlisted personnel 3143	2	8	126
1-F-6	Travel, active duty for training, officers 3144	605	793	967
1-F-7	Travel, active duty for training, enlisted personnel 3145	212	229	740
	Total, 3140 direct obligations	2,598	3,322	7,435

JUSTIFICATION

This activity provides for pay and allowances, subsistence and travel of Army National Guard officers and enlisted personnel on active duty for training. These special tours include Command Post Exercises, Annual service practice, activities supporting annual training, ferrying of aircraft, authorized Policy and Promotion Boards, DOD Reserve Component Study Tests, and payment of per diem authorized by P.L. 90-168.

	Officers		Enlisted	
	Number attending	Amount	Number attending	Amount
Command post exercises:				
Pay and allowances:				
Tactical type-actual participation	3,455	577,066	1,675	156,977
Pre-CPX preparation	(509)	54,851	(169)	9,241
Special security force	444	78,215		
Subtotal	3,899	710,132	1,675	166,218
Subsistence of enlisted personnel: ZI and overseas				7,297

General GREENLIEF. This provides for essential special tours of full-time training duty to maintain individual and unit capability to administer, plan, and conduct training, such as preannual training conferences, command post exercises, annual service practice, and statutory boards.

These tours vary in length from 2 to 90 days and permit participation of individual members as well as unit staffs in training missions essential to the overall readiness posture of the Army National Guard.

The fiscal year 1973 estimate of $7.4 million is a net increase of $4.1 million over the fiscal year 1972 amount of $3.3 million and reflects $2.8 million for recruiting at company level; $0.8 million for DOD Reserve component study tests and annualization of the January 1, 1972, military pay increase.

Chairman ELLENDER. For "Special training" for fiscal year 1973 the estimate is $7,435,000. This is a very substantial increase over the $3,322,000 provided for fiscal year 1972. Describe this budget account.

General GREENLIEF. This budget account provides for pay and allowances, subsistence and travel of Army National Guard officers and enlisted personnel on active duty for training. These special tours include command post exercises, annual service practice, supplemental planning and training activities supporting annual training, ferrying of aircraft, authorized policy and promotion boards, supplemental unit level recruiting duty, Department of Defense Reserve component study tests, and payment of per diem authorized by Public Law 90–168.

Chairman ELLENDER. Please justify all major items causing this increase.

General GREENLIEF. The major causes for the $4.1 million increase are:

(*a*) The military pay raise which increased pay for officers and enlisted personnel.

(*b*) Full-time training duty for unit level recruiters. We are scheduling 3,402 enlisted personnel for up to 2 days' additional active duty per company level unit per month to interview, counsel, and enlist individuals in the National Guard.

(*c*) Department of Defense Reserve component study tests. This requires 7,102 man-days for officers and 9,575 man-days for enlisted personnel in fiscal year 1973.

SPECIAL TRAINING COSTS

Chairman ELLENDER. What is the reason for the increase in the number of officers participating in command post exercises?

General GREENLIEF. The increased number of officers participating in command post exercises is provided for the special security forces. Since last fiscal year there have been a substantial number of changes in the missions assigned to the special security forces. In order for these forces to meet planning and rehearsal requirements caused by these changes, increased participation in command post exercises has been provided.

SPECIAL SECURITY FORCE

Senator YOUNG. What is the function of the special security force?

General GREENLIEF. The official designation of these forces is land special security forces (LSSF). These forces are defined as "Reserve component units designated to protect critical Continental United States installations and activities during the initial phase of an emergency." The utilization of these forces is covered in Continental Army commander's basic land defense plan.

SPECIAL TRAINING COSTS

Chairman ELLENDER. For "Full-time training duty for recruiting," the request is $2,923,987. Please justify this item.

General GREENLIEF. This item is needed to reimburse more than 6,000 part-time Guardsmen who are school-trained recruiters for the additional time they spend recruiting. It is their responsibility to seek non-prior-service enlistments. They will also play a considerable role in retaining many of the over 69,970 projected losses for fiscal year 1973. This allocation is expected to allow each of them approximately 1 day per month for this activity in addition to their normal Guard duties. This is roughly one-fourth of the time allocated to this effort during the last half of fiscal year 1972.

ADMINISTRATION AND SUPPORT

Chairman ELLENDER. At this point there will appear the table from the justifications marked "Administration and support."

(The information follows:)

NATIONAL GUARD PERSONNEL, ARMY (1-G ADMINISTRATION AND SUPPORT 3150)

[In thousands of dollars]

Budget project account	Title	Actual fiscal year 1971	Estimate fiscal year 1972	Estimate Fiscal year 1973
1-G-1	Pay and allowances of officers 3151	2,045	2,180	2,359
1-G-2	Permanent change of station travel 3152	18	19	19
1-G-3	Death gratuities, officers 3153	24	26	25
1-G-4	Death gratuities, enlisted personnel 3154	48	51	48
1-G-5	Disability and hospitalization benefits, officers 3155	325	361	338
1-G-6	Disability and hospitalization benefits, enlisted personnel 3156	772	826	773
1-G-7	Servicemen's Group Life Insurance, officers 3157	10	2	4
1-G-8	Servicemen's Group Life Insurance, enlisted personnel 3158	748	96	146
	Total 3150 direct obligations	3,990	3,561	3,712

JUSTIFICATION

This activity provides for pay and allowances of Army National Guard officers while on active duty (for other than training) under Section 265, 3033, and 3496 of Title 10, United States Code, and under Section 708 of Title 32, United States Code; payment of death gratuities of officers and enlisted personnel as authorized by 32 U.S.C. 318 and 319; pay and allowances to personnel while hospitalized for injury incurred while in a training status; severance pay for physical disability; and Servicemen's Group Life Insurance.

Statutory tours: Pay and allowances, officers		$2,358,841
Gratuities:		
Officers	367,200	
Enlisted personnel	967,000	
Total	1,334,200	3,693,041
Travel (PCS)		19,110
Total		3,712,151
Roundup		−151
Total, 3150 administration and support		3,712,000

General GREENLIEF. This provides for pay and allowances of 96 Army National Guard officers on active duty tours with the Army under various statutory authorities; permanent change of station travel; death gratuities, disability and hospitalization benefits, and that portion of the servicemen's group life insurance which is paid by the Government.

Chairman ELLENDER. Are there any other comments you might wish to make about this account?

General GREENLIEF. Yes, sir. This account provides for 24 officers at Army Command Headquarters, seven officers on duty with the Department of Army General Staff; 17 officers with the National Guard Bureau, and 48 U.S. property and fiscal officers. This is a total of 96 officers.

The fiscal year 1973 estimate of $3.7 million is a net increase of $0.1 million over fiscal year 1972 primarily for annualization of the January 1, 1972, military pay increase.

The logistical and administrative support for the Army National Guard is in the operation and maintenance, Army National Guard, appropriation, which I will present later.

GUARDSMEN PROFESSIONAL COMPETENCE, TEAMWORK AND DEVOTION

Guardsmen continue to reflect their professional competence, teamwork, and devotion to American ideals. The units have demonstrated that if properly equipped, the Army National Guard can achieve a high mark of performance, serving both State and Nation.

This concludes my statement.

I will be happy to answer questions which the committee members may ask.

REIMBURSABLE OBLIGATIONS

Chairman ELLENDER. Please indicate the nature of the reimbursable obligations that appear on the tabulation in the justifications.

General GREENLIEF. The $2.4 million estimated as reimbursable obligations consists of $900,000 from the sale of meals and clothing and

$1.5 million from the Selective Service System. National Guard officers are required to purchase their meals at annual training and at drills, and to purchase required clothing items from clothing stores operated by National Guard property officers. Starting July 1, 1972, Army National Guardsmen assigned to duty and training with the Selective Service will be funded by the Selective Service System. Based on an authorized strength of 478 Army National Guard officers to be assigned to the Selective Service System it is estimated that $1.5 million will be paid to the National Guard by the Selective Service System in fiscal year 1973. This covers basic pay for drills and pay and allowances for annual training, including travel costs.

PAY ACT INCREASES

Chairman ELLENDER. Indicate each of the pay increases received by the Army National Guard in the fiscal years 1971, 1972, and estimated for 1973.

General GREENLIEF. In fiscal year 1971, Public Law 90–207 amounting to $39.5 million, in fiscal year 1972, Public Law 92–129 and Executive Order 11638 amounts to $111.1 million. The estimated additional amount due to Executive Order 11638 for fiscal year 1973 is $33.9 million.

JOINT UTILIZATION OF FACILITIES

Chairman ELLENDER. To what degree have you carried out your plans for joint utilization of facilities in fiscal year 1972 and what is contemplated for fiscal year 1973?

General GREENLIEF. We had one joint use Reserve center in the fiscal year 1972 military construction, Army National Guard program which was located at Lewiston, Maine, and will be constructed this calendar year. There are none in the fiscal year 1973 program. We continue to jointly use with the Active and other Reserve forces many of the weekend and annual training sites.

READINESS OF ARMY NATIONAL GUARD

Senator YOUNG. Please describe the readiness of the Army National Guard, indicating areas of strength and weakness, if any.

General GREENLIEF. We measure the readiness of an Army National Guard unit using four indicators (Redcon):

Redcon 1—Fully ready—the unit is fully capable of performing the mission for which organized or designed.

Redcon 2—Substantially ready—the unit is capable of performing the mission for which organized or designed, but has minor deficiencies which reduce its ability to conduct sustained operations.

Redcon 3—Marginally ready: The unit has major deficiencies which limit severely its ability to perform the mission for which it was designed or organized. It is capable, however, of conducting limited operations for a limited period.

Redcon 4—Not ready: The unit cannot perform its mission.

The [deleted] combat, combat support, combat service support units of the Army National Guard were evaluated as of October 31, 1971. Results of this analysis are as follows:

[Deleted.]

It is significant to note that most units of the Army National Guard cannot attain a higher Redcon than Redcon 2 because of the mandatory ceiling of 93 percent of full strength.

Areas of strengths which have contributed to our readiness posture, and will continue to assist in improving our readiness, are management techniques now being employed; such as additional training assemblies, intensified management of high priority units, the mutual support program, lessons learned from previous experiences such as the Selected Reserve Force (SRF) program, increased technician manning for some units, and specialized programs such as training some units outside of the continental United States. Lastly, we must consider the intangibles. Within the Army National Guard the demonstrated initiative of our commanders and staffs, the long tenure of key personnel, the comradeship and esprit de corps have had a significant bearing on unit readiness.

Our most significant weakness is the loss of our "middle managers" the young leader or specialist. While the recruiting and retention program is improving this situation, it remains our most significant weakness.

REPROGRAMING OF FUNDS

Chairman ELLENDER. In the past year have you reprogramed any funds?

General GREENLIEF. No funds have been reprogramed into or out of this appropriation in fiscal year 1972. In fiscal year 1971, to reduce the backlog of personnel awaiting initial REP training, $18.6 million was transferred into this appropriation from the PEMA appropriation.

REIMBURSABLES

Chairman ELLENDER. Provide a list of items in the reimbursable program together with the amounts.

General GREENLIEF. The reimbursable program is $2.4 million for fiscal year 1973; $900,000 from the sale of meals and clothing to Army National Guard officers and $1.5 million for the pay and allowances for 478 officers on duty with the Selective Service System.

CHANGES IN BUDGET SUBMISSION

Chairman ELLENDER. Describe any changes made in the budget submission by the Department of Defense or higher authority.

General GREENLIEF. The budget request to Department of Defense was for $578 million. This was increased to $582.3 million or an increase of $4.3 million. The $4.3 million is a net amount consisting of the following: an increase of $2.6 million for Department of Defense Reserve component tests and $3.4 million for additional Reserve enlistment program (REP) input offset by miscellaneous deductions of $1.7 million for items such as reduced ration rates, SGLI contributions and unit recruiter training. The $582.3 million was increased to $616.2 million due to the pay raise effective January 1, 1972, of $33.9 million.

ACTIVE DUTY PERSONNEL

Chairman ELLENDER. How many Active Army officers and enlisted personnel will be engaged in training and supporting the Army National Guard in fiscal year 1973?

General GREENLIEF. There are 1921 Active Army officers and enlisted personnel (primarily Army advisor detachments) engaged in full-time training and supporting the Army National Guard in fiscal year 1973.

QUESTIONS BY SENATOR THURMOND

Chairman ELLENDER. As I previously indicated, Senator Thurmond was unable to be here today but has asked that responses to questions he has supplied will be answered for the record. The questions and answers will appear at this point in the record.

(The information follows:)

REORGANIZATION IMPACT

Senator THURMOND. General Greenlief, what impact has the recent reorganization had on the National Guard?

General GREENLIEF. In the current reorganization, the Army National Guard retained all of the Divisions, Separate Brigades and other General Officer Commands, Armored Cavalry Regiments, Maneuver Battalions and Combat Support Battalions. There was a net increase of 182 company/detachment size units and an increase of about 1,000 authorized spaces. Turbulence, at the local level caused by a change of Branch, was considered minimal.

NATIONAL GUARD READINESS

Senator THURMOND. General, when compared with a regular Army division to what degree can a guard division achieve an equal state of readiness?

General GREENLIEF. National Guard units can achieve a readiness level equal to active Army Divisions in some categories. In the area of personnel the National Guard has greater stability. Our enlisted men receive the same basic and advanced individual training as active Army enlisted men and the results of Military Occupational Specialty (MOS) testing which all enlisted men take—Army National Guard passing rate is 90.4%. Our officers must meet military education standards comparable to the active Army. In the area of equipment, that Standard A and B equipment which we have and which we maintain is as ready for deployment as active Army equipment.

I believe that the Army National Guard can attain and maintain battalion level readiness equal to the active Army. This year and next year the Army is conducting tests and evaluations to determine if this level of readiness can in fact be achieved.

The ability of Army National Guard divisions to achieve what active Army divisions should be able to achieve is limited by time, adequate training areas and equipment. As regards equipment this limitation is being rapidly overcome However, because of time available to citizens soldiers and inadequate training areas Army National Guard divisions cannot complete brigade and division level training as should be conducted by active Army divisions. Numerous studies, tests and evaluations are underway to remove these obstacles and provide Army National Guard divisions with equal readiness.

TURNOVER OF PERSONNEL

Senator THURMOND. How much does the lack of turnover in a guard unit help when it comes to readiness ratings?

General GREENLIEF. The lack of turnover in a Guard unit helps considerably in the terms of readiness, by providing Military Occupational Specialty (MOS) qualified individuals for extended periods of time. This gives the commander the experience and expertise to conduct meaningful training. Proper utilization of

this experience and expertise greatly assists the Army National Guard commander in attaining and maintaining his mobilization objectives. Continuity of command also becomes a distinct asset because of lack of turnover.

FIRST TERM REENLISTMENT RATE

Senator THURMOND. General, what is the re-enlistment rate in the Guard for first termers?

General GREENLIEF. Beginning July this year, the Army National Guard began breaking its reenlistments down by category. The Reserve Enlistment Program extension rates for Reserve Enlistment Personnel (first termers) is as follows:

	Percent
July 1971	10.2
Aug. 1971	11.8
Sept. 1971	10.1
Oct. 1971	10.9
Nov. 1971	11.2
Dec. 1971	13.0
Jan. 1972	13.5

Senator THURMOND. What can be done to improve this rate?

General GREENLIEF. We initiated the "Try One" program in February 1970 to induce the Reserve Enlistment Program Guardsman to reenlist for one more year. This program had moderate success. Emphasis is being given to the retention portion of our Recruiting and Retention Program. Incentives such as the Reenlistment Bonus would go a long way toward increasing the Reserve Enlistment Program retention rate. We are not waiting for incentives however. Guardsmen at all levels of command have been, and will continue to be, instructed on the latest techniques of personnel retention. We are also striving to make our training more interesting and challenging in order to maintain the interest of our first termers. We will continue to place emphasis on our retention program until it reaches at least 25%.

ENLISTED SHORTFALL INCENTIVES

Senator THURMOND. What incentives would the Guard desire if the current enlisted strength shortfall continues?

General GREENLIEF. It is realistic to conclude that the National Guard will require incentives comparable to those already afforded the active forces if the Guard is to meet currently mandated strength levels in an all volunteer environment. This is what our available surveys and statistics show, and this is what I believe. These surveys and statistics also show that many incentives can actually save tax dollars rather than increase costs. I feel that the following incentives should be provided for the National Guard to compliment our "all out" recruiting efforts, and to assist us in increasing both enlistments and reenlistments:

Reenlistment bonus.—Our surveys indicate that an appropriate reenlistment bonus limited to personnel during their first twelve years of service will about double reenlistments among Guardsmen completing their last (sixth) year of obligated service and further improve retention among career Guardsmen. I am also convinced that such a bonus will attract large numbers of additional active service separatees to the Guard. Such a bonus will save us money through reduced initial active duty training requirements, as well as improve readiness by attracting and retaining more experienced personnel.

Earlier age title III retirement.—The current age 60 provisions of the title III retirement program does not appear as an attainable goal to most of the young men and women we are attempting to enlist into the Guard. A recent DOD study indicates that we can provide earlier title III retirement options based on actuarial factors, lump sum settlements, and other cost saving factors which will not only greatly increase the attractiveness of this program to enlisted personnel, but can also reduce retirement costs.

Full time servicemen's group life insurance.—Surveys indicate a great recruiting and retention potential in optional full time Servicemen's Group Life Insurance for Guardsmen. This is true not only for current Guardsmen, but for active service separatees, and nonprior service personnel as well—all at no cost to the

Federal government since the individual assumes the full cost of this insurance in peacetime.

Survivors protection.—Extension of optional authority for Guardsmen to participate in Servicemen's Group Life Insurance during the years between transfer to the Retired Reserve with twenty or more creditable years of service and commencement of retired pay would provide a much needed survivors protection plan. Such a plan would be of low or no cost to the Federal government depending upon what amount, if any, of the insurance costs the government would provide. Such protection should encourage greater "wife support" for service in the Guard.

Enlistment bonus.—Despite our most strenuous and continuing efforts the Guard is not enlisting a sufficient number of nonprior service personnel to meet all of our long range requirements for new accessions. The two major factors limiting our ability to recruit nonprior service accessions are the six year enlistment and initial active duty training requirements established by law and regulations. We want to retain both the six year enlistment and initial active duty training because of the force stability and readiness they provide. In my judgment, and enlistment bonus provides the most promising means we have for increasing new accessions while retaining the six year enlistment and initial active duty training. To reduce the enlistment period without determining the effectiveness of an enlistment bonus could prove more costly than a bonus by reason of increasing turnover and attendant initial active duty training costs.

UNIT MANNING PROBLEM

Senator THURMOND. General, what do you feel is the major problem facing the Guard today? In the future?

General GREENLIEF. Senator Thurmond, the major problem facing the Guard today is gaining and maintaining the personnel strength required to man our units at the levels required to meet deployment requirements. Numbers alone will not solve the problem. We must man our units with personnel who are motivated to serve and with education and intelligence sufficient to maintain required skill levels.

Assuming we solve our personnel problems and assuming continued support we must then improve our training techniques, mobilization and deployment planning so as to make maximum use of the limited time available for training in an inactive duty status, and for training and deployment after mobilization.

MAINTENANCE OF EQUIPMENT

Senator THURMOND. Can the Guard adequately maintain the new equipment presently being received?

General GREENLIEF. Yes. Recent expansion of the Army National Guard maintenance manning and re-direction of priorities to the newer equipment are considered adequate to meet the new requirements. Existing maintenance backlogs are generally attributed to a one-time effort being placed on DS/GS support of a larger number of Armored Personnel Carriers being received. Another factor is the maintenance workload involved with disposition of large excesses of old equipment generated by receipt of new issues. Our current ability to maintain our equipment has been enhanced by the action of this committee in increasing the authorization for employment of Army National Guard technicians. We are grateful for this support.

Operations and Maintenance, Army National Guard

STATEMENT OF MAJ. GEN. F. S. GREENLIEF, CHIEF, NATIONAL GUARD BUREAU

ACCOMPANIED BY:

LT. GEN. HARRIS W. HOLLIS, CHIEF, OFFICE OF RESERVE COMPONENTS

MAJ. GEN. J. MILNOR ROBERTS, CHIEF, ARMY RESERVE

MAJ. GEN. J. A. KJELLSTROM, DIRECTOR OF ARMY BUDGET, OFFICE COMPTROLLER OF THE ARMY

PROGRAM AND FINANCING

Mr. Woodruff. The general also had a statement on O. & M., Mr. Chairman.

Chairman Ellender. At this point in the record there will appear certain program and financing information from the justifications.

(The information follows:)

DEPARTMENT OF DEFENSE—MILITARY OPERATION AND MAINTENANCE, ARMY NATIONAL GUARD PROGRAM AND FINANCING

[In thousands of dollars]

	1971 actual	1972 estimate	1973 estimate
Program by activities:			
Direct program:			
1. Training operations	92,115	103,980	115,512
2. Air defense operations	40,517	32,357	33,246
3. Logistical support	164,242	220,292	290,478
4. Headquarters and command support	18,049	22,469	28,186
5. Medical support	33	969	1,088
Total direct program	314,956	380,067	468,510
Reimbursable (total)	3,167	2,569	2,700
Total obligations	318,123	382,636	471,210
Financing:			
Receipts and reimbursements from—			
Federal funds	−3,164	−2,546	−2,677
Non-Federal sources[1]	−5	−23	−23
Unobligated balance lapsing	1,012		
Budget authority	315,965	380,067	468,510
Budget authority:			
Appropriation	311,265	369,961	460,200
Transferred from other accounts	4,700		
Appropriation (adjusted)	315,965	369,961	460,200
Proposed supplemental for wage-board increases		6,100	
January 1972 pay increase supplemental/amendment[2]		4,006	8,310

[1] Reimbursements are derived from commercial carriers for property lost or damaged in transit (31 U.S.C. 489A).

[2] The amounts shown as January 1972 pay increase supplemental/amendment are not distributed to each individual appropriation in the fiscal year 1973 President's budget, but are reflected as a 1-line defensewide contingency amount. The amounts shown above are estimates, pending final determination of the amounts to be requested when supplemental and amended estimates are formally transmitted.

BUDGET REQUEST

Chairman ELLENDER. Proceed.

General GREENLIEF. It is again my pleasure to appear before you to report further upon the functions and activities of the Army National Guard.

At my last appearance before this committee, it was my pleasure to discuss most of our overall responsibilities and specifically those relating to the budget estimates for the "National Guard personnel, Army" appropriation.

My purpose today is to present the fiscal year 1973 "Operation and maintenance, Army National Guard" budget request of $468.5 million, which provides for the administrative and logistical support to Army National Guard units necessary to accomplish their training program. I will discuss briefly those major programs which relate to this appropriation.

TECHNICIANS

The efficient and effective manner in which the Army National Guard performs unit administration, training, supply operations, and maintenance of assigned equipment is credited largely to the work of full-time technician personnel. These people, through their daily diligent efforts, have been responsible for maintaining and increasing the readiness required by mobilization plans, deployment schedules, air defense missions, and civil disturbance operations.

The increase in technician authorizations for fiscal years 1972 and 1973 provided by the Congress in Public Law 92–119, August 17, 1971, will enable the Army National Guard to accomplish these readiness requirements in a more efficient and effective manner. Employment activity has advanced in every State in enthusiastic response to the revised program.

For fiscal year 1972, the employment authorization is increased from the initial 24,365 to 27,035; and for fiscal year 1973, the employment authorization is further increased to 28,654, providing for 25,689 unit, logistical support and State headquarters technicians, 2,733 in the air defense onsite program and 232 for military support to civil authorities.

These numbers include 157 technicians employed on a reimbursable basis for interservice maintenance support agreements.

The fiscal year 1973 budget reflects increases in all activities to provide better support of the current requirements. Substantial increases are reflected in logistical support for required maintenance of increases in aircraft and surface equipment inventories experienced during fiscal year 1972 and projected for fiscal year 1973.

The fiscal year 1973 technician program requires $321.3 million for the 28,193 man-years requested, an increase of $44.3 million and 3,344 man-years over the fiscal year 1972 budget. Of this amount, $8.1 million is required to support the annualization of the January 1, 1972, general schedule pay raise.

ARMY ADVISERS

Members of the Active Army are assigned to duty as advisers to the Army National Guard under authority of sections 104, 315, and 506 of title 32, United States Code, and section 682 of title 10, United

States Code. Their mission is to advise and assist in the training, operational, and mobilization readiness objectives of the organizations or units of the Army National Guard with which they are associated.

Funds in the amount of $2.7 million are requested under this appropriation for the travel and per diem of advisers and instructional and demonstration teams in connection with the training of Army National Guard personnel. This request is $1.4 million over the fiscal year 1972 program of $1.3 million.

This increase consists of $0.972 million to provide for civilianization of clerical positions within Army adviser groups, and $0.419 million for increased adviser travel in support of annual training.

SUPPORT OF FACILITIES

In fiscal year 1972, Federal funds in the amount of $7.9 million were provided for property rental costs and service contracts with the States for operation, maintenance, and repair of nonarmory facilities of the Army National Guard. These funds provided for facilities operating costs including utilities, maintenance, minor construction, and repair of nonarmory facilities, such as offices and warehouses of the U.S. property and fiscal officers, combined support maintenance shops, organizational maintenance shops, and hangars.

Additional Federal funds for support of Federal and State owned or operated training sites were provided in the amount of $7.6 million in fiscal year 1972. These funds provided for opening, closing, and year-round operation, maintenance, and minor construction at training sites and rifle ranges.

Request for support of facilities in fiscal year 1973 is increased $7.5 million over the fiscal year 1972 amount of $15.5 million. This increase provides for a cost increase for utilities, labor, and materials, plus support of security guards at major logistical facilities and the costs for operating new and expanded training and logistical facilities supporting readiness requirements.

Chairman ELLENDER. Does this entail the construction of new facilities?

General GREENLIEF. These facilities are supporting facilities.

We continue to receive increasing allocations of PEMA-type standard A and B equipment. Such input of more adequate and modern systems greatly improves our materiel readiness status and provides a more effective training base. To date, this increase in density has significantly improved the Army National Guard aviation program and the equipping of tactical units with an early mobilization policy. Positive action has been taken at all levels to absorb associated costs within the current operating programs. Maintenance efforts have also been realined to effectively support this new input and permit the gradual purging of obsolete items from our inventory. This trend toward equipment modernization, expanded training, and increased materiel readiness is expected to continue through the next year.

The budget estimates for fiscal year 1973 are designed to support both the operations and maintenance of the newer and more sophisticated equipment systems.

BUDGET PROJECT SUMMARIES

The fiscal year 1973 operation and maintenance, Army National Guard budget request is contained within five major projects totaling $468.5 million, an increase of $88.4 million over the fiscal year 1972 program of $380.1 million.

TRAINING OPERATIONS

Chairman ELLENDER. General Greenlief, before you begin with your discussion of the request of $115,512,000 for training operations, I want to include page 5 of the justifications in the record at this point.

(The information follows:)

	Budget project account and title	*Fiscal year 1973 estimate*
3711	Personnel compensation and benefits	$98,587,000
3712	Command inspection, adviser travel, clerical support	2,691,000
3713	School program training material	146,000
3714	Training aids and materials	256,000
3715	Technician school travel and per diem	851,000
3716	Miscellaneous training supplies and services	2,763,000
3717	Base operations	10,218,000
	Total	115,512,000
	Personnel requirements:	
	Average number of all employees	8,369
	Number of employees at end of year	8,527
	Total personnel obligations	98,587,000

General GREENLIEF. This project provides for the costs of the activities directly contributing to the training mission of our units. Included are the pay costs for 8,369 technician man-years that provides administrative and training support for Army National Guard units. Also included are costs for unit training supplies, trophies and awards, Army adviser travel, and opening, operating, and closing costs at field training camps. The estimate for this project is $115.5 million, an increase of $11.5 million, compared to the fiscal year 1972 program of $104.0 million.

The major increases in this project are $5.8 million for technician pay, $2.6 million for base operation support for operation and maintenance of new and expanded training facilities, $1.6 million for increases in supplies to support operation and maintenance of new weekend training sites and expanded weekend training, and $1.5 million for increased Army adviser support.

Chairman ELLENDER. Of the total requested for training operations, I note that $98,587,000 is for personnel compensation and benefits. Is this total required for the 8,369 technician man-years you referred to?

General GREENLIEF. Yes, sir; it is.

Senator YOUNG. Give us some idea of how these 8,369 technicians are distributed among your various company-sized units. In other words, what is the average number of training technicians you assign to a company-size unit?

General GREENLIEF. Of the 8,369 technicians in training operations, 5,100 are distributed among 3,971 company-sized units, including split units, or an average of 1.3 technicians each.

Chairman ELLENDER. Of the total requested for training operations, I note that $2,763,000 is for miscellaneous training supplies and services, which is an increase of approximately $1.5 million over the sum provided for fiscal year 1972. Just what accounts for this increase?

General GREENLIEF. Sir, increases in supplies to support the operation of new weekend training sites and expanded weekend training accounts for approximately $400,000 of the increase.

The remainder of the increase is a new requirement in fiscal year 1973 to provide commercial bus transportation between home stations and weekend training sites. The commercial bus transportation replaces use of tactical vehicles previously used to transport personnel. This support saves valuable training time, permits more productive training through use of pooled heavy equipment maintained at the training site, reduces highway incident risk by lowering convoy density, and reduces costly operation of heavy Army equipment for personnel transport.

Chairman ELLENDER. Of the $115.5 million requested for training operations, $10.2 million is for base operations, which is an increase of $2.6 million over the sum provided for fiscal year 1972. What accounts for this increase?

General GREENLIEF. Sir, increases in number of training sites to be maintained and operated for annual and weekend training account for this increase. Annual training sites will increase from 42 in fiscal year 1972 to 45 in fiscal year 1973. Weekend training sites will increase from 158 in fiscal year 1972 to 190 in fiscal year 1973. The increase also provides for maintenance, repair, and minor construction of weekend training sites.

AIR DEFENSE OPERATIONS

Chairman ELLENDER. The next activity is air defense operation, for which $33,246,000 is requested. The information on page 13 of the justifications will be included in the record at this point.

(The information follows:)

	Budget project account and title	*Fiscal year 1973 estimate*
3721	Personnel compensation and benefits	$32,191,000
3722	Operating services and supplies and travel of personnel	220,000
3723	Operation and maintenance of facilities	835,000
	Total	33,246,000
	Personnel requirements:	
	Average number of all employees	2,692
	Number of employees at end of year	2,733
	Total personnel obligations	32,191,000

General GREENLIEF. The request for this project is $33.3 million and provides for 27 batteries, 11 battalion headquarters, and 2,733 technicians with 2,692 man-years. The request is an increase of $0.9 million from the fiscal year 1972 program of $32.4 million as a result of increased number of personnel to provide for the operation and maintenance of new target simulators (ANMPQ/TI) and a remote radar integration systems and pay raise.

Chairman ELLENDER. In your statement, you indicate that the fiscal year 1973 request is based on the operation of 27 air defense batteries,

with 11 battalion headquarters. Does this represent any change in the number of batteries and battalion headquarters compared to fiscal year 1972?

General GREENLIEF. Sir, the number of air defense units did not change during fiscal year 1972. We will have the same number in fiscal year 1973. On March 3, 1971, the Army National Guard air defense force structure was reduced to 27 batteries and 11 battalions.

LOGISTICAL SUPPORT

Chairman ELLENDER. The next item is the request of $290,478,000 for the budget activity entitled "Logistical Support." The information appearing on page 17 of the justifications will be included in the record at this point.

(The information follows:)

Appropriation: Operation and maintenance, Army National Guard—
Budget program 3730 logistical support

	Budget project account and title	*Fiscal year 1973 estimate*
3731	Personnel compensation and benefits	[1] $175,698,000
3732	Travel and transportation of personnel	4,864,000
3733	Organizational clothing and equipment	25,168,000
3734	Repair parts, materials and contractual services	42,704,000
3735	Petroleum, oil and lubricants	15,067,000
3736	Transportation services	10,916,000
3737	Communication services	1,018,000
3738	Other supplies, equipment and services	2,280,000
3739	Base operations	12,763,000
	Total	290,478,0000
	Personnel requirements:	
	Average number of all employees	15,830
	Number of employees at end-of-year	16,079
	Total personnel obligations	175,698,000

[1] Dollars do not include technicians for interservice maintenance support agreements provided on a reimbursable basis.

General GREENLIEF. The request for this project provides for pay and related costs for 15,830 technician man-years who are employed in organizational and field maintenance shops and in the offices of U.S. property and fiscal officers. It also provides for procurement costs of stock-funded equipment, repair parts, petroleum products, transportation of equipment and supplies, communication services, and the costs of service contracts with the States. This project, estimated at $290.5 million, is an increase of $70.2 million over the fiscal year 1972 program of $220.3 million. This increase results from increases for technician pay of $36.2 million, $1.1 million for travel, $8.3 million for equipment, $9.4 million for repair parts, $5.0 million for petroleum products, $4.5 million for transportation, $0.2 million for communications, $4.9 million for base operations, and $0.6 million for other supplies, all of which support increased unit readiness.

Chairman ELLENDER. These 15,830 technicians, are full-time employees?

General GREENLIEF. Yes, sir.

Chairman ELLENDER. Are they members of the National Guard?

General GREENLIEF. They are required to be members of the Army National Guard and are civil service employees. But they must be members of the Army National Guard mobilizable within our units.

Chairman ELLENDER. Do they have to sign a contract to that effect?

General GREENLIEF. Sir, the public law on technicians provides that the authority to hire and fire employee technicians is at the level of adjutant general. To be employed, the man must first of all be a member of the National Guard units. He must occupy a military specialty within that National Guard unit which is comparable to the technician job to be performed. So it is the obligation of these technicians to perform the duties they perform while on active duty. There is no contract, sir.

Chairman ELLENDER. Have many of these technicians had prior training while in the service?

General GREENLIEF. Yes, sir, and that number is increasing. Of course, all of them must have had at least their initial active duty training. We are getting an increasing number of active duty personnel returning from active duty because of the skill levels they required on active duty, particularly in aviation and aircraft maintenance.

PERSONNEL COMPENSATION AND BENEFITS

Chairman ELLENDER. Of the total requested for "Logistical support," I note that $175,698,000 is requested for personnel compensation and benefits. Is this total amount required for the 15,830 man-years you referred to?

General GREENLIEF. Yes, sir; it is.

TECHNICIANS

Senator YOUNG. I note on page 18 of the justifications references to organizational maintenance shop technicians, combined support and aircraft maintenance technicians, and U.S. property and fiscal office technicians. Comment briefly the nature of work performed by these categories of technicians.

General GREENLIEF. Organizational maintenance technicians perform first and second echelon (organizational) maintenance of surface equipment assigned to units, which is essential to maintain combat deployable equipment, and to support unit training assemblies.

Support maintenance technicians perform direct and general support maintenance of surface equipment at the combined support maintenance shops and at annual training equipment pools, including administration of the maintenance program, inspection of equipment assigned to units, and assisting OMS technicians with on-site repair of equipment. Aviation maintenance technicians perform direct support maintenance of all aircraft assigned within each State. This support is provided at Support facilities and flight activities. Aviation general support maintenance is provided by four area Transportation Aircraft Repair Shops (TARS). USPFO technicians perform financial and property accounting of funds, supplies and equipment furnished to the State, and receipt, storage and issue of supplies and materials. Functions include Automatic data processing, Technician pay, Financial

accounting, Purchasing and contracting, Stock control and warehousing, and Auditing (examining).

Senator YOUNG. Give us some idea of how these 15,830 technicians are distributed among your various units.

General GREENLIEF. Of the 15,830 technicians, 5,339 are distributed among 773 shops, including 761 OMS—approximately one per battalion headquarters—four parachute shops, seven week-end training equipment pools, and one Marine shop, or an average of 6.9 technicians per shop, based on amount and type of equipment maintained. 4,528 are employed in support maintenance shops, 2,749 are employed in aviation maintenance shops, and 3,214 in U.S. property and fiscal-officer activities.

Chairman ELLENDER. On page 18 of the justifications, I note that these figures do not include some $1.9 million for 157 technicians involved in "interservice maintenance support." This seems to be a reimbursable program. Just what is involved here?

General GREENLIEF. The 157 technicians employed under "Interservice Maintenance Support Agreements" perform organizational or support maintenance of USAR equipment as negotiated between Army Headquarters and the States. Work is performed at National Guard shops and is generally considered beneficial to the government as fewer overhead personnel are required. The $1.9 million is not included in the OMARNG appropriation as the Army National Guard is reimbursed by Army for the cost of salaries and benefits for these technicians.

CLOTHING AND EQUIPMENT

Chairman ELLENDER. Of the total requested for logistical support, I note that $25,168,000 is for organizational clothing and equipment. Please comment on the nature of this clothing and equipment, and also comment on the need for the increase of approximately $8.4 million that is requested for this item.

General GREENLIEF. Stock funded organizational clothing and equipment items provided by this program are defined as all authorized MTOE/CTA/TDA equipment not furnished through PEMA funding. This includes operating supplies and consumables as well as secondary items and nonstandard items. Army National Guard authorized procurement includes both requirements for reduction of unit clothing and equipment shortages, and replacement of items consumed through fair wear and tear.

The increased program is necessary to provide for procurement to provide units with their authorized items of organizational clothing and equipment. Force conversion to the G/H series TOE during fiscal year1972 increased the requirements objective above the authorization under the E series TOE. This growth is due to the number of company-size units added as well as authorization for more equipment. The fiscal year 1973 program support will in all cases be applied against the newer authorizations on a priority of need basis. The increasing cost of this newer sophisticated equipment procured from the Army stock fund also directly affects the budget increase.

Repair Parts, Materials, and Contractual Services

Chairman Ellender. This request includes $42,704,000 for repair parts, materials, and contractual services, which is an increase of approximately $9.4 million over the sum provided for fiscal year 1972. Comment generally on the nature of these parts, materials, and services, and tell us why you need the increase of $9.4 million.

General Greenlief. This budget program provides for repair parts support for all military equipment on hand including both aircraft and surface. In addition, the program covers contractual services for commercial repair of Army National Guard equipment which is beyond the capabilities of National Guard Maintenance Shops. Approximately one-fourth of the surface maintenance support is consumed for depot level support provided by the Army on a reimbursable basis. About one-third of the overall program is dedicated to aircraft maintenance including both repair parts for National Guard Direct/General support maintenance and reimbursement to Army for depot level support provided. Program growth is directly related to the growth in equipment inventory over the past 2 years. Current issue schedules provide for Army National Guard to receive about 98 percent of all authorized aircraft by the end of fiscal year 1973. This constitutes a growth of approximately 300 percent in a 3-year period. There has been a similar growth in surface equipment inventory as well as a clearly defined growth in training operations which also directly affects maintenance support.

Petroleum, Oil, and Lubricants

Senator Young. The request includes $15,067,000 for petroleum, oil, and lubricants, which is an increase of approximately $5 million over the sum provided for fiscal year 1972. What is the requirement for this increase?

General Greenlief. The program for provision of petroleum, oil, and lubricants is based on projected operational and training requirements. Factors used in the development of force requirements are equipment density and demanded training operations, both aviation and ground. Use of heavy equipment during weekend multiple unit training assemblies has added to the petroleum requirements. Any increase demand for Force Mobilization readiness will result in increased petroleum, oil, and lubricants requirements to accommodate the increase in annual training activities.

Transportation Services

Chairman Ellender. $10,916,000 is requested for transportation services, which is an increase of $4.5 million over the sum provided for fiscal year 1972. Just what is the need for this large increase?

General Greenlief. This program provides for all Army National Guard requirements for transportation services including cost of moving equipment issued from Army Supply System to the Guard. The budget growth is related directly to projected requirements for physical movement of materiel. The volume of equipment issue to the Army National Guard combined with the fiscal year 1972 force conversion of G/H series TOE are the primary causes of increase indicated. The

emphasis on improved readiness has expanded force training activities and resulted in movement of equipment and supplies to and from field training areas. An effective Guard program for utilization of excesses has increased transportation between State entities. Following the force reorganization it is mandatory to redistribute certain equipment assets. Much of this readjustment is in the heavy truck vehicle category. The second destination program for fiscal year 1972 as shown is inadequate to meet Army to National Guard shipping costs. This shortfall being covered by reprograming action approximates $1½ million. The fiscal year 1973 requirement, based on projected equipment and supply shipments from the Army, is conservative in view of the number of tanks and armored personnel carriers to be transported.

BASE OPERATIONS

Senator YOUNG. The request includes $12,763,000 for base operations, which is an increase of approximately $4.9 million over the sum provided for fiscal year 1972. What accounts for this large increase?

General GREENLIEF. Sir, the $4.9-million increase supports additional costs in the Federal share of maintenance, repair and operation of Army National Guard nonarmory facilities and installations; rental costs or leased cost of real estate used by the Army National Guard; and minor construction requirements at nonarmory facilities. Also, a programed increase of 532 security guards to provide for the security of Government aircraft, equipment, and weapons located at 50 Army National Guard nonarmory facilities. Property rental cost increase will provide for the leasing of 45 battalion size training sites, and expansion of 35 aviation facilities in support of expanded training and increased aircraft inventory. Minor construction projects previously delayed due to insufficient funds, and reduction of backlog of essential deferred projects is programed for fiscal year 1973.

Chairman ELLENDER. Proceed.

HEADQUARTERS AND COMMAND SUPPORT

General GREENLIEF. The next item is the request of $28,186,000 for the budget activity entitled "Headquarters and Command Support." The information on page 31 of the justifications will be included in the record at this point.

(The information follows:)

Appropriation: Operation and maintenance, Army National Guard—Budget program 3740 headquarters and command support—budget project account and title

		Fiscal year 1973 estimate
3741	National Guard activities	$1,680,000
3742	Automatic data processing operations	3,201,000
3743	State headquarters activities	11,582,000
3744	Military support to civil authorities	3,825,000
3745	Recruiting and publicity	2,150,000
3746	Other operating costs	5,748,000
	Total	28,186,000
	Personnel requirements:	
	Average number of all employees	1,138
	Number of employees at end-of-year	1,158
	Total personnel obligations	$14,822,000

General GREENLIEF. This project supports National Guard Bureau activities with 102 Department of the Army civilians, automatic data processing operations with 100 Department of the Army civilians, 926 technicians authorized at the States' headquarters, 232 technicians for military support to civil authorities, a recruiting and command information program, procurement of official blank forms and publications, reimbursement to the Post Office Department for postal charges, and reimbursement to the Department of Labor for payments made under provision of the Federal Employees Compensation Act. This project estimated at $28.2 million reflects an increase of $5.7 million over the fiscal year 1972 program of $22.5 million, $2.0 million of which provides full reimbursement to the Post Office Department, $1.5 million for increased recruiting efforts needed to maintain the authorized strength of the Army National Guard in a draft-free society, $1.4 million for an increased number of personnel to support Federal Army National Guard requirements within the State, and $0.8 million for miscellaneous supplies and services.

REIMBURSEMENT TO POST OFFICE

Chairman ELLENDER. What is the $2 million you mentioned for full reimbursement to the Post Office Department?

General GREENLIEF. We pay the Post Office at a rate determined by them and agreed to by the Army for mailing of all of our materials. This is an item in our budget which reimburses them.

Chairman ELLENDER. For official mail?

General GREENLIEF. It is the franking privilege for mailing of the official mail.

General KJELLSTROM. Mr. Chairman, each year we go through a survey as to the amount of support that the Army receives from the Postal Department. The National Guard portion is $2 million. The active Army is a sizable portion of that total which we provide the Post Office Department.

Chairman ELLENDER. This official mail is sent out by whom?

General KJELLSTROM. Sent out by all Army units worldwide, from our headquarters down to the posts, camps, and stations for our recruiting efforts, and the like.

NATIONAL GUARD HEADQUARTERS

Senator YOUNG. With respect to the $1,680,000 requested for National Guard activities, is this for the support of your headquarters here in Washington, D.C.?

General GREENLIEF. Yes, sir; it is.

Chairman ELLENDER. How much of this total is for the compensation and benefits of your 102 civilian employees?

General GREENLIEF. Sir, $1,390,000 is for the compensation and benefits of the 102 civilian employees.

AUTOMATIC DATA PROCESSING OPERATIONS

Chairman ELLENDER. I note that the total includes $3,201,000 for automatic data processing operations. Would you please comment on this request?

General GREENLIEF. Yes, sir. $1,366,000 or 43 percent of the total program is programed for the compensation and benefits of the 100 civilian personnel required to operate the National Guard computer Center in Falls Church, Va. There is an increase of $355,000 for personnel costs over the fiscal year 1972 level due to the impact of the January 1, 1972, pay raise over a full year and the addition of 24 personnel authorized in fiscal year 1973.

The remaining $1,835,000 is programed to support the operation of National Guard data processing installations throughout the 50 States, Puerto Rico, and the District of Columbia. There is a net increase of $102,000 over the fiscal year 1972 level primarily in contractual services cost, which includes transportation and installation costs of Government-owned 1401 computers to be received in fiscal year 1973, and other costs required for special features for standard programs.

STATE HEADQUARTERS

Senator YOUNG. The request includes $11,582,000 for State headquarters activities. Just what is the nature of these activities?

General GREENLIEF. State headquarters technicians assist the Adjutant General in performing Federal missions related to administration, training, recruitment, operations, and management of military personnel and technician personnel, and other statewide ARNG programs.

Chairman ELLENDER. Is this total amount required for the compensation and benefits of the 926 civilian employees?

General GREENLIEF. Yes, sir. The total amount of $11,582,000 is required for compensation and benefits for 909 man-years for employment of 926 technicians.

Senator YOUNG. Just what is involved in the request of $3,825,000 for military support to civilian authority?

General GREENLIEF. $3,240,000 provides for the personnel compensation and benefits for military support technicians assigned to each State; $585,000 provides funds necessary for the operation of the military support section of each State. The military support section of each State is charged with the responsibility of military support planning and operations during domestic emergencies to include civil disturbances, natural disasters, other—manmade—emergencies, and civil defense.

Senator YOUNG. How many civilian employees are involved in this activity, and what is the total of their compensation and benefits?

General GREENLIEF. There are 232 MSCA technicians. The compensation and benefits for the 229 man-years is $3,240,000.

MILITARY SUPPORT TO CIVILIAN AUTHORITY

Chairman ELLENDER. Of the total requested for military support to civilian authority, I note that $104,000 is for a program entitled "Civil Disturbance/Civil Defense Exercise" and $52,000 is for "Physical Security Inspections." These seem to be new efforts. Please comment on each.

General GREENLIEF. Yes, sir. After action reports from civil disturbance and disaster relief operations during the past few years indicate that better coordination between military and civilian authori-

ties is of primary importance. Exercises conducted in the past have focused on national postnuclear situations, ignoring the critical situations of smaller, immediate disasters, or civil disturbances. Funds for the program entitled "Civil Disturbance/Civil Defense Exercise" will be used to conduct low level exercises to increase rapport between the National Guard, and city and State officials in their respective areas. Such exercises would clearly outline what the National Guard can do to support civil authorities, and, more important, when they should be called to duty to assist during a domestic emergency.

During the past year, the National Guard has experienced an increasing number of break-ins at the local armory level throughout the country which has resulted in the loss of Government property, including weapons and ammunition. Similar type of losses are being experienced by the Active Army and Army Reserve in their installations. The National Guard has no basic investigative capability such as that found in CID units of the Active Army, and, as such, must rely on the expertise of their military support staffs in the office of each adjutant general. The funds for the physical security inspections program will be used to implement a physical security inspection system of National Guard armories and installations, that are used for storage of weapons and ammunition, which are highly vulnerable to break-ins.

RECRUITING AND PUBLICITY

Senator YOUNG. The total requested for headquarters and command support includes $2,150,000 for recruiting and publicity, which is an increase of $1.5 million over the sum provided for fiscal year 1972. Is this the increase you referred to in your statement?

General GREENLIEF. Yes, sir, it is.

Chairman ELLENDER. On page 36 of the justifications, I note that $1.7 million is requested for the following purpose: "Provides additional funding for Army National Guard activities required to support the recruiting efforts needed to maintain the authorized strength of the Army National Guard in a draft-free environment." I note that only $200,000 was provided for this purpose for fiscal year 1972, so 100 percent of your requested increase is for this purpose. Am I correct about this?

General GREENLIEF. Yes, you are, sir.

Chairman ELLENDER. Please provide a statement for the record setting out in detail exactly what you plan to do with this $1.7 million.

General GREENLIEF. Yes, sir.

(The information follows:)

Army National Guard recruiting advertising program:	
Pamphlets and posters for armories and public places	$160,000
Radio spot announcements (production costs)	30,000
TV spots—production and printing	55,000
Recruiter casette motion picture projectors	50,000
4 films production and prints for 16-mm. cassette	300,000
TV sport program—distributed through military theaters, and television stations	100,000
Transit car cards for recruiting advertising	45,000
Outdoor billboards for recruiting	45,000
Advertising in special publications	195,000
Recruiting expenses at State and unit levels	720,000
Total	1,700,000

Other Operating Costs

Chairman Ellender. The balance of the request for headquarters and command support is $5,748,000 for other operating costs, which is an increase of about $2.1 million over the sum provided for fiscal year 1972. I assume that the major portion of this increase is to cover the increased reimbursement for postage that we discussed earlier. Am I correct about this?

General Greenlief. Yes, sir; you are.

Medical Support

Chairman Ellender. The last item is the request of $1,088,000 for the budget activity entitled "Medical Support". The information on page 38 of the justifications will be included in the record at this point.

(The information follows:)

Appropriation: Operation and maintenance, Army National Guard—Budget program 3750 medical support

	Budget project account and title	Fiscal year 1973 estimate
3751	Emergency medical supplies	$35,000
3752	Medical care in non-Federal facilities	1,053,000
	Total	1,088,000

General Greenlief. This project provides for emergency medical supplies and for medical care in non-Federal facilities. The amount of $1.088 million includes $0.035 million for emergency medical supplies and $1.053 million for medical care in non-Federal facilities. The $0.119 million increase over the fiscal year 1972 program of $0.969 million is indicative of the increased cost of physical examinations.

Trained Units and Qualified Men for Premobilization Readiness

The funds requested will provide the support essential to the training programed for Army National Guard units in fiscal year 1973.

Our mission is to provide trained units and qualified officers and men to attain and maintain the high degree of premobilization readiness required by mobilization plans and deployment schedules. Achievement of this mission reflects the efforts of the States and the continued support of the Congress and the Department of the Army.

This concludes my statement. I will be happy to answer questions at this time.

Guard-Reserves Sharing of Facilities

Chairman Ellender. I am suggesting that something be done to consolidate and coordinate as much as possible use of facilities in the same areas by the Reserves and the National Guard.

General Greenlief. Procedures are designed and they are improving to produce a maximum amount of cooperation and mutual support.

Chairman Ellender. You have only 18 percent——

General Roberts. Some of the Army Reserve is with the Navy Reserve and some with the Marine Corps Reserve. So our figures might be a little different than that.

General Hollis. It is difficult to quantify this. But in my role I would tell you and make the commitment that we are moving toward the fullest cooperation we can get in this business, because we are all a part of the same Army and it just makes good sense to do this; whereas, we might not have done as well as we have in the past, I think the present stewardship is fully committed to this business of making the optimum use of these facilities on a cooperative basis.

General Greenlief. Sir, in the Army National Guard we have currently 73 armory facilities jointly utilized with one or more Reserve components. We have five projects now being programed for that: Bellefonte, Pa.; Bellingham, Wash.; New Brighton, Pa.; Decatur, Ala.; Lewiston, Maine.

State Board Review of Recruitments for Facility Utilization

There is at the State level a State board which consists, as General Roberts mentioned, of the Army Reserve, the Army Guard members, plus all other Reserve components represented in the Army, plus all active and regular service people. They review the recruitments of the Reserve components against all of the available facilities, including active facilities.

They must consider each project and rule that it must be joint utilization or unilateral. It then comes to the National Guard Bureau where we again review it for that very reason.

Army Review

From there it goes to the Department of the Army specifically and General Hollis' office, and the Deputy Chief of Staff for Logistics where they review it for that purpose.

DOD Review

Before final approval, the Department of Defense reviews each of these projects based on the State facility board report and their knowledge of what other facilities exist to insure we get a maximum of joint construction and joint utilization.

Interest of House Appropriations Committee

We watch very, very carefully the House Appropriations Committee. The House Appropriations Committee is very sensitive to this, as well.

Lewiston, Maine, Center

General Roberts. The contract for the Lewiston, Maine, Center was just awarded yesterday, joint with the Army Guard and Reserve. So we are looking at this constantly.

Chairman Ellender. Is there anything else you want to add to what you stated?

General Greenlief. Other than to thank you for your cooperation and confidence and support, sir.

SUBCOMMITTEE RECESS

Chairman ELLENDER. We will recess until 10 o'clock tomorrow morning.

(Whereupon, at 12:50 p.m., Thursday, March 9, the subcommittee was recessed to reconvene at 10 a.m., Friday, March 10.)

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1973

FRIDAY, MARCH 10, 1972

U.S. SENATE
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 10 a.m., in room S. 126, the Capitol, Hon. Allen J. Ellender (chairman) presiding.

Present: Senators Ellender and Allott.

DEPARTMENT OF DEFENSE

DEPARTMENT OF THE ARMY

OPERATION AND MAINTENANCE, ARMY

STATEMENT OF BRIG. GEN. L. R. SEARS, JR., APPROPRIATION DIRECTOR, OPERATION AND MAINTENANCE, ARMY, OFFICE, COMPTROLLER OF THE ARMY

ACCOMPANIED BY:

MAJ. GEN. J. A. KJELLSTROM, DIRECTOR OF ARMY BUDGET, OFFICE, COMPTROLLER OF THE ARMY

MAJ. GEN. D. H. RICHARDS, ASSISTANT DEPUTY CHIEF OF STAFF FOR LOGISTICS (S&M)

COL. J. K. GILHAM, DIRECTOR OF PLANS, STUDIES, AND BUDGET, OFFICE, DEPUTY CHIEF OF STAFF FOR PERSONNEL

BUDGET REQUEST

Chairman ELLENDER. The subcommittee will come to order.

The next appropriation to be considered is "Operation and Maintenance, Army," for which the fiscal year 1973 estimate is $6,903,714,000. For fiscal year 1972, the appropriation was $6,766,488,000, which includes $105,276,000 for civilian pay increases effective January 1, 1972.

PROGRAM AND FINANCING

At this point in the record there will appear certain program and financing information from the justifications.

(The information follows:)

DEPARTMENT OF THE ARMY—OPERATION AND MAINTENANCE

PROGRAM AND FINANCING (IN THOUSANDS OF DOLLARS)

	1971 actual	1972 estimate	1973 estimate
Program by activities:			
Direct program:			
1. Strategic forces	90,548	112,817	132,729
2. General purpose forces	1,957,517	1,879,798	1,767,385
3. Intelligence and communications	385,016	386,417	418,118
4. Airlift and sealift	44,896	40,937	42,479
5. Guard and Reserve	141,109	166,690	208,619
7. Central supply and maintenance	2,131,846	2,111,953	1,983,533
8. Training, medical, and other general personnel activities	1,245,838	1,361,141	1,474,713
9. Administration and associated activities	337,250	382,189	382,496
10. Support of other nations	470,009	462,778	493,642
Total direct program	6,804,028	6,904,720	6,903,714
Reimbursable (total)	1,121,839	992,654	998,790
Subtotal	7,925,867	7,897,374	7,902,504
Intrafund obligations	−78,332	−58,334	−57,580
Total obligations	7,847,535	7,839,040	7,844,924
Financing:			
Receipts and reimbursements from:			
Federal funds	−800,016	−744,099	−765,759
Trust funds	−49,644	−50,088	−47,380
Non-Federal sources	−203,226	−145,133	−132,866
Unobligated balance available, start of year	−49,126	−58,505	−63,505
Unobligated balance transferred from other accounts		−141,000	
Unobligated balance available, end of year	58,505	63,505	68,300
Unobligated balance lapsing	1,007		
Budget authority	6,805,035	6,763,720	6,903,714

INTRODUCTION OF ASSOCIATES

Chairman ELLENDER. The principal witness will be Brig. Gen. Leslie R. Sears, Assistant Director of the Army Budget.

You may proceed.

General SEARS. Thank you, Mr. Chairman.

Mr. Chairman, I have severely limited the number of backup witnesses for today's hearings. If the committee has an area they wish to explore in depth, we can get an expert witness here in 20 minutes or we can insert the information in the record.

I would like to introduce the principal witnesses:

Major General Kjellstrom, Director of Army Budget, Office, Comptroller of the Army.

Mr. C. A. Olson, Office, Director of Army Budget, Office, Comptroller of the Army.

Maj. Gen. D. H. Richards, Assistant Deputy Chief of Staff for Logistics (S. & M.).

Col. J. J. Gilham, Director of Plans, Studies and Budget, Office, Deputy Chief of Staff for Personnel.

PRESENTATION FORMAT

Mr. Chairman and members of the committee, I am pleased to have the opportunity to appear before this committee to present the fiscal year 1973 Operation and Maintenance, Army budget request.

I have held the position of Appropriation Director for the "Operation and Maintenance, Army (OMA)" appropriation since July of last year. Immediately prior to that I was assigned in the Office of the Assistant Secretary of the Army for Financial Management;

therefore, I was already quite familiar with the OMA appropriation when I assumed my present duties.

My presentation to the committee today will highlight:

Significant improvements that have been made in managing the appropriation.

The basis for, and procedures used, in developing the budget request.

A discussion of soldier-oriented programs in the budget.

A brief review of the major activities to be supported by this budget with emphasis on changes that are taking place.

A discussion of activities and programs of special interest.

Detailed information concerning each of the nine major programs.

MANAGEMENT IMPROVEMENTS

When General Kjellstrom appeared before the committee last year, he described a number of actions that had been taken, or were under way, to improve management of the OMA appropriation. These actions have been continued and, where appropriate, our techniques and procedures have been further refined. In addition, we have a number of new initiatives in the management area. I would like to take a few moments now to review some of the more significant aspects of our continuing efforts toward improving management, and to describe some of our more recent actions.

COST ESTIMATING TECHNIQUES

One of the most significant aspects of management of operation and maintenance resources relates to the difficulties involved in the quantification of requirements. In the procurement appropriations we know the unit cost of the various items and can readily compute the number of items required. In the Military Personnel appropriation the rate of pay for each soldier is fixed according to his grade and length of service, and total fund requirements can be computed based on projected strength levels.

In operation and maintenance, however, we are dealing with less tangible areas, such as the state of readiness, the level of training and the standard of living. As a result of the lack of quantification, we have traditionally relied heavily on historical experience and judgment, along with established workload indicators as a means of forecasting requirements. Of course we do not plan to try to replace these proved techniques with purely mechanical or mathematical procedure, but we have developed additional cost estimating methods to supplement these.

Our approach in developing this supplemental methodology has been to consider the military man-year (MMY) as the basic unit of output—our "product"—and to relate OMA costs in the various categories to this output measure. This approach is particularly applicable to the OMA appropriation since so much of the support provided by the appropriation is directed toward the individual soldier. The OMA dollar provides the vital link between the soldier and his equipment, and is directly related to combat readiness of each. Thus, in a very broad sense we are estimating our dollar requirements for training, for medical support, for supplies, equipment, communications and

other support on the basis of the amount of each required to support 1 military man-year.

In the process of formulating and validating these costing procedures we determined which cost elements vary directly with the number of military personnel supported and which tend to remain constant over a wide range of military personnel strength. We identify those costs which do not vary in direct proportion to strength changes as static costs. Such costs have long been recognized in the business community as fixed costs which relate to such elements of expense as rent, depreciation and insurance. Many of the OMA costs which remain static are found in the base operations accounts since there are many base functions that must be continued at essentially a constant level even though the population supported may change. The high proportion of static costs in OMA is one of the reasons that total OMA funding does not increase or decrease in direct proportion to the total strength of the Army. Application of the static/variable cost relationships has added another valuable management tool in our efforts to insure that our budget estimates represent a reasonable and balanced application of the minimum required resources.

STRENGTH REDUCTION AND REQUIREMENT INCREASES

Chairman ELLENDER. In that connection, I notice that your requirements are greater than those of last year notwithstanding the fact that we have a planned reduction in the strength of the Army of about 20,000. What is it in man-years?

General SEARS. 104,000 man-years, sir; 92,000 of those man-years are out of Vietnam.

Chairman ELLENDER. To what extent have those soldiers who were in Vietnam been discharged or are some still or active duty?

General SEARS. It depends, sir. It is really a mixed situation. Some of the soldiers who are draftees who went to Vietnam and came home are being released under their expiration of term of service, or under the early release program. Others who are career soldiers when they return from Vietnam will be reassigned to other posts in the continental United States.

Chairman ELLENDER. When you say there has been a decrease of 104,000 man-years, does that represent men being discharged?

General SEARS. Yes, sir. The strength of the Army and the average man-years is down for 1972–73 by 104,000 men.

Chairman ELLENDER. What is the principal cause of the O. & M. increase when you have 104,000 fewer man-years?

OFFSETTING INCREASE

General SEARS. Sir, we estimate that the savings that would have accrued on the basis of the 104,000 men being out of the Army and the 92,000 men coming out of Vietnam would have been approximately $520 million. Offsetting that $520 million decrease are at least four areas. One is the civilian pay raises, the currency revaluation, cost growth——

Chairman ELLENDER. Can you give weight to each of the four?

General SEARS. Yes, I can, sir. Those three items would be $253 million. The pay raises, the currency revaluation and the cost growth.

The soldier-oriented programs, which I mentioned in my statement which we will discuss in some detail in the statement, add $307 million between fiscal year 1972 and fiscal year 1973.

Chairman ELLENDER. You are going to discuss that program?

General SEARS. Yes, sir; that will be discussed in some detail in the statement outlining what makes up each of the programs and what makes up the increases between fiscal year 1972 and fiscal year 1973.

Another category, sir, is the increased readiness of the Army Reserve. The Army Reserve program——

Chairman ELLENDER. That is a part of the O. & M. appropriation insofar as it relates to support of the Reserves; is it not?

General SEARS. You are right. Program 5 in Operation and Maintenance, Army, includes the OMA support for the Reserve. The Reserve pay is a separate appropriation.

General KJELLSTROM. The Army Reserve as opposed to the National Guard. You heard the National Guard O. & M. yesterday. You did not hear the O. & M. for the Army Reserve.

General SEARS. That figure, sir, is $42 million increase between fiscal year 1972 and fiscal year 1973. We will also discuss in the statement the reasons for that increase. So those three items total $602 million, or essentially $82 million above what we saved as a result of the 104,000-man-year reduction.

Chairman ELLENDER. Many of members of Congress are wondering why it is that, despite the decrease in all of our forces, the funding request is higher in many categories. I can well understand the effect the pay increases would have. But on the O. & M. account, I hope you can make a good case for it.

General SEARS. We will discuss each of these items I have mentioned, sir, in some detail in the statement.

Chairman ELLENDER. All right.

OUTPUT MEASUREMENT

General SEARS. Another management tool which we are attempting to develop and refine involves output measurement. That is, we are trying to develop better information as to specifically what the OMA dollar is buying in terms of production or output. This effort is primarily designed with a view toward execution of the budget rather than for program purposes. In a number of areas we already have well established and proven indicators of output such as vehicles repaired, tons shipped, students trained or patients treated. In some other areas, however, we have generally relied on more subjective measures of results. Our current efforts in output measurement development are concentrating on these subjective areas. Our goal is to develop techniques that will further enhance our capability to continuously review our programs as they are executed. We believe that, through further development of our capabilities in this area, we will be able to minimize unprogramed short falls that sometimes occur.

BASE OPERATIONS MANAGEMENT

In order to better manage the large portion of the OMA budget utilized in operating and maintaining the Army's installations, the Army has intensified the management and control of resources in this

area. Although the primary program director will retain overall responsibility for this total program, development and execution of base operations programing is being placed under the administrative control of the Deputy Chief of Staff for Logistics—DCSLOG—since approximately 70 percent of the expenses incurred in base operation relate to functional responsibilities of that staff office.

We have just recently begun the implementation phase of this effort, and do not expect to have it fully operational until some time during the fiscal year 1974 budget formulation cycle. However, the initial indications are that this program will make a significant contribution toward improving our ability to manage OMA base operations functions.

Chairman ELLENDER. How does this new allocation of responsibilities with regard to base operations management differ from the way this has been handled in the past?

General SEARS. The Deputy Chief of Staff for Logistics—DCSLOG—is now responsible for overall development and management of base operations as a separate administrative budget program. In the past, the major program directors determined both mission and base operations dollar levels within their respective programs. Under the new administrative program, the major program directors will continue to identify the level and type of base operations support required to accomplish their program objectives; however, DCSLOG will convert these support levels into specific dollar requirements for the total base operations program, and defend this program during the budget development and review processes. DCSLOG will also monitor program execution, and recommend redistribution of funds among base operations activities as considered appropriate.

LOGISTICS MANAGEMENT

As mentioned by the Secretary of the Army in his presentation before this committee earlier, during 1969 we initiated a series of logistic improvements designed to reduce expenditures in the Army budget without significantly risking the disruption of our essential mission. The Secretary highlighted such actions as reduction in the number of items stocked overseas, reduction in support items within CONARC, timely elimination of unneeded inventory through Project Clean, expansion of the selected item management system—SIMS—and increased application of inventory in motion principles which minimizes large stocks at immobile combat zone depots. Additional logistics improvement actions include the implementation of direct supply support—DSS—procedures, more effective use of automatic data processing—ADP—capability, reduction of activity in or deactivation of some facilities, and improvements in aircraft maintenance procedures.

SAVINGS RESULTING FROM MANAGERIAL IMPROVEMENTS

Chairman ELLENDER. In all of these changes that you are talking about, to what extent have you been able to save dollars? That is what counts with me. I know you will be able to justify the increases in the four categories you mentioned a while ago. Have the changes in management you have been talking about had the effect of lowering costs of the operation?

General Sears. I would like to ask General Richards to respond to that question, Mr. Chairman.

General Richards. Sir, we have identified either through direct savings or cost avoidance over $3 billion in savings that have come out of these major managerial improvements that we have made.

About $3.5 billion in savings or cost avoidance. The economic benefits resulting from the logistics offensive program are tremendous. The Army has been able to reduce its budget requests by $1.7 billion and to satisfy other higher priority requirements that would have required approximately $2.8 billion through this program over the past 3 years. However, of greater importance is the fact that the logistical readiness of the Army has increased markedly during the same time. From June of 1969 to June of 1971, the worldwide logistics readiness rates for equipment on hand increased from 74 to 93 percent and for equipment deployability from 60 to 74 percent.

Chairman Ellender. Where does that saving appear?

General Richards. It shows in many areas, over a period of years since 1969. These savings of course in some cases have been offset by requirements in other areas.

Vietnam War and Deferred Maintenance

In some areas we have fully funded the Vietnam war but as a result of that effort we have in effect deferred requirements in other areas——

Chairman Ellender. Because of the war?

General Richards. Because of the war, yes, sir; right here in the continental United States, for example, and in the Reserve components, we have extensive programs on now. We are spending an extra $50 million this year over last year or a total of $100 million just to repair our first-line equipment that we want to put into the Reserve components. This kind of deferred maintenance, if you will, is using up some of the savings we have made in other areas.

Training Cost Increase

Chairman Ellender. Last year, as I remember, we discussed the increase in the cost of training military personnel.

General Richards. Sir, I recall that discussion.

Chairman Ellender. Are you this year providing more funds than usual for training?

General Richards. Sir, I would like to let General Sears address that particular aspect of it.

General Sears. Yes, sir, we are providing additional funds for unit training. As you indicated, Mr. Chairman, while the Vietnam war was on, our troops were essentially trained in combat. Now that the Vietnam war is off, for the same number of troops, we are providing additional funds in the United States particularly so that units can engage in brigade and battalion level exercises. Additional funds are also being provided for Reserve components so their training can be made more meaningful. We must step up our new training program because we of course no longer have the Vietnam war as a major training base under combat conditions for the combat soldiers.

Chairman Ellender. When you come to that, would you indicate the difference?

General SEARS. Yes, sir, we can indicate the difference.
Chairman ELLENDER. Proceed.

DIRECT SUPPLY SUPPORT (DSS)

General SEARS. DSS is a simplified integrated supply system making maximum utilization of data processing equipment, communications, and transportation. It is specifically designed to deliver containerized shipments of needed material as far forward as possible and to provide maximum support to the using unit at least costs to the Department of Defense.

DSS was initially implemented in Europe and will be fully operational there by the end of fiscal year 1972. All units in Korea are now being supported under DSS, and plans are being developed to expand the system throughout USARPAC. Further expansion of the direct supply support system is continuing, with attendant refinements and improvements. Expansion of this system will reduce costs and operations in the overseas command but we expect offsetting increases in the Army Materiel Command's (AMC) workload and costs in the United States.

Chairman ELLENDER. Would you briefly describe the advantages of this DSS system over the old system? Obviously cost savings is not included as a saving or benefit, but if that isn't then what is?

General RICHARDS. Yes, sir; I will be glad to. The chief advantages of the direct support system (DSS) are:

1. Eliminates break bulk operation in that cargo goes directly from the United States to the military user overseas in lieu of an oversea depot. In effect, DSS eliminates an operational level of stock overseas for support of peacetime forces.

2. The direct support system reduces "pipeline" days by approximately 50 percent.

3. DSS is cost effective and will reduce overall operating costs when fully operational.

4. The system fully exploits technological advances in transportation, communications and data processing to provide throughput service from point of origin to the point of use overseas. Cost savings are included as a benefit. These savings will accrue over a period of time as stocks in oversea depots are drawn down and as the total supply pipeline is reduced.

ADP SYSTEMS (SPEEDEX, ALPHA)

The SPEEDEX system is a standard ADP system being installed in all AMC depots. This system will provide the capability to accelerate the processing of high priority Materiel Release Orders (MRO) by using remote devices providing immediate access to computer stock data. Utilization of remote terminals which connect to centrally located computers, rather than installing individual computers at each depot, permits significant savings in manpower and site preparation costs. SPEEDEX is currently in operation at Letterkenny, Tobyhanna, and New Cumberland Army Depots.

Chairman ELLENDER. How does that work?

General RICHARDS. We have remote terminals into the warehouses and the shipping and receiving warehouse areas. We can in effect keep track of what is going on in the computer operated bases in the process of what we call materiel release orders. When a requisition comes in it is validated, a depot is told to ship such and such item, such and such a quantity. We can track through the process of the depot operation with this automated system.

Chairman ELLENDER. You mean as to where to find the material?

General RICHARDS. Yes, we know where to find it.

Chairman ELLENDER. And the quantity?

General RICHARDS. And the quantity. And what the status of it is at any time in the processing of that particular release within the depot.

Chairman ELLENDER. Suppose you order x number of items that you have stored in one place and x number of items stored in another place. Does that computer system tell you what is still left in inventory?

General RICHARDS. Yes, sir. It will give you the remaining balance of what is left. Periodically, of course, we have inventories where we check the location and the quantity.

Chairman ELLENDER. Is your computer system accurate? Do you ever find great disparity?

General RICHARDS. No, sir, not in the continental United States where we have progressed further in improving our management system. In places like Vietnam and Korea we don't have the same kind of accuracy. We are working to improve it.

Chairman ELLENDER. You don't have the same system abroad?

General RICHARDS. No, sir.

General KJELLSTROM. At the Sacramento Army Depot they have the computer facility which is controlling on a remote outlet basis the inventories at Sharp Army Depot located about a hundred miles away. The remote terminals are down at Sharp, near Stockton, but the actual computer facility is up at Sacramento. This is the SPEEDEX system. In a short period of time that system is going to be extended to Sierra Army Depot in California and this type of facility is very cost effective in that it reduces the number of people to operate the computer facilities at individual depots. It is a very interesting operation.

Chairman ELLENDER. One of our difficulties in the past was that goods were ordered although they were already on hand. That often happened. To what extent does this computer system help you to avoid ordering material you already have on hand?

General RICHARDS. I think in the United States this would be where we would have sufficient number of the items in stock and at the same time might be buying more. I think that is what you have in mind.

Chairman ELLENDER. I refer to items in inventory but which could not be found and so new orders were placed.

General RICHARDS. That is right; in some cases we had the item but it was not on the books and therefore it was put on order without complete verification.

COMPLETE CONTROL OF PROCUREMENT PROCESS UPON FULL IMPLEMENTATION OF ALPHA SYSTEM

Chairman ELLENDER. To what extent has this system assisted you in that regard?

General RICHARDS. In the United States materially, because it keeps much closer track than we previously were able to do, of the actual stock at any particular point in time. Managers have a better handle on the stock on hand. Now, when we get the ALPHA system fully implemented, which is the counterpart of the SPEEDEX as it relates to our national inventory control points. We will have a complete control of the procurement process or the replenishment process as well as the depot operation.

ALPHA has not progressed as far as SPEEDEX, the depot operation system, has. We now have ALPHA in operation in the Aviation System Command in St. Louis. It is scheduled to go into all our other commodity commands, all our other national inventory control points on a progressive basis.

ANTICIPATED PERSONNEL SAVINGS

Chairman ELLENDER. To what extent will such a system save manpower?

General RICHARDS. If I may insert for the record what our estimated savings in personnel will be when we are fully implemented with both ALPHA and SPEEDEX.

(The information follows:)

As General Sears indicated in his testimony, the primary economic benefit identified to date in cost/benefit studies is a reduction in personnel requirements resulting from increased automation, standardization, and centralization of system design and computer programing. The principal objective, however, in installing standard systems under ALPHA and SPEEDEX is to improve the management of the wholesale logistics system by providing current and integrated data.

The near term benefits associated with personnel identified in the cost benefits study for both ALPHA and SPEEDEX, hardcore and follow-on systems, are $11.94 million. These dollar savings, when realized, will equate to some 1000 personnel spaces. It should be emphasized, however, that these benefits were projected on the best information available at the time of the study and during the prototype stage of both systems. Precise determination of the ultimate personnel benefits which can be achieved will be possible only after these systems have become fully operational.

Chairman ELLENDER. At the three Army depots you mention, what has been your experience to date relative to costs, savings, and efficiency? Do you note a marked improvement?

General RICHARDS. The Speedex hard-core system has been in operation for 7 months at Letterkenny and a lesser period at the other two. Eighty percent of the projected benefits as to cost and savings have been already demonstrated at the Letterkenny Prototype Depot. It is anticipated that these benefits will be obtained at the other two installations. We are entirely satisfied that the Speedex system is a marked improvement over previous nonstandard systems in use and that the confidence placed in Speedex has been fully justified by our experience to date.

PROGRAM DESCRIPTION

Chairman ELLENDER. Proceed.

General SEARS. ALPHA—AMC Logistics Program Hardware Automated—is the standard automated system for commodity commands, and includes provisioning, cataloging, stock control, international logistics supply management, procurement and production, and comptroller systems. ALPHA is currently operating at the U.S. Army Aviation System Command—AVSCOM.

Chairman ELLENDER. I presume that this ALPHA system increases the control you have over inventories and so forth, which should, in the long run, be reflected in reduced inventories armywide, is that correct? Is this where the real savings will be obtained in the long run?

General SEARS. It is anticipated that the ALPHA system will result in increased control over inventories by providing current and integrated data for management. However, a projected reduction in inventories is difficult to ascertain and has not yet been quantified. The primary benefit identified to date in cost-benefit studies, is a reduction in personnel requirements because of increased automation, standardization, and centralization of systems design and computer programing.

PERSONNEL AND ACTIVITY REDUCTIONS

The personnel situation in fiscal year 1973 in logistics operations reflects a stabilization of the personnel turbulence that occurred during fiscal year 1972, due to strength reductions. Associated with these personnel reductions were a number of significant activity actions taken such as consolidation of Army Class Management activities, reduction of two Army depots to reserve status—Navajo and Fort Wingate—discontinuance of Granite City Army Depot as an active depot, and reduced operations at Charleston Army Depot.

Chairman ELLENDER. What units or geographic areas did the three depots in question serve and what depots will pick up the load that these three will be dropping?

General SEARS. Fort Wingate and Navajo depots served the 6th Army or western area of the United States and the Pacific theater. Their workloads were picked up by other depots having ammunition missions in the Western States, such as Tooele Army Depot in Utah and Umatilla Army Depot in Oregon.

Granite City depot serviced the mid United States, and Caribbean area. Its mission was transferred to six depots; that is, Atlanta, Pueblo, Red River, Tobyhanna, Tooele, and Sharpe Army Depots.

Charleston depot serves the Southeast area of the United States, as well as Europe and the Caribbean areas. The depot, although retaining its mission of storing watercraft, is to be satellited on Atlanta Army Depot for administration.

Chairman ELLENDER. Will there be increases requested for the increased workloads at the picking-up stations?

General SEARS. No, sir, the budget estimates of the Army reflected the net savings from depot closures after consideration of the offsetting costs at the gaining installations.

RETROGRADE AND REBUILD OF AIRCRAFT

We have initiated several management techniques and practices to improve the control of our depot overhaul program and hold costs to a minimum.

Our Closed Loop Support System semiannually programs aircraft support requirements by theater and command. In order for the user to obtain the greatest possible utilization of aircraft we extended the maximum time between overhaul in combat areas. Concurrently, policies were established for providing periodic technical inspections to certify further air worthiness or eligibility for overhaul, assure that all possible lower echelon maintenance has been accomplished prior to retrograde, and assure that only crash-battle damaged aircraft meeting economical repair criteria are returned to CONUS. Other programs, such as our Aviation Component Intensive Management System—ACIMS—have provided life cycle visibility, by end item serial number, for high-dollar value and critical components distributed through worldwide commands.

Despite this intensive management, we had continued to build up significant deferred maintenance on the aircraft fleet in Vietnam. Deferment of this work and the hard usage in Vietnam has resulted in an increased maintenance requirement that must be accomplished prior to our worldwide redistribution of these aircraft to new customers.

We have initiated a program called Project Extend. This program is designed to accomplish only the minimum essential repair functions required to insure that a safe, reliable, maintainable, and customer acceptable aircraft is provided for redistribution. In this manner, we believe we can cope with the increased maintenance workload created by the rapid drawdown of aviation resources in Vietnam and still meet the needs of projected Active Army and Reserve component requirements in the most cost effective and expenditious manner.

BUDGET REQUEST DEVELOPMENT

The fiscal year 1973 OMA budget request was developed within the framework of the revised Department of Defense planning, programing, and budgeting system. Development of detailed estimates began in February 1971 upon receipt of the tentative fiscal guidance memorandum from the Secretary of Defense. Based on this, and subsequent guidance, we developed the fiscal year 1973 program and formulated the budget request.

Emphasis on the development of soldier oriented programs designed to strengthen professionalism, to improve Army life for the individual soldier and his dependents, and to improve the accession program in attainment of an all-volunteer Army was begun early during the development of our fiscal year 1973 program and was maintained throughout the budget formulation process. These programs include not only those activities designated as Modern Volunteer Army or Project Volunteer, but also selected aspects of a number of other ongoing OMA funded activities such as civilianization of kitchen police, improvements in real property maintenance, medical care, and recruiting. I will address these and other soldier-oriented programs in more detail later in my presentation.

Our requirements for manpower and financial resources were developed and evaluated both in functional categories—major program—and with reference to requirements for each of the Army's commands and operating agencies. Thus, we examined and validated requirements for such activities as transportation, maintenance of equipment, medical support, and training not only from the point of view of the total Army, but also in relation to how much of the total in each category would be required for the Continental Army Command, U.S. Army, Europe, Army Material Command, and other commands or agencies. Concurrently, our intensified management program for base operations resources, which I described earlier, enabled us to insure a proper balance between resources allocated to mission support and those for base operations.

We relied heavily on the analytical costing methods which I described earlier, as well as on historical experience and estimates developed by field commands and agencies. Application of OMA cost factors and the static and variable cost relationships permitted us to evaluate resource requirements in terms of dollars required for various force structure configurations and deployments. This technique also enabled us to examine the programed level of support as related to dollars per man, or dollars per unit of projected workload, such as vehicles to be repaired or soldiers to be trained.

After the overall OMA program had been developed we provided updated guidance concerning funding levels, force structure and workloads to field commands and agencies. The commands then submitted their estimates of resource requirements to include identification of areas where adjustments to projected funding or workload levels were required.

Following consideration of the estimates submitted by the field commands and integration of their requirements in the total OMA budget by program, we began another period of critical examination and analysis.

For a period of over 3 weeks during September 1971 my staff and I reviewed the budget and made adjustments. Following this, the Budget Review Committee (BRC), which is composed of general officers from the Army Staff, again reviewed each program and presented its recommendations to the Chief of Staff. In conjunction with the review of the budget by the BRC, the Office of the Director of Army Budget—Assistant Director for Resources—accomplished a number of detailed qualitative and quantitative analyses to assist in validation of the programed levels of support in various functional categories. The findings and recommendations arising from these analyses were considered by the BRC in making adjustments to the budget.

Before submission of the budget to the Office, Secretary of Defense, a final review of each OMA program was accomplished personally by the Secretary of the Army and his immediate staff.

The budget was submitted to the Office, Secretary of Defense on September 30, 1971. Throughout the months of October, November, and December, the budget was reviewed jointly by Office, Secretary of Defense and Office, Management and Budget.

ORIGINAL BUDGET REQUEST

Chairman ELLENDER. When you presented your budget to the Secretary of the Army to what extent was it reduced?

General SEARS. We have to provide the details for the record.

Chairman ELLENDER. Did you receive all you asked for or were reductions made?

CHANGES BY SECRETARY OF THE ARMY

General KJELLSTROM. If I may, sir, within the Secretary of the Army office there was little, if any, adjustment between the request that the Army Staff developed and the Army secretariat because we work concurrently with the Army secretariat in this process, going through the programing cycle in the process.

Chairman ELLENDER. Who is the final arbiter as to whether reductions or additions should be made?

General KJELLSTROM. Mr. Froehlke, the Secretary of the Army within the Army.

NET REDUCTION BY DOD

Then our submission goes to the Office of the Secretary of Defense where Mr. Laird is the final arbitrator for the level of the Army.

Chairman ELLENDER. Then to what extent was your budget changed and in what respect?

General SEARS. Our budget was changed by the Office of Secretary of Defense in the amount of $255 million. It was lowered by that amount. That was made up of quite a number of plusses and minuses, sir. The net was $255 million lower. Our budget submission to the Secretary of Defense was $7,159 million; the President's budget presented to the Congress was $6,904 million, $255 million lower.

REDUCTION AREAS

Chairman ELLENDER. In what area were the cuts made?

General SEARS. The areas that the cuts were made were second destination transportation, $15.8 million; supplies for Vietnam, $14.9 million; benefits resulting from direct supplies support system, $8 million. I believe, Mr. Chairman, you asked a question a little while ago what direct savings are you getting out of these management improvements. The Secretary of Defense determined that we could save $8 million, our budget request was reduced by that much as a result of this direct supply support system. In order to cut down the Continental Headquarters, that is the CONUS Army Headquarters, we reduced our budget $5.9 million, to cut down the staffing in the headquarters.

In the area of automatic data processing, $4.5 million was reduced. Supply depot operations, $8.1 million. In the area of base operations, worldwide, maintenance of our posts, camps and stations, $6.6 million. They reduced CHAMPUS, civilian health and medical program, by $11 million, basically on the basis of cost growth. They did not think as much cost growth would occur as the Army had projected.

In the area of depot maintenance, maintenance of our material, $59.5 million was reduced. These are individual items of equipment that we were going to overhaul and the quantities were reduced.

Chairman ELLENDER. In that area was any reduction made to reduce employment?

General SEARS. Yes, sir. In this area I mentioned CONUS Army Headquarters, in the O. & M. appropriation this would be mainly civilian employees. Many of these cuts, sir, would result in a lesser number of civilian employees. Actually, we had a specific reduction of $25.9 million in civilian employment. This is an effort to both cut numbers of civilians and the average grade of civilian employees.

Mr. Chairman, I can submit the entire list for the record, if you wish.

Chairman ELLENDER. I wish you would put that in the record, yes.

(The information follows:)

	Thousands
Army's fiscal year 1973 budget submission to OSD	$7,158,923
OSD Adjustments	
Increases:	
Overseas dependent's schools	+7,668
Increased workload—Fort Buchanan	+4,500
Civilian health benefit insurance	+5,867
Transportation rate adjustment	+22,400
Drug abuse and alcohol rehabilitation	+11,200
Military assistance service funded programs (MASF)	+111,200
Foreign currency revaluation	+15,803
Operational test and evaluation	+6,197
Classified pay raise—Jan. 1, 1972	+113,900
Total increases	+298,735
Decreases:	
Second destination transportation	−15,800
H Series TOE conversion	−4,600
RVN supplies	−14,900
Savings resulting from direct supply support system—Europe	−8,000
Transfer of secondary items from the Army stock fund to procurement account	−9,800
Reduction in CONUS Army headquarters	−5,900
Army Reserve and National Guard	−17,000
Automatic data processing systems (ADP)	−4,500
Supply depot operations and inventory control points (ICP)	−8,100
Base operations	−6,600
CHAMPUS	−11,786
Depot maintenance	−59,500
Savings due to the directed reduction in average grades of civilians	−41,125
Reduction in SAFEGUARD sites	−12,046
Cost growth	−48,000
Real property maintenance	−54,500
Reduction in trained strength target	−9,902
Civilian employment	−25,928
Savings resulting from FRG offset agreement	−80,000
Soldier oriented programs	−84,010
Intelligence activities	−14,611
Other miscellaneous adjustment	−17,336
Total decreases	−553,944
Fiscal year 1973 President's budget	6,903,714

EXTENT OF DOD BUDGET REVIEW

Chairman ELLENDER. Please proceed, general.

General SEARS. The review is extensive, sir, and is a joint review conducted by both OSD and the Office of Management and Budget.

They jointly review the Army budget. They review it during a 3-month period; October, November, and December. A hearing is held with OSD and OMB and they go through the budget in minute detail, every item in the budget, before it is submitted for Presidential approval for submission to the Congress.

The request before the committee at this time, therefore, represents the culmination of a budget development process that began over a year ago. The requirements expressed in the request have been subjected to analysis and verification. We believe that the procedures which we have followed throughout the cycle have resulted in a budget request which represents an accurate and balanced statement of the minimum resources required to support the successful accomplishment of the Army's assigned mission.

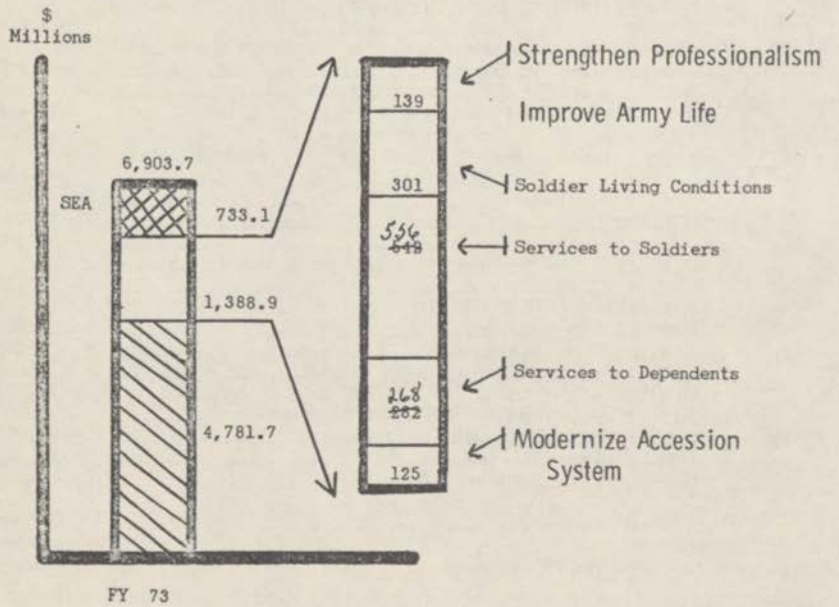
O. & M. TABULATION ON SOLDIER ORIENTED- PROGRAMS

Chairman ELLENDER. General, before you address yourself to the soldier-oriented programs, I think it would be wise to provide in the record the tablulation on such programs as included in your statement.

General SEARS. Thank you.

(The information follows:)

OPERATION AND MAINTENANCE, ARMY



SOLDIER ORIENTED PROGRAMS

SOLDIER-ORIENTED PROGRAMS

At this point in my discussion, I would like to address a set of activities which we refer to collectively as "Soldier Oriented Programs." As I mentioned previously, we placed early emphasis during the budget development cycle on allocation of resources to programs which would improve conditions for the soldier and his family and assist in attainment of our goal of a zero draft Army by July 1973. To provide an overall framework within which to examine the budget request, we will now tell you why the Army's soldier oriented programs are necessary, what they consist of, and what they will cost.

I would like to emphasize also that these programs do not represent a compromising of essential professional standards, or an attempt to entice volunteers with the promise of a soft life. Instead, the soldier oriented program is an integral part of our effort to focus on the essentials, to return to the basics of soldiering, and to move to higher standards of competence and professionalism.

First, it is necessary to examine what was happening in the Army during the period from fiscal year 1965 to fiscal year 1972. While we fully met the requirements arising from the Vietnam war, we did so at great cost to the Army in other areas.

VIETNAM PRIORITY

First priority on issue of new equipment, and on repair and replacement of unserviceable items, went to our units in Vietnam. As a result, many of our units elsewhere suffered severe shortages of essential equipment. Further, the requirement to utilize our most experienced officers and non-commissioned officers in Vietnam, coupled with the fact that the expansion of the size of the Army was accomplished almost entirely without activation of reserve forces, led to shortages of experienced leaders in these same units.

RESULTANT DEGRADATION OF UNIT TRAINING

The above problems, along with overall funding constraints, led to a degradation of both the amount and intensity of unit training activities. The lack of meaningful training exercises and activities not only adversely affected the combat readiness of these forces, but also had a severe detrimental impact on morale.

Mr. Chairman, you mentioned before the unit training area and indicated you would like to have information on that. A comparison of the overall training between fiscal year 1972 and fiscal year 1973 would show a total of $62 million in the fiscal year 1972 and $60.4 million in fiscal year 1973. The total cost is down a little bit but of course when we consider the size of the Army, it is down by a hundred thousand men, if we put it on a per man-year basis the training cost would be up. Those costs are made up of annual service practice, Army training exercises, rifle and pistol marksmanship, triple capability division, command area schools, Combat Arms Training Board, which is a new activity to emphasize combat training and Joint Chiefs of Staff exercises conducted throughout the world, a total of $60.4 million this year.

Chairman ELLENDER. Last year we made a similar comparison.

General SEARS. Right, sir. If you would care to look at 1971, the previous fical year these costs were only $20.8 million. So we have had a

threefold increase in training between 1971 and this current budget. Most of the increase did occur last year in 1972. It is essentially a level budget this year but with a lower Army strength.

Deferred Maintenance and Repair, Modernization, and Personnel Development

Finally, the unusual personnel turbulence and the need to place funding priority on Vietnam required us to defer many of our essential maintenance and repair, modernization, and personnel development programs.

Morale Problems

These factors, coupled with the fact that we are moving toward a zero draft Army, have led to the current problem.

The current problem can be expressed as consisting essentially of three major aspects of Army life which combine to shape the attitudes of our soldiers and potential enlistees. These are: First, the work we offer our soldiers; second, diversion of soldiers from military duities; and third, poor living conditions for our soldiers and their dependents.

Work

Surveys indicate that the Army ranks lowest of all services in "Best chance to use one's skills or abilities." This is especially important since 88 percent of enlistment candidates list interesting and challenging work as a most important aspect of a job, and less than half of these young people believe that the Army offers such work.

Diversion from military duties. Each day about 45,000 soldiers are utilized in details not directly related to their military duties. Surveys and interviews show that this diversion from "soldiering" is the main source of frustration among our more highly motivated soldiers.

Chairman Ellender. Were these 45,000 soldiers assigned to combat units or support units?

General Sears. These soldiers were assigned to a variety of units; combat units, combat support units, combat service support units. These were soldiers assigned to the Regular Army units.

Chairman Ellender. What were they complaining about?

General Sears. They were complaining about the fact that they had to cut grass around the post, that they had to haul the trash away, that they had to perform KP, that they had to go on various kinds of guard duty not necessarily connected with the military.

Chairman Ellender. What changes have you made?

General Sears. Sir, we have a direct program to take care of that. There is $35 million proposed in the fiscal year 1973 budget to replace enlisted men on detail. This I will also get into in the statement.

Chairman Ellender. Will this work be done by civilians?

General Sears. It will be, sir, if this budget request is approved, this work that the 45,000 soldiers are required to do each day. We would like to make a dent in getting the soldiers back to soldiering. I could give an example of a platoon size organization in a combat unit. The platoon leader calls out his platoon for training in the morning to conduct meaningful training. He has 50 or 60 percent of the men in that platoon present for duty. He says where are my 30 or 40 men in the platoon. Some are on KP, some on battalion detail, some on post detail,

some on guard duty. Naturally, some are on leave and pass and perhaps sick. When it gets through, he has half of a platoon to take to the field.

Our objective is to get him as close to a hundred percent of that platoon to take out for meaningful training rather than the 50 or 60 or 70 percent that he currently has.

Chairman ELLENDER. Proceed.

LIVING CONDITIONS

General SEARS. Poor living conditions are a major deterrent to reenlistment in the Army. The Army ranks lowest of all services in terms of living conditions for single servicemen. The impact of this situation is evident in view of the fact that 80 percent of our soldiers with under 2 years service rate privacy and comfortable living conditions as very important, and that only about one-fourth of these soldiers believe that the Army provides these things.

NO COST PROGRAMS

Our fiscal year 1973 program reflects a determination to minimize the effects of these negative factors. One of the first things we have done is to initiate what are essentially no cost programs to eliminate some of the sources of irritants and to improve job satisfaction for our soldiers.

We have implemented procedures to provide a greater degree of stabilization in duty positions, and eliminate the frequent reassignments that were so common during the peak war years.

We have eliminated unnecessary formations which have no relationship to the unit's mission, and have removed other unnecessary restrictions such as requiring soldiers to carry a pass when off duty. These innovations in no way represent a lessening of the standards of discipline or order, but instead are evidence to the soldier that he is considered to be a mature individual who can be expected to be responsible for his own actions without being led by the hand.

One of our most promising no-cost initiatives designed to improve job satisfaction involves the adventure training programs now in effect in many of our units. These programs, which are conducted on a volunteer basis, involve advanced physically and mentally demanding training in such arts as mountain climbing, scuba diving and long-distance hiking. The purpose of the adventure training program is to provide a challenging opportunity for our more highly motivated soldiers to pursue the development of selected skills both as recreation and for physical training.

Another no-cost program which is being favorably received involves the offering of a wider variety of enlistment options. Although the range of options available is too extensive to detail here, they generally consist of providing the qualified enlistee with a guarantee of the unit, geographic area, or job assignment of his choice. Such options permit the individual to participate in the decisions affecting his military service so that he recognizes that he is being considered as an individual.

OTHER PROGRAMS

Although we anticipate that the no-cost items I have discussed will do much toward our overall goal of attaining a highly professional all-

volunteer Army, it is apparent that these alone are not enough. Other programs which must be intensified require significantly increased funding levels. Thus, our fiscal year 1973 request includes $1,389 million specifically for soldier oriented programs. This represents an increase of $311 million over the revised fiscal year 1972 estimate of $1.078 million.

Soldier oriented programs fall generally into three major categories: First, those designed to strengthen professionalism, second, those to improve Army life, and third those intended to modernize the accession system.

PROGRAM FUNDING LEVELS

The chart (see p. 352) indicates the level of funding programed for each of these three major areas. It can be seen that we anticipate that about 20 percent of the total OMA budget will be devoted directly to soldier oriented programs, and that over 80 percent of the soldier oriented funding will be devoted directly to improvement of Army life for the soldier and his dependents.

STRENGTHENING PROFESSIONALISM

Our efforts to strengthen professionalism aim to do so in two basic ways. These involve making the individual soldier available for training more of the time, and upgrading the professional qualifications of our noncommissioned officers.

We have found that one of the primary reasons that we experience difficulty in accomplishing realistic unit level training is that on any given day a significant number of the personnel are assigned to other non-military details ranging from kitchen police to grass cutting and trash collecting. Good soldiers recognize that such duties make no direct contribution to the combat effectiveness of their unit, and find this to be thoroughly frustrating.

It should be noted here that the program to civilianize KPs is one that has already been accomplished by the other services.

The noncommissioned officer education system (NCOES) is a program which is designed to provide professional education to our unit leaders at the point where it is most visible to the soldier. This is one of the areas in which we were forced to defer our efforts during the past few years due to the requirements of the war.

Chairman ELLENDER. What is the amount that you are adding to your budget so that other than soldiers can do the work you are describing?

CIVILIAN ASSIGNMENTS TO KP DUTY

General SEARS. In the area of civilianization of KP, the total is $99 million and that is an increase of $71 million over 1972. In the area of replacing enlisted men on detail, the total budget request is $35.1 million as compared to $2.4 million in 1972, or about $32 million increase.

Chairman ELLENDER. Will this be carried out throughout the Army?

General SEARS. The civilianization of KP will obtain throughout the Army with the exception of basic combat training. We believe when an enlisted man first enters the Army he should be exposed to

KP duties for two reasons. The first reason is that when the unit goes to the field, and of course we would not possibly take civilian KP's to the field in a maneuver, so the soldier has to know something about how to handle his mess equipment and how to perform KP duties.

The second thing is to show the soldier what KP is so that when he graduates from basic combat training he can appreciate the fact that he can now devote himself entirely to soldiering and will no longer have to serve on KP. He has done it once or twice, so he knows what it is.

Chairman ELLENDER. I hope it works.

General KJELLSTROM. Sir, we are continuing the program which has been directed by the Office of the Secretary of Defense and has been substantially implemented by the Air Force and Navy previous to this year. We are behind in our implementation of this program worldwide, and we are behind because we just didn't have the resources available in our total budget in previous years.

Chairman ELLENDER. I personally do not see how KP duty can seriously interfere with a soldier performing his assigned duties, especially while he is in a training status. I remember several years ago when I was on the Board of Visitors to the Naval Academy I raised the question as to why the students could not serve in the dining room. I thought it would be good for the first-year students. However, my main objection was that they were using regular Navy enlisted personnel, which I did not think was proper. They are now using civilians in the dining hall.

General SEARS. I think we are basically following your philosophy in that regard, Mr. Chairman. We are going to have our soldiers in basic combat training pull KP. At least the lowest ranking man on the totem pole will pull KP in his basic training.

ATMOSPHERE FOR AND COST OF VOLUNTEER ARMY: COMPETITIVE CAREER AND LOSS OF PATRIOTISM

Chairman ELLENDER. All of this, you contend, is being done to create a better atmosphere in your efforts to provide a volunteer army.

General SEARS. Yes, sir; exactly. To create the atmosphere and put the soldier back to soldiering.

Chairman ELLENDER. I would like to find out how much all of this volunteer service effort will cost the Government. In my personal opinion, I doubt if you will be able to create an effective volunteer army.

General SEARS. Sir, we are making every effort to create a volunteer army.

Chairman ELLENDER. What we are doing here is to make it so nice for young men that they will choose the Army, the Navy, or the Air Force as a career. They will be paid well, and they will probably be treated better than if they were working for a corporation in the town in which they live. It is more or less a mercenary army. It removes patriotism. I hope it works. When I was in World War I, the salary was very, very small. I did it because I felt that I owed that to our country. But this new approach, I think, will have a different effect on those who serve. They will go into the service, more or less, to obtain a job rather than to give some of their time in support of their country.

I believe that it will have the effect of reducing the quality of the soldier and down-grading the patriotism that would cause him to want to do it as a duty to his country.

Anyhow, that is water under the bridge. I suppose you will continue to try to develop an all volunteer force. I hope and pray you will succeed.

General SEARS. Yes, sir.

Chairman ELLENDER. What you are doing about the problem of men being trained in certain skills and then being assigned to unrelated positions? It seems to me that this is one of the biggest deterrents to professionalism and we both know that it is a very real problem in the Army today—especially with the turbulence of the war in Southeast Asia? What are you doing to curb this misuse of trained personnel?

General SEARS. Sir, I agree with you that this has been a very significant problem. The Army became aware of a greater need for more intensive and personalized management of personnel prior to 1970 when several factors came into focus. Some background to the problem may be meaningful at this point. The first factor was the growing number of personnel returned to CONUS from Vietnam whose training had been in Vietnam oriented MOS and thus, without a vacancy or position in CONUS, were "mal-assigned" within the letter of the law. This particular condition was, of course, based upon the fact that the structure of the Army was established as the most effective organization to support combat requirements of Southeast Asia and an equitable distribution of service in Southeast Asia by all enlisted personnel of the Army was necessary. To assure such equity, involuntary tours in Southeast Asia were limited to 1 year and personnel requirements for short tour areas were supported from personnel resources not only in the United States but also those in overseas areas where dependents were permitted—sustaining base. The fact that supporting combat requirements would create distribution, utilization and training problems was recognized. The imbalance of skills between short tour areas and the sustaining base resulted in large surpluses in the sustaining base of personnel possessing certain skills and who had rotated from short tour areas. The majority of Army enlisted personnel were draftees with a 2-year term of service and, therefore, retraining in a required MOS was not practical. Thus, the tag end of the service obligation required performance in skills in which the individual had not been trained. Imbalances also created requirements for exceptions to the established personnel distribution system. Since no specific requirements or vacancies existed for some personnel returning from overseas, quantitative allocations became a necessity. In other words, it has not always been possible to assign and utilize many men in their primary military skill.

The Army has several "on-going" actions which were designed to alleviate many of the conditions which had resulted from short tour created turbulence and other inherent factors which had infiltrated our various management systems. For example, we have provided direct guidance to the field for requisitioning, classifying and assigning personnel. Additionally, we have directed the audit of records to be increased from two to three times a year. An automated system for reporting accessions for assignment of trainees is being redesigned to

provide an integrated and centralized system for training accounting; a centralized transient accounting system was established to simplify reporting and accounting for personnel at unit level; new procedures have been established for reporting data from Army personnel centers and separation and transfer activities direct to Headquarters, Department of the Army, which bypasses major field commanders and eliminates delay. The personnel reporting system was redesigned in May 1970 to improve edits and processing routines, effect better utilization of ADP equipment and increase timeliness and accuracy of data. The centralized control of reclassification actions at Department of the Army level for grades E–7, E–8 and E–9 has been established with control of such actions for E–6 and below at major command levels. Planned actions for the future include installation of third generation ADP equipment at Headquarters of CONUS Armies and major overseas commands which will result in further improvement. Consolidation of unit personnel offices at CONUS class I installations is now underway to further improve personnel management procedures. The goal of the present program is to establish a firm personnel inventory for the computation of future training requirements followed by the required training and proper assignment in a progressively more stablized atmosphere.

Chairman ELLENDER. Do you think that more effort should be exerted to see that trained men are assigned to jobs for which they are trained and, if so, do you think that we should reduce the amount of money being requested for some of these other nice-to-have, programs?

General SEARS. Sir, more effort toward this goal is paramount in the Army's intentions. Recent events have virtually dictated this course of action. For example, the early release of enlisted men created immediate overages and shortages in various military occupational specialities which made it impossible to evaluate assets. Consequently, all reclassification actions were terminated in January 1972 and a personnel inventory was directed. Commanders were advised to retrain locally all personnel who could legitimately progress into shortage fields such as combat engineers, maintenance, construction and utilities, administrative, finance, data processing, and military police. The early release program coupled with previous experience in "no draft or low draft" periods, indicates that the Army will operate for a period of time at about 60 percent of requirements in some highly skilled areas. This deficit is expected to continue perhaps as late as the last half of fiscal year 1973.

Although achieving a closer match between training and assignments is important, it is only one facet of the Army's program to strengthen the professional competence of the Army, and I do not think that the money being requested for other programs should be reduced. Once a soldier is assigned to a job for which he is best suited, he must be allowed to perform that job—to participate in scheduled training or operational tasks. A serious drawback in the Army today is the extent to which soldiers in units are drawn away from their primary duties to perform administrative support chores. This confronts the soldier with uninteresting menial tasks such as KP, and in the process frustrates the effort of his leaders to build teamwork and a sense of practiced excellence in their units. It has been well documented that diversion from challenging, soldierly work is the main source of frus-

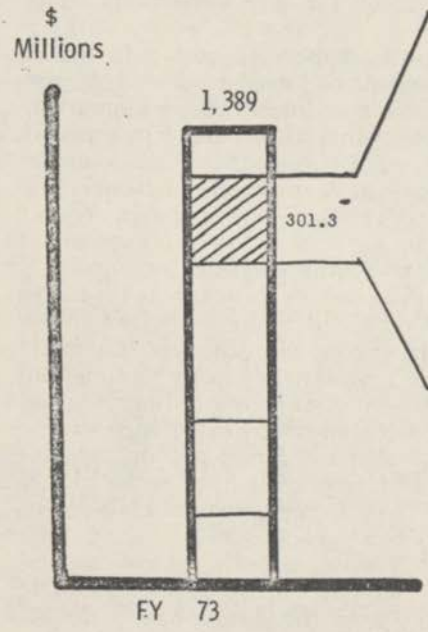
tration among good soldiers. It is for these reasons that the Army's program to civilianize KP and other ancillary, nonmilitary tasks are absolutely essential. It is, perhaps, the single most important part of the Army's program to build a better, more professional Army, and in the process reduce reliance on the draft.

Improvement of Army Life

Because of the large number of individual projects included in the category "Improve Army Life," I will address these in three subdivisions. The first of these—improvement of soldier living conditions—includes the activities displayed below, to which we plan to devote $301 million.

(Chart 7 follows:)

IMPROVE ARMY LIFE



Soldier Living Conditions	73	72	71
Barracks Privacy	10.0	2.0	1.4
Barracks Furniture and Washers and Dryers	25.0	10.0	6.6
Maintenance/ Repairs*	252.8	221.5	203.0
Self-Help (Europe)	13.5	7.8	6.2

*FRG Offset Funds Provide $176M for FY 72 and FY 73

SOLDIER ORIENTED PROGRAMS

Soldier Living Conditions

Barracks privacy and modernization funding represents the effort to provide a reasonable measure of privacy to the individual. This is to be accomplished primarily through the use of temporary, relocatable partitions which will divide the open-bay-type barracks into two- or three-man rooms.

We plan also to provide basic furniture for each two- or three-man room consisting of a desk, chair, lamp, and rug. The funding for washers and dryers represent our initial efforts toward making these items, which are highly popular with the troops living in barracks, available to the soldier at no cost to him.

Chairman Ellender. Excluding the situation of married personnel, who are not billeted in barracks, what percentage of barracks tenants will be provided with the furnishings you just described in fiscal year 1973?

General Sears. On the basis of one washer and dryer per 15 men the funds requested for fiscal year 1973 will provide washers and dryers for approximately 59 percent of the barracks tenants. On the basis of one desk, chair, lamp, and a rug for each two- to four-man cubicle, the funds requested in fiscal year 1973 together with the funds provided in fiscal year 1971 and fiscal year 1972 will permit provision of furniture for approximately 79 percent of the barracks tenants.

Chairman Ellender. How much do you estimate the entire program will cost through completion of the initial installation of furniture for these barracks tenants?

General Sears. The initial provision of furniture for barracks tenants is estimated to cost $33.9 million.

Maintenance and Repair of Real Property

The last two items on the chart relate directly to our accelerated program to accomplish essential maintenance and repair of real property. The funds committed to this effort are required if we are to meet minimum standards of health, safety, and comfort.

Chairman Ellender. Will that improved barracks program be offered to soldiers who are assigned to all parts of the world?

General Sears. Yes, sir. Many of the barracks in Europe are already partitioned. It would be a question of providing the furniture that I mentioned, a desk, a lamp, a chair, and a rug in each room.

Chairman Ellender. For each soldier?

General Sears. There are two- or three- or four-man bays, three or four men in the room. Each room gets a desk, a lamp, and a chair, not one for each man. Each man does get a rug, 3 by 5 feet.

Services to Soldiers

The second facet of improving Army life deals with a broad range of activities grouped under services to soldiers. In general, these activities emphasize health and welfare, food service, and other morale related items, and the development and enhancement of basic soldier skills.

Many of the items which we are emphasizing here are those which we have found to be most important to the individual, and which have a direct influence on his attitudes.

Chairman ELLENDER. What is the basis for your conclusion that the activities you say are pivotal have a "direct influence on his attitudes?"

General SEARS. With regard to services to soldiers, a survey conducted by Human Resources Research Organization at the five Volar test sites during the period January through April 1971 reported that items rated "most important" by soldiers were: (1) being able to get good medical and dental services—(this items ranked first in the survey; (2) having good food—ranked fifth. In addition, the respondents in the survey perceived the Army as pursuing an active effort in the areas of educational opportunities, legal counsel, medical and dental services, and counseling and aid for drug users—these items were among the top ten items rated by soldiers at the Volar installations. More current research conducted by System Development Corp. on the effect of various modern volunteer Army actions—December 1971—indicate those having the greatest impact both on attitude toward the Army and on retention are in the areas of opportunities for individual educational growth, health care, pay, and benefits. Specific types of action in this regard include opportunities to continue education, opportunity for travel and experience, and medical and dental convenience. Additional areas that have had a high impact on attitudes were such things as freedom to decorate rooms, PX goods and services, transportation services, and entertainment and recreational opportunities. The results of these are also supported by individual reports from the various modern volunteer Army test installations.

Of the projects displayed on the chart I would like to briefly comment further on modernizing the feeding system and on the expansion of Project Transition since this is where the major increases are found.

Modernization of the feeding system involves upgrading of the physical facilities on food serving lines and in dining areas. This includes development of facilities for providing short order and specialty items as well as the regular "full meal" service. In addition, we are continuing to work toward development of modernized food service systems which utilize central food preparation facilities.

Chairman ELLENDER. The increase requested is $39.3 million, which is quite a sum. Would you please go into more detail about what this increase will be used for?

General SEARS. These funds will be used to initiate the modern feeding system. The modern feeding system is one which entails the preparation of food in a central food processing facility and the delivery of the prepared food to satellite dining facilities where it will be heated, served, and consumed. It is planned to install the system in two phases with upgrading of the satellite dining facilities first, followed by the central food preparation facility. It is planned to utilize these funds to begin the first phase during fiscal year 1973 at nine installations in the continental United States—CONUS—and two overseas areas. Ultimately it is planned to have the modern feeding system at division-size-type troop installations in CONUS having an average troop population in excess of 10,000 and selected oversea commands having comparable concentrations of units and personnel.

Chairman ELLENDER. Is this modernization program still in the experimental phase or is this increase to make is operational? If this funding is for the initiation of the operational phase, would you please

tell the committee what installations are to be affected with these funds?

General SEARS. The program has progressed beyond the strictly experimental phase and these funds are needed to begin to make it operational. The facilities to be modernized at Forts Lee and Lewis will support operational requirements while at the same time provide refined data to be used in establishing these improved systems at other installations. Current plans also provide for beginning the initial phased upgrading of dining facilities at seven other CONUS installations and in two oversea areas—Forts Bragg, Jackson, Carson, Hood, Campbell, Riley, Sill, and overseas in Hawaii and Germany.

Chairman ELLENDER. Would you also please indicate for us how much you expect this increased food service will cost each year over and above the cost of the traditional service once the new service is completely implemented?

General SEARS. Actually, we anticipate an overall savings, rather than an increase over and above the current system. The limited scale Fort Lewis experiment in fiscal year 1972 provided food service support for approximately 1,200 troops, and was used as a basis for estimating savings expected to result from a larger central food preparation facility—CEPF. Cost benefits will relate directly to the number of troops being served at each installation. The greatest saving is expected in personnel costs, with additional savings realized in equipment, maintenance, utilities, and food costs.

Chairman ELLENDER. Do you anticipate that there will be direct savings reflected elsewhere in the budget as a direct result of this program?

General SEARS. Yes, sir. We anticipate that direct savings will be reflected elsewhere in the budget as a result of the program. The greatest savings will accrue in the areas of reduced food service manpower requirements at installation level. Savings can not be reflected in the budget however until the program becomes fully operational. There are no direct savings reflected in the fiscal year 1973 budget. As the first central food preparation facilities are not expected to become operational until late fiscal year 1974, savings in other parts of the budget should be realized during fiscal year 1975.

PROJECT TRANSITION

One of the most important considerations for the individual leaving the service is being able to obtain suitable employment in civilian life. Project Transition provides for counseling, on-the-job training, coordination with government and private agencies, and job referral and placement services for those leaving the Army.

Chairman ELLENDER. That is another relatively new program. On this program you are spending $16.5 million.

General SEARS. That is correct, sir.

Chairman ELLENDER. That is to help the soldier to get a job on discharge from the service.

General SEARS. Yes. It is to give him a skill while he is in the last days of service that is a marketable skill on the outside.

Chairman ELLENDER. How does that work?

General SEARS. We have arranged with private industry in many cases for off-duty training for the soldier so that he can learn a skill such as an auto mechanic, a carpenter, or plumber, or laborer. We have

had a large number of people take advantage of this so that they can have an employable skill when they get on the outside.

I am sure you recognize, Mr. Chairman, that an infantry soldier who has been an infantry soldier when he goes on the outside may have some difficulty finding a job because he has difficulty in relating his military experience to something he can do on the outside. We have so far since the program started in January 1968 through the second quarter of this fiscal year counseled 652,000 soldiers. We have trained 151,000 soldiers in a marketable skill. So when they get out they can move immediately into an auto mechanic job, plumber or carpenter or whatever skill a man is interested in attaining. This is done in the very last part of his service.

Chairman ELLENDER. Is this accomplished through schooling or through industry?

General SEARS. It is done in a wide variety of ways. We work with private industry in the area where the post is. If a man has gone to Fort Polk, and is going to be discharged from that post, then there may be an industry, a garage, any type of thing where they cooperate with us, almost always on a no-cost basis, to help train this man. We also have our own counsellors that we hire. That is one of the major costs of the program. We have 369 people who set up these programs and assist in training the soldier.

Chairman ELLENDER. Are they civilians?

General SEARS. Yes, sir. There are 369 civilians in the program.

Chairman ELLENDER. Is that done throughout the Army?

General SEARS. Throughout the Continental United States.

Chairman ELLENDER. I can appreciate the fact that, if a man is going to leave the service, he ought to be able to get a job on the outside but you lose me when you imply that the Army has an obligation to see that these personnel are trained for and placed in jobs on the outside. You have been training men in specialized fields for years only to lose them to private industry and all this results in is losses to the services for the time and money spent on these individuals' training. Would you please explain to the committee why this program is being emphasized so much? What real advantage is there to this program?

General SEARS. Chairman Ellender, these two questions are related to the philosophy on which the program is based. Actually, Project Transition is but a part of the national effort to provide training to individuals who lack marketable skills, to provide instruction to the academically deprived, to reduce the unemployment rate of the young citizen and to assist youth in effective adjustment to the mainstream of America. Based on his concern for the Vietnam era veteran's unemployment rate, the President, on December 15, 1970, directed the heads of the Executive Departments to lead the way in finding jobs for veterans. On June 11, 1971, President Nixon issued a six-point memorandum to the Secretary of Labor directing him to assume leadership of an intensive effort to place Vietnam era veterans in jobs or training. The second point of this memorandum directed the Secretary of Labor to work with the Secretary of Defense to expand substantially the Transition program for separating servicemen in order to improve job counseling, job placement and job training. For this purpose, the U.S. Employment Office and Defense Training Centers will be used with Labor, Veterans' Administration and Health, Education and Welfare support.

Based on this guidance, the Department of Defense directed in July 1971 expansion of the on-going transition program. This included: extending transition guidance and training to overseas areas; second, providing transition services to personnel undergoing drug treatment; third, increasing participation by soldiers assigned to posts in continental United States; and fourth, establishing transition training skill centers at selected locations to provide 2 months of concentrated vocational training for personnel without a civilian skill.

There is a very real need for Transition for the soldier leaving the service. A study recently completed by the Human Resources Research Organization of nearly 1,000,000 (968,000) Army first term separatees points this out. The unemployment rate of 248,000 infantry, armor and artillery solders 10 months after discharge was about 14.5 percent for three quaters in fiscal year 1971.

Furthermore, unemployment for this group of soldiers is the highest of any Army occupational category. It is important to note that the unemployment rate for those men having a civilian related Army job runs 4 to 5 percent below that of the ex-combat soldier.

Chairman ELLENDER. Exactly what is this increase in funding to go for?

General SEARS. I will have to provide those details for the Record.

(The information follows:)

Through fiscal year 1972, the Army has responded to these expansion directives by adding personnel spaces, and thus vocational counseling, to overseas areas. Because of the personnel turbulence, which was increased by the Army's early release policy, we have cautiously approached expansion of Transition in the other three areas. Based on Office of the Assistant Secretary of Defense (Manpower and Reserve Affairs) directive of 17 September 1971 we have postponed full implementation of the originally directed skill center concept until funds are available in fiscal year 1973. We have, however, implemented the skill center plan on a reduced basis. Additional costs of this expansion in fiscal year 1973 over fiscal year 1972 are broken down in this manner:

7 additional Army counselors for drug rehabilitation centers	$87,500
For Continental U.S. operations for fiscal year 1973, costs were not identified as a Transition cost in fiscal year 1972. This includes:	
10 supervisory personnel at Army and Continental Army Command Headquarters	130,885
Department of Army civilian administrative and clerical personnel	244,297
Costs for travel, rental of classrooms, contractual services, supplies and equipment for 52 installations conducting transition training	308,380
Development of full transition skill centers at three major locations is planned. Personnel turbulence and early release programs precluded this development in fiscal year 1972. These skill centers will train 27,000 men per year. Our costs total $6,351,000.	
Detail of these costs are:	
Administrative: 93 professional and clerical personnel	1,000,000
155 KP's for all centers	1,155,000
Travel and transportation	45,000
Supplies and materials	20,000
Equipment	15,000
Reopen and repair buildings, classrooms and barracks	255,000
The base support for cadre and trainees will be paid from OMA funds	3,800,000
General administration; travel, supplies, publications, contractual services	138,000
Civilian personnel compensation	103,000

Recap of total costs on:	
Drug rehabilitation	87,500
Expansion of program in continental United States	683,562
Transition skill centers	6,351,000
General administration	138,000
Civilian personnel compensation	103,000
Total	7,363,062
Cost growth for fiscal year 1973	412,000
Grand total	7,775,062

Chairman ELLENDER. Proceed.

SERVICES TO DEPENDENTS

General SEARS. We recognize that one of the primary factors which influences these soldiers attitudes and morale is the extent and adequacy of services which we provide for his dependents. Accordingly, we have included $268.3 million in the fiscal year 1973 request for services to dependents. This level of funding represents an increase of $32.3 million over the fiscal year 1972 level. The emphasis in services to dependents is being placed on education and health care since these are the areas where our married soldiers express the greatest anxiety for the welfare of their families.

OVERSEA DEPENDENT EDUCATION

The overseas dependent education program provides for operation of classes from kindergarten through grade 12 in the European school area. As a part of our effort to improve the quality of education provided in these schools, we have expanded the vocational education program to include a variety of vocational areas tailored to fit the needs of those students who do not plan to pursue an academic course of instruction in college.

Chairman ELLENDER. Would you be more specific about this increase for the overseas dependents schools? Is it entirely for vocational training, if it is not, would you please tell us how much is for vocational training and how much is for whatever else you are requesting the funds for?

General SEARS. Of the total requested, $2.7 million is for vocational training. I will submit for the record a tabulation giving the other items included in the total increase of $16.6 million.

(The information follows:)

An amount of $2.7 million is being requested for vocational training. A distribution of the additional funds being requested for fiscal year 1973 is as follows:

	Millions
Pay raise for Public Law 86-91 employees	$2.9
Within grade pay increases	1.4
Increases related to personnel salaries (benefits, summer school, compensation for extra school activities, and the cost of living and quarters allowance)	.8
Increased staffing	.6
Increase for tuition-fee schools	.3
Full year cost of cocurricular (sports, music, etc.) and paraprofessional school aides programs	1.0
Program improvements (facilities, vocational education, and educational supplies and equipment)	5.8

Other increases (supplies, equipment, transportation, rents and utilities, custodial services, real property maintenance, permanent change of station costs, and miscellaneous items)	3.5
Additional supplemental and amendment for pay	.3
Total	16.6

Chairman ELLENDER. Will all of the dependent schools in Europe be adding vocational programs to the curricula?

General SEARS. No sir. Vocational education programs will be instituted in 29 of the 35 senior high schools in the European area for fiscal year 1973. Considerable leadtime is needed to implement a program of this magnitude. These funds will permit us to prepare the facilities and purchase the required equipment and supplies in fiscal year 1973. Instructors for the vocational education programs will be included in the fiscal year 1974 budget and classes will actually begin in September 1973.

CHAMPUS PROGRAM

The CHAMPUS program is one of the strongest incentives to accession and retention of personnel and is a major factor in soldier satisfaction. Although the growth of CHAMPUS over the past few years has consumed a significant amount of resources, we believe that this is one of the soundest investments that we can make.

ACCESSION SYSTEM MODERNIZATION

The programs which I have described to this point are designed primarily for the soldier after he enlists. It is apparent, however, that a major part of our effort toward attainment of a zero draft Army must be directed toward improving the recruiting system. I wish to emphasize that our goal here is to attract quality individuals as enlistees and junior officers, and not merely to meet the requirements for quantity.

ADVERTISING

Chairman ELLENDER. I notice you have an advertising program. What is the cost?

General SEARS. Sir, in terms of dollars, the amount we plan to spend for fiscal year 1973 is $30.6 million. That compares approximately with the $28.3 million for 1972.

Chairman ELLENDER. That is solely for advertising?

General SEARS. That is solely for advertising.

Chairman ELLENDER. That does not include the cost of the recruiting personnel?

General SEARS. Sir, the recruiters are military in the main and of course are paid for out of military personnel appropriations. There are some civilian employees such as clerical, administrative and logistical people who are paid out of this. They will not be paid out of the advertising budget per se. That is strictly for newspaper advertising, billboards, cars and streetcars, pamphlets and books.

Chairman ELLENDER. How is this advertising handled?

General SEARS. We have a contractor, N. W. Ayers, Inc., which is an advertising agency, which handles our advertising program. However, we also have an advertising policy council made up of military personnel who work with this agency to determine how they can best

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present their message to the prospective enlistee. It is a group effort, advertising effort plus considerable effort and guidance from the Department of the Army Staff.

Congressional Prohibition of TV and Radio Advertising

Chairman Ellender. Do you use TV and radio?

General Sears. We have used paid TV and radio toward the latter part of fiscal year 1971. However, the Congress prohibited us from further use of radio and TV. We think that the paid radio and TV advertising was a very cost effective method of getting our message across to the potential enlistees. As you know, sir, young people listen to radio and they watch quite a bit of television. But since we have been prohibited from doing that we have stopped the paid radio and TV advertising and have confined ourselves to newspapers and magazines.

Competitive Bid Contracts

Chairman Ellender. How do you let an advertising contract? Is it by bid?

General Sears. Yes, sir, that contract is by competitive bid. I think Colonel Gilham can give you some of the details on how that was done.

Colonel Gilham. Yes, sir. The contract with N. W. Ayers was let out by competitive bid. During the next year the Secretary of the Army is allowed to extend that 1 year. It will be extended 1 year during fiscal year 1973, but it will definitely be let again for competitive bid for fiscal year 1974.

Chairman Ellender. Is that one firm doing the work for the entire country?

Colonel Gilham. Yes, sir.

General Sears. This firm places contracts with the media, sir. In other words, they place a contract with Life magazine or Time to put the ad in.

Chairman Ellender. They get a percentage of the cost of the ad?

General Sears. They do.

Chairman Ellender. That is their pay.

General Sears. Yes, sir.

Chairman Ellender. Proceed.

Integration of Recruiting Functions

General Sears. The success of the overall accession system requires the integration of three essential functions. These are (1) the active recruiting effort conducted by the recruiters in the civilian community, (2) improvement and intensification of the recruiting advertising program, and (3) continuation of the Army Reserve officer training program—ROTC—as the source of quality junior officers. Emphasis of all of these functions contributes to the increased costs of operating the accession system.

Recruitment of Civilians

To improve our recruiting efforts in the field we have increased the number of recruiters from 3,505 at the end of fiscal year 1971 to 6,080 for fiscal years 1972 and 1973. We have also increased the number of recruiting stations and have relocated a number of them to more desirable locations.

To support the recruiters in the field we have provided for reimbursement of out-of-pocket expenses, and for leasing of additional sedans to enable the recruiters to maintain close contact with potential enlistees throughout their area of responsibility.

Our recruiting advertising program is programed to continue in fiscal year 1973 at about the same level as in fiscal year 1972 for the Active Army. However, we have expanded our advertising effort in recruiting for the Army Reserve. Continuation of a relatively strong program of advertising is essential if we are to "sell" the Army's opportunities to the youth of today, especially in the absence of the draft and the pressures created by the draft.

ROTC Programs

Recognizing that the junior officer is a vital link in the overall concept of a modern professional army, we are placing additional emphasis on the ROTC program. We plan to continue our efforts in recruiting and advertising for the ROTC program. We awarded 5,479 ROTC scholarships for the academic year 1970–71. At the beginning of the academic year 1971–72, we awarded 5,500 scholarships. The recent congressional authorization providing for 1,000 additional scholarships permitted us to award to a level of 6,500.

Chairman Ellender. How much money is involved in each scholarship?

General Sears. It varies, sir, depending on the school the man selects, but it pays the full tuition, whatever the tuition is at that school. As you know, some schools are relatively low, $200 to $300 a year; others are $2,500 a year. The soldier has the option of selecting his school. He must get into the college himself. He selects his school and get in. Now, it must be a college that has a ROTC program. He participates in the ROTC program as part of his education. The money also pays for books and laboratory fees at the university. It provides subsistence of $100 per month. That was recently enacted by the Congress this past year, an increase from $50 to $100 per month. The total value of the scholarship to the student could be from $5,000 to $12,000 or $13,000 for the entire 4-year period.

Chairman Ellender. I am given a note to the effect that the tuition and other costs at the colleges averages about $1,400.

General Sears. I would think that is a very close average, sir.

Chairman Ellender. As I recall, the ratio of students in ROTC that are on Army scholarships to the total number in the program has gotten greater and greater each year. Would you care to comment on this in light of the fact that you are requesting authorization for an additional 1,000 scholarships in 1973?

General Sears. Yes sir, the ratio of scholarship students to nonscholarship students has increased. In fiscal year 1971, the ratio was one scholarship to 13.4 nonscholarship. In fiscal year 1972, the ratio was one scholarship to eight nonscholarship. This occurred because of a decrease in total enrollment from 73,963 students in fiscal year 1971 to 52,034 in fiscal year 1972 and an increase in total scholarships authorized from 5,500 to 6,500. As you see there is still a relatively large number of students not on scholarship. An increase in total scholarships was needed to offset the downward trend in enrollment.

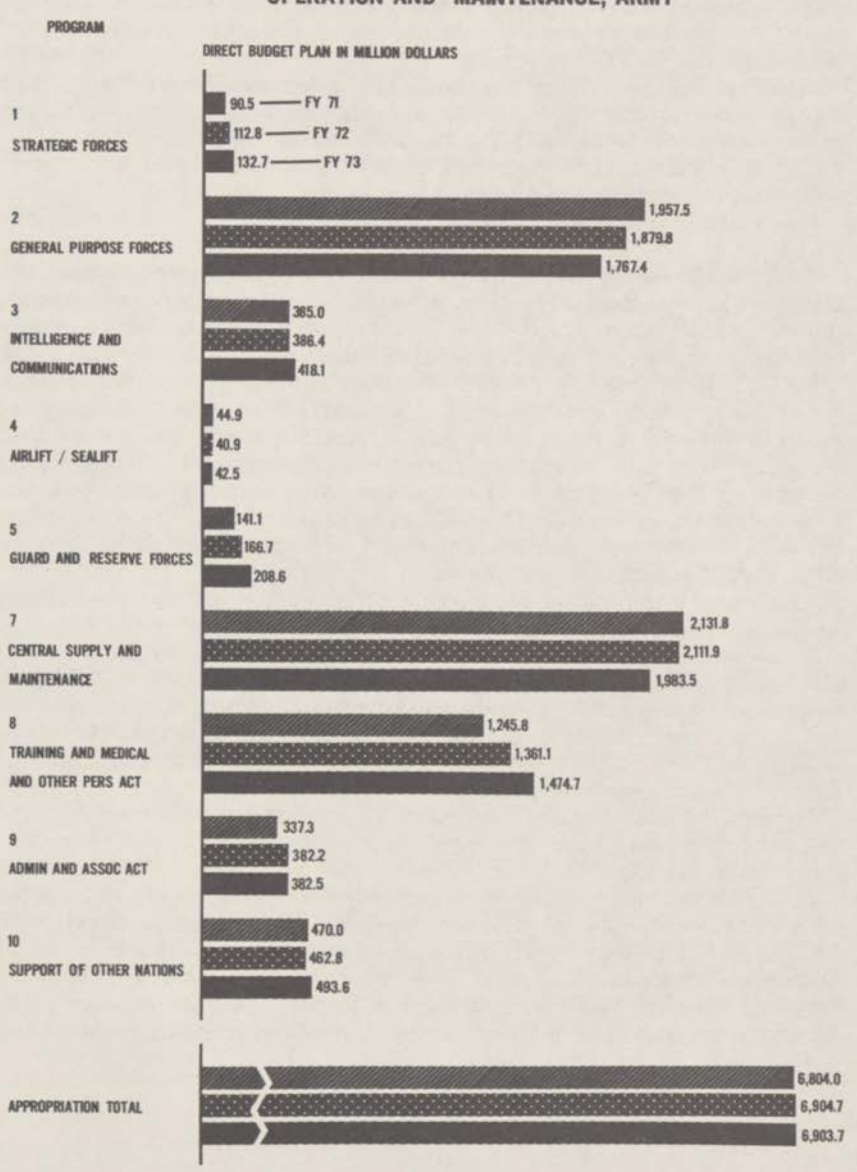
Chairman Ellender. Proceed.

General Sears. To summarize the soldier oriented program, let me again state that we are not attempting to create a "country club" atmosphere, but instead are determined to provide the Nation with a smaller, better trained, and more highly motivated professional force tailored to fill the national security needs now and in the future.

O&M FUNDING BY MAJOR ACTIVITIES

Chairman Ellender. At this point in the record, General, we will include the table from your statement deliniating the "Operation and Maintenance, Army" program requests by major activity.

(The information follows:)



BUDGET SYNOPSIS

General SEARS. We revised fiscal year 1972 estimate for "Operation and Maintenance, Army," totals $6,904,700,000. This includes the enacted appropriation of $6,661,200,000—Public Law 92–204—the proposed supplemental request for pay raises, and a proposed transfer under authority of section 736, Public Law 92–204.

The supplemental request for pay raises for fiscal year 1972 will include $58.1 million for the January 1972 pay raise for classified civilian personnel and $47.2 million for raises for Wage Board and foreign national employees.

The transfer for high priority requirements under the provisions of section 736, Public Law 92–204, totals $141 million to OMA, offset by a $2.8 million decrease for a functional transfer to GSA for real property lease costs—a net increase of $138.2 million. These transfers are proposed in accordance with the intent of the Congress expressed in committee reports on the fiscal year 1972 DOD appropriations bill by the Senate Appropriations Committee and the joint conference committee. In these reports it was indicated that funding for high priority requirements such as the civilian health and medical program, uniformed services—CHAMPUS—should be accomplished through the indicated transfer authority where appropriate.

Chairman ELLENDER. Would you please break out the transfer of the $141 million you just referred to to show the other programs which received funds via the transfer method and to show how much each of these received.

General SEARS. The table I will provide will show the breakdown of the $141 million transfer by budget program.

(The information follows:)

Item	Total	MP–2	MP–3	MP–4	MP–5	MP–7	MP–8	MP–9	MP–10
Champus	53.0						53.0		
Medical supplies	27.0						27.0		
Recruiting	20.0	1.5			1.0		17.5		
Currency revaluation	38.1	21.4	1.1	0.5		11.1	3.9		0.1
Civilian health benefits	2.9	0.5	0.2		0.1	1.1	0.8	0.2	
Total	141.0	23.4	1.3	0.5	1.1	12.2	102.2	0.2	0.1

PROPOSED REPROGRAMING OF FUNDS FROM STOCK FUND

Chairman ELLENDER. I have a note here indicating that there is a reprograming contemplated. Is that to put the program in effect immediately?

General KJELLSTROM. Yes, sir; we have a section 736 reprograming; it is fiscal year reprograming 72–19 in which we propose that $141 million be transferred from the defense stock fund to the OMA appropriation.

Chairman ELLENDER. Why the stock fund?

General KJELLSTROM. Sir, the defense stock fund has the excess funds as a result of the drawdown in the inventories required in support of Southeast Asia. The funds are available in that account.

Chairman ELLENDER. Is that because you have an excess?

General KJELLSTROM. Yes, sir, there are excess funds in that account. During the period of the Vietnam war the stock fund inventories were

built up to support the Vietnam war. Now with the major withdrawal from Vietnam, the requirements for inventories out of the stock funds are lessened and cash has been accumulated which is available for transfer to support this urgent requirement for the OMA appropriation.

Chairman ELLENDER. The committee has that reprograming request before it.

All right, proceed.

DISPROPORTIONMENT BUDGET REQUEST AND PERSONNEL REDUCTIONS

General SEARS. The "Operation and Maintenance, Army" request for fiscal year 1973 totals $6,903.7,000. This level represents about 31 percent of the total Army direct budget plan. The request reflects a net decrease of about $1 million from the revised fiscal year 1972 level.

I am sure that one of the first questions that enters your mind when examining the level of operation and maintenance funds requested for fiscal year 1973 is: Why does the total requirement for funds only decrease by one million dollars while military man-years decrease by over 100,000?

Chairman ELLENDER. That is correct.

General SEARS. This question is especially pertinent since the major portion of this reduction in man-years is related directly to the decrease in troop strength in Vietnam, where the variable OMA cost per man-year is relatively high.

SOLDIER-ORIENTED PROGRAMS

I have already discussed one of the reasons that funding has not declined as much as one might expect—that being our renewed emphasis on soldier-oriented programs. As I discuss other activities and programs, other factors will also become apparent, and additional details relating to the specific causes are contained in the justification book. At this time, however, I would like to identify the major increases between fiscal years 1972 and 1973 that were absorbed by the appropriation.

Chairman ELLENDER. What is the total cost of the soldier oriented programs?

General SEARS. The total amount of funds is $1.3 billion. That is a little over $300 million increase over fiscal year 1972.

Chairman ELLENDER. Proceed.

General SEARS. I believe that it will become apparent to the committee that these essential increases more than offset the saving resulting from the decline in man-years, and that it was only through an intensive and determined management effort that we were able to effect the modest decrease reflected in the estimate, rather than an increase.

ABSORPTION OF INCREASES

There are six general areas in which significant increases were absorbed which consumed the potential savings resulting from reduced man-years.

Chairman ELLENDER. Please provide for the record a tabulation listing all of the items in the requested increase of $92 million for upgrading the readiness of the Army Reserve and National Guard.

General Sears. I have that information here, Mr. Chairman, and I will submit it for the record.

(The information follows:)

Of this $92 million, $50 million is in program 7 for depot overhaul and rebuild of equipment being issued to the Reserve components. The remaining $42 million is the increase in program 5, Army Reserve distributed as shown below:

Additional USAR technicians	$11,795
Other civilian personnel costs (includes pay raises of $3,622)	4,590
Equipment and material maintenance	11,065
Operational and training activities	4,202
Operation of USAR centers and installations	6,745
Recruiting and other MVA activities	3,532
Net increase	41,929

Increases Over 1972 Estimates

General Sears. The increases over the revised fiscal year 1972 estimates include (1) pay raises for U.S. and foreign national civilian employees of $77 million; (2) noncompensation price level increases $176 million; and (3) increased costs of foreign currency for both pay of personnel and purchase of supplies and services in overseas areas of $15 million.

Increased Cost of Foreign Currencies

Chairman Ellender. The $15 million, as I understand it, is to pay the difference between the dollar value last year and at present because of devaluation.

General Sears. Yes, sir.

Chairman Ellender. What is the dollar cost of the programs involved in this $15 million item?

General Sears. Sir, if I understand your question, the rates of valuation are in the case of the German deutsch mark, the rate used in the 1972 budget was 3.66 to 1; the agreed upon rate on December 20 of this past year was 3.22 to 1. The current rate as of March 3, this past week, is 3.18. So, it has gone from 3.66 in the case of the deutsche mark down to 3.18. In the case of the Japanese yen, it has gone from 3.66 to 3.02. In the case of Italian lira 6.25 to 5.87. In the case of the French franc, 5.5 to 5.3.

Chairman Ellender. This $15 million will compensate ——

General Sears (continuing). For that decline in the purchasing power of the dollar. We can expect, sir, that the increase over the initial 1972 budget will be about $38 million in total. Now, of course we are hoping to level off as a result of the agreements that have been reached between the countries. Thus, the increase in fiscal year 1973 is estimated at about $15 million.

Chairman Ellender. This situation strikes me as the essence of ingratitude. One of the primary reasons for our fiscal situation abroad can be traced to the economic and military aid we have given these countries. As a result, they have become prosperous at our expense. I believe that our country is being taken advantage of.

General Sears. Increases in addition to pay and cost growth include (4) $311 million for soldier-oriented programs which I identified, (5) upgrading readiness, and modernization of the Army Reserve and the Army National Guard of $92 million ——

UPGRADING READINESS AND MODERNIZATION OF RESERVE COMPONENTS

Chairman ELLENDER. Is this No. 5 item primarily for more materiel, or is it for materiel maintenance?

General SEARS. It is more the maintenance of the materiel. The materiel is furnished out of the PEMA appropriation in the main. There is $50 million in this budget of additional money for the overhaul of the materiel making a total of $100 million that will be used to overhaul equipment.

Chairman ELLENDER. Let me be sure I understand this. New equipment for the Army Reserve and Army National Guard is purchased with funds provided in the Army's various procurement appropriations.

General KJELLSTROM. That is correct, sir.

Chairman ELLENDER. The equipment assigned to the Army Reserve is maintained with funds made available in this appropriation, and the Guard's equipment is maintained with funds provided in their O. & M. appropriation.

General KJELLSTROM. Yes, sir.

Chairman ELLENDER. Then there is no transfer of funds involved when you transfer equipment originally purchased for the Active Army to the Reserve and National Guard?

General KJELLSTROM. No, sir. The one Army concept includes the Active Army, the National Guard and the Army Reserve, and the procurement appropriations which you address each year addresses the total requirements of the three components of the Active Army.

SUPPORT OF EQUIPMENT TO BE TURNED OVER TO VIETNAM

Chairman ELLENDER. When a transfer is made from the Army to the Vietnamese, is that handled in the same way as the transfer made to our Reserve?

General KJELLSTROM. Sir, I would like General Richards to handle that, please.

General RICHARDS. Yes, sir. We turn this equipment over to them against an approved program. They have a regular program that specifies the specific items which are to be furnished to the Vietnamese. Much of this material has come from turn-in of equipment by our own units which have departed Vietnam.

Chairman ELLENDER. Are there any separate accounts to compensate you for the transfer?

General RICHARDS. Of course the support of the Vietnamese is service funded. There are certain transfers, for example, that are made between programs within O. & M.A. General Kjellstrom is probably better prepared to address those fund transfers.

General KJELLSTROM. We do not have separate accounts external to the Army for support of the Vietnamese, sir. Within our O. & M.A. appropriation we have funds for the maintenance of the equipment to be turned over to the Vietnamese.

Chairman ELLENDER. Is the amount used for maintenance so marked to put that in condition for transfer to the South Vietnamese?

General KJELLSTROM. Sir, we have an accounting system within our overall appropriation structure which identifies the amount of money which we plan to provide for support of the equipment to be turned over to the Vietnamese.

Chairman ELLENDER. But in making your requests to the Congress, do you ask for certain amounts in order to do this?

General KJELLSTROM. We do, sir.

Chairman ELLENDER. Proceed.

TOTAL INCREASES

General SEARS. Sir, the sixth item is continued development of the Safeguard missile system at $17 million.

These increases alone, then, amount to some $687 million, and more than offset the potential man-year savings.

Chairman ELLENDER. You speak of $17 million for development of the Safeguard missile system. I would infer from that the funds would be in the research and development appropriation, yet, they are requested here in the operation and maintenance appropriation.

General SEARS. Sir, this is to support the sites where the missile is going. The missile system is still in development. But the O. & M. portion picks up the cost of supporting the two sites that are currently being deployed.

Chairman ELLENDER. When you say support——

General SEARS. I mean base operations type support, sir. The administrative, logistical type of support for the Safeguard system.

Chairman ELLENDER. What is the $17 million used for specifically?

General KJELLSTROM. The Safeguard cost in O. & M. A. provides for the pay of personnel in the Safeguard systems organization, some of the Safeguard logistics system that is being built up in preparation for the deployments at Grand Forks and Malstrom in fiscal 1974 and 1976 and to overall support to the contractor. We have Safeguard costs in the request before the Congress in six Army appropriations: the Military Personnel, Army appropriation, O. & M. A., two procurement appropriations, research and development and also the military construction appropriation. It is a total of $92.7 million for Safeguard within the Operation and Maintenance, Army appropriation.

Chairman ELLENDER. When will these sites be operational?

General KJELLSTROM. The first operational site for Safeguard will be in October 1974.

Chairman ELLENDER. It takes a considerable period.

General KJELLSTROM. Yes, sir. I believe General Leber, the Safeguard systems manager, is going to be over here next week for a very detailed discussion of Safeguard. I do not have a backup witness who is really technically qualified in this area at this point in time.

Chairman ELLENDER. Proceed.

MISSION AND BASE OPERATIONS

General SEARS. Another view of the support provided by the OMA appropriation considers the balance between mission funding and base operations funding. Mission funds provide support for the soldier, his parent unit, and other supporting units without regard to geographical location. Mission funds provide for command and control, individual and unit training, operating supplies, and equipment maintenance.

On the other hand, base operations funds support individuals and their units only at specific geographical locations. These funds pay for utilities, property maintenance, minor construction, police and fire

protection, and other such support. Generally, base operations support encompasses those services which a city would provide to its residents plus some others that are peculiar to military requirements.

The budget requests before the committee reflects a proper balance between these two classes of support with $5,071 million or 73 percent of the total, in mission support, and $1,837 million—27 percent of the total—in base operations. This represents a change in the proportions in each area from the fiscal year 1972 levels when we had 77 percent in mission and 23 percent in base operations. The shift is due largely to the fact that mission funds tend to increase and decline in conjunction with changes in military strength levels while base operations costs are more static. In addition, many of the soldier oriented program increases which I mentioned earlier are in base operations activities.

MAINTENANCE OF REAL PROPERTY

One of the major activities within the base operations account is the maintenance and repair of real property facilities. In past years, we have found it necessary to defer much of the essential maintenance in this area due to higher funding priorities primarily related to support of our forces in Vietnam. As a result of our inability to fully fund this essential property maintenances, we had developed a backlog of over $268 million by the end of fiscal year 1970. Since then, however, we have been making a determined effort to reduce this backlog through increased funding for real property maintenance. We are recommending that the Congress establish the floor, or minimum amount to be spent, for this activity at $240 million.

Chairman ELLENDER. To what extent will your backlog be decreased if this sum is made available?

General Sears. Sir, the Army-wide backlog at the end of 1971 was $240 million, which was a decrease of $27 million from the $268 million at the end of 1970. It is estimated to be reduced to $196 million by the end of 1972 and $178 million by the end of 1973, assuming approval of this budget request. So that we will have gone from $268 million backlog down to $178 million.

Chairman ELLENDER. Describe the utilization of those funds.

General SEARS. Repairs, maintenance, new roof on the building, a new latrine in the building, a new water system. It is all types of building maintenance and repairs.

Chairman ELLENDER. Is this maintenance for continental United States as well as overseas?

General SEARS. This is for continental United States and also for overseas.

OVERSEA FACILITY MAINTENANCE

Chairman ELLENDER. To what extent has the German Government contributed to the repair of barracks?

General SEARS. The Germans have contributed for fiscal year 1972 and 1973 $176 million to repair the barracks and mess halls in Germany.

Chairman ELLENDER. How much of the funds you are requesting will be used overseas and in what particular countries? Do you have that information?

General RICHARDS. Sir, I can give you a little bit just on the pro-

gram 2 side of it which would cover most of the overseas outside of Japan. For example, in program 2 the total for general purpose forces, base operations in Europe is $283,158,000.

Chairman ELLENDER. Is that for repairs and maintenance?

General KJELLSTROM. Sir, that is the total base operations and it is not for real property maintenance. We have the details which we would like to provide for the record, if we may, on the distribution of the real property maintenance between the United States installations and the installations in the overseas commands.

(The information follows:)

The distribution of the estimated obligations for real property maintenance is $214.8 million for the Continental United States, $70.5 million for the U.S. Army, Europe, $34.9 million for the U.S. Army, Pacific, and $5.6 million for the U.S. Army Southern Command.

Chairman ELLENDER. Are those installations that we ourselves constructed?

General KJELLSTROM. Yes, sir, in some cases. However, these are in the minority of the cases in Germany. The German Government has made those facilities available to us so that we are providing the recurring maintenance and repairs. The German Government as you know, under the offset agreement, has made the $186 million available to the Defense Department. In Japan we are utilizing facilities basically built by the Japanese which we are occupying.

In Korea the facilities are basically those which we built for our own forces. In Okinawa the facilities were built with U.S. Government funds and belong to the U.S. Government.

Chairman ELLENDER. Part of this money is going to be used to repair facilities that we constructed?

General KJELLSTROM. Yes, sir, on the basis that we will continue to have a requirement for these facilities for the foreseeable future.

Chairman ELLENDER. Is the floor that you are recommending for the maintenance of real property a floor for fiscal year 1973 as a one time expense to get back on top of the situation or is your recommendation one that you are recommending for each year?

General SEARS. The recommended fiscal year 1973 floor of $240 million for maintenance of real property facilities is not a one-time expense. Although it will not get us completely on top of the Backlog of Essential Maintenance and Repair—BEMAR—situation, we expect that our total planned obligations of $326 million in this area will result in a continued reduction of BEMAR.

Chairman ELLENDER. Once the backlog is eliminated, how much do you expect it will cost per year to stay on top of the situation?

General SEARS. We do not expect nor plan to completely eliminate the Backlog of Essential Maintenance and Repair—BEMAR. It is inherent in a magnitude and variety of real property facilities. Our objective is to continue to reduce the backlog and reach a level for prudent management which we estimate at this time to be about $80 million.

Chairman ELLENDER. Proceed.

EUROPEAN BARRACK RENOVATION

General SEARS. In our budget request last year we discussed the problems we had experienced due to the deplorable state of repair of barracks and kasernes in Europe. We are now conducting a pro-

gram designed to upgrade troop living conditions in 165 of the kasernes housing U.S. Army troops in Europe. This program involves both complete renovation of the 120 worst kasernes—stem-to-stern and selective renovation of 45 others. Through fiscal year 1972 we will have spent $60.2 million on stem-to-stern renovation and $23.7 million on selective rehabilitation.

1972–73 German Contribution

Chairman Ellender. Are the kasernes you mention in Germany?

General Sears. Yes, sir, they are all in Germany.

Chairman Ellender. How much will the German Government furnish in order to——

General Sears. I was quoting you figures up through 1972. In this fiscal year and next fiscal year the Germans will provide $176 million for the stem-to-stern program.

Chairman Ellender. Is the German Government contributing to the repair of the 120 worst kasernes?

General Sears. Yes, sir.

Chairman Ellender. Are you requesting fiscal year 1973 funding for these kasernes?

General Sears. Sir, we are not asking in this budget for any money for Germany for stem-to-stern repairs for those 120 kasernes.

Chairman Ellender. You refer to the repairs in your statement.

General Sears. This was spent through this year. In next year's budget we are not asking for any money for stem-to-stern renovation in Europe.

General Kjellstrom. If I may, sir, you will recall we have requested that the German Government provide support for the forces in Germany. The Secretary of Defense and the State Department were able to obtain an agreement for this support, as a first-time agreement. In the past we have been forced to use our own funds for the support of our facilities in Germany.

Chairman Ellender. How many soldiers occupy a kaserne?

General Kjellstrom. Sir, that varies. Some kasernes are battalion size, other kasernes are brigade size. There are very few kasernes in Germany that go larger than a brigade, as contrasted to the United States where we have installations which will hold a full division or even in the case of Fort Bragg and Fort Hood, two divisions.

Chairman Ellender. In the past the United States furnished the funds for such repair?

General Sears. Yes, sir. This money I speak of here up through 1972 was U.S. Government money. Now the Germans are taking over this program to upgrade the 120 worst kasernes.

Chairman Ellender. They must be in bad shape for it to cost as much as $176 million.

General Sears. Yes, they are in bad shape. I saw them last summer and they are in bad shape.

Chairman Ellender. Is the United States required to expend a certain amount for the renovation of these kasernes in Germany as a condition to the German contribution you just referred to?

General Sears. No, sir. The United States is not required to expend any dollars on renovation of kasernes in Germany as a condition to the German contribution under the Offset Agreement.

Chairman Ellender. Will the German contribution expand the

number of facilities that you plan to renovate or will it just reduce our share of the cost or both?

General SEARS. We have not expanded the number of facilities planned for renovation. However, in some locations we plan to increase the scope of work from the original stem-to-stern concept by including privacy partitions, exterior painting of the barracks, and certain utility system work, for example. The German contribution will reduce the amount of dollars that would be required to finance the essential renovation of barracks and dining facilities in the old German kasernes.

Chairman ELLENDER. Proceed.

UNITED STATES-GERMAN AGREEMENT

General SEARS. In connection with the barrack and kaserne renovation program, the recently concluded agreement with the Government of the Federal Republic of Germany provides that they will furnish 600 million deutsche marks (DM) equivalent to about $186 million, for modernization and improvement of barracks and troop facilities for the U.S. forces in Germany during fiscal years 1972 and 1973. Of this amount, DM 576 million (about $176 million) will be used for Army facilities in the stem-to-stern renovation program. We expect that the contracts for accomplishment of the program will have been awarded by the end of fiscal year 1973 and that renovation will extend through 1975.

SELECTED REHABILITATION OF REMAINING KASERNES

Chairman ELLENDER. Will that provide for the repair of all of them, or will there be further repair necessary in later years?

General SEARS. There will still be some left. The remaining stem-to-stern program is about $18 million. So it will take care of most of it. However, we will have the other 45 kasernes which have been under the selected rehab program. In other words, they are not in such bad shape to need a complete stem-to-stern renovation. We can rehab them selectively, like replacing the pipes or latrines.

Chairman ELLENDER. That will be done at our expense?

General SEARS. In the 1973 budget we have budgeted $13 million for self-help supplies for those other 45 kasernes to keep them livable.

Chairman ELLENDER. Proceed.

REQUIREMENT REDUCTION RESULTING FROM GERMAN AGREEMENT

General SEARS. As a result of the agreement for participation by the Federal Republic of Germany in this program, we were able to reduce the OMA fiscal year 1973 requirements for maintenance of real property in Europe by $80 million.

Another significant aspect of this agreement is that it will have a favorable effect on the balance of payments problem.

CIVILIAN PERSONNEL

Chairman ELLENDER. General, before you proceed with your discussion of civilian personnel I want to have included in the record at this point the tabulation on page 9 of the justification setting out a summary of the civilian personnel paid from this appropriation.

(The information follows:)

DEPARTMENT OF THE ARMY—DIRECT HIRE CIVILIAN EMPLOYMENT OPERATION AND MAINTENANCE, ARMY

[Dollars in thousands; strength in whole numbers]

	Fiscal year 1971 actual			Fiscal year 1972 estimate			Fiscal year 1973 estimate		
	Average strengths	End Strength June 30, 1971[1]	Estimated obligation	Average strengths	End strength June 30, 1971[1]	Estimated obligation	Average strengths	End strength June 30, 1971[1]	Estimated obligation
Direct hire civilians:									
Full-time permanent	271,328	262,345	$2,562,918	263,081	240,587	$2,689,972	239,363	238,140	$2,646,899
Other	15,222	17,758	69,013	18,496	11,417	87,268	18,064	12,511	88,698
Total direct hire civilians	286,550	280,103	2,631,931	281,577	252,004	2,777,240	257,427	250,651	2,735,597
Detail by budget activity:									
Strategic Forces	3,359	3,297	43,304	3,524	3,499	49,695	3,676	3,853	53,579
General Purpose Forces	93,599	89,273	587,130	87,087	71,579	638,775	69,557	66,688	595,712
Intelligence and communications	15,883	16,173	191,629	15,643	14,920	199,813	14,350	14,450	195,818
Airlift and sealift	1,661	1,313	7,622	1,180	517	6,313	461	406	3,362
Guard and Reserve Forces	9,251	10,314	87,541	9,872	11,236	99,177	11,329	12,909	115,562
Central supply and maintenance	75,933	75,792	838,273	72,813	64,986	839,399	64,756	64,527	799,461
Training, medical, and other general personnel activities	65,815	63,023	622,711	68,521	62,344	673,829	70,726	65,108	704,785
Administrative and associated activities	20,735	20,577	250,632	20,211	20,161	261,734	19,762	19,746	257,681
Support of other nations	314	341	3,089	2,726	2,762	8,505	2,810	2,964	9,637
Total direct hire civilians	286,550	280,103	2,631,931	281,577	252,004	2,777,240	257,427	250,651	2,735,597

[1] End strength excludes schoolteachers for overseas education of dependents.

General SEARS. The budget request includes funds to support a civilian personnel and strength of 250,651. This reflects a net decrease of 1,353 from the fiscal year 1972 level. We would have been able to accomplish a greater reduction of strength had we not incurred essential increases in some areas. These increases include 3,271 for support of all volunteer force projects, 427 for air and water pollution abatement, 1,408 for support of the Army Reserve and 293 for the SAFEGUARD Program.

PROJECT VOLUNTEER

Chairman ELLENDER. I have a number of questions regarding the additions in civilian personnel that you just mentioned. First would you please break out the 3,271 increase in Project Volunteer by the various Project Volunteer programs and show this increase compared to the number of personnel employed in each program in fiscal year 1972?

General SEARS. I will provide that information for the record, Mr. Chairman.

(The information follows:)

CIVILIAN END STRENGTH

	Fiscal year 1972	Increase	Fiscal year 1973
Expand USAREC	0	1,208	1,208
Reserve recruiting	0	365	365
Health care and supplies	517	1,187	1,704
Athletic, recreation and religious activities	274	870	1,144
Replace EM on detail	833	(833)	0
Extend special VOLAR programs	1,080	474	1,554
Total	2,704	[1] 3,271	5,975

[1] The estimated cost for these 3,271 civilian personnel is $21,600,000 based on 2,429 man-years at average rate of $8,900 per man-years.

Chairman ELLENDER. Would you also please explain why these additional 3,271 personnel are necessary for Project Volunteer to be successful?

General SEARS. The increase in fiscal year 1973 Modern Volunteer Army civilian hire is a critical part of the program to strengthen the Army and in the process reduce its reliance on the draft.

A modernized accession system to recruit more young men for the Active Army and Reserve Components requires larger recruiting organizations with a corresponding increase in their civilian support forces.

The twin pressures of wide-ranging commitments and continuous budget constraints have made it increasingly difficult to provide the kind of life our soldiers deserve. Hire of additional civilians will help to remove from Army life those irritants which detract from the total environment of the soldier by improving medical services, expanding religious and recreation activities, and eliminating other areas which serve as deterrents to continued service.

New employees will fill these general positions: administration, information, logistical, personnel, recreational and religious education

specialists; recruiting technicians; and laborers (for example, bus drivers, custodial, et cetera). They will be generally in the lower classified and wage board grades (levels 1–7).

POLLUTION ABATEMENT

Chairman ELLENDER. Second, would you please provide the committee with some more background regarding the increase you are requesting for pollution abatement?

General SEARS. The National Environmental Policy Act of 1969 declared a national policy to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man. In support of this policy all Federal agencies were directed to maintain review and surveillance of their respective facilities and equipment to assure continuous compliance with emission standards. The 427 people discussed in my statement will be used to accomplish this mission and to insure that our facilities and equipment are operated and maintained to meet applicable emission standards.

Chairman ELLENDER. How many personnel are presently in the pollution abatement program and why are the additional 427 personnel needed? Precisely what will they be used for?

General SEARS. The Federal, State, and local rules promulgated as a result of the Clean Air and the Federal Water Pollution Control Acts require that local municipalities, industries, and other entities monitor and control their emissions. In furtherance of the goals contained in the National Environmental Policy Act of 1969 and the two aforementioned acts, the President, by Executive order, directed the Federal agencies, in the design, operation and maintenance of Federal fixed and mobile facilities, to provide leadership in the nationwide effort to protect and enhance the quality of our air and water resources. As part of this leadership the Federal agencies were directed to maintain review and surveillance of their facilities to assure that the standards for air and water quality were met. The Army currently has approximately 263 individuals who spend at least 50 percent or more of their time in pollution abatement work. However, because of the large numbers of Army installations and the thousands of pieces of equipment which emit air and/or water pollutants, the Army does not currently have the capability to accomplish the required monitoring and control of our emissions. The 427 additional personnel will be used in monitoring and controlling our pollutants.

RESERVE SUPPORT

Chairman ELLENDER. Third, would you please explain the reason for the requested increase of 1,408 personnel in Army Reserve personnel support?

General SEARS. I will provide that information for the record, Mr. Chairman.

(The information follows:)

OSD Reserve Component Test Program Support ..... +4

This program is designed to evaluate concepts showing promise for increasing the readiness of the "Total Force" (Active and Reserve Components). These personnel are required in the base operations support of this test program.

Office, Chief of Army Reserve ..... +41

This is a functional transfer of responsibility from Program 9, OMA to Program 5, OMA of all civilian personnel employed at this Agency. This is not an increase in the Army budget but is for better identification and control of funds appropriated for support of the Army Reserve.

USAR Technicians ..... +1,363

USAR technicians are dual status Federal Civil Service employees who are participating unit members of the Army Reserve. They are the only full-time support available to units and are vital and indispensable to maintenance of equipment, management, unit readiness, training, and recruiting. Their provision is in accord with Public Law 90–168, and the FY 1973 increase is almost entirely for maintenance of equipment and for strength recruiting. I would like to provide for the record the detail justification by category of technicians.

Distribution by Category/Justification:

a. Maintenance Technicians (MT) ..... +798

These personnel are required for unit and area organizational and support maintenance on equipment issued to Army Reserve units. In addition, they instruct unit personnel in proper maintenance techniques. The USAR is programmed to receive increased quantities of equipment during Fiscal Year 1973. The increased inventory of equipment in use will require additional maintenance technicians in the following categories:

Organizational maintenance technicians	305
Aviation maintenance technicians	279
Support level maintenance technicians	214
Total	+798

b. Recruiting Technicians ..... +365

An intensified and strengthened recruiting program is necessary in the approaching zero draft and volunteer strength environment. The budget will provide an additional 365 for a total of 430 recruiting technicians at larger units and selected headquarters locations. These recruiting specialists will perform direct recruiting, provide recruiting instruction, coordinate and evaluate effectiveness of recruiting programs and techniques.

c. Aviation Technicians ..... +46

With the modernization and expansion of the USAR aviation program, centralization of operations and support has been necessary to insure safe operation and efficient utilization of personnel and equipment. USAR aviator personnel are authorized 24 additional training periods to mantain combat readiness in the type of aircraft assigned, and full-time instructor and training supervision is required. For this purpose 24 USAR Aviation Flight Facilities have been established and will be manned by Technicians in the positions of Airfield Operations Officers, Flight Instructor and Aircraft Dispatcher personnel.

d. Staff Technicians ..... +49

Staff Technician positions are required at battalion and higher Command headquarters. They are key staff personnel who are reserve unit members with duties in the areas of personnel, training, and logistics. These increases are based on workload data, and support increased requirements at the General Officer Command level.

e. Administrative-Supply Technicians (AST) ..... +105

The AST is a member at company and comparable unit level. In most instances he is the only individual present on a full-time basis to accomplish the normal day-to-day administrative, training and supply functions at unit level. Increases in Fiscal Year 1973 provide personnel within authorized manning criteria.

Safeguard Program

Chairman Ellender. Finally, would you please explain the 293 man increase in the Safeguard program? With the program as far along as it is, why are more civilian personnel being requested?

General Sears. The civilian personnel are required for the orderly buildup of the work force as the system is developed and deployed. They will assist primarily, in activating, manning, and supporting the two tactical sites and the depot.

Chairman Ellender. Precisely, what will these 293 be employed to do?

General Sears. The additional people wil be used to assure that the Grand Forks, N. Dak., site will be operational early in fiscal year 1975, that work at the Malmstrom, Mont., site progresses as scheduled, and that the depot at Glasgow AFB, Mont., will be ready to receive its first material early in fiscal year 1973. Involved at the sites will be site activation, engineer, base operations support, tactical, and communications personnel. Logistics personnel will man the depot that will provide support to the tactical sites.

MILITARY PERSONNEL IN EUROPE

Chairman Ellender. As I understand, there is no contemplated reduction in Europe in military personnel.

General Kjellstrom. Sir, as far as Europe is concerned, our force structure in fiscal year 1973 contemplates the same level of effort, 198,391 troops in Europe, which is the approximate level for fiscal year 1972.

Chairman Ellender. Is that the four and a third divisions?

General Kjellstrom. That is the four and a third divisions we discussed yesterday when General Kerwin was here.

Chairman Ellender. That constitutes the 198,000 to which you just referred?

General Kjellstrom. Yes, sir.

Chairman Ellender. Those are all Army?

General Kjellstrom. Those are all Army troops, 198,000.

CIVILIAN PERSONNEL

General Sears. A concerted effort is being made in fiscal year 1972 to reduce the size of our civilian work force. One action in this regard, which also impacts on headquarters operation and administration, was the decision to reduce the number of personnel employed in military functions in the Washington, D.C., area by 2.5 percent, or some 777 spaces from the November 30, 1971, on-board strength.

WASHINGTON, D.C., AREA STRENGTH

Chairman Ellender. What is the corresponding reduction in the number of civilian personnel in military functions in Washington, D.C., using June 30, 1971, on-board strength?

General Sears. The corresponding reduction using June 30, 1971, on-board strength as a base against the June 30, 1972, projected strength would be 966 civilians, or 3.4 percent.

Chairman Ellender. Were these civilian personnel that were reduced replaced by military personnel?

General Sears. None of these was replaced by military personnel, and it is not anticipated that such replacement will occur as a result of reductions in civilian employment to be achieved by June 30, 1972. Stringent controls are in effect to assure that military personnel are not used improperly to offset reduced civilian employment or as substitutions for civilians separated involuntarily by reduction in force or through attrition.

COST GROWTH AND FOREIGN CURRENCY REVALUATION

When our initial fiscal year 1973 budget estimates were being prepared in early 1971, we computed and priced our requirements for nonpersonnel resources based on the price levels existing in mid-1970. The estimate now before the committee is based on price levels prevailing as of September 1971. The general increase in prices experienced during that period averaged about 5 percent of total noncompensation requirements and has absorbed $176 million of our OMA resources.

Initial program pricing for activities requiring foreign currency transactions was accomplished using currency exchange rates existing during late 1970. The floating of the U.S. dollar relative to foreign currencies has resulted in higher costs for these programs. The request for fiscal year 1973 is based on exchange rates as of December 1971 and includes increases of about $53 million resulting from changes occurring since August 1971. Thus, were it not for currency revaluations and cost growth, this estimate would have been about $229 million lower.

Chairman ELLENDER. In order to compute the increase due to the change in exchange rates, I presume that you took country-by-country estimates and adjusted them accordingly. Would you please provide for the record a table of the countries that you are budgeting for with the total adjusted amount estimated for each?

General SEARS. Yes, sir; you are correct in defining our method of computing the $53-million increase. I will be happy to provide for the record a table reflecting the increase and adjustments by country.

(The information follows:)

ADJUSTMENT COSTS TO THE FISCAL YEAR 1973 OPERATIONS AND MAINTENANCE, ARMY, BROUGHT ABOUT BY FOREIGN CURRENCY REVALUATION

[In millions of dollars]

Country	Budget estimate excluding currency adjustment [1]	Adjustments		Budget estimate including currency adjustment
		Percent change [2]	Amount	
Federal Republic of Germany	368.487	11.7	43.113	411.600
Japan	46.436	11.0	5.108	51.544
Okinawa [3]	23.682	11.0	2.605	26.287
United Kingdom	7.897	3.9	3.8	8.205
Italy	6.471	3.4	.220	6.691
All other [4]	32.280	5.0	1.614	33.894
Total	485.253		52.968	538.221

[1] Budget amount to be impacted by foreign currency revaluation.
[2] Percent change in foreign exchange rates as of Dec. 3, 1971.
[3] Based on Japanese rates. Reported separately because Okinawa will not be reverted to Japan until May 15, 1972.
[4] Includes the Netherlands, Belgium, Spain, Singapore, and 7 other countries.

CONGRESSIONAL INTEREST AREAS

General SEARS. I would now like to discuss those areas in which the Congress has previously expressed a special interest.

HEADQUARTERS

Headquarters operation and administration is an area which has been of concern to both this committee and to the Army for some time. We have made a determined effort to improve the efficiency and effectiveness of our headquarters so that a smaller organization can accomplish the required functions.

The actions which we have taken in this respect, and in consideration of the intent of this committee, have resulted in reductions in both personnel strengths and operating costs in headquarters. We have planned overall manpower reductions of 19 percent between the actual fiscal year 1971 level and the fiscal year 1973 levels. This reduction represents a civilian manpower reduction of 12 percent and a military manpower reduction of 28 percent.

Chairman ELLENDER. In connection with this reduction, can you show any savings?

General KJELLSTROM. We would have shown savings, Mr. Chairman, except for the significant pay increases. The total dollars involved of all appropriations in the headquarters area in 1971 were $332 million, while the dollars involved in 1973 were $319 million. Civilian personnel went down from 13,800 to 12,300 while military personnel went down from 9,400 to 6,700, and the pay increases have practically compensated for the reduction in personnel.

Chairman ELLENDER. What reductions do the percentage reductions in headquarters operation and administration represent?

General SEARS. The 28-percent military personnel reduction planned between actual fiscal year 1971 level and the projected fiscal year 1973 level represents a net decrease of 2,665 spaces. The civilian personnel reduction of 12 percent planned for the same period represents a net decrease of 1,586 spaces.

Chairman ELLENDER. How does the size of the headquarters staffing you are planning for fiscal year 1973 compare to the size of that staff in fiscal year 1965?

General SEARS. The strength of the departmental area and the major Army field commands are now below the pre-Vietnam—(fiscal year 1965)—build-up levels, and further reductions in these commands are programed for fiscal year 1973.

Chairman ELLENDER. Proceed.

PUBLIC AFFAIRS

General SEARS. The Army request contains $8.4 million in fiscal year 1973. This includes $4.1 million in the Military Personnel, Army appropriation, $2.4 million in Operation and Maintenance, Army, and $50,000 in the Operation and Maintenance, Army National Guard appropriation. The request reflects a reduction of 26 military and 11 civilian spaces, and $533,000 from the fiscal year 1972 level in compliance with congressional action in the fiscal year 1972 appropriations bill. The fiscal year 1973 estimate represents an increase above the adjusted fiscal year 1972 estimate of $400,000 which is attributable to pay increases, effective January 1, 1972, for both military and civilian personnel.

Chairman ELLENDER. Can you describe the scope of public affairs for the record?

General KJELLSTROM. The public affairs programs provides for the support of public information and community relations at Army installations and Army activities worldwide. It includes contact with the public media, such as the press, radio, TV. It includes the hometown news center in Kansas city, Mo., and community relations activity between the Army and the civilian community. We include in this group both civilian and military people and the operating costs such as travel, supplies, and equipment.

The number of military personnel has been reduced drastically from fiscal year 1971 end strength of 618 to fiscal year 1973 end strength of 403, about a 30-percent reduction. The civilian end strength has not been reduced as sharply due to a change in the personnel accounting procedure. Funding has been reduced from a total in fiscal year 1971 of $9.4 million to a total in fiscal year 1973 of $8.4 million.

Chairman ELLENDER. How is this liaison between the Army and the public maintained?

General KJELLSTROM. Sir, it is on an informal basis. At an installation, for example, at Fort Bragg, the public information office receives inquiries from the media—the press, TV, and so forth. Inquiries are channeled through that office to insure that they are handled expeditiously and properly. They handle contacts with the local community and civic organizations, the chambers of commerce, veterans organizations, Rotary, and the like.

Chairman ELLENDER. Does it consist of any paid lectures?

General KJELLSTROM. No, sir; we do not pay to have people lecture. These are only administrative people who handle the contact for the commanding officer.

Chairman ELLENDER. What is the nature of these requests?

General KJELLSTROM. Sir, from the news media they will want a story about what activity is going on in the installation for the foreseeable future or a particular visit of a high-ranking individual from the Government, the Congress, and the like.

We handle this type of activity. We are not in a propaganda type activity but we are presenting the facts on the Army activities to the local community.

Chairman ELLENDER. The activity is not limited to requests, is it?

General KJELLSTROM. On request and of course when we have an event that we are sponsoring. As an example, an appreciation day, we advise all the media in the area that the appreciation day is forthcoming and invite them to participate in the appreciation day.

Chairman ELLENDER. Proceed.

FUNDING INCREASES

General SEARS. The reserved fiscal year 1972 estimate of $8 million represents a net increase of $600,000 above the initial fiscal year 1972 estimate. This increase is caused by civilian and military personnel pay raises, and by the inclusion of public affairs activities in four commands not previously included in public affairs estimates, as presented in our reprograming request. The four commands for which we had not previously included public affairs activities in our estimates are: U.S. Army War College, U.S. Army Computer Systems Command, the Surgeon General, and the U.S. Military Academy.

Inclusion of these commands caused the amount reflected in the fiscal year 1972 estimate to increase by $543,000, with $305,000 of this in

OMA. These increases were partially offset by the fiscal year 1972 congressional reduction of $533,000.

NEW PROGRAM ELEMENT

Beginning with fiscal year 1972, a separate program element has been established in Program 9, Administration and Associated Activities, to provide for centralized control of public affairs activities worldwide. This action will provide visibility to all public affairs costs and enable the Army to better monitor its public information activities to insure compliance with directives and to provide Congress, the news media and the public with information about its activities.

SENIOR ADVISER FAMILY LEAVE PROGRAM

The fiscal year 1973 request contains $404,000 for support of the special family leave program incentive for senior province and district advisers serving on voluntarily extended tours of 18 months or longer in the Republic of Vietnam. This program provides for payment of transportation and per diem allowances for families to enable them to join the service member during his rest and recuperation leave for a period of up to 2 weeks. Authority for continuation of this program through March of 1972 was granted in the fiscal year 1972 Department of Defense Appropriation Act. The Department of Defense has requested Congress to enact specific legislative authority for this program prior to expiration of the current authority. The proposed legislation has been introduced into Congress and is awaiting further action.

Chairman ELLENDER. How many Army senior advisers have qualified for this family leave so far this year and at what cost?

General SEARS. Family leaves have been granted to 74 province and district senior advisers between the period July 1, 1971, and February 29, 1972, at a cost of $249,554.

Chairman ELLENDER. How many family leave trips do you expect to be funded with the $404,000 requested in this budget?

General SEARS. Sixty-four senior advisers have been programed for this family leave in fiscal year 1973. However, no leaves have been programed for officers joining the senior adviser program since December 6, 1971, pending enactment of legislation presently before Congress which provides for its continuance.

Chairman ELLENDER. How many Army senior advisers will there be in fiscal year 1973?

General SEARS. There will be 200 senior advisers in fiscal year 1973 of which 44 are province senior advisers and 156 are district senior advisers. However the number of district senior advisers will be gradually reduced so as to completely phaseout these advisory positions by the end of fiscal year 1973.

ADVERTISING

During the last quarter of fiscal year 1971 we conducted a test of the effectiveness of the use of prime time radio and television advertising in support of the recruiting program. We found such advertising to be highly effective in supporting the recruiting effort.

However, in compliance with congressional directives, we have discontinued our prime time radio and television advertising during fiscal year 1972. Our current program utilizes other available media to include newspapers, magazines, and direct mail.

In recognition of the important role that recruiting advertising plays in both the active Army and the Army Reserve, we have included $31 million in the fiscal year 1973 request for this purpose, and we will continue to concentrate on utilization of other media to the extent required.

Chairman ELLENDER. Are funds included in this 1973 request for paid radio and television advertising?

General SEARS. No, sir. The Army is prohibited from utilizing paid advertising on prime time radio and television and has relied exclusively on the print media in fiscal year 1972. This has resulted in an insufficient and improperly balanced program. It is hoped that the Army will be permitted to use paid broadcasts in the future. The fiscal year 1973 budget has no funds specifically earmarked for paid radio and television advertising, but should the Army be allowed to use these media, then funds contained in the budget would be reprogramed so as to provide a balanced advertising program.

Chairman ELLENDER. Would you please provide for the record a breakdown of the $31 million you are requesting for advertising into the types of media you will be utilizing in fiscal year 1973 and compare these amounts to those used for the same type media in fiscal year 1972?

General SEARS. I will be happy to do.

(The information follows:)

ARMY ADVERTISING PROGRAMS

	Fiscal year 1972		Fiscal year 1973	
	Active Army	Reserve	Active Army	Reserve
Media:				
Magazines	$5.9	$0.2	$6.1	$0.6
Newspapers	3.4	.2	1.0	.6
Direct mail	.5	.1	.6	.1
Outdoor	2.1		2.0	
Transit			.4	
Theaters	.1		.6	
National varsity club	1.6		1.0	
Yellow pages			.2	
Airport displays			.3	
Subtotal	13.6	.5	12.2	1.3

OTHER

	Fiscal year 1972		Fiscal year 1973	
	Active Army	Reserve	Active Army	Reserve
Field representatives	1.5		3.0	
Production	4.7	0.17	3.1	0.35
Films	1.5	.02	.9	.10
Research, exhibits, displays	.2	.15	.6	.15
Printing	1.5	.14	1.2	.40
Local recruiting support	1.4	.62	2.2	1.40
Miscellaneous	2.3		3.5	.20
Subtotal	13.1	1.10	14.5	2.60
Total	[1] 26.7	1.60	26.7	3.90

[1] Includes $6,300,000 requested in reprograming action, fiscal year 1972, 19 P/A—"Operation and Maintenance, Army."

Chairman ELLENDER. How much of the $30.6 million is for Active Army and how much is for the Army Reserve?

General Sears. Of the $30.6 million requested $26.7 million is for Active Army advertising and the balance of $3.9 million is for Reserve advertising.

JCS Directed and Coordinated Exercises

During the hearings on the fiscal year 1972 budget request and later in actions on the floor, the Congress expressed disapproval of Exercise Reforger, however, the fiscal year 1972 funds were appropriated with the understanding that no fiscal year 1973 funds would be obligated during the course of any continuing resolution. In accordance with the will of the Congress, the Army does not plan to obligate funds for this exercise in fiscal year 1973 until such authority is granted. We have included funds in the estimate for a large-scale, dual-base, restationing-type exercise and hope that the Congress will reconsider its position on this question.

Conus JCS Exercise

In the event such authority is not granted, a large-scale CONUS JCS exercise will be substituted.

Chairman Ellender. Would you give us some particulars on this proposed dual restationing exercise such as where it will be conducted, how large the operation will be, how much it will cost and so on?

General Sears. I will be glad to do so.

(The information follows:)

First, may I emphasize the Exercise Gallant Duel 73 is not a "dual restationing exercise." Gallant Duel 73 is a division level training exercise to be conducted if Reforger IV is not conducted. The JCS stated purpose for Gallant Duel 73 is [deleted].

Exercise Gallant Duel 73 is scheduled to be completed at Camp McCoy, WI. in the spring of CY 1973 at an estimated cost to the Army of approximately $1.205 million. The exercise sponsor is United States Readiness Command.

General Sears. The JCS exercise program is composed of joint and combined training exercises as recommended by the commanders of unified and specified commands in the field. These exercises provide training for Army forces in strategic mobility, the conduct of contingency plans and point operations, and permit the evaluation of both the readiness of our forces and the effectiveness of our contingency plans. Several of the larger exercises such as Reforger are viewed by our allies, as well as our potential adversaries, as indications of U.S. willingness and intent to support treaty obligations and as indices of our operational capability.

Although we have not specifically scheduled Reforger IV, we believe that it is imperative that a large scale dual base restationing exercise such as Reforger be conducted. The total program of exercises to be supported by the Army in fiscal year 1973 is less than one-half of that program recommended by the unified and specified commands and is generally at the same level ($8.6 million) as that conducted in fiscal year 1972. As the Army's involvement in Southeast Asia is further reduced, the requirements for joint and combined training will become more pressing. Hence, it is anticipated that the level of support for this exercise program should increase over the next several years.

Chairman Ellender. How much will that cost?

General Sears. Approximately the same amount of money, the $5 million we have in the budget for Reforger. This exercise within the continental United States will cost approximately the same amount of money.

Chairman Ellender. As I recall, the Reforger exercise conducted last fall cost close to $15 million, including the Air Force's costs of airlifting the personnel.

Are we to understand that you will not proceed with another Reforger-type exercise, unless it is specifically approved by the Congress?

REFORGER BUDGET REQUEST FOR RECONSIDERATION BY CONGRESS

General Sears. That is right. We are asking for authority from the Congress to send these troops to Europe as we have done for the past 2 years.

Chairman Ellender. Is any legislation required for that?

General Kjellstrom. Sir, it is not part of the legislation. It is part of the budget request within this appropriation and within the Air Force appropriation.

Chairman Ellender. You are asking for funds on this request?

General Sears. Yes, sir; we are asking in this budget request for $5 million for Reforger.

Chairman Ellender. Is it specifically requested in the budget?

General Sears. We have it as a specific item in the budget.

Chairman Ellender. Mr. Woodruff, I want this item specifically brought to the attention of the committee during the markup of the bill. It will be recalled that, in reporting an amendment to the continuing resolution for fiscal year 1973, the committee requested that no funds be obligated for Exercise Reforger and the Air Force's Crested Cap exercise. However, this request was disregarded by the Department of Defense.

This matter was discussed in the manager's statement in the conference report on the Department of Defense appropriation bill for fiscal year 1972, and those paragraphs will be included in the record at this point.

(The information follows:)

[Excerpts from House Report No. 92-74, 92d Cong., first sess.]

OPERATION AND MAINTENANCE, ARMY

The conferees are in agreement with the Senate action disallowing the $7,200,000 requested for Exercise Reforger III. The Department of Defense disregarded a request of the Committee on Appropriations of the Senate not to obligate funds under the Continuing Resolution for Exercise Reforger III and Exercise Crested Cap, and the funds requested were actually obligated. While funds requested for these exercises have been specifically disallowed, the conferees have agreed to the restoration of $7,200,000 to cover the deficiencies created by the Department's disregard of the Senate Committee's request. The objective of the conferees is to prevent any further obligations for these exercises through the use of funds provided in this bill, and to prohibit the use of funds made available through Continuing Resolutions for similar Reforger and Crested Cap exercises during fiscal year 1973.

OPERATION AND MAINTENANCE, AIR FORCE

The Senate agreed to restore the $12,858,000 requested by the Air Force for the Reforger III and Crested Cap exercises. The conferees' position concerning the Army's participation in the Reforger III exercise is also applicable to the Air Force's participation in these exercises.

Exercise Gallant Duel

General Kjellstrom. Mr. Chairman, we have provided an alternative. If the Congress does not authorize the Reforger exercise, we respectfully request that the funds be left in the program so that we can conduct a similar type exercise within the continental United States.

Chairman Ellender. Why is that necessary?

General Kjellstrom. It is absolutely essential that we exercise our units and conduct joint training exercises with the Air Force. It is essential that we pick these units up from one installation, for example, Fort Hood, and take them to another installation, using Air Force aircraft, conduct the maneuver under simulated combat conditions so that at some point in time in the future when our forces are called upon to reinforce Europe, if this were to be necessary, we would have the experience within our units to conduct the necessary military action.

Chairman Ellender. Have you ever done that before?

General Sears. Yes, we have done it in past years. Operation Desert Strike, which brought together large numbers of units, was of this type. Actually, the exercise proposed, if the Congress does not wish to go along with Reforger, is called Exercise Gallant Duel. [Deleted.]

We believe as the Vietnam war winds down we will need these exercises. We must train the unit in total. There is an enormous coordination effort with the Air Force to move these units. We believe we need to conduct these exercises in order to make certain we have the expertise to reinforce anywhere in the world that it is required.

Chairman Ellender. Is that done in case we should find it necessary to move troops from the continental United States to countries abroad?

General Sears. Yes, sir; that is the purpose of the exercise, if we have to move troops anywhere in the world, we have Southeast Asia, Korea, Europe, Africa.

Chairman Ellender. Proceed.

Sedans for Recruiters

General Sears. In accordance with the intent of the Congress, we have reviewed our overall requirements for additional sedans to support the expanded recruiting effort in support of the all-volunteer force program. We established in initial requirement of 1,747 additional sedans for recruiters in fiscal year 1972. These sedans are being provided through leasing as directed.

Our fiscal year 1973 request includes a total of $6.1 million for leasing and operating costs of 2,655 vehicles.

The study of which is the overall least-cost method of providing these vehicles has not been completed at this time. Our average leasing and operating costs are projected at $2,280 per vehicle per year. On this basis, we have chosen to continue the leasing program until a final determination can be made.

Lease-Purchase Economy Study

Chairman Ellender. Do you find it less expensive to lease these cars than to purchase them?

General SEARS. Sir, the study is currently underway. We do not have a definite answer yet. However, we are going the lease route and that is what we are doing now.

The problem seems to be for all the services to get a lease with the General Service Administration. The General Service Administration normally can lease at less cost on an overall basis than any service can lease. So the Department of Defense is negotiating with the General Services Administration to determine if they can supply our requirements. They were asked if they could supply our requirements officially for this fiscal year and they could not. They have now been asked officially if they can supply our requirements for next fiscal year. The GSA lease cost is about $50 per month per car, $600 a year for lease, and 5 cents per mile for operation.

Chairman ELLENDER. What type car is this?

General SEARS. That would be an ordinary compact four-door-sedan-type automobile.

General KJELLSTROM. Sir, if I may interject, our past experience in this area has indicated that purchase of sedans has been the least costly. However, at the time of presentation of the budget last year there was conflicting data available and it was determined that we would go to the lease route. On the basis of the information that I have seen, it would be more economical to the Government to purchase the sedans.

Chairman ELLENDER. You are still studying it?

General KJELLSTROM. Yes, sir.

Chairman ELLENDER. When do you expect to complete the cost study on the leasing of additional recruiter vehicles?

General SEARS. A study to determine the most economical method of leasing sedans is currently being conducted by the Department of Defense and should be completed by June 10, 1972.

Chairman ELLENDER. As I recall you are increasing the number of recruiters to just over 6,000 in fiscal year 1972 and you will maintain that strength in 1973. This requirement of additional cars will allow for one car for every three recruiters, in round figures. Would you please explain to the committee how you arrived at that ratio and why more men per car could not be utilized to achieve the same results?

General SEARS. I will be happy to provide that information for the record.

(The information follows:)

1. The basic criterion used by the United States Army Recruiting Command in determining the number of vehicles required by the recruiting force is the size of the recruiting station in terms of the number of authorized recruiters working out of the station. Based on experience and evaluation, the following guidelines for vehicle requirements have been established:

Size of recruiting station:	*Number of sedans*
1 man	1
2 man	1
3 man	2
4–5 man	3
6 man	4
7–8 man	5
9 man	6

2. This basic data is then refined based on examination of market data reports for individual recruiting stations; the overall geographical areas of responsibility; population distribution and density; distances involved and frequency of itinerary visits to isolated areas and other factors imposed by local conditions.

In areas characterized by high density and a high proportion of "walk-in" type enlistees, the number of vehicles assigned is reduced. Conversely, in rural areas where the recruiters must travel considerable distances to contact potential enlistees, an increased proportion of vehicles is necessary. In addition, because of the area of coverage and distance traveled to accomplish their recruiting mission, special recruiting personnel such as Nurse Recruiters, Women's Army Corps Counselors, Area Supervisors, and Assistant Area Supervisors are asigned vehicles on a one-for-one basis.

3. To be effective, a recruiter can not be tied to the recruiting station and wait for volunteers to come to him. On the contrary, he must be an active field salesman who uses his vehicle as a mobile office. The typical recruiter spends from 50 to 75 percent of his time out of the office during a normal work week. Additionally, up to one-third of his recruiting activities are carried on at night and on weekends. In short, recruiters must be highly mobile and readily available at all times for attendance at community functions, high school activities, athletic events, visits to local community organizations and for discussions with prospective applicants and their families in the home.

4. The fiscal year 1973 budget request for leasing of vehicles represents the minimum essential vehicles to maintain the required mobility of the expanded recruiter force and optimize the recruiting capability that has been placed in the field.

UTILIZATION OF EXCESS RVN SUPPLIES

General Sears. During the hearings on the fiscal year 1972 request, some concern was expressed about the large stockpiles of supplies in Vietnam.

The speed and magnitude of the build-up in Vietnam during 1965–68 resulted in the stockpiling of large quantities of supplies. In order to insure an orderly reduction of stocks and preclude accumulation of a large volume of excesses, as occurred at the end of World War II, the Department of Defense established the Pacific Utilization and Redistribution Agency (PURA). The purpose of this agency was to establish screening procedures to insure maximum effective utilization of these excesses both in USARPAC and in other areas of the world.

In addition, the Army took separate action to reduce excesses and redistribute them where they were most needed. A project entitled, "DA CLEAN," was established to reduce the authorized stockage of items in overseas areas, including Vietnam, and to identify the resulting excesses for redistribution or disposal.

Further, a program identified as Stop/See was established which consisted of blocking shipment of selected items to Vietnam and specifically validating the requirement prior to shipment from CONUS. Action was also taken to have USARV reduce the requisitioning objective and subsequently cancel replenishment actions based on the anticipated drawdown of units in Vietnam.

During fiscal year 1971, shipments of excess OMA supplies to Okinawa for redistribution amounted to 66,600 short tons, of which 59,600 short tons were identified and redistributed. The dollar value of this total excess shipped was $151.3 million while redistribution was $138.3 million.

As redeployment of U.S. units from RVN continues, retrograde is escalating. Shipments for fiscal year 1972 through November amounted to $91.7 million with disposition totaling $67.6 million. The balance is in process.

I will now discuss each of the 9 major OMA programs.

Program 1—Strategic Forces

Program 1, Strategic Forces, provides for the operation of our missile defense against manned bombers and the support of Safeguard, our defense against enemy missile attack. This request contains $93 million for the Safeguard program, which is an increase of $17 million over fiscal year 1972. Other than Safeguard, there is no significant change in the program from fiscal year 1972. The phasedown of Nike-Hercules batteries in continental United States and in Alaska during the latter part of fiscal year 1971 is complete and the program is stabilized.

(Program 1 follows:)

PROGRAM 1—STRATEGIC FORCES

[In thousands of dollars]

	Fiscal year—		
	1971	1972	1973
Missile forces	3,443	3,944	4,360
Safeguard	43,690	75,391	92,733
Command-control-communications systems	5,929	4,125	4,128
Training	3,018	2,706	2,706
Command	4,357	4,083	3,992
Base operations	30,111	22,568	24,810
Total	90,548	112,817	132,729

Program Detail

General Sears. The Detail of Strategic forces is displayed in terms of missile forces, Safeguard, command-control-communications systems, training, command and base operations.

Missile Forces

Funds in missile forces provide for the operational requirements of the Nike-Hercules batteries. It is estimated that $4.4 million will be required for Nike-Hercules operational requirements in fiscal year 1973. This is an increase of $416,000 over the fiscal year 1972 estimate.

The Safeguard system is the subject of a separate hearing and will not be addressed here.

Nike-Hercules Batteries in Europe

Chairman Ellender. How many Nike-Hercules batteries have you?

General Sears. There are 48 batteries. There are 10 in the Washington-Baltimore-Norfolk area, 10 in the New York-Philadelphia area, four in each of New England, Pittsburgh, Chicago. Three in Detroit, four in San Francisco, six in Los Angeles and three in Seattle.

Chairman Ellender. What is the cost of operating those batteries?

General Sears. The cost of that is $4,360,000.

General Kjellstrom. In the O. & M.A. appropriation, sir. There are some funds in the National Guard appropriation. Also this does not include military personnel cost.

Chairman ELLENDER. This is a combined effort of the Army and the National Guard——

General KJELLSTROM. Yes, sir, a joint effort between the Active Army and the National Guard.

Chairman ELLENDER. What is the need for the increase of $416,000 for these Army-operated Nike-Hercules batteries?

General SEARS. The decrease in funding levels associated with the elimination of 24 Nike-Hercules batteries and seven battalion headquarters batteries during fiscal year 1971 has had an adverse impact upon the operational support of the remaining batteries. The fiscal year 1971 cost per battery amounted to $60,632 as compared to an average actual cost per battery of $101,633 for the 3-year stable period of fiscal years 1968–70. The increase in fiscal year 1973 is to close the gap in the cost per battery. These additional funds will provide necessary repair parts and other operating supplies which are required to bring the Nike-Hercules batteries to authorized levels of operation.

COMMAND-CONTROL-COMMUNICATION SYSTEM

Funds in this account provide for tactical communications and fire control systems which identify targets for the Nike-Hercules units. Approximately 95 percent of the costs in this account support the U.S. Army Air Defense Command Communications Control System which includes long-term leased communication facilities providing the vital links between command echelons and the firing batteries. The fiscal year 1973 estimate for this account is $4.1 million which is unchanged from the fiscal year 1972 estimate.

TRAINING

Funds totaling $2.7 million provide training for the Nike-Hercules batteries. It is estimated that $800,000 will be required for the joint exercise program which pits bombers of the Strategic Air Command against the Nike-Hercules units of the Army Air Defense Command. Most of these funds are for contractual services which reduce electronic data to a record of the results of each test run. The exercises are designed to measure the effectiveness of the North American Air Defense System against penetration.

Operational training will require $1.8 million in fiscal year 1973. The major portion of these funds is for contractual services which design and produce synthetic training exercises, computerized training aids, films which are used to simulate enemy attacks, and collect data which records the responses of the command and control systems. The remainder of the fiscal year 1973 training fund requirement is for annual live firing service practice at Fort Bliss, Tex. The estimate for this activity is $200,000, which covers the costs of transporting unit personnel to and from McGregor Range at Fort Bliss.

COMMAND

The command account supports the headquarters operation of the Army Air Defense Command. This consists of the command headquarters located at Colorado Springs, Colo., and two regional headquarters, one located at Stewart Field, N.Y. and the other located at

Fort Baker, Calif. Funds provide for the pay of civilian personnel, temporary duty travel, supplies, and rental of equipment. The fiscal year 1973 estimate of $4 million comparies with the actual fiscal year 1971 cost of $4.4 million.

BASE OPERATIONS

It is estimated that $24.8 million is required for installation support requirements in fiscal year 1973. Of the funds requested for fiscal year 1973, 51 percent is for the pay and benefits for civilian personnel. The fiscal year 1973 budget request for base operations includes funds for the operation of 11 missile support shops which are essential to maintain the operational readiness of the on-site Nike-Hercules units and reduce nonoperational time to a minimum.

SAFEGUARD INCREASE

Chairman ELLENDER. I realize that the Safeguard program will be covered in greater detail in a subsequent hearing but I would like you to insert for the record at this time a brief explanation of the increases that you list on page 1–7 with the exception of the increase for civilian personnel which we have already covered in the justification. In these explanations, please break down the increases into the components listed in the description of the increases and compare them to the amounts provided for the same purposes in fiscal year 1972.

General SEARS. I will be glad to do so.

(The information follows:)

[In thousands of dollars]

Increases[1]	Fiscal year 1972	Fiscal year 1973	Change
Communication construction costs of defense communication system (DCS)	12,446	15,266	2,820
Personnel support	3,015	4,939	1,924
On-site Safeguard costs	1,328	5,323	3,995
On-site security	144	1,654	----------
Provisioning of tactical support equipment	130	----------	----------
Operate and maintain tactical support equipment	513	1,767	----------
Corps of engineer support	448	258	----------
Fire protection	43	----------	----------
Vehicle and medical support	50	----------	----------
Site base operations support	----------	1,644	----------
Student mission support at Safeguard central training facility	----------	2,225	2,225
Automatic data processing	3,334	3,780	446
Air Defense Command	221	181	----------
Cost analysis	----------	120	----------
Safeguard Management Information System	2,351	2,017	----------
Safeguard Logistics Command	762	1,462	----------
Other changes	11,571	12,245	674
Travel	2,722	2,989	----------
Transportation	491	437	----------
Rent/utilities	589	1,520	----------
Tactical communication non-DCS	1,823	3,166	----------
Other communications	401	636	----------
Printing	92	145	----------
Supplies	685	578	----------
Depot equipment	4,000	2,057	----------
Other equipment	768	717	----------

[1] Increases (less those pertaining to civilian personnel).

HEADQUARTERS OPERATIONS

Chairman ELLENDER. I notice that there is a decrease of $108,000 due to a reduction in headquarters operations which is mainly due to a reduction in the number of civilian personnel. Would you please tell the committee how many personnel are actually to be relieved in this reduction and what effect this will have on the operation of the headquarters in question?

General SEARS. There are no planned civilian personnel reductions in these headquarters for fiscal year 1973. The decrease in headquarters operations is identified with lower costs both in travel and other headquarters operating expenses.

Chairman ELLENDER. Would you please indicate the number of civilian personnel presently employed at the three headquarters and how many of these will come from each of these three?

General SEARS. At the end of February, 294 civilian personnel were employed at the three headquarters. No reductions are planned for fiscal year 1973 for the headquarters in question.

SELFRIDGE AIR GUARD BASE

Chairman ELLENDER. Turning now to page 1–15 of the justification. and the increases that are requested in the base operations portion of the strategic forces program, would you please tell the committee why there is a request for funding Selfridge Air Guard Base in the request for strategic forces?

General SEARS. Effective July 1, 1971 the Michigan Air National Guard assumed host responsibility at Selfridge Air Force Base from the Air Force. The base is now operated as a reserve installation and is not funded to provide services normally provided military personnel at active military installations—for example, housing, commissary, base exchanges, dispensaries, and so forth. The following Army activities stationed at Selfridge Air National Guard Base and located in the Detroit area require base operations support from Selfridge: ARADCOM, 28th Group Headquarters, STRATCOM Signal Company, ARADCOM Maintenance Support Shop, and U.S. Army Tank Automotive Command.

As a result of negotiations conducted with the Michigan Air National Guard, Department of Army has entered into support arrangements at Selfridge. Pursuant to these arrangements the Army assumed partial operation and maintenance responsibility for Selfridge in fiscal year 1972.

Chairman ELLENDER. Would you also please indicate just exactly what this $900,000 will be used for?

General SEARS. The Army will assume total responsibility—excluding the airfield itself—in fiscal year 1973. The fiscal year 1973 increase includes the Navy, Air Force, and Army Materiel Command share of the Commissary operating costs, $557,860, which was funded in fiscal year 1972 by those organizations, and $335,000 for personnel support, maintenance of real property, engineering,and administration costs not financed in fiscal year 1972.

CIVILIANIZATION OF KP

Chairman ELLENDER. Further down on page 1–15, you indicate that $1.2 million for the additional request is for civilianization of kitchen police. Would you please tell the committee what facilities will be assisted by this increase in funding?

General SEARS. A total conversion of all kitchen police functions to civilians is contemplated in fiscal year 1973. Forty-eight Nike-Hercules fire units and associated brigade-group-battalion headquarters batteries are supported by Program 1 funds. These units-headquarters located at facilities throughout the United States will be assisted by this increase in funding.

STEWART FIELD INCREASE

Chairman ELLENDER. Would you please explain the increase for Stewart Field? Exactly what are these funds for?

General SEARS. On December 31, 1969, the Air Force ceased operations at Stewart AFB. This action terminated certain base operations support services provided to Headquarters, 1st Region ARADCOM which is located at Stewart. The Army has retained selected areas and facilities at Stewart Field in order to provide continued base operations support to Headquarters 1st Region ARADCOM. The increase in funds for fiscal year 1973 is to finance essential repair and utilities projects previously deferred.

PROJECT VOLUNTEER

Chairman ELLENDER. The last item on page 1–15 is a request for $540,000 for Project Volunteer. I know that this is not going to be the last item for this project but I would like to get a summary of all the increase for Project Volunteer before we get too far into the hearing. Would you please provide a summary by budget activity and budget program or program element for the entire Army request and insert it in the record here?

General SEARS. Yes sir, I will be happy to do so.

(The information follows:)

[In thousands of dollars]

Program and budget activity	Increase	Decrease	Net
1—Strategic forces, base operations	540		540
2—General purpose forces, base operations	47,228		47,228
3—Intelligence and Communications, base operations	1,090		1,090
4—Air lift and sea lift, base operations	2		2
5—Reserve Forces, command	3,444		3,444
5—Reserve Forces, base operations	88		88
8—Recruit training		4,577	−4,577
8—Specialized training		2,312	2,312
8—Recruiting and examining	15,868		−15,868
8—Other personnel support		67	−67
8—Training activities, base operations	9,413		9,413
8—Other training activities		847	−847
8—Hospital operations	7,311		7,311
8—Medical activities, base operations	265		265
Total	85,249	7,803	77,446

Chairman ELLENDER. Would you also please explain exactly what this increase of $540,000 is for?

General SEARS. The $540,000 increase includes $40,000 for barracks improvements, partitions and furniture, and $500,000 for replacing enlisted men on detail.

PROGRAM 2—GENERAL PURPOSE FORCES

Program 2, General Purpose Forces, mirrors the size and readiness posture of the Army in that it bears the costs of unit training, supplies, administration and organizational maintenance of our forces. The net decrease of $112.4 million in the fiscal year 1972 request for general purpose forces is directly relatable to the planned reduction in the end strength of the Army, and the projected decrease in combat activities in Vietnam.

(Program 2 follows:)

PROGRAM 2—GENERAL PURPOSE FORCES

[In thousands of dollars]

	Fiscal year 1971	Fiscal year 1972	Fiscal year 1973
Unified commands	4,596	4,574	4,468
Combat forces	161,970	182,221	172,075
Combat support forces	148,900	172,321	129,824
Combat service support forces	716,671	462,203	257,250
JCS directed and coordinated exercises	7,071	8,621	8,096
Training	12,157	52,415	52,235
Command	23,071	24,923	23,525
Base operations	883,081	972,520	1,119,912
Total	1,957,517	1,879,798	1,767,385

FUNDING REQUEST

Chairman ELLENDER. How much for "General Purpose Forces"?

General SEARS. For $1,767.4 million. That is a decrease of $112.4 million in the fiscal year 1972 request.

Chairman ELLENDER. How does that compare with fiscal year 1972?

General SEARS. Last year's figure was $1,879.8 million. It is down $112 million.

Chairman ELLENDER. Proceed.

PROGRAM DETAIL

General SEARS. The detailed justification of General Purpose Forces is displayed in terms of the missions of the Army supported by the program.

UNIFIED COMMANDS

This program aggregation provides the dollar resources for operation of the headquarters of the two unified commands for which the Army is executive agent: the U.S. European Command and the U.S. Southern Command. We are projecting a net decrease of $106,000 from the revised fiscal year 1972 requirements.

COMBAT, COMBAT SUPPORT AND COMBAT SERVICE SUPPORT FORCES

These three aggregations represent the dollar requirements for the operation and maintenance of worldwide Army forces. The fiscal year 1973 estimate reflects a decrease in excess of $257 million in these three aggregations. The budget justification book addresses each of these aggregations separately and in detail.

JOINT CHIEFS OF STAFF AND COORDINATED EXERCISES

Estimated requirement for Joint Chiefs of Staff directed and coordinated exercises decrease by $525,000 between fiscal years 1972 and 1973. There had been a continuing emphasis through this program to provide training for Army units in joint operations, prepare forces for the conduct of contingency operations, test the effectiveness of airlift planning, and the reaction capability and combat readiness of selected units.

TRAINING

The training aggregation reflects requirements for unilateral Army training exercises, annual service practice firing, and individual proficiency firing. The training objectives to be achieved include the training of individual soldiers and their commanders to mold cohesive units; the development of the combined arms teams; increased proficiency in logistic operations; and the development of command leadership capabilities and sound, reliable staff operations.

This aggregation represents a $180,000 decrease over fiscal year 1972. There is an increase in funding requirements in fiscal year 1973 for area schools, formerly funded in another OMA program, and the Combat Arms Training Board which will study training problems and develop dynamic training techniques and solutions to deficiencies surfaced. This increase is fully offset by a reduction in training and development costs for the TRICAP Division and a savings in annual service practice contract costs.

COMMAND

Intensive efforts to reduce costs of headquarters operations continue to be made and actual reductions of $1.398 million are programed. These decreases are primarily associated with the reduction of effort in Southeast Asia and the associated reduction in Headquarters, U.S. Army Pacific between fiscal year 1972 and fiscal year 1973.

BASE OPERATIONS

The principal expenditure in the base operations account is for civilian personnel compensation. Approximately 46 percent of the base operations cost is for compensation of personnel employed in the various areas of base support such as supply operations, facilities maintenance, and utilities operations. The $1.119.9 million requested in this aggregation is a net increase of approximately $147 million between fiscal years 1972 and fiscal year 1973. This increase includes $126 million for projects directly supporting soldier oriented programs.

HEADQUARTERS OPERATIONS

Chairman ELLENDER. Turning now to the request for general purpose forces, and the unified commands, I notice that you are reducing the headquarters operations. I also notice that you are doing this without effecting reduction in personnel. That being the case, would you please tell the committee how you plan to make the reduction?

General SEARS. The planned reduction will be achieved by phase-down of contractor programer support in USEUCOM ADP systems support from 13 man-years in fiscal year 1972 to 10 man-years in fiscal year 1973, plus the reduction in supply and equipment support requirements for the ADP systems. A portion of the descrease can be attributed to annualization of fiscal year 1972 congressional reductions including the civilian average grade level which is reflected in reduction of average civilian man-year cost.

COMBAT FORCES

Chairman ELLENDER. With regard to the combat forces, on page 2–6 you indicate that the estimated force structure in 1972 would cost $182 million whereas the 1973 force structure would cost only $172 million. As I see it, the only difference is the reduction of [deleted] yet the reduction in cost is seemingly disproportionately large. Would you please explain how the reduction is arrived at and whether it is entirely attributable to the reduction of [deleted]?

General SEARS. I would like to point out that the columns shown in the general purpose forces, program 2 force displays reflect the authorized June 30, force structure and not the average or unit years that are supported during the fiscal year.

As force structure changes normally occur during a fiscal year rather than at the beginning or end they, therefore, affect 2 fiscal years. The first year involved is the one in which the change takes place. In the instance of an inactivation, as is the case in this question, the unit is funded for that period of time that it is in existence. This will cause the initial decline in funding requirements and be reflected as a decrease from the previous year's funding level. An adjusting reduction must be made to the funding level of the fiscal year subsequent to the inactivation to totally account for units annual costs. For example if a unit costing $10 million in fiscal year 1971 were inactivated one half way through fiscal year 1972 the required funding decrease for the first year would be $5 million. Then in fiscal year 1973 an adjusting reduction of $5 million must be made to completely account for the units annual costs.

The $10 million reduction is a net of all required adjusting reductions related to force structure changes during fiscal year 1972 and the initial funding changes associated with force structure changes scheduled for fiscal year 1973. The reduction of the [deleted] which accounts for only a small portion of the $10 million reduction in fiscal year 1973, will also cause a decrease in the fiscal year 1974 funding requirement.

UNMANNED DIVISIONS

Chairman ELLENDER. In a footnote on page 2–6, you indicate that the 1972 force structure includes a classified number of unmanned divisions. Would you please explain what you mean by this?

General Sears. I will be glad to do so.
(The information follows:)

The fiscal year 1972 force structure, due to manpower constraints, contains [deleted]. In order to reach the goal of 13 combat-ready divisions the Army will [deleted]. The Army will have sufficient manpower spaces to accomplish this assuming no arbitrary reductions are made to the fiscal year 1973 manpower program.

CONARC Combat Forces

Chairman Ellender. With regard to the combat forces in CONARC, you indicate on page 2–7, in the table an increase of [deleted] but a total dollar increase of some $27 million. In the narrative you indicate that there is projected an increase of [deleted]. Would you please explain why the table and this narrative do not correspond?

General Sears. Yes. The narrative addresses the fact that [deleted] will physically increase combat forces, CONARC in fiscal year 1973. [Deleted] noted in the narrative correspond to the footnote regarding [deleted] listed in table on page 2–7 is the [deleted].

USAREUR Combat Forces

Chairman Ellender. With regard to the combat forces, USAREUR, that you have broken down on page 2–8 of the justification, I notice that the $1.5 million increase is due essentially to the need to increase readiness. Would you please go into more detail on this request?

General Sears. Approximately $900,000 of this increase is directly related to the increased requirements for the conversion of the divisional and nondivisional combat forces in Europe to the H series table of organizational equipment. The readiness improvement funding for Europe includes a specific increase of $525,000 for the initial stockage of maintenance and repair parts packages required for support of additional M–551's to be issued to the USAREUR units in fiscal year 1973. The minimal balance included in this increase is a small increase in the tactical unit supplies and repair parts for the nondivisional combat forces in Europe to bring their level of support up to that level provided for the major combat units by the addition of the readiness improvement funding in fiscal year 1972.

Force Level Changes

Chairman Ellender. On page 2–9 where you deal with the combat forces, USARPAC, the only difference I see between the force level in 1972 and that projected in 1973 is the [deleted] and a total dollar reduction resulting from the removal of this [deleted] is almost $40 million or two-thirds of the 1972 estimate. Would you please explain this?

General Sears. The USARPAC fiscal year 1971 end of year combat forces structure contains 2⅓ divisions, one airborne brigade and one mechanized brigade that are supported in Vietnam [deleted]. The majority of the $40 million reduction between fiscal years 1972 and 1973 is attributable to the adjusting reductions required to totally eliminate, in the case of inactivations, or reduce, in the case of redeployments, the unit's costs in the budget. The reduction of the [deleted] which accounts for only a small portion of the $40 million

reduction in fiscal year 1973, will also cause a decrease in the fiscal year 1974 funding requirement.

VIETNAM RECONCILEMENT

Chairman ELLENDER. Also in this regard, on page 2–9 you indicate the removal of [deleted] whereas on page 2–7 you indicate that [deleted] will be returning from Vietnam. How do you reconcile these two different figures?

General SEARS. The [deleted].

CHANGE IN FORCE STRUCTURE

Chairman ELLENDER. On page 2–10, where you deal with the other combat forces you indicate a reduction of $154,000 out of a total budget in 1972 of $4.4 million. The reduction is associated with the phaseout of [deleted]. I am puzzled by the fact that a unit that represents over one-fourth of the total force structure can be phased out at such slight savings. Would you please explain this to the committee?

General SEARS. The net reduction reflected in this account from 1972 to 1973 considers both the [deleted] offset by increased one-time requirements for the 3d Infantry Battalion—The Old Guard—in the Military District of Washington. Based upon the plans for the [deleted] only a portion of its support is being withdrawn in fiscal year 1973. The balance of the support will be withdrawn from the fiscal year 1974 program. The increased requirements for the 3d Infantry are related to the unique ceremonial mission of this unit and the nonstandard supplies that are required for the accomplishment of this mission. Increased funding would also permit the expansion of the schedule for the "Spirit of America" presentation which is another part of the mission of the Old Guard.

Chairman ELLENDER. Still on page 2–10, there is a summary of increase and decreases to the 1972 revised budget that I would like to pursue in a bit more detail, beginning with the decrease associated with the force structure reduction. Would you please explain to the committee how you arrived at the $18 million reduction that you reflect in this summary? Would you also please break it down into major areas of reduction?

General SEARS. Yes, sir. The line items in the decrease trail are developed through the analysis of the changes in the aggregation for each command that are, subsequently, summarized in the line items that are published. This entry in the net reduction resulting from all force structure related changes during and between fiscal year 1972 and fiscal year 1973. These adjustments are developed by major command as follows:

A. CONARC: During fiscal year 1972 CONARC was provided one-time funding for the unique requirements related to the restationing-activation of major combat units. Specifically they were given $5.5 million for the activation of the headquarters and one brigade of the 101st Airborne Division and $2 million for the [deleted]. In fiscal year 1973 these funds were withdrawn and the command was provided $11.5 million for the balance of the activation requirement for the [deleted]. These activation funds will be required to provide the initial issue of all OMA purchased supplies and equipment required for [deleted].

Furthermore, the regular day-to-day operating costs are an additional requirement for CONARC in 1973 for the operation of the [deleted] with estimated fiscal year 1973 costs of $4,500 thousand for initial stockage and operation.

B. [Deleted.]

C. USARPAC adjustments include the reduction in support requirements for the combat forces in Southeast Asia offset by the annual operating costs of a brigade in Hawaii that was activated in 1972. In 1972, $5,500,000 was provided for the establishment and stockage of this brigade; these funds are withdrawn in fiscal year 1973.

D. Other commands adjustments reflect the net reduction from the change in requirements [deleted] and Military District of Washington that was previously addressed.

Readiness Improvement

Chairman Ellender. Among the increases, at the top of the list is an item for readiness improvement. I have already questioned this but since we have come to it again and are likely to several more times before the hearing is over, would you please provide for the committee a summary by budget activity and budget program of all the increments for readiness improvement that appear in this total budget request and insert it into the record at this point?

General Sears. Yes, sir; I will be happy to do so.

(The information follows:)

Program and budget activity:	*Changes (thousands)*
2 General Purpose Forces	+$4,880
5 Reserve Forces	+41,929
7 Central Supply and Maintenance	−87,700
Total	−40,891

H-Series Changes

Chairman Ellender. The fourth item on the summary on page 2–10 is an increase of $6.9 million for "Modernization of Tables of Organizational Equipment (H series)". This is the first I've heard of this and I want you to describe what this is all about to the committee. I would like you to be very specific in telling the committee exactly what this increase is for.

General Sears. In October 1968, the Army began a program to convert divisions, armored cavalry regiments, and special forces groups to G Series TOE. Due primarily to manpower and space restrictions, G Series conversion was never completed. In order to accommodate these structure and manpower constraints, reduced TOE called H Series have been introduced. Due to the modernization of procurement account items and the addition of certain units (e.g., an additional company per Infantry Battalion; an additional Aviation Company/Finance Company per division) required by the H–TOE, additional program 2 funds must be earmarked for planned unit conversions. These funds are required to cover one-time OMA equipment costs and the initial ASL/PLL for the items furnished by the procurement accounts. Funds to support the fiscal year 1972 H–TOE conversion of the brigade of the 1st Infantry (M) and the 3d Infantry Division (M) in Europe total $5,700,000. CONARC was funded $924,000 for con-

version of the 1st Infantry Division (–). Fiscal year 1973 H–TOE conversion costs set-out in the following tabulation:

(The information follows:)

USAREUR		CONARC	
1st Armored Division	+$1,638	4th Infantry Division (M)	+$1,637
3d Armored Division	+1,638	2d Armored Division	+1,637
8th Infantry Division (M)	+1,638	101st Airborne Division AMBL)	+1,637
14th Armored Cavalry Regiment	+819	3d ACR(–) and 1–6th Cavalry Squadron	+821
2d Armored Cavalry Regiment	+819	Special forces groups	+1,185
Special forces groups	+80		
Total	6,632	Total	6,917

Chairman Ellender. Please indicate any other increases listed in the justifications for this purpose.

General Sears. There is only one other increase included in the justification for this purpose. That is an increase of $3,993,000 in Combat Service Support Forces, USAREUR, for the conversion of the prepositioned unit sets of equipment (POMCUS). Therefore the total increase is $10,918,000. I will provide the details for the record.

(The information follows:)

H SERIES CONVERSION COSTS

[In thousands]

	Fiscal year 1972	Fiscal year 1973
CONARC combat forces	$924	$6,917
USAREUR combat forces	5,700	6,632
Subtotal	6,624	13,549
Combat forces increase	6,925	
USAREUR POMCUS	4,607	8,600
POMCUS increase	3,993	
Total costs	11,231	22,149
Total increase	10,918	

USARPAC Adjustments

Chairman Ellender. In regard to your request for combat support forces, I am again puzzled by the fact that, overall, such a slight reduction in units cause such a great reduction in the total request. Out of all your support units, you are showing a reduction of four companies and one battery, but your budget request is reduced by about 25 percent. Would you please explain this for us again in the context of the combat support forces?

General Sears. Yes, sir. The USARPAC fiscal year 1971 end of year combat support forces structure contains [deleted] field artillery battalions, [deleted] aviation companies, [deleted] air defense artillery batteries, and [deleted] combat engineer battalions that are supported during a portion of fiscal year 1972, but which are inactivated/redeployed before the end of that fiscal year. An adjusting reduction must be made to the funding level of the fiscal year subsequent to the inactivation to totally account for the units' annual costs. The reduction for combat support forces between fiscal years 1972 and 1973 is mainly attributable to the adjusting reductions required to totally eliminate, in

the case of inactivations, or reduce, in the case of redeployments, the unit's costs in the budget. The reduction of [deleted] which account for only a small portion of the fiscal year 1973 reductions, will also cause a decrease in the fiscal year 1974 funding requirement.

Criminal Investigation Division Decreases

Chairman Ellender. Skipping now to page 2–16, and the summary of budget changes there are two decreases I would like to question you about. The first is with regard to the decrease of $250,000 because of the transfer of the Criminal Investigation Division functions to program 9, administration and associated activities. Would you please explain to the committee why this transfer was made?

Colonel Gilham. The transfer was made to aline all criminal investigative resources into program 9 under the Criminal Investigation Command.

Chairman Ellender. Would you also please indicate whether this $250,000 is the only amount in this entire request for criminal investigation? If it is not, would you please tell the committee how much is in this request, by budget activity and program, for criminal investigation and how much was the total revised estimate in 1972?

Colonel Gilham. No, sir; it does not. The $250,000 represents only the criminal investigative activities that were transferred from program 2, "Combat support forces, other." The total fiscal year 1973 request is $6,294,000 which is included in program 9, administration and associated activities, field headquarters and activities. The total revised fiscal year 1972 estimate is $5,856,000.

Combat Support Force Reduction

Chairman Ellender. The next item is another reduction due to the force structure reduction. Would you please break down the $45 million reduction for combat support forces into the major programs or cost elements if that is easier, showing the total for 1972 and then the reduction in each category.

General Sears. Yes, sir. The force structure reduction entry for the combat support forces is a combination of the reduction in the Pacific due to the withdrawal of forces from the Southeast Asia conflict of $45,279,000 plus the additional reduction of $97,000 for the combat support force reduction related to the reduction of [deleted]. These reductions were made based upon the estimated fiscal year 1973 requirements that would result from the phased redeployment of these units as well as the required adjusting reduction of the residual funding for the unit redeployed or eliminated from the structure in fiscal year 1972.

Deactivation of Alaskan Atomic Reactor Plant

Chairman Ellender. In the area of increases, we have dealt with the readiness improvement increase already so we will go to the next item, an increase of $400,000 for the deactivation of an atomic reactor plant in Alaska. Would you please explain to the committee what reactor plant you are referring to, why it is being deactivated when we are on the verge of a power shortage, and how the Army is involved in this?

General Sears. During the past 10 years, the SM–1A has provided electrical power and steam for post heating purposes for Fort Greeley, Alaska. In considering a major funding requirement for a new nuclear fuel reload in fiscal year 1971, the Corps of Engineers made a determination that the mission of the SM–1A had been successfully accomplished. Furthermore, an economic study by the Office of the Chief of Engineers clearly favored the operation of adequate existing conventional diesel generators at Fort Greeley, over the SM–1A, to meet the electrical demands of the post. Additionally, the Army plans to use the turbine generators for the SM–1A, which can be operated with steam from the post heating plant, to provide a standby source of power to augment the existing conventional generating equipment.

Combat Service Support Forces Decrease

Chairman Ellender. I have the same question with regard to the combat service support forces as I had with combat forces and combat support forces, namely, how do you explain the large decrease in funding when the total number of units being reduced is relatively slight? In this case, there will actually be an increase in the number of units but there will be a reduction of $205 million or 44 percent in the funding for them. Please be specific and tell us exactly where the reductions will be made.

General Sears. The units reflected in the display on page 2–18 include all separate detachments which have a wide variance in manning levels and required funding support. It is for this reason that the reduction in military end strength gives a truer picture of fund requirements than does the force display. Additionally this is the aggregation in which the base operations type support for all U.S. forces in Vietnam is funded. Because this is a combat zone, all costs are mission costs. The funding reduction attributable to the transfer of U.S. installations to the Republic of Vietnam, and the decrease in maintenance and supply activities are associated with the withdrawal of U.S. forces from Vietnam and is estimated to be $204 million. All other known funding changes in this aggregation net with this reduction to result in an overall estimated reduction of $205 million.

MUST Medical Unit

Chairman Ellender. You are requesting an increase of $6.4 million, which you indicate is for the procurement and phased deployment of medical unit, self contained, transportable (MUST) hospital, equipment sets. Would you please tell the committee why these units are needed at this time? In your answer please indicate how many of these units or comparable units are in the Army's inventory or in use at the present time, where this new unit would be deployed, and what specific need it would alleviate.

General Sears. The MUST hospital is not related to RVN requirements. Although five MUST hospital units (prototypes) were deployed to RVN in 1966 they were removed approximately 2 years ago and their components used to offset current requirements.

The need for the MUST hospital is based upon conversion of all conventional surgical and evacuation hospitals into a MUST hospital

configuration which will provide for: mobility, ease of transportation, provision for a sterile environment for patient care, and use of equipment which will provide for the best and latest developments in the practice of field medical care.

The funds requested only relate to active Army unit deployments already effected or to be made and only for conversion of existing conventional field-type hospitals. To date seven surgical and six evacuation hospitals have been converted for a total of 13. A total of two surgical and four evacuation will complete the Active Army program. I will provide for the record a listing of the deployments.

(The information follows:)

Unit	Type of hospital		Location
	Surgical	Evacuation	
1. 41st	X		Fort Sam Houston.
2. 5th		X	Fort Bragg.
3. 28th	X		Do.
4. 86th		X	Fort Campbell.
5. 32d	X		Germany.
6. 31st	X		Do.
7. 7th		X	Do.
8. 128th		X	Do.
9. 93d		X	Fort L. Wood.
10. 10th		X	Fort Meade.
11. 46th	X		Fort Devens.
12. 5th	X		Fort Knox.
13. 4th	X		Fort McClellan.
14. 2d		X	Fort Benning (fiscal year 1973).
15. 8th		X	Fort Ord (fiscal year 1973).
16. 15th		X	Fort Belvoir (fiscal year 1973).
17. 21st		X	Fort Hood (fiscal year 1973).
18. 16th	X		Fort Riley (fiscal year 1973).
19. 47th	X		Fort Lewis (fiscal year 1973).
Totals	9	10	
Grand total	19		

Classified Projects

Chairman Ellender. Of the decreases on page 2–26 that are listed in the summary of budget changes, I believe the ones we haven't touched on are numbers 4, 5, 6, and 7, dealing with Red Hat, drug abuse, force structure reduction, and secondary item savings respectively. Taking them in order, would you please explain to the committee what the Red Hat one-time funding was?

General Sears. Yes, sir. [Deleted.]

Drug Abuse Reduction

Chairman Ellender. Would you also please explain why you are requesting a reduction in the funding for drug abuse programs—are they being consolidated elsewhere?

General Sears. Yes, sir. There have been some changes in the drug abuse program since inception. I will provide more information on this point later.

Net Force Change Reductions

Chairman Ellender. With regard to the force level reduction of $210 million, would you please do as we have requested in the other activities and explain specifically how this reduction is derived and how it will be distributed among the various different categories within the program?

General Sears. Again this force structure reduction entry is a net entry from all the force related changes in this aggregation. Specifically related to the reduction in the Army forces involvement in the Southeast Asia conflict, previously discussed, is the reduction of $204 million. Additional reductions include one-time support given to the forces in Vietnam in fiscal year 1972 to offset the increased requirements due to the acceleration of the redeployment schedule ($4.5 million), a reduction in the military payment certificate printing requirement ($97,000), elimination of requirement for Army support of the repair parts for the sensors deployed in Vietnam by the defense special projects group in prior years ($1.1 million), combat service support forces increment of the [deleted] which includes one band ($187,000), reduction in support requirements for the floating aircraft maintenance facility [deleted] ($100,000), and the withdrawal of one-time funding support provided to CONARC for the provision of logistics assistance instruction teams at the depots on Okinawa ($14,000).

Realinement Between Stocks and Procurement Accounts

Chairman Ellender. The last item in the decrease reflected in the combat service support area is one for $8.1 million, which is attributable to savings from secondary item transfer to procurement account. What is this all about and what will be the effect of this transfer on the procurement? Please be specific.

General Sears. Realinements between the Army stock fund and the procurement accounts are planned in fiscal year 1973 for the Army Materiel Command's Weapons Command and Electronics Command. As a result, the secondary items will be furnished to the user from the procurement accounts rather than be purchased from the stock fund with consumer funding. The procurement will continue to be accomplished through the responsible commodity commands; this transfer will result in their purchase with appropriated procurement funds rather than appropriated operation and maintenance funds. The secondary item migration affects electronics, weapons and fire control, and missile secondary items.

Presidential Inaugural Support

Chairman Ellender. Turning to the increases, there are only two increases that we have not dealt with elsewhere, the Presidential inaugural support and general/support aircraft maintenance, executive aviation detachment for $50,000 and $141,000 respectively. Would you please indicate to the committee what the inaugural support item of $500,000 will provide for?

General Sears. I will have to provide that information for the record, Mr. Chairman.

(The information follows):

The breakout of types of costs anticipated for the inaugural support for the Military District of Washington are as follows:

Travel and per diem for security and parade personnel	$100,000
Commercial hire of vehicles	50,000
Transportation of equipment	10,000
Billeting for parade and security personnel	25,000

Communications requirements	20,000
Printing requirements	10,000
Snow removal costs which must be considered. Even if no snow is forecast all equipment must be in place in case of a snow emergency	35,000
Laundry and drycleaning costs for parade/security personnel	5,000
Civilian pay	15,000
Supplies	40,000
Equipment	50,000
Uniforms	90,000
Contractual services	50,000

GENERAL SUPPORT

Chairman ELLENDER. Would you also tell the committee, in regard to the aircraft support, how much is already in the budget for aircraft maintenance support for the executive aviation detachment and what will this additional $141,000 provide for?

General SEARS. The current funding for the maintenance support requirements of the executive aviation detachment, together with the operations requirements, is $574 thousand.

The $141,000 increase relates to the Military District of Washington's added mission to provide for general support maintenance of aircraft stationed at Davison U.S. Army Airfield. This mission was formerly provided for in the base operations budget for the Continental Army Command. The recent identification of the Military District of Washington as a separate major Army command results in the MDW assumption of GS aircraft maintenance responsibility as a mission requirement with a resultant increase in this aggregation. The increase also provides $25 thousand for contractual maintenance of H–53 helicopters of the executive aviation detachment as maintenance skills required to support these aircraft are not available within the Army skill training programs.

JCS-DIRECTED EXERCISES

Chairman ELLENDER. On page 2–27 of the justification, you deal with the request for the JCS-directed and coordinated exercises, which is being reduced by almost $500,000 this year from an estimated $8.6 million in 1972. Would you please explain to the committee how you developed this request for JCS exercises and, if it is available, would you please provide a list of the proposed exercises and the amount each will cost for the record? You can furnish that for the record.

General SEARS. I will be glad to do so.

(The information follows:)

At the time the Fiscal Year 1973 budget was submitted, a tentative list of proposed exercises was being reviewed. The $8.6 million dollars represented the best Army estimate of the cost of the proposed exercises. The present proposed exercises, reflects those exercises which will provide the most benefit to the Armed Forces.

A conference to coordinate and resolve the scheduling of JCS-Directed and JCS-Coordinated exercises was sponsored and conducted by the Joint Chiefs of Staff during the period 18–20 January 1972. JCS-directed exercises are strategic mobility and major unified and specific command directed exercises with which the Joint Chiefs of Staff are primarily concerned. JCS-Coordinated exercises are minor exercises, the scheduling of which requires coordination of the Joint Chiefs of Staff because units or forces of more than one unified or specified command or agency are involved.

The conferees considered the exercises previously approved by the Joint Chiefs of Staff for planning purposes and exercises proposed by commanders of unified and specified commands. The conferees developed an exercise program based upon the recommendations of the Services and the unified and specified commands.

A list of the proposed exercises involving Army participation and the amount each will cost the Army is as follows:

JCS-directed exercises, fiscal year 1973 (Army participation)

Name:	*Army cost*
Deep Furrow 72	85,000
Exotic Dancer VI	179,000
Freedom Torch	175,000
Gallant Hand 73	350,000
Reforger IV/Gallant Duel 73 [1]	5,000,000
Total	5,789,000

[1] Gallant Duel 73 possible substitute exercise for Reforger IV.

JCS-coordinated exercises, fiscal year 1973 (Army participation)

Name:	*Army cost*
Ace Card	$55,000
Alexander Express	70,000
Aloud (N, O, P, Q)	31,000
Amalgam Mute 73-1	No cost
Black Hawk II	37,000
Black Knight III	1,000
Black Star III	No cost
Bonus Light 73	8,000
Brave Shield III	200,000
Brave Shield IV [1]	176,000
Brave Shield V [1]	50,000
Condeca Aguila IV	29,000
Ember Dawn IV	60,000
Flintlock Five	153,000
Halcon Vista VIII	6,000
High Heels 73	275,000
Logex 73	320,000
Nebbia Blue	10,000
Opportune Journey	25,000
Seato PX-48	75,000
Snow Time [2]	(800,000)
Strong Express	75,000
Unnamed Airborne 73	75,000
Wintex 73	576,000
Subtotal	2,307,000
JCS-Directed exercises	5,789,000
JCS-Coordinated exercises	2,307,000
Total	8,096,000

[1] Conduct subject to future confirmation of funding support.
[2] Program 1. Total $800,000.

Chairman Ellender. Would you also please indicate the distribution of this request by geographic area, that is, x dollars for exercises in the United States; y dollars for exercises in Europe, and so forth?

General Sears. I will be glad to do so.

(The information follows:)

A list containing the Army cost of exercises by geographic area is as follows:

Geographic area	*Army cost*
Europe	$6,044,000
United States	1,315,000
Pacific	275,000
Alaska	115,000
Panama and surrounding area	72,000
Home stations (world-wide) CPX	275,000
Total	8,096,000

TRAINING OF TRICAP DIVISION

Chairman ELLENDER. With regard to the item for the general purpose forces training that is covered on pages 2–29 through 2–31, would you please explain to the committee why you are reducing by one-half the funding for training for the TRICAP division in 1973?

General SEARS. Additional funds were required during the TRI CAP Division's initial year of existence to insure the development of concepts and tactics and establish a cohesive force. Subsequent year's training costs can logically be expected to decline since division formulation training requirements have been met and trained forces are available for utilization in the TRICAP testing and development program in fiscal year 1973.

ANNUAL SERVICE PRACTICE CONTRACT

Chairman ELLENDER. Would you also please explain the reduction of $1 million that had to do with an annual service practice contract? What is a practice contract and how much is left in this request for such?

General SEARS. I will be glad to do so.

(The information follows:)

U.S. Army HAWK Air Defense Artillery units participate in training exercises during which live (service) missiles are fired. These exercises, conducted on an annual basis, are referred to as annual service practice. Army owned drones are used to present the targets required for this training. Flight and maintenance services for the drone targets are provided for by contract.

In this budget we are requesting $1,436,000 for these contract services as compared with $2,389,000 in fiscal year 1972. The reduction of $953,000 is the result of the use of competitive bidding procedures and increased scheduling efficiencies which reduced the number of teams required to provide the necessary services. U.S. Army Europe HAWK units receive target support from the NATO Missile Firing Installation, the costs of which are not provided for by these contracts.

USARPAC TRAINING EXERCISE

Chairman ELLENDER. There is an increase of $87,000 in training support for the U.S. Army, Pacific in this request. Would you please tell us specifically what this small increase is for?

General SEARS. Yes, sir. The small increase in field training exercise funds in USARPAC was provided to support the unit training requirements of the additional brigade of the 25th Infantry Division that was activated in fiscal year 1972. Since the training funds in USARPAC were extremely limited, it was necessary to provide additional support to the command.

Civilian Pay Cost Reduction

Chairman Ellender. Would you please explain how you are able to effect the reductions in civilian personnel pay costs that you have without reducing the number of personnel on the staffs?

General Sears. Yes, sir. The civilian personnel costs are based on the average paid employment or man-years. The primary reason that the costs are lower in fiscal year 1973 is that the average paid employment (man-year) is programed to be lower. The man-year estimate is higher in fiscal year 1972 because the on-board strength at the beginning of fiscal year 1972 was higher than the end-year strength.

ADP Systems Requirements Reduction

Chairman Ellender. Turning now to base operations and the summary of budget changes on page 2–36 of the justification. Would you please explain to the committee, in detail, the reason for the reduction in automatic data processing systems requirements?

General Sears. The reduction for automatic data processing on OMA program two base operations was primarily in the U.S. Army, Pacific. Because of the troop drawdown in this area, substantial reductions were possible in the USARPAC Standard Supply System (3S), the Direct Support Unit/General Support Unit system (DSU/GSU) and the Personnel Management and Accounting Card Processor system (PERMACAP). Additional reductions for DSU/GSU and PERMACAP were also possible in Europe. Increased efforts in the area of standardization also resulted in other minor reductions. The command distribution of this reduction is:

	Fiscal year 1972	Fiscal year 1973	Difference
CONARC	$12,730	$12,174	−$556
USAREUR	7,447	6,413	−1,034
USARPAC	17,085	12,887	−4,198
USARSO	1,027	1,027	
USARAL	811	965	+154
USAMDW	501	484	−17
USASTRATCOM	11	11	
Total	39,612	33,961	5,651

Chairman Ellender. Would you also please indicate how much is left in this request to meet these ADP systems requirements?

General Sears. The amount left in this request for OMA program 2 base operations is $33,961,000 for ADP systems requirements. This is the amount shown in the fiscal year 1973 column of the chart provided for the preceding question.

Transfer of General Educational Development Funding

Chairman Ellender. Another reduction is due to the transfer of General Educational Development funding to Program 8. Would you please explain why this transfer was effected and whether there are any savings expected to come out of it?

General Sales. Chairman Ellender, when General Educational Development funds were in various Operation and Maintenance, Army

programs, local commanders could transfer funds from the educational program to other activities. This practice produced divergent educational programs at the installations and developed unequal opportunities at different locations. Consequently, as a control the General Education funds were transferred to Program 8 and given a program element designation specifically allocating the funds to general education needs. This action will assure better program planning at the installation level and will equalize educational opportunities at the major Army bases. While there will be no cash savings, there will be an improvement in program management and cost effectiveness.

Drug Abuse

Chairman Ellender. The next item being reduced is the drug abuse program. I believe that this is the second time we have encountered a reduction in this particular program and I wonder if you would provide the committee with a consolidation of the drug abuse funding reductions and increases if there are any? Would you please do this by budget activity and program?

General Sears. Yes, sir. Program 2 was decreased in two areas, $1,133,000 for Combat Service Support Forces, USARPAC, and $2,161,000 for base operations. Program 3 was increased by $35,000 for base operations and program 8 was increased $7,441,000 for hospital operations. These are the major changes in the programs and the net effect overall represents an increase rather than a decrease.

Chairman Ellender. Would you also please explain in detail why these reductions are being made?

General Sears. I'll be happy to. Both Program 2 decreases resulted directly from our withdrawal from Vietnam. As the number of forces in Southeast Asia declined, our requirements for the drug abuse program decreased correspondingly. The increase in program 3 represents an add-on to support Forts Huachuca and Ritchie which were not funded in fiscal year 1972. The increase in Program 8 reflects expansion of the drug abuse effort to include alcohol abuse and an increased shift of emphasis toward treatment and rehabilitation.

Criminal Investigation Division

Chairman Ellender. Another item which we have dealt with briefly before in connection with another request is the transfer of criminal investigation division funding to budget Program 9. Again I would like to provide for the record a summary of all the transfers that are being made for this purpose, giving the budget activity and program that these are being transferred from.

Colonel Gilham. I will be glad to do so.

(The information follows:)

Program	Budget activity	Amount
General purpose forces	Combat support forces, other	$250,000
Do	Base operations	3,974,000
Intelligence activities	Counterintelligence and investigative activities	80,000
Training	Base operations	215,000
Administration and associated activities	Servicewide support	887,000
Do	Field headquarters and activities	189,000
Total transfers		5,595,000

Chairman ELLENDER. I would also like to have a complete explanation of why these transfers are being made and of exactly what these funds will provide.

Colonel GILHAM. The transfers are being made to provide the necessary resources for the Criminal Investigation Command that has the centralized responsibility for all criminal investigation functions worldwide. These functions were previously the responsibility of various major Army commands. The funds will provide for the pay of 313 employees, temporary duty travel, purchase of services, supplies and equipment.

BASE OPERATIONS SUPPORT

Chairman ELLENDER. With regard to the increases that are outlined on page 2–37, we have dealt with a few of them in reference to your prepared statement but there are still a few matters that I would like to question. To begin with, of the $37.7 million increase due to increased base operations support and real property maintenance, how much is due to the increase in base operations support and how much is due to increased real property maintenance and exactly what will these increases provide for?

General SEARS. Of the $37.7 million increase for base operations support and real property maintenance, increased base operations support required $5.4 million while essential maintenance and repair projects required $18.8 million and self-help supplies for USAREUR were the final $13.5 million. Both the essential maintenance and repair projects and the self-help supplies for the forces in Europe are considered part of the increased real property maintenance program.

Chairman ELLENDER. How much is in the base budget before these increases for both real property maintenance and base operations support were included, and why, if reallocated, isn't what is already provided sufficient to meet those new needs?

General SEARS. The base budget contains $175,097,000 for real property maintenance exclusive of these additions. The total aggregation reflects the base operations support requirement. Increased requirements result from two major considerations both of which are directly related to the drawdown of forces in Southeast Asia. First, there is no base operations support, per se, in Southeast Asia. Because it is a combat zone, all costs are mission costs. When the units are redeployed from Vietnam, the mission costs are withdrawn from USARPAC in the combat support and combat service support aggregations as has been previously discussed. There are no base operations savings that could be reallocated. However, when the units are restationed/activated in Hawaii, the United States or Europe, additional base operating costs develop in the parent command because of the increased troop population, the increased maintenance and suppy requirements, and so forth. Also, in the past several years, the priority requirements of the Southeast Asia conflict forced the Army to defer the required maintenance of real property. Now that the forces are returning to noncombat bases, these projects can no longer be deferred because the facilities are required to be in an acceptable condition for troop utilization.

The increased requirement for self-help supplies in USAREUR will be used to accomplish projects developed by troop units and accom-

plished by troop labor using materials provided through the facilities engineers' self-service supply system. The funds provide for supplies for limited improvements such as replacing window glass, repair of faucets and shower heads, unplugging drains, painting, and other work not requiring skilled labor which can be accomplished by troop labor. This effort serves to correct minor deficiencies before they become major.

CIVIL ORGANIZATION OF KP

Chairman ELLENDER. We have already covered the KP increase to an extent but the more I see it the more I wonder if such a large amount is necessary to get rid of this "irritant" as you call it. Would you please explain precisely what the $54 million increase for this purpose will provide? Please include the posts, etc., that will be covered by this funding and indicate whether this level of funding is sufficient to completely eliminate KP in the Army.

General RICHARDS. The $54 million increase is for civilianization of the KP function at general purpose forces installations except for basic combat training activities. There is also an increase of $34.6 included in this budget for civilianization of the KP function in other program areas. The total increase of $88.6 million should enable the elimination of KP in the Army except for basic combat training activities.

GENERAL AIRCRAFT SUPPORT

Chairman ELLENDER. There is another increase item that I do not believe we have encountered thus far in our deliberations, that is general aircraft support, for which $5.1 million is requested. What is this increase about, how much is already in the budget for this purpose, and why is this item in the general purpose forces program and not in the central supply and maintenance budget activity?

General SEARS. In fiscal year 1972 the general support maintenance mission for CONUS-based aviation assets was transferred from the Army Materiel Command where it had been funded in Program 7, central supply and maintenance, to CONARC to be funded from the base operations accounts of the General Purpose Forces. General support maintenance is that level of maintenance below the depot maintenance program supported from Program 7. General support and direct support maintenance are appropriately part of the maintenance of materiel account of the base operations activity. The function was transferred into Program 2 because Program 2 is the base operations carrier program for the installations on which this maintenance function was being performed. In the transfer, $3.2 million was provided to Program 2 for the accomplishment of this mission.

With the phasedown in Southeast Asia and the resultant increase in the aircraft inventoried in CONUS, the requirements for the general support aircraft maintenance are increasing. Implementation of the general support maintenance program for aircraft at 12 additional CONUS installation cannot be accomplished unless the requested $5.1 million is received.

INTRUSION DETECTION DEVICES

Chairman ELLENDER. The last item that I want to query you about in the general purpose forces budget activity is the increase of $5.7 million for arms room intrusion detection devices. I am certain that

my colleagues share my concern over the fact that the Army is forced into the position of having to place these devices on its arms rooms and I wonder if there isn't some other way that this problem can't be solved? Would you please comment on that?

General Sears. The use of these devices results from the loss of weapons, ammunition and explosives from Department of Army (DA) storage facilities that has been of continuing concern of the DA since 1969. In terms of dollars, losses are relatively small. In terms of potential danger and loss of life, these items in the hands of unauthorized personnel represents a great risk. The physical location of most storage facilities containing the items in question, render them unprotected when no personnel are present, particularly during hours of darkness and on weekends. It has been primarily during these periods when forced entry of these facilities have occurred. The alternatives to use of intrusion detection system (IDS) for the protection of storage facilities are:

(*a*) Stationing of guards at each site.

(*b*) Improved structural hardness of the facilities.

(*c*) Reduction in number of storage facilities through consolidation.

The use of guards at storage facilities would require approximately 10,000 guards per day. The average annual cost of civilian guard in the United States is approximately $6,000 per 8-hour shift, and approximately $4,000 per shift overseas using indigenous guards. The use of military guards would defeat one of the primary objectives of the "Modern Volunteer Army," that is the reduction of requirement provides two primary deterrences which tend to discourage theft availability for combat training. The cost to support a guard force for such protection is considered prohibitive.

Forced entry continues to occur in spite of structural improvements being taken. Additional "hardening" of storage facilities would provide only a minimal increase in security since most physical barriers can be overcome by a determined intruder. Consequently guards would still be required for protection.

Application of IDS is the most cost effective means of improving security of weapons, ammo, and explosive storage areas. Use of IDS provides two primary deterrences which tend to discourage theft by forced entry. First, psychological, second, detection. The use of IDS at military installations will allow for consolidated central monitoring locations for receipt of alarms signaling intrusions. Consolidations of this type will provide savings in guard requirements through the use of a small centralized guard reaction force, properly trained, to cover many storage facilities. It is an established fact that within the civilian community the use of IDA at financial institutions have practically eliminated theft by forced entry.

Chairman Ellender. Would you also please indicate what facilities will be furnished with these devices and at what cost?

General Sears. This request will support the installation of intrusion detection devices in arms rooms of the general purpose forces supported installation in CONARC and Europe. This is approximately 2,300 arms rooms in CONARC and 1,500 arms rooms in Europe. The average cost of the system per storage facility is estimated at $1,500.

Of this amount, approximately one-third is the estimated installation charge while the balance would be used for the purchase of the equipment.

Chairman ELLENDER. Would you please explain why this item is in the O. & M. appropriation request and not in the procurement request?

General SEARS. This item has been included in the OMA appropriation request because it is actually a modification to the physical facility; once installed it becomes a permanent part of the building in which the arms room is housed. The devices themselves cost less than $1,000 each; maintenance is provided from local sources rather than from standard Army stockage; and the actual detection systems must be tailored to meet the physical security requirements of each individual arms room thus precluding the bulk development and procurement of a single system or a family of items. For these reasons, this requirement has been determined to be properly a post, camp, and station base operations requirement rather than an Army standard procurement requirement.

PROGRAM 3—INTELLIGENCE AND COMMUNICATIONS

Program 3 includes the operating costs of Army intelligence and security, communications, and combat development activities. The fiscal year 1973 request of $418.1 million is $31.7 million more than the fiscal year 1972 level of $386.4 million.

(Program 3 follows:)

PROGRAM 3.—INTELLIGENCE AND COMMUNICATIONS

[In thousands of dollars]

	Fiscal year—		
	1971	1972	1973
Intelligence	143,048	138,587	144,781
Communications	198,988	203,432	219,646
Combat development activities	42,979	44,398	53,691
Total	385,015	386,417	418,118

WORLDWIDE CRYPTOLOGIC AND GENERAL INTELLIGENCE ACTIVITIES

General SEARS. The intelligence and security costs provide operating funds for the conduct of Army worldwide cryptologic activities and general intelligence activities at theater army level and above. The estimated costs are based on levels of effort recommended by the national intelligence community and approved by the Secretary of Defense.

Communications costs include the resources required to provide Army support for the Defense Communications System; armywide communications for the Department of the Army; support of the National Military Command System, special activities providing for the continuity of Government; command and control functions, and base operations activities.

Combat development activities costs provide for the formulation and integration into the Army of new concepts, doctrine, material re-

quirements, and organization necessary to obtain maximum combat effectiveness.

Although there are many accounts in Program 3, I will discuss the program in terms of the above three major subdivisions.

1972 Congressional and 1973 Reductions

Chairman Ellender. In fiscal year 1972, as I recall, we cut back intelligence overall by approximately $370 million. To what extent were your funds cut in that category?

General Kjellstrom. Sir, the total Army budget request for fiscal year 1972 to the Congress was $418 million, all appropriations. The enacted budget for fiscal year 1972 was $385 million; the 1973 request is down another $20 million to $365 million. Manpowerwise, in our initial request for both military and civilian for fiscal year 1972 to the Congress, we asked for 37,651 personnel. The Congress reduced this to 33,653. In this request we are down to 26,798 in the intelligence program, a reduction of about 11,000 from the request that was submitted to you last year. I can provide the details by appropriation for the record if you would like, but I assure you that the Office of the Secretary of Defense in consonance with the services has made a significant reduction in the intelligence program of the Department of the Army.

Chairman Ellender. Proceed.

Intelligence

General Sears. The Army's intelligence program is influenced in fiscal year 1973 by reorganizational changes which were directed on November 5, 1971. The reorganization and consolidation of intelligence activities impacts on three functional areas: (1) the consolidation of Department of Defense Mapping, Charting, and Geodesy operations under a single Defense Mapping Agency. This reorganization should become effective on or about July 1, 1972; (2) the establishment of a Defense Investigative Service as a separate Defense Agency which will have a major impact on investigative activities. On July 1, 1972, the program management of counterintelligence and investigative activities passed from the Defense Intelligence Agency to the Assistant Secretary of Defense (Comptroller); (3) the establishment of the Central Security Service under the Director, National Security Agency. This reorganization will impact on cryptologic activities.

Although the fiscal 1973 estimate for intelligence reflects a net increase of $6.2 million in OMA above the revised fiscal year 1972 level, this increase is more than offset by reductions in other appropriations resulting from the realinement, reorganizational, and consolidation actions addressed above. The total Army intelligence program reflects a net reduction of $16 million and over 5,000 personnel between fiscal year 1972 and fiscal year 1973. The major reductions occur in the military personnel appropriation which experiences a 19-percent reduction in personnel spaces and $30 million in costs.

Chairman Ellender. What have been the results so far from this reorganization?

General KJELLSTROM. As far as the reorganization, sir, the impact of the reorganization on the Army is not fully recognized as yet. We do not know the impact on the Army budget now. For example the Defense Mapping Agency has just reorganized, so there could be more impact in the future.

Chairman ELLENDER. The organization plan that was contemplated is not in effect yet?

General KJELLSTROM. It is not in effect yet; that is correct, sir.

Chairman ELLENDER. Proceed.

General SEARS. The more significant increases in OMA are in scientific and technical intelligence and in cryptologic activities. Increases reflect annualization of the January 1972 classified pay raise, realinement of intelligence activities worldwide, relocation of the Foreign Science and Technology Center, and increased contractual costs.

PROGRAM DETAIL

Intelligence. This program provides operating funds for the Army's worldwide cryptologic activities and for the intelligence activities at theater Army and above. The estimates included in this program are based on levels of effort recommended by the National Security Agency and the Defense Intelligence Agency. The fiscal year 1973 request of $144.8 million will provide for the following activities:

Cryptologic activities, which include communications and electronics intelligence, target exploitation and electronics security functions of the U.S. Army Security Agency and the U.S. Army Strategic Communications Command.

Intelligence communications activities include cryptologic communications; the defense special security system (DSSS); special intelligence communications (SPINTCOMM); and intelligence communications (other).

Other intelligence and security comprises all general defense intelligence activities of the U.S. Army at Theater Army and higher levels except for cryptologic activities and intelligence communications activities.

COMMUNICATIONS

The fiscal year 1973 estimate for communications, $219.6 million, reflects an increase of $16.2 million over the fiscal year 1972 estimate of $203.4 million. Communications include the following subaccounts:

Chairman ELLENDER. Why is that increased? Salary increases, I presume, are one item.

General SEARS. Yes, sir, salary increases, foreign currency revaluation, the communications station operations have gone up from $82 million to $93 million.

General KJELLSTROM. Mr. Chairman, we can summarize this by saying that inflation and the increase in salaries are the basic cause of the increase. The program is at approximately the same level of effort as the previous year.

Chairman ELLENDER. Is it your understanding that the reorganization which has not yet taken place will affect this?

General KJELLSTROM. It is doubtful that the realinement in the intelligence community will affect the communications portion. This

is the Army's portion of the defense communications system and also the Army's internal communications activities.

General SEARS. The National Military Command System provides national command authorities with the means to exercise strategic direction of the Armed Forces of the United States through the military chain of command. This includes a survivable and effective communications system that, under emergency conditions as well as nuclear attack and postattack conditions will provide a means to exercise this strategic direction. The Army's support to this system is estimated to be $7.2 million in fiscal year 1973.

The costs of armywide communications systems and Army portion of the defense communications system are estimated to be $159.4 million in fiscal year 1973. These costs support communications management and leased communications circuits and equipment, including access to the defense communications system switched networks—automatic voice network and automatic digital network; the leased communications costs for Army's pro rata share of the cost of operation and maintenance of the Defense-switched networks through the Communications Services Industrial Fund, the operation of communication centers; civil defense networks and warning centers; operation of joint refile points which retransmit messages for all U.S. military services into commercial facilities for delivery to addressees not served by Government-owned or leased communications and costs associated with installation of major items of equipment procured for communications projects.

This program also includes Army support to the Office of Emergency Preparedness, Executive Office of the President. The Department of the Army is the executive agent for the Director, Office of Emergency Preparedness, in providing resources for this support. The fiscal year 1973 estimate is $26.7 million.

The costs of the command and control functions for the Headquarters, Department of the Army Command and Control System, and the Headquarters, U.S. Army Strategic Communications Command, Fort Huachuca, Ariz., are also supported in this program, and are estimated to be $1.8 million in fiscal year 1973.

The base operations portion of communications provides for the operation and maintenance of facilities at Fort Huachuca, Ariz., and Fort Ritchie, Md. The fiscal year 1973 estimate for base operations is $24.5 million.

COMMUNICATION SUPPORT FOR OFFICE OF EMERGENCY PREPAREDNESS

Chairman ELLENDER. The first full paragraph on page 47 states: "This program also includes Army support to the Office of Emergency Preparedness, Executive Office of the President." What is that reference?

General SEARS. This is communications support for OEP, the Executive Office of the President. We are the executive agent in providing the resources for the support, and it costs $26.7 million.

Chairman ELLENDER. Is that handled separately from your ordinary communications system?

General KJELLSTROM. Yes, sir. This is an independent organization, sir, headed by General Lincoln, who is the Director of the Office of

Emergency Preparedness. We are the agent for that organization in funding the activity.

Chairman ELLENDER. What will the $26.7 million be used for, specifically? Is it to administer the separate organization you just mentioned?

General KJELLSTROM. It is basically the communication network for emergency preparedness and some of the administrative costs of the organization. I would like to provide the details for the record, if I may, sir, since we do not have an expert witness on this organization available here today.

Chairman ELLENDER. All right. I wish you do so.

General KJELLSTROM. I will, sir.

(Classified information was furnished separately to the committee.)

Chairman ELLENDER. Proceed.

COMBAT DEVELOPMENT ACTIVITIES

General SEARS. The request for fiscal year 1973 is $53.7 million. These funds represent an Army investment for the future. They provide for tests, evaluations, and studies of the organization of the Army in the field, and the tactics it employs. The Army aims to increase its combat effectiveness by developing new weapons and tactics to provide for the substitution of materiel for manpower on the battlefield. As the Army becomes smaller and available resources decrease, it is necessary to develop a carefully considered program of studies, improved tactical doctrine, material requirements documents, field tests and experiments.

INCREASE OVER 1972

The fiscal year 1973 estimate is a $9.3 million increase over the revised fiscal year 1972 estimate. This increase is primarily attributable to the Army's increased efforts in operational test and evaluation. The Army has programed a total of about $45 million for this purpose in fiscal year 1973, of which $15.5 million is in OMA. Operational test and evaluation is the continuing assessment of materiel from inception through production by operational personnel. It is not a specific test, but includes the test and evaluation of a materiel system under actual or simulated operational conditions by or for the user to aid in determining the system's operational effectiveness and in validating the related organization, doctrine, tactics, basis of issue, training requirements, and logistical support. In addition, the concept of operational test and evaluation is being expanded to include items still under development, so that an independent evaluation can be made by the user, of an item's acceptability for service use prior to a major production decision.

FIELD TESTING OF EARLY PRODUCTION AND PREPRODUCTION ITEMS

Chairman ELLENDER. Is this money research related in any way?

General SEARS. Not really. This is where we field-test early production items or preproduction prototypes to obtain operational data required for major production decisions.

General KJELLSTROM. I would say, sir, it is related to R. & D. in that it takes the product from R. & D. to insure that the operational side of

the Army, as opposed to the development and procurement side of the Army, is satisfied with the piece of equipment that is being produced and that it is properly responsive to the material need established by the Army.

R. & D. Program Development

Chairman Ellender. General, when your field commanders have a need for a new weapon, just how is this transmitted to the R. & D. people?

General Kjellstrom. Yes, sir. The Combat Development Command which develops the doctrine and the materiel requirements for the Army of the future determines a materiel need. This document or materiel need is turned over to the research and development community.

Chairman Ellender. Under Dr. Foster?

General Kjellstrom. Under Dr. Foster and within the Army under Mr. Johnson, who will be here next week.

Operational Test and Evaluation

The R. & D. community develops an item, has it available, and then we go through the process of operational test and evaluation. This operational test and evaluation is one of Mr. Packard's innovations. Within Dr. Foster's office, General Starbird, who used to head the SAFEGUARD system, is the head of the operational test and evaluation area to insure that the services do not make the same types of mistakes with equipment that has happened in the past.

Chairman Ellender. Is that in consonance with what Secretary Packard suggested, which is to make prototypes of any hardware that is to be used by any of the Services before it is put into production?

General Sears. Yes, sir. In part, the testing of the functional or engineering characteristics of the material would be paid for out of R. & D. funds. That would be a part of Mr. Packard's proposal to build prototypes, fly before you buy. Any testing done to integrate materiel into Army organizations, doctrines and concepts is paid for out of O. & M. funds. This is what this $15.5 million is for.

Chairman Ellender. Why is it not paid out of R. & D. funds?

General Sears. The R. & D. funds pay for the engineering and functional design, in other words, to make sure that the aircraft will fly as it is supposed to fly in the specifications, or as high, or will carry a certain load, whereas the test that the Army conducts and pays for out of O. & M. A funds is how this piece of equipment is going to fit into the organization of the Army. They actually use troops in the field to test the equipment as if it were already available and they test the doctrine and the use of this equipment. It is not the functional characteristics of how fast or how high it flies, but how does it properly fit into the Army organization. Can the troops use it.

Chairman Ellender. But it was first ordered by you, was it not?

General Sears. Yes, sir. The specifications were developed by the Combat Developments Command in this materiel need request.

Chairman Ellender. And these funds will be used to apply it to the user organization?

General Sears. How it fits into the organization, yes, sir.

CONTRACTUAL COST DECREASE

Chairman ELLENDER. On page 3–6 in dealing with the cryptologic activities, you indicate that there is a $514,000 reduction in contractual costs. Would you please tell the committee what these contractual costs consist of and how it happens that they are being reduced at this time?

General SEARS. The contractual costs being reduced by $514,000 in Cryptologic Activities are for technical service contracts for maintenance associated with [deleted] in Southeast Asia.

REALINEMENT OF INTELLIGENCE ACTIVITIES

Chairman ELLENDER. The other item that I would like you to explain in the cryptologic activities program is the increase of $2.3 million for costs associated with the realinement of intelligence activities. What is this increase to provide for and why is it necessary? Please be very specific.

General SEARS. Sir, these funds are being requested because in fiscal year 1972 we are closing the facility at [deleted] and are transferring essential cryptologic functions to other stations. These closures were not anticipated in the fiscal year 1972 budget; therefore, costs associated with the closures had to be absorbed by reducing expenditures for such items as supplies, maintenance, and minor equipment. In fiscal year 1973, it will be necessary to replenish the supplies, accomplish deferred projects, and incur some one-time costs to relocate and reinstall essential cryptologic equipment. Realinement of the activities will permit fewer military personnel to perform the cryptologic mission at less total cost to the Army.

Chairman ELLENDER. Looking at the SPINTCOMM request on page 3–9, I see that there are more funds requested for the AUTODIN integration. Would you please tabulate all these increases in the intelligence area by budget program and explain what the increases will provide.

General SEARS. I will be glad to do so.

(The information follows:)

AUTODIN integration—fiscal year 1973 request

[In thousands of dollars]

Budget program:	
Cryptologic communications–31055A	$1,037
Special intelligence communications–31056A	1,148
Total	2,185

General SEARS. The total increase in the intelligence area for AUTODIN integration is $2,185,000. This amount represents the total cost for AUTODIN integration which will become effective in fiscal year 1973. Operation of parallel communication systems will be necessary during a portion of the year, but will result in greater economies of the total Department of Defense communication systems.

TRANSFER OF INTELLIGENCE DATA HANDLING SYSTEM FUNDS

Chairman ELLENDER. In the SPINTCOMM request there is reflected a reduction of $243,000 due to the transfer of funding for intelligence data handling systems communications, which is reflected on page

3–10. The increase on page 3–10 is for $751,000. Would you please tell us where the other $508,000 is to come from, whether by transfer or direct appropriation and also, would you please tell us what these funds are to be used for?

General Sears. The other $508,000 came from Intelligence Data Handling Systems, program element 31025 which is shown as a decrease on page 3–14 and is the result of an internal realinement within Program 3-Intelligence. The $751,000 will be utilized for the activation of the Intelligence Data Handling Systems Communications, a new program element. This new element will include all communications devices and services required for communications between Intelligence Data Handling Systems Computers and with remote users of intelligence data bases in addition to providing base communications for the U.S. Army Topographic Command The activation of this system will provide increased visibility for improvement in data transfer and exchange to support improved responses to commanders' intelligence needs.

Chairman Ellender. As I turn the page to the other intelligence support and security request, I see that there is another item of increase regarding the intelligence data handling system so I wonder if you would consolidate all the requests for these funds, including the transfers et cetera, and explain what the system is about and how it will affect the operations of the various activities within the intelligence and communications budget activity.

General Sears. I will be glad to do so. The other intelligence and security request contains a separate program element 31025 for intelligence data handling systems (other than communication). This element constitutes information systems utilized for the processing and manipulation of intelligence data required by military commands, and intelligence organizations and agencies in the performance of their respective missions. They are characterized by the application of general purpose computers, peripheral equipment and automated storage and retrieval equipment for documents and photographs. The increase of $977,000 is for annualization of the January 1972 classified pay raise, annualization of increased health benefit contribution, increased contractual costs, site preparation, unbundling charges which is offset by decreases in foreign currency revaluation, average civilian man-year cost, civilian reduction and the transfer to the new element, "Intelligence Data Handling Systems Communications."

Scientific and Technical Intelligence Activities

Chairman Ellender. Another item in the other intelligence and security program that I would like you to be more specific about is the scientific and technical intelligence activities. You are requesting an increase of $2.4 million, which you attribute to a number of items. Would you please indicate the dollar impact on the areas you mention and tell us exactly what the increased dollars will be used for?

General Sears. Yes, sir.

1. Foreign Science and Technology Center Relocation, $430,000.

The Foreign Science and Technology Center moved from the Washington, D.C., area to Charlottesvile, Va., in mid fiscal year 1971. The increased costs relate to expenses for a guard force, leased communication lines, medical facilities and vehicle maintenance that were

not applicable when the Foreign Science Technology Center was located in the Washington, D.C., area.

2. Increase in man-years at the Foreign Science and Technology Center, $475,200.

Increase in man-years is a result of additional Defense Intelligence Agency tasking particularly in the areas of electronics, command and control and basic sciences.

3. Contractual costs, $710,000.

Increase in external assistance at the Foreign Science and Technology Center and the Missile Intelligence Agency in response to Defense Intelligence Agency tasking in the areas of ABM telemetry and combat vehicles and equipment.

Increases in operation cost including a pay raise for the Missile Intelligence Agency, an Army industrial fund activity, $310,000.

4. Annualization of January 1972 Classified Pay Raise, $481,000.

5. Annualization of Increased Health Benefit Contribution, $12,000.

MISCELLANEOUS ITEMS

Chairman ELLENDER. Turning to page 3–14 I see that a few of these items are broken out. Three that we haven't spoken to and that need further explanation are the $233,000 increase for geographic specialty teams; $108,000 for EUCOM and PACOM new workload et cetera; and $72,000 for unbundling charges. If you would take each of these three items of increase and explain why they are needed and precisely what they will be used for and insert them into the record, we will move on to questions on communications.

General SEARS. I will be happy to.

(The information follows:)

OTHER INTELLIGENCE AND SECURITY INCREASES

FISCAL YEAR 1973 REQUEST

1. Geographic specialist teams, $233,000.

Teams will be composed of highly qualified Army personnel specifically trained to collect military geographic intelligence. Each team will consist of a commander (geographer) and three enlisted men (photographer, physical science assistant, and cartographer), but may be augmented as required. These Geographic Specialist Teams operate in foreign countries after agreements have been reached by the United States Government and the government of the foreign country. The host government provides a team of similar composition which operates with the United States Army Geographic Specialist Teams. The host Geographic Specialist Teams are also funded by the Army.

2. EUCOM and PACOM new workload and tasking for intelligence production, $108,000.

The increase in Fiscal Year 1973 over Fiscal Year 1972 is in the area of operating expenses resulting from PACOM and EUCOM intelligence tasking of United States Continental Army Intelligence Center. In past years approximately 80% of Continental Army Intelligence Center's production supported ARSTRIKE/STRICOM intelligence requirements. STRICOM however, was disbanded 31 December 1971 and part of its intelligence mission was assigned to PACOM and EUCOM. As a result of the STRICOM phase down and termination of intelligence requirements, Continental Army Intelligence Center operating expenses for Fiscal Year 1972 were considerably below Fiscal Year 1971 expenses because fewer products were published and disseminated. In Fiscal Year 1973, it is anticipated that the Continental Army Intelligence Center, with fewer people, will assume full scale production. In addition, since Continental Army Intelligence Center's consumers will be primarily in overseas areas, intelligence studies will have to be prepared and disseminated in a finished form. Previously data could be stored

in Continental Army Intelligence Center's computer and disseminated to local consumers, primarily at Fort Bragg, North Carolina on short notice. Continental Army Intelligence Center's Fiscal Year 1973 operating expenses represent an increase of $108,000 over Fiscal Year 1972, they are approximately only $20,000 above comparable Fiscal Year 1971 levels.

3. Unbundling charges, $72,000.

To provide for System Engineering "on-call as required" and Automatic Data Processing education. These services were formerly provided by Automatic Data Processing vendors as part of their basic rental contracts, but are now, in most cases, separate charges in accordance with current Services Administration contracting procedures.

INTEGRATED COMMUNICATIONS SYSTEM: THAILAND

Chairman ELLENDER. On page 3–18 of the justification, there are several increases that I wish you would explain to the committee. The first of these is an increase of $5.96 million for the support of integrated communications system—Thailand. This is a transfer from budget activity 10 and I would like to know why the transfer is being made. What is the reason for transferring this program?

General SEARS. The cost for the contractor operation of the Integrated Communications System—Thailand was originally carried in Program 10—Support of Other Nations. Since this communication system supports U.S. forces, and not "Other nations", the costs are properly chargeable to Program 3–C—Communications.

Chairman ELLENDER. How does the funding as transferred compare to the funding provided in the support of other nations budget activity?

General SEARS. All resources for the Integrated Communications System—Thailand are now contained in Program 3–C Communications with none in Program 10—Support of Other Nations. The fiscal year 1972 and 1973 funding for the system remains at the same level in both years.

Chairman ELLENDER. Can you explain exactly what this program is for and how the funding is utilized?

General SEARS. The Integrated Communications System, Thialand was installed by the Army to meet valid communications requirements of U.S. forces in Thailand. The system ties together those long-haul communications resources of the Defense Communications System (DCS) including submarine cable, microwave, tropospheric scatter, and satellite circuits used for trunking purposes into and within Thialand. Prior to fiscal year 1972 the system was operated and maintained by military personnel with contractor assistance. Because of Army force reductions in Thialand, the system is now operated and maintained primarily by contractor personnel.

AUTOMATION OF TELECOMMUNICATION CENTER

Chairman ELLENDER. Another item of increase is $1.6 million for the automation of telecommunications centers. Would you please give us a bit of background on these telecommunications centers, how many there are, their function, where they are located and so forth.

General SEARS. There are three Army Telecommunications Centers under the Army Telecommunications Automation Program (ATCAP) plan currently approved by Department of Defense for automation.

In addition, plans await Department of Defense approval for Fort Shafter, Hawaii, and Panama, Canal Zone to improve speed of service in these areas.

These telecommunication centers will provide a rapid method for the processing of messages from the originator to the addressee by utilization of automated equipments and the existing Automatic Digital Network (AUTODIN).

The location of the currently approved telecommunication centers are Oakland, Calif., Bayonne, N.J., and Huntsville, Ala.

Chairman ELLENDER. With that background, would you now tell us what this increase is requested to do and why it cannot be done without?

General SEARS. The increase of $1.6 million is primarily required for one-time procurement of a software package to initially be utilized for the Oakland system, and adapted to the follow-on installations. Present plans are to utilize the basic software package for a total of 27 planned installations.

The Oakland prototype facility will be employed to test the equipment and procedures for providing responsive writer-to-reader service to selected Army Commands, to preclude excessive delays in the transmission and receipt of narrative and data messages. Without the development of the prototype facility the Army would have to rely on manual facilities that impose unacceptable delays in processing message traffic.

DEFENSE SATELLITE COMMUNICATIONS SYSTEM

Chairman ELLENDER. The increase of $1.1 million requested for the Defense Satellite Communications system is the next one in the summary table on page 3–18. Would you please tell us how much is already in the budget request for this purpose and then explain exactly what this increase is for?

General SEARS. The budget request contains $2,297,000 in fiscal year 1972 and $3,397,000 in fiscal year 1973 for the Defense Satellite Communications System. The $1,100,000 increase in fiscal year 1973 is required for contract support costs for two new transportable terminals being deployed from the development phase to operational status; operating costs for 3 additional terminals over those operational in fiscal year 1972; support of modifications to provide increased capacity available through the Phase II satellites launched by the Air Force in November 1971.

MISSION ESSENTIAL OPERATING SUPPLIES

Chairman ELLENDER. The next item is for an increase of $950,000 for mission essential operating supplies. Would you please indicate to the committee how much is already in the budget request for this purpose? Would you also tell the committee what the special circumstances are that require an increase of $1 million worth of essential operating supplies in 1 year? Exactly what are these additional funds for?

General SEARS. $4,300,000 is in the budget request for mission essential operating supplies. The requested increase of $950,000 will provide partial restoration of prior years drawdown of prescribed availability levels for repair parts, supplies and materials to assure continued operational readiness of worldwide communications systems. It will provide for the restoration of systems when major failures occur, reduce equip-

ment failures, decrease equipment outage time, and substantially reduce high-priority supply requisitions by permitting the normal ordering supply items.

WORLDWIDE COMMUNICATIONS SUPPORT

Chairman ELLENDER. The worldwide communications support program is being increased an additional $1.7 million in 1973 as well. Here again I will ask you to indicate how much is already in the budget request for this purpose and what special circumstances cause you to request this large an increase in the yearly funding at this time?

General SEARS. The requested fiscal year 1973 increase for worldwide communication support is necessary to improve and modernize the existing communication system and to insure continuity of operations by continuous testing of major long-haul communication links; replacement of deteriorated and obsolete equipments; and installation costs associated with major items of equipment procured for approved telecommunication projects.

Approximately $1.1 million is in the base budget to perform comparable worldwide communication support for improvements and replacements. The immediate necessity for the request is related to the improvement deferrals and system declines in previous years due to fund limitations.

SPECIAL ACTIVITIES PROGRAM

Chairman ELLENDER. In the special activities program there is only one additional increase that is at all discretionary and that is one for purchased services, supplies and equipment for $472,000. Would you please give us an idea of what that increase is all about and how much is already included in the budget request for that purpose and so on?

General SEARS. The currently budgeted amount for these areas is $2,205,000. A substantial portion of the increase is for the performance of periodic maintenance projects on Government facilities. These projects have been deferred for the past several years, but should not be deferred any longer if the government's investment in these facilities is to be protected. The remainder of the increase relates to the purchase of spare parts to maintain required inventory levels, required replacement of test equipment, and increased costs of services performed by other Federal agencies.

ARMY OPERATIONS CENTER SYSTEM

Chairman ELLENDER. Turning now to page 3–21 and command, I see that you are requesting an additional $194,000 for the conversion of the present The Army Operations Center System (TARMOCS) to TARMOCS II. In the narrative on page 3–21, you indicate that the increase is due to increased training that the conversion requires and cost associated with dual system operation. Would you please indicate how much of the amount requested is associated with the duality of the operation and will you also please explain why this duality is desirable?

General SEARS. The cost in this program element associated with dual system operation is $150,000, and relates primarily to software conversion. During the conversion of The Army Operations Center System (TARMOCS) to TARMOCS II, the present second genera-

tion computer system will be replaced by third generation equipment. Since the conversion is time-phased to provide for continuous uninterrupted operation of the Army Operation Center, dual software conversion costs will be required for a period of time. When the third generation equipment is fully operational the second generation equipment will no longer be utilized in the Army Operations Center. The duality, although not desirable, cannot be avoided in view of the requirement to maintain continuity of operations throughout the conversion period.

EXECUTIVE TYPE AIRCRAFT

Chairman ELLENDER. Skipping back in time a bit, as I recall, this organization is the one involved in the transportation controversy last year, is that correct? In that case, what has been done since then to ensure that that sort of waste doesn't recur? Are you satisfied that the problem is solved?

General SEARS. Yes sir; STRATCOM was the Army Command whose leasing and chartering of executive type aircraft for administrative support was questioned. The Department of the Army issued instructions that this type airlift would not be obtained by Army commands without prior approval from this Headquarters. However, as of this date, the Army has not been able to obtain rapid response airlift within available DOD resources. Action is currently being taken to address this problem to the Office of the Secretary of Defense.

PERSONNEL TRANSPORTATION

Chairman ELLENDER. Would you please furnish for the record the comparative figures for transportation of personnel for this command for 1972 and 1973?

General SEARS. Yes, sir.

(The information follows:)

The U.S. Army Strategic Communcations Commands program 3-C—"Communications" travel of personnel expenses estimated in fiscal years 1972 and 1973 are $6,400,000 and $6,300,000, respectively. These figures include transportation as well as per diem costs for the Command's worldwide mission requirements. However, these costs are not directly related to the transportation controversy mentioned in the previous question. The costs for the leasing of administrative aircraft by this command were collected under the element of expense "Other Purchased Services" in fiscal year 1971.

COMBAT DEVELOPMENT ACTIVITIES

Chairman ELLENDER. With regard to the combat development activities program, which is responsible for the testing and evaluation of weapons systems, among other things, I see that you are requesting an additional $9.2 million for operational test and evaluation on to a base budget of approximately $44.4 million. This represents an increase of almost 25 percent over last year. Would you please tell the committee how much of the $44.4 million budgeted in 1972 was for this purpose and how much, including the increase, is budgeted for 1973?

General SEARS. In fiscal year 1972 it is estimated that $7,090,000 will be required for operational test and evaluation projects. The fiscal year 1973 request includes $16,241,000 for this requirement.

COMBAT DEVELOPMENT ACTIVITIES REQUESTS FOR 1972 AND 1973

Chairman ELLENDER. Now, being very specific, would you please indicate for the committee exactly what the requests for 1972 and 1973 are for. I would like to have this information by cost code and then by major project.

General SEARS. Sir, I would be happy to provide that information for the record.

(The information follows:)

The element of expense break for Operational Test and Evaluation (OTE) projects is as follows:

	Fiscal year—	
	1972	1973
Travel of personnel	$902,000	$2,041,000
Transportation of things	181,000	523,000
Operations research studies	1,392,000	2,688,000
Purchased services, aircraft	100,000	119,000
Other purchased services	181,000	31,000
Petroleum, oil and lubricants	110,000	100,000
Other supplies	510,000	7,873,000
Equipment	3,714,000	2,806,000
Other expenses		60,000
Total	7,090,000	16,241,000

Fiscal year 1972 OTE, by major project

1. Attack helicopter, field experiment	$4,442
2. M60A1 tank add-on stabilization, troop test, (Evaluation of the M60A1 add-on stabilization system)	338
3. XM-19 evaluation (21.9) field experiment (To obtain data on the use of the MX-19 rifle in small infantry units)	549
4. TETAM 11.8, field experiment (To contribute to the assessment of anti-tank missile systems)	1,761
Total	7,090

Fiscal year 1973 OTE, by major project

1. Attack helicopter, field experiment	$5,634
2. TETAM 11.8, field experiment (To contribute to the assessment of anti-tank missile systems)	2,000
3. Improved HAWK, intensified confirmatory troop test	843
4. LANCE, intensified confirmatory troop test	1,222
5. M60A2 tank, intensified confirmatory troop test	2,113
6. DRAGON, intensified confirmatory troop test	4,019
7. Forward area alerting radar (FAAR), intensified confirmatory troop test	410
Total	16,241

Chairman ELLENDER. Proceed.

PROGRAM 4—AIRLIFT AND SEALIFT

General SEARS. Program 4 covers the costs of operating the Army water ports in overseas areas, except those in Southeast Asia; Army costs of traffic management services provided by the Military Traffic Management and Terminal Service (MTMTS); and the base operations support for six installations in the United States. The adjusted estimate for fiscal year 1973 is $42.5 million, a net increase of $1.5 million from fiscal year 1972.

(Program 4 follows:)

PROGRAM 4.—AIRLIFT AND SEALIFT

[In thousands of dollars]

	Fiscal year—		
	1971	1972	1973
Water ports	20,503	19,303	17,744
Base operations	4,801	4,216	6,408
Command	19,592	17,418	18,327
Total	44,896	40,937	42,479

PROGRAM DETAIL

General SEARS. Water Ports: The fiscal year 1973 estimate of $17.7 million is $1.6 million less than revised fiscal year 1972. The net decrease is the result of the projected decrease in oversea port workloads. This decrease in workload is primarily attributed to a reduction in requirements for supply support in USARPAC.

BASE OPERATIONS

Base operations provides the non-AIF funds for support of six MTMTS installations located at Brooklyn, N.Y.; Bayonne, N.J.; Sunny Point, N.C.; Kings Bay, Ga.; Oakland, Calif.; and Fort Mason, Calif. The fiscal year 1973 estimate of $6.4 million is $2.2 million more than the fiscal year 1972 level. The increase is largely due to increased cost at the Military Ocean Terminal, Brooklyn, for minimum essential maintenance. This maintenance, which has been deferred since 1965, cannot be deferred longer without risking a forced closedown of the installation.

COMMAND

This account provides for the traffic management services in connection with the transportation of persons and things within the continental United States and to the oversea commands. The fiscal year 1973 estimate of $18.3 million is $900,000 more than fiscal year 1972. The increase is primarily due to the annualization of the civilian pay raise.

REQUESTED INCREASE

Chairman ELLENDER. As I recall, the Navy and Air Force have sustained reductions in their airlift sealift funding in 1973 and I am surprised to note that overall the Army is forecasting and requesting even more funds than in 1972. Do you have any offhand comment that you would care to give now before we get into particulars?

General RICHARDS. The airlift and sealift program does reflect a reduction in resource requirements for normal activity which is in line with the reduced workload. However, this reduction is more than offset by the requirement to perform essential maintenance at the Military Ocean Terminal, Brooklyn; increased requirements for under-utilized capacity resulting from decreases in workload; and annualization of civilian pay raise for wage board and classified employees.

Chairman ELLENDER. The only items that I see in the materials that we have not covered in either your statement or earlier in the questioning are on page 4–4 of the justification regarding the first three items of increase. With regard to the repair and maintenance

of the Military Ocean Terminal, Brooklyn, N.Y., would you please tell us something about the facility, its utilization, volume of cargo as a percentage of the capacity of the facility, cargo, physical plant, and future Army plans for the utilization of this terminal?

General RICHARDS. The Military Ocean Terminal, Brooklyn, N.Y., is primarily used for office and warehouse space. The waterfront facility has been leased to the city of New York (two cargo piers) and the city is negotiating for the third which is idle. The city has leased the two cargo piers to a commercial shipping firm for shipping containerized cargo. The passenger pier (1) is used by the Navy for berthing of inactive ships. The administrative space is occupied by Headquarters, Eastern Area, MTMTS; Navy and other DOD tenants; and the Post Office Department. The Postal Service occupies a large portion of the warehouse and open space for postal operations. The major portion of the warehouse space is vacant. The Army does not use the facility for shipping cargo to and from oversea activities. Use of the facility for cargo operations was discontinued in fiscal year 1967. The entire installation has been declared excess by DOD. Future plans are to relocate DOD tenants to MOT Bayonne, N.J., when Congress appropriates funds for administrative office space and an electrical substation at Bayonne. Approval of the Military Construction, Army funds would substantially reduce the need for increased maintenance and repairs at Brooklyn. However, the total requirement for Base Operations would not change from that contained in this budget since the Operation Maintenance, Army expense to relocate the personnel to Bayonne and performing of essential maintenance at Brooklyn until the relocation occurred would equate to the approximate $2 million requested for increased maintenance and repair.

Both the city of New York and the U.S. Postal Service have expressed interest in the real estate and the waterfront. They have plans for use of the installation if they could acquire it.

Chairman ELLENDER. Would you also please tell us exactly what this $2 million will provide in the way of repair and maintenance to the facility?

General RICHARDS. The $2 million for repairs and maintenance will be used for: Renewal of risers, steam distribution system-administration building, $63,000; replace domestic hot water piping, $101,000; renewal of return lines, steam distribution system-administration A and B buildings, $297,000; renewal of risers, steam distribution system—buildings A and B, $528,000; replace primary steam distribution system, $748,000; replace deteriorated roof leaders—buildings A and B, $50,000; and repair eight freight elevators—buildings A and B, $248,000.

TRANSFER OF LEASE TO GSA

Chairman ELLENDER. The next item on page 4–4 is for $51,000 for the transfer of a lease to GSA. I am puzzled by the fact that you transferred a lease to GSA and, as a result, sustained an increase in base operations. It seems that should be just the opposite. Could you explain that to us?

General RICHARDS. Sir, your observation would appear to be correct. I would like to recheck this item and provide the answer for the record.

(The information follows:)

The increase for $51,000 is in error. The Military Traffic Management and Terminal Service (MTMTS) entered into a ten (10) month lease for space in the Mariner Building in Newport News, Virginia in Fiscal Year 1971. In accordance with Office of Management and Budget (OMB) Circular A–11 Paragraph 13.5, dated 21 June 1971 Army must budget for a full year's cost prior to the General Services Administration (GSA) assuming responsibility for budgeting and financing the lease requirement. An appropriation transfer to GSA was effected in Fiscal Year 1972, and GSA will budget the requirement in Fiscal Year 1973 and subsequent years. Consequently, the Army does not require the $51,000 for this purpose.

UNDERUTILIZED CAPACITY

Chairman ELLENDER. The third item I would like you to explain is the $460,000 increase for "underutilized capacity." In the narrative of the justification, you indicate that while there has been a cutback in cargo, "the port facilities, however, must be maintained as part of the mobilization base to support future emergency requirements," and I have no quarrel with that. But I am under the impression that provision for the maintenance of these facilities has always been incorporated in the budget. Is this correct?

General RICHARDS. This is correct. However, total maintenance costs are financed in two segments. First, maintenance costs of fully utilized facilities are included in tariff rates established by the Military Traffic Management and Terminal Service (MTMTS) Army Industrial Fund for its supported customers (e.g., Military Personnel, Army, Navy, Air Force, Operation and Maintenance Army, et cetera). The second segment of these maintenance costs is associated with underutilized facilities. With the decline in support required by the industrial fund customers, these maintenance costs are financed by OMA, Program 4. Thus, as the MTMTS workloads fluctuate, that portion of maintenance costs associated with underutilized facilities also fluctuates causing increases or decreases in funding requirements in this program.

MAINTENANCE OF PORT FACILITIES

Chairman ELLENDER. How much then was included in last year's budget request for the maintenance of these port facilities and how much is being requested in this 1973 request?

General RICHARDS. The airlift and sealift program included $3.1 million in fiscal year 1972 for underutilized capacity and the fiscal year 1973 requirement is $3.6 million.

Chairman ELLENDER. Given what you have just said, would you please explain to us just exactly what this additional $460,000 is for?

General RICHARDS. The $460,000 increase in underutilized capacity covers increased cost in utilities, normal maintenance and repair, and post engineer functions funded from the airlift and sealift program resulting from decreased utilization of facilities at the military ocean terminals, Sunny Point, N.C., and Brooklyn, N.Y. Also contributing to the increase cost are rising utility prices and the use of more expensive fuel oil with a lower sulfur content. For example, the Department of Health, Education, and Welfare has directed that No. 5 fuel oil be used at Brooklyn in lieu of No. 6. Water prices at Brooklyn are increasing from $1.50 to almost $3 per thousand cubic feet.

PROGRAM 5—RESERVE FORCES

General Sears. This program provides direct support funds for a wide variety of operation and maintenance requirements of the U.S. Army Reserve (USAR). The Army Reserve troop unit program for fiscal year 1973 is programed to attain average strength of 261,300 and end strength of 262,500.

(Program 5 follows:)

PROGRAM 5.—RESERVE FORCES

[In thousands of dollars]

	Fiscal year 1971	Fiscal year 1972	Fiscal year 1973
General purpose force (USAR)	47,316	55,550	67,866
Training forces (USAR)	43,111	46,412	57,774
Command (USAR)	5,273	9,367	14,836
Base operations (USAR)	39,203	51,061	62,455
Depot maintenance (USAR)	6,206	4,300	5,688
Total	141,109	166,690	208,619

INCREASE OVER 1973

General Sears. The fiscal year 1973 request is for $208.6 million. This is a net increase of $41.9 million over the fiscal year 1972 amount of $166.7 million. The fiscal year 1973 increase over fiscal year 1972 is primarily to fund the equipment and logistical programs required to achieve an unprecedented increase in mobilization readiness, and to intensify and strengthen the unit recruiting program. This is resulting in the provision of significant quantities of modern equipment, increased readiness training, additional technician manpower support, and funding for accelerated provision of proper training facilities. In addition, the Army is intensifying its efforts to include in this program all costs that can be identified in support of the Army Reserve.

Within this budget, the requirements for technicians, equipment, maintenance, and personnel recruiting are key factors for readiness improvement in compliance with Public Law 90–168 and with mobilization requirements. This budget provides necessary support in these areas.

Unit technicians are the only full-time manpower support available to Army Reserve units and are vital for proper management, unit readiness, maintenance of equipment, and for training. This fiscal year 1973 budget provides for 8,505 technicians, an increase of 1,363 over fiscal year 1972. In the majority of cases, the technicians to be hired during fiscal year 1973 will also be military members of the units they serve. Thus, the technician program provides support to units while on both Reserve duty and active duty for training, and during both peacetime and mobilization/deployment.

STOCK FUND EQUIPMENT INCREASE

This request will increase stock fund equipment to approximately 78 percent of authorized requirements. The fiscal year 1973 increase is an essential step in the effort to increase unit readiness.

Significant quantities of new and modern equipment are being issued to the Army Reserve, and this is steadily overcoming the great-

est deterrent to readiness in past years. The increase in materiel readiness requires additional funds for maintenance, operation, and storage of equipment. This budget includes funds to maintain Army Reserve equipment in a fully deployable condition.

Intensification of Recruiting

An intensified and strengthened recruiting program is necessary in the approaching zero draft and volunteer strength environment. This budget will provide 430 recruiting technicians at larger units and selected headquarters locations. These recruiting specialists will perform direct recruiting, provide recruiting instruction, coordinate and evaluate effectiveness of recruiting programs and techniques. Also included is an increase in the recruiting program to intensify all aspects of recruiting advertising, redirect of thrust where needed, expansion of coverage, greater effort on individual interest groups, and survey and evaluation of motivational factors.

Program Detail

Base operations.—This account finances operations costs of six Army Reserve component installations and three field maintenance shops used primarily by Army Reserve components and reserve officer training corps (ROTC) for annual and yearround training, ROTC summer encampments, direct support/general support maintenance of USAR equipment, operation of home station training centers and Army Reserve field operational support. The request for this account for fiscal year 1973 is $62.5 million as compared with the fiscal year 1972 estimate of $51.1 million.

Command

This account finances elements of the Army Reserve program such as Office, Chief Army Reserve; unit advisor operations; supply management; recruiting; information; civilian personnel; and inspection activities. The request for this account for fiscal year 1973 is $14.8 million, an increase of $5.5 million over the fiscal year 1972 estimate. Included in the fiscal year 1973 estimates is $3.9 million for support of Project Volunteer. This increase will be used to intensify USAR recruiting and information.

General Purpose Forces (USAR)

This account provides funds for the force-oriented troop structure of Units to Reinforce Active Army, Division Forces, Brigades, and Support to Other Services. The fiscal year 1973 request for this account is $67.9 million, as compared with the fiscal year 1972 amount of $55.6 million. The net increase of $12.3 million is primarily for an expanding aviation program, unit technicians, and equipment maintenance.

Training Forces (USAR)

This account provides funds for support of Mobilization Base and Training Units whose mobilization mission is to provide services, facilities, and operations at posts, camps, stations, and U.S. Army Training Centers. This account also includes support of individual training.

Our fiscal year 1973 request of $57.8 million is an increase of $11.4 million over the fiscal year 1972 estimate. The net increase is for the aviation program, unit technicians, and equipment maintenance.

Depot Maintenance

This account finances depot maintenance of USAR-owned major equipment on a repair-and-return-to-user basis. $5.7 million has been included in the fiscal year 1973 request for this purpose, as compared with the fiscal year 1972 estimate of $4.3 million.

Organizational Maintenance of Equipment

Chairman Ellender. With regard to the General Purpose Forces, U.S. Army Reserve, on pages 5–6 you indicate the increases and decreases to the fiscal year 1973 budget. Of the total increase of some $13.7 million, I would like you to explain a bit more thoroughly the increase you are requesting for organizational maintenance of equipment for training and readiness, for which an increase of $800,000 is requested and the increase for operation and training costs for increased readiness, for which $1.1 million is requested. Both of these items appear to be similar to the "readiness improvement" catch all request that you made last year and I would like to know specifically what it is for this year. Would you please explain?

General Sears. Readiness improvement is a continuing requirement. Funds were provided and are being used for this purpose in fiscal year 1972. This is improving the current readiness of the Army Reserve. However, to attain the degree of readiness required in current mobilization plans means that our efforts must be further increased and additional funds must be provided.

The increased organizational maintenance fund requirement is directly related to the increased issues of equipment actually being made in fiscal year 1972 and programed to continue for fiscal year 1973. Included are the periodic maintenance checks of all equipment, repairs which must be performed by unit personnel during inactive duty training and annual training encampments and by USAR technicians in units and in area support maintenance shops. The requested increase of $0.8 million in General Purpose Forces results from increased quantities of equipment coming to units and from utilization of increased numbers of technicians who help to maintain this modern equipment in combat serviceable condition.

The increase in operation and training costs results from increased use of petroleum, oil, and lubricants; for operation of equipment as Reserve units receive additional equipment with which to train; from increased travel of civilian employees concerned with Reserve training, administration, and equipment maintenance; from increased travel of Reserve unit commanders and staffs to supervise Reserve preparedness efforts; and from increased consumption of supplies and materials by Army Reserve units.

Transportation Increase

Chairman Ellender. With regard to the increase of $1.1 million for transportation of increased issues of equipment, would you please tell

the committee how you reached the total $2.2 million figure for this transportation? In your response please indicate what this new equipment is and why it will cost so much to get it to the units.

General Sears. Transportation costs are computed using actual past experience of transportation costs to equipment issues. This ratio is then applied to planned equipment issues for the fiscal year. Reserve funds are charged for second destination transportation costs and for lateral distribution. When materiel is shipped direct from a manufacturer to a Reserve unit, transportation is included in the procurement cost. However, when material is shipped from an Army depot or installation to a Reserve unit, Reserve funds are charged for these transportation costs. The value of equipment planned to be issued to Army Reserve units subject to second destination charges in fiscal year 1973 is $225 million. The actual transportation cost for fiscal year 1971 was 1.3 percent of the valuation, and this experience factor was applied to fiscal year 1973 for an estimated transportation cost of $2.9 million. Of this total, $2.2 million is in General Purpose Forces and $0.7 million is in Training Forces. The equipment will include all of those items required to bring Army Reserve units to authorized training equipment level. Heretofore, units have been provided minimum equipment, much of which was obsolete and non-standard. Now, due to increased readines objectives and reliance on Army Reserve, we are now receiving and will continue to receive in fiscal year 1973 additional modern equipment comparable to that provided Active Army units.

This replacement and additional quantities include vehicles, weapons systems, communication equipment, aircraft, and related materiel and account for the increased transportation costs.

Transportation charges include costs of packing, handling, and crating of equipment as well as costs of air and surface movements.

Purchase of Stock Fund Equipment

Chairman Ellender. One item of increase for $1.4 million is for the purchase of stock fund equipment. Would you please tell the committee how the Reserve ended up in the position where they have to request such a large amount to make up for equipment that it does not have?

General Sears. The total requirement for stock fund equipment has been $95 million since reorganization in 1968. In 1969, 45 percent of the required equipment was on hand. Our program for provision of equipment within a 5-year period have repeatedly been extended as a result of funding limitations. Due to these reductions, the Army Reserve was able to attain only 70 percent of its training requirement at end fiscal year 1971. The present materiel readiness plan is based on full equipment during fiscal year 1975, and only equipment replacement funds required thereafter. The fiscal year 1973 total request is $11.3 million. This is an increase of $2.3 over fiscal year 1972. This total increase is distributed between General Purpose Forces ($1.4 million) and training forces ($0.9 million). Provision of these requested funds will bring the Army Reserve to 84 percent of its requirement and will provide the first significant increased increment to meet Reserve mobilization objectives.

Increases for Training Forces

Chairman Ellender. Turning to the request for Training Forces, U.S. Army Reserve, I notice that the areas of increase are almost the same as those in the General Purpose Forces program, U.S. Army Reserve. This is so in the areas of purchase of stock fund equipment, organizational maintenance of equipment for training and readiness, transportation of increased issues of equipment, and operation and training costs for increased readiness. Would you please consolidate the total increase for these items in the Reserve forces request and then provide for the record a concise description of exactly what the increased funds will provide?

General Sears. Yes, sir. I will provide that for the record.

(The information follows:)

[In thousands of dollars]

Item	General purpose forces	Training forces	Total increase
Stock fund equipment	1,371	880	2,251
Organizational maintenance of equipment	813	2,607	3,420
Transportation of increased issues of equipment	1,142	366	1,508
Operation and training costs for increased readiness	1,124	1,001	2,125

As the Active Army phases down, reliance on the readiness of the Army Reserve is being increased. The fund increases above are needed if we are to attain the increased mobilization readiness.

The stock fund equipment increase will allow the Army Reserve to attain 84% of its training requirement. Limited prior years funding has precluded earlier improvement.

The organizational maintenance of equipment increase is so we will be able to maintain the increased quantities of equipment being issued to the Army Reserve. Provision of this amount is required in order to maintain the equipment in a combat ready condition.

The transportation cost increase is to pay second destination transportation costs of equipment to be issued to the Army Reserve. These costs include packing, crating, and handling, as well as costs of air and surface movements. The operation and training costs increase is to support additional readiness training. These costs include petroleum, oil, and lubricants, consumable supplies and materials, travel of both military and civilian personnel, and purchase of installed equipment in constructed Army Reserve Training Centers.

Costs of Advisory Groups

Chairman Ellender. On page 5–10 of the justification, you get into the command area, and while I have already requested that you furnish consolidated information on an Army-wide basis regarding command, I have a couple of questions with specific reference to the Army Reserve. Would you start by explaining to the committee the item on page 5–10 of operating costs of advisory groups and overseas headquarters, which is budgeted for $2.2 million? I see on page 5–11 that included in this figure is an increase of $447,000 which I wish explained in detail as well.

General Sears. Active Army officer and enlisted personnel provide professional guidance, military expertise and training assistance to Army Reserve units at all levels. These advisors are assigned to advisory groups within the United States and to major headquarters overseas; 2,050 advisors are currently authorized. The $2.2 million

operating costs for these personnel include travel, consumable supplies, and provision of office space. The increase of $447,000 is the result of additional advisors, increased advisor travel for Reserve component tests, training Reserve personnel on new equipment, and increased emphasis on Army Reserve readiness.

PROJECT VOLUNTEER INCREASE

Chairman ELLENDER. Again, we have addressed this subject before, but I want to get your response with specific reference to Project Volunteer. Would you please tell us why an increase of $3.4 million, from $1.4 million in fiscal year 1972, is necessary?

General SEARS. This increase of $3.4 million is required to support the fiscal year 1973 Army Reserve recruiting and information program. Early in fiscal year 1972 we began to feel the full impact on recruiting and retention due to the Active Army phasedown, the diminishing draft, and increased emphasis on a volunteer Army. With the phasedown of the Active Army, the Army Reserve components have been assigned greater responsibility in mobilization planning. The need for a more dynamic, innovative, and organized recruiting effort was apparent and demanding. The fiscal year 1972 program has gained momentum. We are intensifying, at both the national and local levels, all aspects of recruiting advertising and publicity, redirecting its thrust where needed, focusing on additional interest groups, and are including paid space advertising in printed media, and a direct mail approach to targeted groups. This fiscal year 1973 request is required to continue and to increase the effort. Innovative and imaginative approaches are required. Advertising programs must be coordinated closely with specific recruiting programs and be more immediately responsive to the needs of recruiters at all levels. We must continue to be aware of problem areas in recruiting and retention, and address them directly through the advertising and publicity program. These problem areas may be in special skills such as medical, aviation, etc., or geographical in nature where there is a short-fall in unit strengths in specific localities.

The most urgent justification for funds for an increased recruiting effort is that the Army Reserve Selected Reserve strength has dropped by about 27,000 during this fiscal year.

MAINTENANCE OF EQUIPMENT

Chairman ELLENDER. On page 5–13, would you please explain the increase in direct support/general support maintenance of equipment of $2.5 million? Exactly what will this increase provide?

General SEARS. This increase of $2.5 million is directly related to two areas. Increased reliance has been placed on the Reserve components and they are now required to attain an unprecedented level of readiness. This is resulting in the provision of significant quantities of modern equipment which requires maintenance. Also, to help attain this level of readiness, the Army Reserve will provide additional readiness training in fiscal year 1973 which will increase the use and maintenance of equipment.

The requested amount will enable the Army Reserve to maintain equipment in a combat ready condition to meet mobilization require-

ments. Further, the provision of newer or modern equipment is requiring replacement of repair parts and shops stocks previously on hand and used for obsolete and nonstandard equipment.

Major mission equipment is being issued to Army Reserve at a rate of about 20 percent a year.

Reserve Installation Support

Chairman Ellender. I would also like you to explain in detail, the increase of $4.2 million in Army Reserve component installation support and how that particular figure was arrived at. What specific installations will require increased support as a result of the increased emphasis in the Army Reserve?

General Sears. Army Reserve funds support and operate six major Army Reserve component field training installations. Through lack of funds, maintenance and repair work has been deferred until there is now $10 million backlog in such work. The deficiencies have definite safety, health, security, morale, and utility implications, and will also have a negative effect on our drive for recruiting and retention of unit personnel.

This fiscal year 1973 increase will fund a meaningful phase in the reduction of these deficiencies. The fiscal year 1973 amount was determined by a thorough analysis of all fiscal year 1973 Army Reserve requirements, availability of funds, and determination of the most urgent installation support requirements. The Army Reserve component installations that require this increased support include Camps Drum, N.Y.; McCoy, Wis.; Picket and Hill, Va.; Indiantown Gap Military Reservation, Pa.; and Fort Chaffee, Ark.

New Logistical and Training Facilities

Chairman Ellender. Specifically what new facilities will have to be leased for logistical and training facilities in fiscal year 1973? Or is there some other reason for the increase in this area?

General Sears. As you know, the Army Reserve is receiving significant quantities of modern equipment, increased readiness training, and construction funding for accelerated provision of proper training facilities. While the current Military Construction, Army Reserve programs will subsequently permit reduction of leases, the reductions will not be realized until sereval years later. The requested funds will provide both new leases and expansion of current leases for the following operational activities: area organizational maintenance shops, direct support/general support maintenance shops, equipment storage areas, aviation facilities, and advisor groups and subgroups. The leased facilities and space are currently not available through any other means and are essential to continued increase in materiel and unit readiness.

USAR Center Facilities Support

Chairman Ellender. Since the USAR Center Facilities Support program had been well established before this current emphasis on the Army Reserve, I am a bit surprised that you are requesting a greater than 10 percent increase in the funding for this activity in fiscal

year 1973. Would you please explain what this increase is for, specifically?

General Sears. There are several basic causes for this increase in U.S. Army Reserve Center support. Army Reserve funds support and operate 1,019 Army Reserve inactive duty training centers. Through lack of funds, maintenance and repair work has been deferred until there is now some $5 million backlog in such work. Also, this includes the extensive repair projects being accrued from our initial construction effort in 1950. Most Army Reserve centers were supported on a minimal basis during the Vietnam period, and a large backlog of maintenance has accumulated that is bringing complaints from reservists and the public alike. The deficiencies include roofs, heating plants, and interior and exterior repairs. The deficiencies have definite safety, health, security, morale, and utility implications, and also have a negative effect on our drive for recruiting and retention of unit personnel.

Depot Maintenance Increased

Chairman Ellender. On pages 5–14, you indicate that an additional $1.2 million will be required for depot maintenance due to the increased equipment density. Would you please tell the committee how that figure was derived and why a sum less than that would not be sufficient?

General Sears. The Army Reserve is receiving in fiscal year 1972 a significant increase in equipment issues. A similar increase is programed for fiscal year 1973. In addition, all USAR equipment will be in greater use due to priorities for additional training and increased readiness. The requested increase of $1.2 million will provide for depot maintenance and return to user of the rapidly increasing equipment in the possession and use of units. The fiscal year 1973 requirement was established by first analyzing the fiscal year 1972 program, in which we began with a backlog of $6.1 million. Fiscal year 1972 funding of $4.3 million will reduce this backlog to $1.8 million at end year. The estimate of new requirements for fiscal year 1973 is $5.3 million. With the previous year backlog, this is a total requirement of $7.1 million. Application of requested fiscal year 1973 amount of $5.7 million will reduce our backlog at end year to $1.4 million.

Chairman Ellender. Off the record.

(Discussion off the record.)

Subcommittee Recess

Chairman Ellender. The subcommittee will stand in recess until 1:45 p.m.

(Whereupon, at 12:30 p.m., the subcommittee was recessed, to reconvene at 1:45 p.m.)

(Afternoon Session, 1:45 O'clock, Friday, March 10, 1972)

DEPARTMENT OF DEFENSE

Department of the Army

Operation and Maintenance, Army

STATEMENT OF BRIG. GEN. L. R. SEARS, JR., APPROPRIATION DIRECTOR, OPERATION AND MAINTENANCE, ARMY, OFFICE, COMPTROLLER OF THE ARMY—Resumed

Program 7—Central Supply and Maintenance

Chairman Ellender. The subcommittee will come to order, You are on page 55.

General Sears. Yes, sir.

The Central Supply and Maintenance program finances the operation of the Army's worldwide supply and depot maintenance activities. These activities are at the wholesale level, in comparison to a business community, with the retail side of supply and maintenance being conducted at the installation level and financed by other programs in Operation and Maintenance, Army. The requirements for this program are not self-generated but are determined by the requirements of the force oriented programs.

(Program 7 follows:)

PROGRAM 7—CENTRAL SUPPLY AND MAINTENANCE

[In thousands of dollars]

	Fiscal year—		
	1971	1972	1973
Supply depot operations	213,598	211,688	200,638
Inventory control points	133,366	132,323	126,946
Procurement operations	114,352	115,079	109,803
Depot maintenance activities	515,777	580,878	546,703
Base operations	196,397	194,092	199,359
Maintenance, technical, administrative, and new equipment training	6,491	7,476	7,333
Command	155,972	155,736	155,648
Second destination transportation	581,776	482,972	398,935
Industrial preparedness	25,910	32,156	38,014
Logistics support activities	51,838	50,601	52,414
Maintenance support activities	136,369	148,952	147,740
Total	2,131,846	2,111,953	1,983,533

Overseas Depots

Chairman Ellender. Have you centers in Europe where you distribute to certain areas?

General Sears. Yes, sir, we do.

Chairman Ellender. Do you have one in Greece?

General Sears. None in Greece.

General RICHARDS. The only depot that we have in the Mediterranean area is at Leghorn, Camp Darby, Italy.

Chairman ELLENDER. I understood there was a large one in Greece.

General RICHARDS. There may be a Greek operated distribution center for MAP furnished material but none that we are funding in Army O & M.

Chairman ELLENDER. To whom do you furnish material in Italy?

General RICHARDS. We support the Southern Europe Task Force (SETAF), the missile oriented U.S. Army force in Italy. There also are certain contingency stocks.

Chairman ELLENDER. Where are your depots in other parts of Europe?

General RICHARDS. They are in Germany and England.

Chairman ELLENDER. Do those depots furnish material to the countries of Western Europe?

General RICHARDS. They support U.S. forces. However, there are some cooperative support arrangements which have been arrived at with other countries. We do provide some support through our own logistics system over there to them on a reimbursable basis.

Chairman ELLENDER. To what extent do we use facilities that we constructed in France, such as the pipelines?

General RICHARDS. Except for the pipeline system to my knowledge we are not using anything in France.

Chairman ELLENDER. Just the pipelines.

General RICHARDS. Yes, sir.

Chairman ELLENDER. Proceed.

CONTINUOUS PROGRAM STUDY

General SEARS. The manner in which we manage the Army's logistic activities also impacts on the amount of funds requested in this program. We continually strive to improve our systems to achieve and maintain combat readiness of the Armed Forces of the United States and our allies worldwide as efficiently as possible. The fiscal year 1973 budget request reflects the continuing action started in prior years of shifting and consolidating our maintenance and supply activities worldwide, thereby simplifying the system and reducing requirements for supporting workforce and funds. We are constantly looking at all aspects of the logistic system, including our systems by application of lessons learned from past experiences and by updating and modernizing our supply system utilizing modern computer transportation and communication techniques. In order to operate the Army's supply and maintenance activities in fiscal year 1973, we are requesting $1,983.5 million, a net decrease of $128.5 million from the fiscal year 1972 level of funding of $2,112 million.

DEPOT PERSONNEL

Chairman ELLENDER. Are both military and civilian personnel utilized in depot activities?

General RICHARDS. They are both. We have both military and civilian personnel at all depots.

Chairman ELLENDER. What percentage of the people at the depots in Europe are local civilians?

General RICHARDS. Most of our civilian employees in our depot system in Europe are local nationals. We also have quite a few Department of the Army U.S. citizen employees over there but the great bulk of our civilian employees in Europe are local nationals.

Chairman ELLENDER. Is the pay of those civilians comparable to what they get within their country?

General RICHARDS. Pay of local nationals is based on the local wage scale.

DECREASES AND INCREASES

General SEARS. This net decrease primarily represents a reduction in both wholesale supply and depot maintenance workload related to force structure changes and the elimination of some onetime costs which were incurred in fiscal year 1972 to improve the readiness of the Armed Forces worldwide. Partially offsetting the reduced program are additions for increased maintenance of equipment for the Reserve components, annualization of the civilian pay raises approved in fiscal year 1972 and increased Military Airlift Command tariff rates.

SUPPLY DEPOT OPERATIONS

The operation of 16 Army depots and 21 depot activities in CONUS, and 20 Army depots and 19 depot activities in overseas commands, other than Southeast Asia, is provided for in this request. The request for this account for fiscal year 1973 is $200.6 million, a decrease of $11.1 million as compared to the fiscal year 1972 level of $211.7 million. Decreases reflect the reduction of workloads related to force structure changes, savings realized through implementation of the direct supply support system, and the dropping out of $8.3 million provided in fiscal year 1972 for elimination of the backlog of supplies and equipment requiring preservation in Europe. These decreases were partially offset by increases for wage board and classified pay raises.

INVENTORY CONTROL POINTS

This account provides for the operation of seven National Inventory Control Points in continental United States and the U.S. Army, Europe inventory control point. The request for this account for fiscal year 1973 is $126.9 million, a decrease of $5.4 million from the fiscal year 1972 level of $132.3 million. The decrease is due principally to the anticipated reduction in supply support associated with reduced strength levels, and the reduction in the Army's retail stockage levels, offset by increases for wage board and classified pay raises.

PROCUREMENT OPERATIONS

The fiscal year 1972 contract execution program involves approximately 393,000 line items processed with a total value of $4.8 billion. For fiscal year 1973 we are estimating that the workload will encompass 369,000 line items, valued at $4.7 billion. The request for fiscal year 1973 is $109.8 million, as compared to the fiscal year 1972 level of $115.1 million.

DEPOT MAINTENANCE ACTIVITES

Depot maintenance activities are those functions that restore the combat serviceability of Army-owned material through depot level

maintenance. A portion of this work is performed by private industry through contractual service, in accordance with Department of Defense policies, since it is not intended that organic Army facilities accommodate the entire workload. The depot maintenance activities account is programed at $546.7 million in fiscal year 1973, representing a net reduction of $34.2 million below the estimated fiscal year 1972 level. The fiscal year 1973 level will permit the Army to avoid any further substantial increase in the unserviceable equipment backlog, and at the same time increase rebuild for the Reserve components from $50 million in fiscal year 1972 to $100 million in fiscal year 1973. These funds, which are required to upgrade materiel readiness, are the second increment of a multiyear program to meet the Reserve components' mobilization and training requirements. Also included in this program is an increase due to the annualization of classified and wage board pay raises enacted during fiscal year 1972 and an increase for the Government's contribution to the civilian health benefits.

Base Operations

This account provides funds for the day-to-day operation and maintenance costs of support activities at major supply installations in continental United States and for the maintenance and supply installations in Europe, the United Kingdom, Taiwan, and Japan. The request for fiscal year 1973 is $199.4 million, an increase of $5.3 million above the fiscal year 1972 level of $194.1 million. This increase is related to pollution abatement programs and modern volunteer Army requirements, as well as civilian pay increases.

Maintenance Technical, Administrative and New Equipment Training

This element provides for organic and contract engineering and technical services related to maintenance, technical and administrative training, and new equipment training for all categories of equipment. The $7.3 million requested for fiscal year 1973 is at approximately the same level as fiscal year 1972.

Command

This account provides for the primary managerial effort required to operate the Army's logistics system at commodity commands subordinate to the Army Materiel Command. U.S. Theater Army Support Command, Europe, and the U.S. Army, Japan. The request for this account for fiscal year 1973 is $155.6 million, as compared to the fiscal year 1972 level of $155.7 million.

Second Destination Transportation

This account provides for costs of transportation of material from depots to an ocean port by land and air; shipments overseas by surface and air; redistribution shipments in continental United States or oversea areas; and the costs of loading and unloading vessels in continental United States. The request for this account for fiscal year 1973 is $398.9 million compared to fiscal year 1972 level of $482.9 million. The reduction reflects more effective management of shipments, reduced requirements associated with the decline in strengths

to be supported in fiscal year 1973, and completion of the fiscal year 1972 improved readiness program; offset in part by increased costs for support of allied forces, and increased Military Airlift Command tariff rates.

INDUSTRIAL PREPAREDNESS

These funds provide for continuation of those activities designed to assure the production capability needed to support emergency procurement programs, and decrease the time required to attain scheduled production rates in an emergency. The request for this account for fiscal year 1973 is $38 million, an increase of $5.8 million over fiscal year 1972. This request will provide for maintenance and protection of inactive facilities at 39 installations in the Army's industrial plant reserve which have an estimated replacement value of $7.6 billion; for the maintenance and protection of the Army's reserve of production equipment; and for industrial preparedness planning.

LOGISTIC SUPPORT ACTIVITIES

This account provides for other logistic activities including: supply services; production engineering; the Defense standardization program; real estate administration; and facilities management. The request for this account for fiscal year 1973 is $52.4 million, an increase of $1.8 million from the fiscal year 1972 level of $50.6 million. This increase is primarily related to classified and wage board pay raises.

MAINTENANCE SUPPORT ACTIVITIES

This element finances maintenance technical engineering services and assistance provided by Army military and civilian maintenance specialists and contractors in direct support of all levels of maintenance. The request for this account for fiscal year 1973 is $147.7 million, compared to the fiscal year 1972 level of $148.9 million.

SUPPLY DEPOT OPERATIONS

Chairman ELLENDER. With regard to supply depot operations, I notice that page 7–7 you indicate a reduction of $8.3 million due to the one-time cost of preservation and packing, Europe, that occurred in 1972. Would you please refresh us on that one program?

General RICHARDS. As a result of the Army being forced to withdraw all of its supplies from France in 1967, much of the equipment had to be stored in Germany in open storage areas. This caused an abnormal accumulation of materiel requiring represervation for storage to prevent deterioration; $8.3 million was provided in fiscal year 1972 to reduce the backlog to a more manageable level. The work is progressing in Europe according to plan, and funds for this purpose are not required in fiscal year 1973.

WORKLOAD REDUCTIONS

Chairman ELLENDER. Also in the reductions category, would you please outline for us the $4.8 million reduction that is attributable to workload reductions? I would like to know exactly what areas these reductions are realized in and why greater reductions could not be made

in light of the fact that the major recipient of supplies, the Army in Southeast Asia, is not requiring the amount of supplies it has.

General RICHARDS. The $4.8 million represents a net decrease in the total workload in the Army depot system. It considered not only the reduction in requirements for Southeast Asia, but also the effect of the receipt of retrograded materiel from Vietnam. Also, it is pointed out that less than one-third of the materiel shipped to Southeast Asia passed through Army depots in the United States. The remainder of the materiel was shipped directly from manufacturers or from Defense Supply Agency and Government Services Administration depots.

IRREGULAR FORCES IN LAOS

Chairman ELLENDER. On the increase side of the ledger there is the support of allied forces, for which an increase of $600,000 is requested. Would you please explain exactly what this increase will provide? Would you also indicate how much there is in the regular base budget for this purpose, excluding this increase?

General RICHARDS. This is an increase for support of approved irregular forces in Laos which previously were not funded in the Operation and Maintenance Program 7 budget. The increase represents a factored cost distribution based on movement of an estimated 58,000 short tons of supplies and equipment from CONUS Army depots. Entries for other portions of this distribution appear in the estimates of other program elements of our budget. Prior to this increase, our support for forces of this country in this program element in fiscal year 1973 would have been about $1 million.

Chairman ELLENDER. Finally, will you tell us what an item for support of allied forces is doing in the request of supply and maintenance when there is a separate budget activity for this very purpose?

General RICHARDS. Support of allied forces has been carried in program 7 rather than program 10 because it is essentially indirect support, representing transportation, supply depot and associated logistics costs of supplies and equipment shipped to Southeast Asia which will be provided to allied forces. Such costs have not been isolated from support of our own forces in our accounting procedures. However, in regonition of the need to identify the full allied nations support in one place, we are taking action to consolidate all appropriate costs in a single budget program, for example Program 10 in fiscal year 1974.

WORKLOAD REDUCTION IN NATIONAL INVENTORY CONTROL POINTS

Chairman ELLENDER. With regard to the inventory control points, I have the same question about the workload reductions that I had in the supply depot operations program, namely, I would like to know exactly what areas these reductions are in and why greater reductions could not be made in light of the reduced need in SEA? Please be specific in your response.

General RICHARDS. The workload reduction of $8.3 million is primarily in the National Inventory Control Points (NICP) in the United States, and was assessed to all functional areas. The reduction is based on forecasted workloads shown in the budget and relates to the reduced requirements in Southeast Asia. There are, however, some functions at the NICP's that increase as the combat operations decrease. For instance, some on a sustained basis such as more frequent supply

control studies which will improve procurement or overhaul management. Some on a short-term basis ,such as the additional work incurred in determining where retrograde material should be shipped for most efficient use of SEA excesses.

Chairman ELLENDER. Over the past year, have there been any reductions in the number of inventory control points? Or perhaps consolidations of functions etc.?

General RICHARDS. There has been no reduction in the number of inventory control points. However, the Army has maintained class manager activities (ACMA) at each of the Defense Supply Agency inventory control points. For purposes of economy and efficiency, we have consolidated six of these agencies into three organizations, for example U.S. Army Support Center, Philadelphia, Pa., U.S. Army Petroleum Center, Washington, D.C. and General Materials and Parts Center, New Cumberland Army Depot, Pa.

Chairman ELLENDER. Would you please furnish for the record, a list of the inventory control points, and their staffing, both military and civilian for the past 2 years and 1973, and insert it into the record?

General RICHARDS. Yes, sir; I will be glad to do so.

(The information follows:)

	Fiscal year—					
	1971		1972		1973	
	Military	Civilian	Military	Civilian	Military	Civilian
U.S. Army Tank-Automotive Command	20	1,200	20	1,247	20	1,060
U.S. Army Mobility Equipment Command	31	1,321	24	1,160	24	996
U.S. Army Aviation Systems Command	18	1,110	22	951	22	808
U.S. Army Missile Command	28	833	22	694	22	637
U.S. Army Weapons Command [1]	10	574	8	680	8	588
U.S. Army Munitions Command	32	561	39	523	39	462
U.S. Army Electronics Command	21	1,668	35	1,637	35	1,423
Inventory Control Point, Europe [2]	925	1,252	1,024	917	815	920

[1] Fiscal year 1972 increase reflects a functional transfer of personnel previously financed through the Army industrial fund to direct hire O. & M.A. funding. The fiscal year 1973 decrease reflects a reduction in personnel associated with workload requirements.

[2] The fiscal year 1972 increase in military strength is due to a change in mission and staffing which will be offset by headquarters reorganization in fiscal year 1973.

MICHIGAN MISSILE PLANT TRANSFER

Chairman ELLENDER. On page 7–12, you indicate that there is a reduction in funding due to the transfer of the Michigan Missile Plant to DSA of some $767,000 and at the same time an increase of $722,000 due to the transfer in, from the Navy, of plant cognizance of the Boeing Vertol. Aside from explaining what you mean by transfer of cognizance, would you please explain to the committee why these two transfers are going to be made.

General RICHARDS. Plant cognizance is the responsibility for performance of contract administration services on all contracts in a contractor's plant. It is Department of Defense policy that plant cognizance will be assigned to the Defense Contract Administration Service of the Defense Supply Agency, except where certain conditions exist warranting assignment to a military service. These conditions ceased to exist in the case of the Michigan Missile Plant, hence the transfer to the Defense Supply Agency. Plant cognizance for Boeing Vertol was transferred from the Navy to the Army based on Navy phasedown of

orders and 93 percent of the remaining production at the plant being associated with the Army.

BACKLOG OF MAINTENANCE OF DEPOTS

Chairman ELLENDER. I presume that you expect it will be sometime before the backlog of depot maintenance created by the Vietnam conflict is taken care of, is that correct? When do you expect that you will be "caught-up"?

General RICHARDS. Based on planned overhaul programs, the rising trend in the accumulation of backlog equipment will be reversed beginning in fiscal year 1972. By end fiscal year 1973 some reduction in the overhaul backlog is predicted, particularly in Aviation, and by end fiscal year 1974 a significant reduction should have occurred. Our goal is to reduce the overhaul backlog to the optimum management level by end fiscal year 1975. With currently programed funding levels, however, this level will not be reached until after fiscal year 1977.

AREAS OF REDUCTION

Chairman ELLENDER. On page 7–15 you indicate that a reduction of $94 million is reflected in the total request of $546.7 million. Would you please outline where these savings are being effected and how they are coming about, whether through decreased purchases of supplies, reduction in personnel, or some other method?

General RICHARDS. I will be glad to. The total decrease of $94.1 million is partially offset by an increase of $59.9 million for a net decrease between fiscal years of $34.2 million. This reduction resulted from Southeast Asia redeployment and reductions in the overall force structure. The major reduction is in the area of purchased equipment maintenance (commercial contractor) which dropped from a fiscal year 1972 level of $156.4 million to a level of $136.4 for fiscal year 1973.

Chairman ELLENDER. You are requesting an increase of $50 million for the modernization of equipment for the Reserve components. As I recall, you stated earlier that the total requested for this purpose is $100 million.

General RICHARDS. That is correct, Mr. Chairman.

Chairman ELLENDER. Could you give us some idea of the requirement of the Reserve components for equipment?

General RICHARDS. Yes, sir. It was estimated that approximately $1.6 billion (acquisition value) of equipment would be required to fill existing shortages and replace outdated equipment in the Reserve components. The equipment to be provided under this program to improve combat readiness will come from procurement or from Active Army assets which will require overhaul prior to issue. This overhaul is estimated to cost approximately $450 million spread over the next several years.

SECONDARY ITEM TRANSFER

Chairman ELLENDER. Another add-on is the secondary items transferred to PEMA that results in an increase of $2.3 million. Would you please explain how this transfer out is going to result in an increase to the depot maintenance program?

General RICHARDS. The $2.3 million indicated as secondary items transferred to Procurement of Equipment and Missiles, Army (PEMA) is a functional transfer, caused by the realinement between Army Stock Fund (ASF) and PEMA of certain electronics and weapons categories of materiel. These items were classified as expense items (ASF), but were later classified as investment (PEMA). When equipment is overhauled and returned to the ASF, the ASF reimburses the depot maintenance activity for work completed. However, work performed on PEMA items is not reimbursable, so therefore additional funds have been provided the depot maintenance activity account to allow these PEMA items to be overhauled.

INTEGRATED FACILITIES SYSTEM INCREASE

Chairman ELLENDER. I believe that we have covered all of the items of increase in the base operations program at some earlier time in the hearing, except for perhaps the $46,000 increase due to the Integrated Facilities System. Would you please tell us what this system is, how much is already in the budget for this purpose, and what this increase of $46,000 will provide?

General RICHARDS. The Integrated Facilities System (IFS) is a system to provide structured, accurate, and up-to-date information required for the more effective management of Army real property assets. When fully implemented, this system will support managers at every echelon of the Army with facilities data relating to master planning, new construction, real property assets reporting, contingency and mobilization planning and real property acquisition, use and disposal. This system will enable managers to more accurately relate facilities requirements to force structure and operating plans.

The fiscal year 1972 budget includes $175,000 for the initial Program 7 participation in the development of this system. These funds were provided for the acquisition of raw data relating to installations supported by this program. The increase of $46,000 is to be used to pay expenses for three man-years of effort in functional testing and evaluation of these data.

ADP EQUIPMENT INCREASE

Chair ELLENDER. It appears that, in the case of command the entire reduction due to the reduced workload, a reduction of $7.6 million is being offset by various increases, several of which are quite large. I will address three of these increases. First, would you please explain the increase due to the expansion of ADP equipment for logistics data processing. In your explanation, I would like to know what equipment is being added as well as what equipment is presently on board and what equipment will be replaced by the addtion of this new equipment.

General RICHARDS. Sir, additional equipment will consist of a large-scale general-purpose third generation computing system configuration comprised of multiple central processors and peripheral components including remote terminal devices in the Pentagon which are directly connected (via high-speed transmission lines) to the central computer site in Radford, Va.

Current equipment includes a large-scale second generation scientific computer, a medium-scale general purpose third generation computer and a minicomputer for data communications. The workload accom-

plished by the simultaneous operation of the three currently installed computers will be accommodated by the installation of the new ADPE system.

Chairman ELLENDER. Is there going to be no saving as a result of the increase in the ADP equipment, such as might result from the turn in of old equipment?

General RICHARDS. Sir, as an offset to the acquisition of this new equipment, savings have been identified in two areas. First, the present Government-owned equipment, valued at $306,000, will be diverted to the surplus equipment pool for immediate use elsewhere within the Government. A suitable application for this surplus equipment has already been identified with attendant savings. Secondly, the vendor-owned portion of the present equipment, which rents for $32,000 monthly, will be returned to the vendor. Our budget requests for fiscal year 1973 considered the savings which will result from the release of the currently installed equipment.

Chairman ELLENDER. With the increase in this equipment, I presume that you have justified it internally on the basis of savings. Would you please tell the committee what savings you expect to achieve as a result of this expansion and why?

General RICHARDS. Yes sir, I will be pleased to provide the information available at this time. In fact, the detailed cost study is not yet completed and cannot be finished until the actual replacement ADPE is selected through competitive procurement processes. When ADPE is selected a detailed cost study will be finalized. The replacement of ADPE was predicated on a tripled workload within 5 years. Included among the principal workload components which constitute the increase are:

(1) Automated Logistics Operating Information System, which provides for cross-functional integration of logistics systems at the Headquarters level.

(2) Consolidation of several logistics simulation and gaming systems for centralized operation on the new ADPE.

(3) Intensification of support for response-oriented cost impact analyses.

(4) Activity related to the Army Damage Assessment System. As the present equipment was operating at capacity, competitive procurement of new equipment was initiated. We anticipate that the new equipment may cost more than the comparable rental of current equipment, but expect this increase to be offset by benefits based upon the broadened scope of application of direct automated support of analytical and decisionmaking activities at the HODA level for the DCS LOG. The expanded uses of the new ADPE have not yet been fully developed to determine monetary savings. For example, the Office of the Deputy Chief of Staff for Logistics is presently conducting an intensive program for improved ADPE utilization by which each element of the planning, programming and budgeting system for PEMA will be fully supported by automated information processing. Moreover, an automated interface between the PEMA and OMA budget processes is in the planning stages for implementation on the new ADPE. The results of these and associated logistics efforts will be integrated into the Headquarters automated operating information system. In addition to the direct and indirect benefits to be achieved,

directed reductions in financial and personnel resources experienced by the Army Staff necessitate the automation or automated support of an increased number of functions as an offset to the diminished resources. These offset ADPE functions are not creditable to the new ADPE. Primary future benefits associated with the new ADPE are greater responsiveness in all aspects of programming and budgeting and improved utilization of operations reesarch in future logistics planning and resource control.

Relocation of Army Materiel Command

Chairman Ellender. A second item of increase is with regard to the relocation of the Army Materiel Command, which will increase the budget by some $1.9 million. Would you please tell the committee why this headquarters is to be moved? Is there some saving to be achieved as a result of this action? If so, what is it?

General Richards. Sir, the Army Materiel Command (AMC) Headquarters must vacate their present quarters (building T–7) since it is scheduled to be demolished by the General Service Administration (GSA) during the 3d quarter of fiscal year 1973 and land returned to the Federal Aviation Administration. Building T–7 is a temporary World War II structure erected to last 5 years. The operation and maintenance of this outworn plant is very high and the razing of this building is in line with GSA's policy to tear down temporary and obsolete structures. There will be no direct savings to the Army OMA appropriation because GSA is responsible for this building. Savings that will accrue to GSA will be in the areas of custodial services and repair and maintenance costs. Intangible benefits to be obtained by the Army include improved efficiency and morale of personnel from a better working environment.

Chairman Ellender. Would you also tell the committee how you came up with the estimate of $1.9 million for the cost of moving this command?

General Richards. I will provide that information for the record, Mr. Chairman.

(The information follows:)

The costs are segregated in the following major subdivisions:

Rental ($1,124,000)—a one-time requirement. The cost is based on an estimated charge of $4.72 per sq. ft. for 480,000 sq. ft. for a nine month rental of $1,700,000 less GSA credit for Bldg. T–7 of $576,000. In accordance with OMB Circular A 11 paragraph 13.5, dated 21 June 1971, Army must budget for nine months rental costs in Fiscal Year 1973 and for 12 months in Fiscal Year 1974. An appropriation transfer in Fiscal Year 1974 will provide the funds to GSA. GSA will budget for the rental commencing in Fiscal Year 1975.

Transportation ($207,000)—a one-time requirement. Essential for moving the furniture ($144,000) and relocating the computer ($63,000).

Equipment ($300,000)—a one-time requirement. Essential for the purchase of an emergency generator.

Communications ($269,000)—for a total of $1,900,000.

Chairman Ellender. Where is the Materiel Command Headquarters now and where will you be moving it to?

General Richards. Sir, the Army Materiel Command Headquarters is now housed in building T7, Gravely Point, Va., and is scheduled to be moved to the Bush Hill Building, 5001 Eisenhower Avenue, Alexandria, Va., near Cameron Station.

PROCUREMENT MANAGEMENT REVIEW SURVEY

Chairman ELLENDER. The third item in the command program that I would like to ask you about is the $200,000 item transferred from program 9, the procurement management review survey. Can you tell us what this program entails, why it was transferred, and what the total cost is expected to be if this additional $200,000 reflects only the annualization of the cost involved?

General RICHARDS. Yes, sir, I will be glad to. The Procurement Management Review Division conducts the Army program for procurement management review, AR 715–11, including review of the preaward as well as the contract administration or postaward phases of procurement. These reviews are applicable to all organizations of the Army in CONUS and overseas engaged in central or local procurement and in contract administration. This activity is more appropriately charged to Program 7S since the responsibilities of the functions performed are related primarily to the central supply and maintenance program. The annual cost of the program is $383,000. The transfer was made in January 1972 with a cost of $182,000 for the remainder of fiscal year 1972 and an annualization of $200,000 for fiscal year 1973. No additional cost is involved. Program 9 was reduced by $182,000 in fiscal year 1972 and $200,000 for fiscal year 1973 while program 7S was increased by the same amounts respectively.

Chairman ELLENDER. Looking over the increase in this program again, I see that the annualization of the classified civilian pay raise is over $3 million and it makes me wonder how many personnel are in this program. Would you please provide a table for the record showing the number of personnel in this program for fiscal years 1972 and 1973. Please break this total down into military and civilian personnel.

General RICHARDS. I will be glad to.

(The information follows:)

	Fiscal year—	
	1972	1973
Direct hire civilian personnel	7,612	7,638
Military personnel	1,778	1,724

Military Personnel costs are not included in the OMA fiscal year 1973 budget.

SUPPORT OF ALLIED FORCES

Chairman ELLENDER. In the second destination transportation program there is an increase of $5.1 million for the support of allied forces. Please indicate the total of these increases in this budget activity and the requirement for the increase.

General RICHARDS. Sir, as indicated in my response to a related question on supply depot operations, these increases represent an estimate of the cost of moving equipment, supplies, and ammunition from CONUS for support of these special forces which have been funded outside the Operation and Maintenance, Army budget. The total increase is $6.5 million. Transportation costs of land transportation, port handling, and ocean movement are $5.1 million. Supply depot costs

mentioned previously were $600,000. The balance is distributed among out accounts for supply management operations, procurement operations, base operations, command, and other logistic activities.

Chairman ELLENDER. If there is more than one allied country involved, would you please indicate the distribution of the total supply and maintenance assistance among the countries and if there is only one country involved would you please identify it?

General RICHARDS. Mr. Chairman, the dollar amounts we have been addressing are limited to support in Laos. However, the program seven budget for fiscal year 1973 includes support for other countries. The distribution is supplied for the record.

(The information follows:)

SUPPORT TO OTHER NATIONS, FISCAL YEAR 1973 PROGRAM 7

[In millions of dollars]

	Central supply	Depot maintenance
South Vietnam Forces	128.1	26.4
Republic of Korea Forces in RVN	12.5	
Loation Forces	16.3	
Total	156.9	26.4

TARIFF RATE CHANGES

Chairman ELLENDER. Finally, on page 7–27, you indicate that cranked into your cost estimates on the previous pages is an increase of $10.2 million due to the annualization of tariff rate changes. Would you please explain what that change was and what modes of transportation were affected and to what extent?

General RICHARDS. Military Airlift Command tariff rates were changed effective the first of January 1972. Channel cargo rates were increased 25.8 percent; channel passenger rates were decreased 5.7 percent; and special assignment airlift rates were increased 34.4 percent. The tariff rate for CONUS port transshipment will be increased 5.5 percent effective July 1, 1972. These tariff changes required fiscal year 1973 increased funding of $7.1 million for MAC shipments and of $3.1 million for Military Traffic Management and Terminal Service port handling costs.

INDUSTRIAL PREPAREDNESS

Chairman ELLENDER. With regard to industrial preparedness, I see that you are requesting an increase of $5.5 million for the increased maintenance workload for inactive plants and equipment. On page 7–28, you indicate that 24 of the 39 Army owned plants will require additional funding due to the performance of higher level maintenance. Would you please provide for the committee a listing of these 24 plants and the estimated cost of maintenance of each for 1972 and 1973, giving the specific reason for the increase in each case of increase?

General RICHARDS. I will be glad to provide the information requested for the record.

(The information follows:)

[In thousands of dollars]

Reserve industrial plants	Fiscal year— 1972	1973	Reserve industrial plants	Fiscal year— 1972	1973
Michigan Army missile plant	1,082	1,251	Riverbank AAP	589	1,094
Badger AAP	1,042	1,874	Scranton AAP	76	426
Burlington AAP	402	449	Sunflower AAP	667	841
Hays AAP	115	173	St. Louis AAP	811	929
Holston AAP	113	165	Twin Cities AAP	665	1,137
Indiana AAP	530	629	Pine Bluff Arsenal	0	31
Joliet AAP	508	672	Rocky Mountain Arsenal	0	198
Longhorn AAP	141	193	Edgewood Arsenal	0	72
Milan AAP	42	58	Detroit Arsenal	291	363
Newport AAP	151	348	Lima Army Mod Center	453	485
Radford AAP	120	176	Rock Island Arsenal	913	1,095
Ravenna AAP	476	1,886	Watervliet Arsenal	442	495

The increases fall in one or more of the following categories: a. An increase in the amount of inactive space at the plant; b. An increase in the cost per square foot of space maintained; or c. An increased level of maintenance.

Funds are used for surveillance, and repair of idle plant equipment; maintenance and repair of buildings and structures; maintenance and repair of utilities (roads, railroads, overhead and underground distribution systems (electrical, water, steam, sewage and waste)); operation of heating systems and other utilities systems as required; maintenance of grounds; guard and fire protection; and general and administrative overhead costs. Most of the plants are maintained by contract and the work to be performed is specified in the contract, either directly or by reference.

Funding is not in uniform yearly increments at each plant, but rather on a priority basis considering the specific requirements at each plant. Maintenance that should be done can nevertheless be delayed for a year to eighteen months, but must be done within a reasonable period of time to avoid severe deterioration of the property. Due to restricted fund availability, maintenance has slipped at some of the plants in Fiscal Years 1971 and 1972 and this results in the higher level of required maintenance for Fiscal Year 1973.

Maintenance of Inactive Army-Owned Equipment

Chairman Ellender. How much of the $5.5 million increase is due to the maintenance of inactive Army-owned equipment?

General Richards. $1.3 million of the increase is associated with maintenance of inactive Army-owned equipment.

Pollution Abatement

Chairman Ellender. I think that we have already covered the pollution abatement issue in earlier testimony but if we haven't, would you please consolidate all the pollution abatement increases that appear in this total Army O. & M. request, by budget activity and program and supply it for the record?

General Sears. The increases in the O. & M. program for pollution abatement by program/budget activity are:

	Millions
Program 2	$1.0
Program 7S	1.9
Program 7M	1.5
Program 8T	1.7
Program 8M	1.1
Program 9	0.1

Chairman Ellender. Would you please describe what each increase will provide for?

General Sears. The increase in program 2 will provide for elimination of water pollution from petroleum, oil, and lubricant facilities in Europe. In program 7S the increase will provide personnel required

to maintain continuous review and surveillance of ambient air/water quality and sources of pollution and assure reliable operation of industrial and domestic waste treatment plants at Army Materiel Command installations. The increase in Program 7M will provide for Product Improvement Engineering to existing components and modifications in Technical and Field manuals, Technical bulletins and parts bulletins, for the development of correction devices to be applied to vehicles, and engines produced and delivered since, January 1, 1970 in order to meet emission standards. Program 8T is similar to 7S but will provide the additional personnel necessary to maintain continuous review and surveillance of the air ambient and water quality at Continental Army Command installations. Program 8M increases will provide augmentation of the U.S. Army Environmental Hygiene Agency to acquire a capability essential to accumulating, evaluating, and disseminating data on water quality and waste discharges, air quality, health aspects of solid waste management, noise pollution and pesticide monitoring, and other similar activities through onsite field investigations and special studies. In Program 9 the increase will provide augmentation to the Army's Environmental Office. All of the increases are required to assure that the Army meets the requirements of the Clean Air and the Federal Water Pollution Control Acts and the National Environmental Policy Act of 1969.

PROGRAM 8—TRAINING, MEDICAL, AND OTHER GENERAL PERSONNEL ACTIVITIES

This program provides for the major activities of training, medical care including CHAMPUS, and recruiting. Other functions include the Reserve Officers' Training Corps program; the U.S. Military Academy; oversea education of Department of Defense school-age dependents in the European school area; and operation of the Disciplinary Barracks and Correctional Training Facility. The adjusted fiscal year 1973 request totals $1,474.7 million, a net increase of $113.6 million from the adjusted fiscal year 1972 level of $1.361.1 million.

(Program 8 follows:)

PROGRAM 8 TRAINING, MEDICAL, AND OTHER GENERAL PERSONNEL ACTIVITIES

[In thousands of dollars]

	Fiscal year—		
	1971	1972	1973
Recruit training	32, 457	30, 300	28, 935
Specialized training	118, 957	117, 759	114, 458
Professional training	40, 636	44, 978	45, 781
Flight training	85, 794	63, 027	49, 910
U.S. Military Academy	29, 312	30, 965	30, 764
ROTC	24, 195	28, 339	31, 014
Recruiting and examining	56, 614	82, 562	99, 597
Other personnel support	24, 362	22, 223	19, 734
Overseas education of dependents	81, 937	94, 885	111, 439
Education program	2, 846	8, 706	37, 916
Base operations (training)	256, 353	290, 206	320, 659
Other training activities	69, 293	65, 481	63, 156
Hospital operations	228, 441	269, 721	288, 790
Medical care in nonservice facilities (CHAMPUS)	124, 324	141, 062	156, 860
Health benefits in non-Army facilities	17, 133	16, 527	17, 704
Other medical activities	33, 520	34, 259	36, 794
Base operations (medical)	19, 664	20, 141	21, 203
Total	1, 245, 838	1, 361, 141	1, 474, 712

Training Costs

General Sears. The costs of training our Army relate not only to the size of the force, but also to the complexity of the required skills, the degree of proficiency desired, and the personnel losses and gains during a given period of time. Training a stable force with rather primitive weaponry and equipment would be a rather simple and easily predictable task as compared to our Army of today. Although our losses, quite expectedly, are larger than our anticipated gains in fiscal year 1973, it is significant that approximately 208,600 enlisted men will be entering the active Army without prior experience in the Army. Training activities account for $670.5 million for our fiscal year 1973 request, excluding adjustments.

Chairman Ellender. Is this training worldwide or solely in the Continental United States?

General Sears. Almost entirely in the Continental United States in this program.

Chairman Ellender. But you do carry on training abroad?

General Sears. Yes, sir, that would be unit type training in the main whereas this is individual type training, such as our basic combat training and advanced individual training.

Medical Activities

The primary mission of the Army Medical Department is to maintain and preserve the health of the Army, to take care of the sick and wounded and to provide health services to the families of our servicemen and other authorized personnel. During the past year the Army Medical Department has expanded clinical services to provide for increased responsiveness for those needing care. Progress was made in programs to train physicians' assistants and nurse clinicians. Procedures were established to provide safety lenses to those wearing spectacles and environmental health activities were expanded. Increased utilization of the CHAMPUS program has continued at about the same rate as experienced during the last fiscal year. The total request for medical activities for fiscal year 1973 is $542.5 million.

Other Personnel Activities

Excluding adjustments, other personnel activities, such as recruiting, and the education of dependents in the European school area, are projected to cost $261.8 million in fiscal year 1973. This is a $60.5 million increase from fiscal year 1972, which includes $15.8 million specifically for the Modern Volunteer Army, $21.4 million for general educational development, $7.6 million for expansion of Project Transition, and $15.7 million for pay raises and improvements in the oversea dependent education program.

Recruit Training

This program element provides for the operation of U.S. Army training centers which conduct basic combat, advanced individual, and combat support training for nonprior service enlisted personnel. The request for fiscal year 1973 of $28.9 million is $1.4 million less than the fiscal year 1972 level of $30.3 million. This reduction is primarily

due to fiscal year 1972 one-time costs for new courses, and for Modern Volunteer Army activities.

SPECIALIZED TRAINING

This program element provides for the operation of the Army school system and Officer Candidate Schools. The request for fiscal year 1973 of $114.5 million is $3.3 million less than the fiscal 1972 level of $117.8 million. The Army will provide specialized training for 201,989 personnel, a decrease of approximately 47,000 from the fiscal year 1972 level.

PROFESSIONAL TRAINING

This program element provides for advanced schooling of selected military personnel in civilian institutions, senior service schools, Army medical facilities, and schools of other Federal agencies. The request for fiscal year 1973 is $45.8 million, as compared to the revised fiscal year 1972 level of $45.0 million. The net increase of $800,000 is primarily due to civilian personnel pay raises, new medical training programs, and increases in tuition costs of medical training at civilian institutions.

FLIGHT TRAINING

This program element provides for the operation and maintenance of the Army Aviation School and the primary helicopter school. This budget submission contains a net reduction of $13.1 million in aviation training associated with the continuing reduction in training requirements.

U.S. MILITARY ACADEMY

This program element provides for the operation of the U.S. Military Academy at West Point. The request for fiscal year 1973 of $30.8 million, which includes $16.2 million for base operations, is $200,000 less than the fiscal year 1972 level of $31.0 million due to the one-time fiscal year 1972 costs for updating of the expansion program master plan.

RESERVE OFFICERS' TRAINING CORPS (ROTC)

This program element provides for the operation of ROTC units at civilian educational institutions where instruction is given in military science. It also supports ROTC summer camps where military science and tactics training is conducted. The request for fiscal year 1973 of $31.0 million is $2.7 million more than the fiscal year 1972 level of $28.3 million. The increase is primarily due to the additional scholarships recently authorized, and an increase in the junior ROTC program.

RECRUITING AND EXAMINING

This program provides for recruiting of enlistees for the U.S. Army as well as examining (medical and mental) and induction activities of enlistees and inductees for the U.S. Army, Navy, Marine Corps, and Air Force at 74 Armed Forces examining and entrance stations. The request for fiscal year 1973 of $99.6 million is $17.0 million more than the fiscal year 1972 level of $82.6 million. This is primarily for increased recruiting effort under Project Volunteer and civilian pay raises.

Other Personnel Support

This program funds the operation of the U.S. Army personnel centers, welfare and morale services, disposition of remains expenses, operation of the U.S. Army Disciplinary Barracks at Fort Leavenworth, Kans., the Correctional Training Facility at Fort Riley, Kans., and support of the Army Enlisted Evaluation Center at Fort Benjamin Harrison, Ind. The request for fiscal year 1973 of $19.7 million is $2.5 million less than the fiscal year 1972 level of $22.2 million. This decrease is the result of lower workloads at personnel centers and disposition of remains.

Oversea Education of Dependents

This program provides for the education of authorized school-age dependent children (kindergarten through grade 12) of Department of Defense military and civilian personnel stationed in the European school area. The request for fiscal year 1973, $111.4 million, is $16.5 million more than the fiscal year 1972 level of $94.9 million. This increase provides for a pay raise for school teachers, increased costs of services, supplies and equipment, and educational improvements.

Education Program (Other)

This program provides for Project Transition and General Educational Development (GED) of military personnel. The request for fiscal year 1973 of $37.9 million is $29.2 million more than the fiscal year 1972 level of $8.7 million. The increase in this program has been brought about by the consolidation of all GED activities into this single program element and the expansion of the Transition program.

Base Operations of Training Activities

This program element provides for operation and maintenance of 16 installations in the Continental United States where program 8, training, has the primary mission. The request for fiscal year 1973 of $320.7 million is $30.5 million more than the fiscal year 1972 level of $290.2 million. The increase is primarily caused by the continuation of Modern Volunteer Army programs and civilianization of kitchen police (KPs).

Other Training Activities

This program element provides for training devices, films, publications, and temporary duty travel costs and per diem of students at Army schools. The request for fiscal year 1973 of $63.2 million is $2.3 million less than the fiscal year 1972 level of $65.5 million reflecting the reduction in students at Army service schools.

Hospital Operations

This account provides for medical and dental services through the operation of medical centers, hospitals, and dispensaries. Our requests for fiscal year 1973 is $288.8 million, an increase of $19.1 million from the fiscal year 1972 level of $269.7 million. The increase is primarily related to continuing support of the Project Volunteer and the alcohol and drug abuse prevention and control programs.

Medical Care in Nonservice Facilities

This program, known as CHAMPUS, provides for the administration of the dependents' medical care program and certain health services, training, and special education and rehabilitation for handicapped dependents of Active Army personnel in civilian facilities. Our request for fiscal year 1973 is $166.9 million, an increase of $15.8 million from the fiscal year 1972 level of $141.1 million. This increase is primarily related to increased utilization and rising medical care costs.

Health Benefits in Non-Army Facilities Except Those Administered by Executive Director

This account provides medical and dental care for Army beneficiaries in Federal facilities outside the Department of Defense and civilian facilities. The request for this program is $17.7 million in fiscal year 1973 and is $1.2 million higher than the estimate for fiscal year 1972 of $16.5 million, primarily due to the continued rise in cost of medical care.

Other Medical Activities

This program provides for Army medical and dental laboratories, veterinary services, optical fabrication and repair facilities, and the Armed Forces Institute of Pathology. For fiscal year 1973 we are requesting $36.8 million, which is an increase of $2.5 million from the fiscal year 1972 level of $34.3 million, primarily reflecting increased support of occupational health and pollution control programs.

Base Operations of Medical Activities

The base operation account provides for expenses in connection with operating and maintaining the Army medical installations and activities under the command jurisdiction of the Surgeon General. The request contains $21.2 million for this purpose in fiscal year 1973, which is an increase of $1.1 million from the fiscal year 1972 level of $20.1 million, primarily due to increased support of real property maintenance and Project Volunteer.

Recruit Training

Chairman Ellender. Although the total request for recruit training is below the 1972 estimate, it would be even more so if it were not for the increase of $3.5 million due to the increased training loads. This increased figure is given on page 8–8 of the justification and I would like you to break this down to indicate the major areas of increase in the training cost centers or categories.

Colonel Gilham. The increase of $3.5 million for higher training loads in fiscal year 1973 represents the variable cost for the increase in recruit training loads. Approximately 75 percent of the variable cost is for supplies and equipment, 8 percent for petroleum oil and lubricants (POL), 15 percent for purchased services such as equipment maintenance, and 2 percent for communications and travel. The variable cost does not include civilian personnel costs or one-time costs which are considered separately, since these costs do not necessarily vary directly with changes in the workload.

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Basic Electronic Training

Chairman Ellender. In the specialized training program, there is an increase of $930,000 for basic electronic training. Would you please tell us exactly what that increase will provide and how much is in the total budget for this purpose, including this increase?

Colonel Gilham. The $930,000 represents the total amount being requested for common basic electronic training. It includes the costs to design instructional materials, techniques, innovations, and methodology instruction for electronics fundamentals which are applicable, in whole or in part, for use throughout the Army school system. I will provide a detailed breakout for the record.

(The information follows:)

Cost of common basic electronic training, fiscal year 1973

(*a*) Terminal performance objective equipment chassis—300 each	$150,000
(*b*) Test equipment—300 each	210,000
(*c*) Tool equipment	14,000
(*d*) Learning environment equipment	101,000
(*e*) Contractual services (audiovisual lessons, programed instructional units, instructional literature)	455,000
Total	930,000

Nuclear Weapon Training

Chairman Ellender. Nuclear weapons training is also in the specialized training program this year after having been transferred from the Defense Nuclear Agency. Would you please tell the committee why this training was transferred and whether the funding of this training is comparable to the level it was funded at under the Defense Nuclear Agency control?

Colonel Gilham. In its report, the Blue Ribbon Defense Panel concluded that each of the military services could adequately conduct its own nuclear weapons technical training. Subsequently, studies were conducted on the nuclear weapons technical training conducted by all Department of Defense agencies and on March 29, 1971 the Deputy Secretary of Defense directed the military departments to assume full responsibility for nuclear technical training. This coincided with the Army position that it was feasible and desirable for the Army to conduct its own peculiar nuclear weapons technical training. The funding of this training is comparable to the level it was funded at under the Defense Nuclear Agency control.

New Doctrine Training

Chairman Ellender. The last item of increase I will address pertains to the new doctrine training for DOD procurement workforce, for which an additional $80,000 is requested. Would you please explain to the committee what this new training is and why it is necessary?

Colonel Gilham. I will be happy to. The new doctrine training for the DOD procurement workforce has as its objective the dissemination of new or revised procurement policies established by OMB or DOD to the workforce on an expedited basis. The training is necessary to insure timely response by the entire workforce and minimize the delay in implementing new or revised procurement policies. It also

provides for a more detailed explanation of the policies than can be given solely in writing and protects against misinterpretation of the policies.

Reduced Training Loads

Chairman Ellender. At the top of page 8–13 there are several decreases, two of which we haven't talked of before. One regarding the reduced training loads troubles me because it would seem that this could only be a temporary savings with subsequent increases in the recruit training loads during 1973. Would you care to comment on this?

Colonel Gilham. The savings shown for reduced specialized training loads are not considered to be temporary savings. All new personnel coming in the Army receive basic combat training in the Army training centers. Follow-on MOS-awarding advanced individual training is conducted in either the Army training centers, the costs of which are accounted for in recruit training; at Army service schools, where costs are accounted for in specialized training; or in units. The data displayed for training loads in recruit training consist entirely of new personnel for either the Active Army or the Reserves. The data displayed for training loads in specialized training consist not only of new personnel completing basic combat training who are trained in service schools, but also includes other Active Army officer and enlisted personnel, Reserves, other services, foreign military personnel, and civilians. Accordingly, the training loads of recruit and specialized training are not necessarily related.

Specialized Training Costs

Chairman Ellender. The other decrease in the specialized training area that I wish you would explain is the "onetime costs incurred in fiscal year 1972". This is a $945,000 item and I think that it requires a bit more explanation. Exactly what "onetime" expenses make up the savings of $945,000 reflected here?

Colonel Gilham. During fiscal year 1972 it costs $157,000 to move the civil affairs school from Fort Gordon to Fort Bragg and $926,000 to purchase equipment and supplies needed to initiate training for the improved Hawk. These onetime fiscal year 1972 costs of $1,083,000 were offset by the fiscal year 1973 cost of $138,000 to transfer signal courses from Fort Monmouth to Fort Gordon for a net reduction in one time costs of $945,000.

Professional Training

Chairman Ellender. With regard to the professional training that the service provides, it appears that essentially the same level of training is to be followed in fiscal year 1973, with a few exceptions. The only question I have is with regard to an off the wall item that I notice on page 8–19 concerning the automated library at the command and general staff college. You indicate that the library costs $200,000. Would you please provide the committee with some background on this, the whys, hows, etc.

Colonel Gilham. The system referred to is an automated library document reference system for the Command and General Staff College at Fort Leavenworth. We feel that an automated system is re-

quired to improve the management of resources and increase the efficiency, scope, and depth of services provided students at one of our advanced educational institutions. The present collection at the college is over 100,000 documents and is increasing by approximately 6,000 titles annually. Together with the wide variety of information included in the collection, the present manual system presents an almost insurmountable problem of retrieval. The proposed library document reference system will tie into an existing automatic data processing system at the installation, which is the reason for its inexpensive cost.

Chairman ELLENDER. Would you also please indicate the total cost of making the system operational as well as the expected yearly operational cost?

Colonel GILHAM. The total cost for making the system operational is $200,000 and the expected yearly operational cost is estimated to be $24,000.

VISITING PROFESSOR AT WEST POINT

Chairman ELLENDER. With regard to the U.S. Military Academy at West Point, I have but one question—What is this item for $35,000 for a professor of military history? Please explain.

Colonel GILHAM. The Army is requesting $35,000 in fiscal year 1973 for the salary, movement of household goods, and travel funds for a visiting professor of military history at West Point. The concept of a visiting professor is commensurate with the views held by the members of the U.S. Military Academy accrediting agency, the Middle States Association of Colleges and Secondary Schools. The association stated in its 1969 accrediting report on the Military Academy that, while the quality of the military faculty was excellent, its professionalism could be enhanced by a more or less regular influx of visiting professors. In administering such a program, one means common to many undergraduate institutions is to establish a "visiting professor" position. The Army position, being considered on a 1-year trial basis, is an attempt to provide the aforementioned benefits in light of the accrediting agency report and in response to a need to further strengthen the Army's military history program. The establishment of this chair does not imply the mere addition of another member to the Military Academy faculty. The visiting professor is expected to benefit the Military Academy by providing tested and pertinent teaching expertise through the selection of a distinguished military historian; exposing cadets and faculty to new concepts and viewpoints in the field of military history; improving the ties between West Point and civilian academic circles; providing a fresh insight to the military history portion of the curriculum and assisting the Military Academy Library in improving its holdings.

DISCIPLINARY BARRACKS WORKLOAD

Chairman ELLENDER. In the other personnel support program there is one item of increase that I would like you to explain to us. It concerns an increase of $60,000 for the "disciplinary barracks workload." Would you please indicate how much of the total other personnel support request is for disciplinary barracks and what will this $60,000 increase provide.

Colonel GILHAM. We are requesting $1,844,000 in fiscal year 1973 for the disciplinary barracks. The increase of $60,000 is primarily attributable to the larger prisoner population, and the general price escalation

for such items as subsistence, health and comfort necessities, civilian clothes for released prisoners, consumable supplies, and equipment. The increase will also provide for the travel of released prisoners, escorts, and guards.

TRANSFER OF FORT BUCHANAN SUPPORT

Chairman ELLENDER. The only increase in base operations of training activities that we haven't already dealt with is in regard to the transfer of support for Fort Buchanan, which is estimated at $4.5 million. Would you please explain why the support for this facility was transferred and why it was done at this time.

Colonel GILHAM. Fort Buchanan, formerly the Naval Station Annex, San Juan, was a U.S. Naval facility. The Navy made a decision in March 1971 to close the Naval Station Annex by the end of calendar year 1971, thereby terminating support for the Army elements located in the San Juan area. The Office of the Secretary of Defense approved an Army recommendation that the Army assume responsibility for the operation and control of all facilities at Fort Buchanan to serve as a home for all Army elements there. These elements include the Armed Forces Examining and Entrance Station, Recruiting Main Station and the Department of Defense Joint Transfer Point.

Chairman ELLENDER. Is the funding for Fort Buchanan at $4.5 million comparable to that provided for it in whatever activity it was accounted for before?

Colonel GILHAM. The Navy did not account for the costs of Fort Buchanan separately but included them with those of the U.S. Naval Facility at San Juan and is therefore unable to provide us with the exact cost of operating Fort Buchanan while it was a Naval facility. From cost studies conducted by the Army it is believed that the costs are comparable.

Chairman ELLENDER. Where was this facility funded before, in which budget activity?

Colonel GILHAM. This facility was previously funded in Base Operations Support for General Purpose Forces of the Operation and Maintenance, Navy Appropriation.

TRAINING AIDS

Chairman ELLENDER. The other training activities program provides for training aids, films, etc. and I notice that you are requesting reductions in the training film production. Would you tell us why?

Colonel GILHAM. The $120,000 reduction in fiscal year 1973 is due to a lower aggregate cost to write, produce, print, and distribute a lower number of training film requirements.

Chairman ELLENDER. Would you please indicate how much is provided in the 1973 request for TDY for training after this reduction of $2.2 million?

Colonel GILHAM. After the $2.2 million reduction, $37,680,000 is provided for student TDY for fiscal year 1973.

TDY FOR TRAINING

Chairman ELLENDER. You are also planning a reduction in TDY for training. Does this refer to TDY for the students or for the instructors?

Colonel GILHAM. The reduction in TDY for training is for the students.

Chairman ELLENDER. What will be the effect of such a large reduction in the TDY for training funding?

Colonel GILHAM. The reduction of $2.2 million for travel and per diem represents the variable cost associated with the reduced number of military personnel attending Army Service schools, Defense schools, and schools of other services projected for fiscal year 1973, and should have no measurable effect on the funding for student TDY, assuming no change in the per diem rates.

SUPPORT OF TRAINING AID CENTERS

Chairman ELLENDER. On page 8–36 you indicate that an increase of $491,000 is necessary for the support of training aid centers. Would you please tell us how many training aid centers the Army maintains at the present time and how much it costs to maintain them?

Colonel GILHAM. I will be glad to do so. The Army operates 35 training aid centers in the Continental United States and eight centers in overseas areas. The cost for maintaining the Army's Training Aid Centers is $14,559,000 for fiscal year 1973.

Chairman ELLENDER. Exactly then, what will the addition of this $491,000 provide for and why couldn't this additional funding be done without?

Colonel GILHAM. The centers fabricate and maintain training devices, transparencies, and graphic training aids; distribute and loan these devices and aids to all Army components. The increase in funds for fiscal year 1973 of $491,000 is attributed to the necessity to replace obsolete production equipment in the training aid centers. It will also replace the lighter duty equipment to support the production of locally fabricated training aids and devices using wood, metal and plastics, which will permit both increased production quantities and higher quality devices. This increased capability will enable the training aid center system to meet increased requirements for training aids and devices in support of active Army and Reserve component training activities without requiring an increase in personnel.

TRAINING DEVICE PROCUREMENT

Chairman ELLENDER. The item immediately following the training aid center request is for an increase of $312,000 for training device procurement. Would you please tell the committee how much you already have in this budget for training device procurement, aside from this increase, and what this increase is for?

Colonel GILHAM. Yes, sir. Without the increase of $312,000 the amount for training device procurement in the fiscal year 1973 budget is $562,000. The increase of $312,000 is for purchase of 50 burst-on target trainers to be used to support gunnery instruction at the U.S. Army Armor School. These devices, designed for classroom use, will result in more effective instruction in the burst-on target method of tank gunnery, reduce the training time devoted to the subject, and reduce vehicle operation and maintenance.

HOSPITAL OPERATIONS INCREASE

Chairman ELLENDER. The net hospital operations increase of over $19 million is due to the civilian pay raises, Project Volunteer, the drug abuse program, and the increased medical supply costs—essentially. We have discussed all of these factors except the increase in the medical supply costs at some time during the hearing so right now would you please explain to us what has brought about this increase in the medical supply costs?

Colonel GILHAM. The increase in cost of medical supplies is directly related to technological advancements, that is, new items entering the market. An in-house study by the Army Surgeon General revealed that new items are being introduced in to the medical supply system at a faster rate than the deletion of old items and in a majority of cases cost more than similar items they supplement or replace.

HOSPITAL OPERATIONS

Chairman ELLENDER. How much did you have in the 1972 budget for the supply costs and how much is in the one presently before us?

Colonel GILHAM. The fiscal year 1972 budget was short $27 million in hospital operations affecting all elements of expense. Items such as civilian personnel and contractural services are relatively fixed, thus the flexibility on a short term basis is in the supply area. Therefore only $40 million applied to supplies. The revised 1972 estimate in this budget is $67 million.

MEDICAL CARE IN NONSERVICE FACILITIES

Chairman ELLENDER. I see no reason to get into the medical care in nonservice facilities question since you have nothing to do about it except pay the bills. All I will ask is if you are reasonably certain of your estimates.

Colonel GILHAM. As of now, no, sir. The President's budget is prepared in the August–November time frame. Data for the current fiscal year is not available at that time because of the lag in processing CHAMPUS claims by civilian agencies. Our first reliable data becomes available in late January. This data now indicates that the President's budget is understated slightly in 1972 and in 1973, but it is too early to determine precise amounts.

ENVIRONMENTAL HYGIENE AGENCY

Chairman ELLENDER. In regard to the other medical activities, I notice that the only really significant increase is in the Environmental Hygiene Agency which is requesting an increase of $1.4 million, which in turn is part of the $1.6 million increase for occupational health and pollution control programs, as indicated on page 8–48. Would you please describe what these programs are and how much is going to each? What do you expect to achieve with these programs?

Colonel GILHAM. The Army Medical Occupational Health Program was designed to meet the needs basic to the working and environmental condition at Army posts, depots, arsenals and manufacturing plants.

New laws, Federal directives and other pressures demand increased surveillance to determine environmental health hazards, conduct radiological surveys, toxicological analyses, health education and hearing conservation programs. The 1973 estimate for this program is $0.5 million.

The Army Medical Air and Water Pollution Control Program is a phased program for the preventive control and abatement of air and water pollution at Federal facilities. The program encompasses such tasks as accumulating data on water quality and waste water discharges, air quality effects from emission to ambient air, health aspects of solid waste management, noise pollution and pesticide monitoring, and disposal for all Army owned or operated installations and activities through on-site field investigations and evaluations.

Included in these tasks are provision for safe, effective demilitarization and disposal of chemical and biological agents that exist in bulk form as well as in weapons systems. The 1973 estimate for this program is $1.1 million.

PROGRAM 9—ADMINISTRATION AND ASSOCIATED ACTIVITIES

Funds in this program provide for the operation of the headquarters of the Department of the Army, the Continental Army Command and subordinate armies, the Military District of Washington, the Criminal Investigation Command, and public affairs activities worldwide. Although this program is usually associated with the cost of headquarters operations, it should be noted that 62 percent of the costs in this program are for essential but nonheadquarters-type activities such as the centralized direction of all Army finance and accounting activities, the operation of an integrated Army-wide personnel end strength reporting system, multicommand automatic data processing system, reimbursement to the U.S. Postal Service for official mail and other servicewide support.

(Program 9 follows:)

PROGRAM 9.—ADMINISTRATION AND ASSOCIATED ACTIVITIES

[In thousands of dollars]

	Fiscal year 1971	Fiscal year 1972	Fiscal year 1973
Departmental headquarters	83,312	87,199	86,401
Field headquarters and activities	63,846	60,490	60,088
Servicewide support	188,911	228,971	230,419
Public affairs		4,142	4,238
Other support	1,181	1,387	1,350
Total	337,250	382,189	382,496

CIVILIAN-MILITARY PERSONNEL RATIO

Chairman ELLENDER. In your administration and associated activities, what is the proportion of civilian employees compared to military personnel?

General KJELLSTROM. Sir, an order of magnitude of five percent military to 95 percent civilian. I would like to provide the precise details for the record, if I may.

Chairman ELLENDER. Is the same thing obtainable——

General KJELLSTROM. Well, in headquarters abroad, sir, they would be predominantly military, with some U.S. civilians and a limited number of overseas civilians, local civilian employees. The reason we have a limited number of local civilian employees abroad is the fact that most of them are not cleared for classified information.

(The information follows:)

Program 9 has 71 percent civilian employees and 29 percent military personnel. Of this total Program 9 strength, 11 percent are enlisted military personnel.

CIVILIAN COMPENSATION BENEFITS

Chairman ELLENDER. I notice here that you have an item in your program of administration and associated activities of $257.7 million for compensation benefits to 19,746 civilian employees. Will you discuss that?

General SEARS. I believe that would be the total pay of people, Mr. Chairman. That is the pay of all the personnel employed.

Chairman ELLENDER. What are the benefits?

Mr. WOODRUFF. That is the Government's contribution to Civil Service Retirement Fund.

General SEARS. That is the total and it does include the benefits that Mr. Woodruff mentioned.

Chairman ELLENDER. Proceed.

HEADQUARTERS COSTS

General SEARS. The fiscal year 1973 estimate for the headquarters costs in this program reflects our recognition of the necessity to improve the efficiency of these functions as well as the requirement to tailor these functions to be consistent with a reduced Army force structure. The adjusted fiscal year 1973 level is higher than the adjusted fiscal year 1972 level because of the addition of $12.9 million for civilian pay raise, $6.1 million increased reimbursement to the U.S. Postal Service and $3.4 million for reimbursement to the Department of Labor. When these uncontrollable costs, which total $22.4 million, are subtracted from the fiscal year 1973 level, it shows that the Army has reduced this program well below the fiscal year 1972 level.

DEPARTMENTAL HEADQUARTERS

This account provides for the operation of the executive offices of the Department of the Army. The request for this account for fiscal year 1973 is $86.4 million, as compared with the fiscal year 1972 estimate of $87.2 million.

FIELD HEADQUARTERS AND ACTIVITIES

This account provides for the operation of the Headquarters, U.S. Continental Army Command, the headquarters elements of the four Continental U.S. Armies, the headquarters of the Military District of Washington, and the headquarters and field activities worldwide of the Criminal Investigation Command. The request for fiscal year 1973 is $60.1 million, as compared with the fiscal year 1972 estimate of $60.5 million.

SERVICEWIDE SUPPORT

This account provides for the support of personnel, administrative automatic data processing, and financial field activities which provide these services Armywide. The request for servicewide support for fiscal year 1973 is $230.4 million as compared to the fiscal year 1972 estimate of $229.0 million. The net increase of $1.4 million is primarily attributable to increases of $6.1 million for reimbursement to the U.S. Postal Service, due to increased postal rates, $3.4 million for reimbursement to the Department of Labor for employee compensation and $3.5 million for the civilian pay raise. These increases were primarily offset by reductions based on force structure changes and reduced man-year costs totaling $11.6 million.

PUBLIC AFFAIRS

This account provides for the support of all public information and community relations activities at Army installations worldwide. The fiscal year 1973 request of this account is $4.2 million as compared to the fiscal year 1972 estimate of $4.1 million. The net increase of $100,000 is attributable to the civilian pay raise and foreign currency revaluation.

OTHER SUPPORT ACTIVITIES

This element provides for support of the U.S. Army Audio-Visual Agency which provides pictorial services to the Office of the Secretary of Defense and Department of Army commands and activities, and standardization and testing of audio-visual media and equipment for Armywide application. The request for fiscal year 1973 is $1.35 million as compared to a fiscal year 1972 estimate of $1.39 million.

FIELD HEADQUARTERS AND ACTIVITIES

Chairman ELLENDER. The increase in field headquarters and activities of $4.8 million for the Criminal Investigation Command activities is the result of the field headquarters and activities program taking over full funding responsibilities for the CIC activities. Would you please tell the committee what full funding, though split, amounted to in fiscal year 1972 and what the full funding, as consolidated, will be in fiscal year 1973?

Colonel GILHAM. The full funding in fiscal year 1972 amounts to $5,856,000 and in fiscal year 1973 to $6,294,000. The increase is attributable to the January 1972 classified civilian pay raise, the drug and alcohol abuse program and the need for additional funds for operating costs.

AUTOMATIC DATA PROCESSING REDUCTION

Chairman ELLENDER. On page 9–6, I notice that you are reflecting a reduction in automatic data processing. Would you tell us the reason for that reduction and how much you have left budgeted for this purpose?

Colonel GILHAM. Management improvement actions by U.S. Continental Army Command (CONARC) resulted in standardization of various automatic data processing (ADP) systems, the elimination of command unique applications, and the reduction of $225,000 in ADP costs. $7,515,000 remain budgeted in the ADP program.

SERVICEWIDE SUPPORT

Chairman ELLENDER. With regard to servicewide support, I would like you to break down the $230 million requested into the activities that you describe in the purpose and scope on page 9–7 of the justification. I also want the comparative fiscal year 1972 figures to be reflected on this table.

Colonel GILHAM. Sir, I will supply that for the record.

(The information follows:)

[In thousands of dollars]

	Fiscal year—	
	1972	1973
U.S. Army Civilian Appellate Review Agency	1,388	1,492
Civilian Personnel Field Offices	1,971	2,000
U.S. Army Criminal Investiagtion Division and 1st Military Police Detachment	400	0
Long Term Civilian Training	525	525
U.S. Army Personnel Information Systems Command	11,776	11,521
U.S. Army Physical Disability Agency	337	361
U.S. Army Enlistment Eligibility Activity	191	207
U.S. Army Personnel Information Activity	167	177
Department of Army Personnel Management Teams	75	75
U.S. Army Reserve Components Personnel and Administration Center	16,271	16,150
Armed Forces Courier Service	345	345
Army Field Law Library Program	500	500
Army Safety Program	225	225
Army Wide Printing	8,890	9,390
Central U.S. Registry	16	16
Counseling TDY, RVN	25	25
U.S. Army Enlisted Personnel Support Center	1,635	1,616
First Destination Transportation	350	350
The Institute of Heraldry, U.S. Army	628	628
Memoralization of Army Personnel	3	3
Postage and Free Mailing Privileges	42,258	42,928
U.S. Army Postal Service Agency	866	866
U.S. Army Publications Agency	7,292	7,259
Department of the Army Selection Board Travel	75	75
Travel of Next of Kin of Seriously Ill Army Personnel	35	35
Temporary Disability Retired List (Travel)	400	400
Army and Air Force Exchange Service	35	35
U.S. Army Aeronautical Service	1,157	1,162
U.S. Army Board for Aviation Accident Research	2,826	2,567
U.S. Army Communications-Electronics Computer Applications Agency	682	692
Comptroller of the Army Field Activities	48,681	47,833
Employee Compensation Fund	9,388	12,753
U.S. Army Audit Agency	19,537	19,629
U.S. Army Military History Research Collection	334	320
U.S. Army Nuclear Weapons Surety Group	139	140
U.S. Army Strategy & Tactical Analysis Group	1,932	1,946
Project Grain Feed	6,000	6,000
U.S. Army Management Systems Support Agency	5,907	5,384
U.S. Army Chaplain Board	41	41
U.S. Army Claims Service	441	429
U.S. Army Computer Systems Support and Evaluation Command	2,678	2,532
Director, Military Support	197	197
U.S. Army Command Information Unit	470	451
U.S. Army Judiciary	582	617
Miscellaneous Chief of Staff Activities	185	196
The Big Picture/"The Green Scene"	727	351
Armed Forces Radio & Television Services	200	0
Armed Forces Information Program	400	0
Armed Forces Explosive Safety	415	425
Office of Building Management	982	990
Defense Supply Service, Washington, D.C.	2,434	2,636
Department of Defense Wage Fixing Authority	418	425
Per Diem Travel and Transportation Allowance Committee	414	420
Procurement Management Review Agency	210	0
Miscellaneous Secretary of Army Activities	374	285
U.S. Army Computer Systems Command	26,751	26,812
Assistant Chief of Staff for Intelligence Support	838	810
Engineer Activities of Office, Chief of Engineers	6,566	6,753
Total obligations	238,585	240,000
Less reimbursements	9,614	9,581
Direct obligations	228,971	230,419

HERALDIC ACTIVITIES

Chairman ELLENDER. I would also like you to go into greater detail about the heraldic activities of the Army, to include the number of personnel employed in this activity.

Colonel GILHAM. Yes, sir. The heraldic activities of the Army consists of one activity. The Institute of Heraldry, U.S. Army, which also serves as the U.S. Government's Office of Heraldry. The Institute's mission includes heraldic services provided Department of the Army, as well as Department of Defense, The Executive Office of the President, and other Government agencies. For organizations outside the Department of the Army, heraldic items and services are provided on a reimbursable basis. The Institute of Heraldry is currently authorized two military and 46 civilian personnel.

COMPUTER SYSTEMS COMMAND

Chairman ELLENDER. With regard to the Computer Systems Command, last year we reduced funding for this organization because of some difficulties regarding implementation of one of its systems, BASOPS. Would you please bring us up to date, officially. You realize that our staff has been in close contact with this program since last fall but I think that a statement should be provided for the record.

General SEARS. The BASOPS system has been highly successful. It has definitely improved the management of our installations. In fact, our commanders in the field are anxious to have this system proliferated to all of our major posts in the Continental Army Command. BASOPS is an example of the standard computer systems which the Army has planned for many years and which are now becoming operational. As recently as a year ago many of our installations had three or four small computers. Generally speaking, one computer was dedicated to handling military personnel records. Another was dedicated to keeping track of supply while the third computer performed the automation of financial matters. Each computer had its own operating personnel. Each local supply, personnel and financial manager devised his own method of operation and instructed the local programer what he wanted.

We recently introduced the Base Operating System or BASOPS to our major Continental Army Command installations. BASOPS runs standard supply, personnel and financial management programs on its one computer. The management procedures were designed by the Department of the Army Staff and the programing was done centrally at the Computer Systems Command. We have proved that this manner of operation is less expensive and more efficient.

The Base Operating Information System (BASOPS) hardware has been installed at 30 Continental Army Command installations. The Military Personnel Accounting subsystem is operational at 28 of these installations while the Supply and Financial Subsystems are operational at 24 installations. Further extension was temporarily deferred until the Army implemented improvement recommendations made by the General Accounting Office. These recommendations were implemented. The Army position reflects that there are no critical deficiencies currently in BASOPS. The Army has complied with instructions issued by The Congress and completed the improvement recommendations required by the General Accounting Office on January 31, 1972.

On January 31, 1972, the Army requested authority to resume extension. This was also based on requests from the Commanding Generals of Continental Army Command and the Military District of Washington to extend BASOPS to their installations at the earliest possible date. The delay in receiving approval has made it necessary to delay any further extension until August 1972. Experience gained from the initial extension of BASOPS has proven that it is unwise to install financial and supply subsystems just prior to fiscal year and closing activities. A new system at this time complicates year end certifications.

Based on a favorable decision, extension to Continental Army Command, Panama, and Alaska will resume August 1, 1972. Other installations are currently being studied as possible candidates for the BASOPS system. Fort Huachuca, Ariz.; Fort Benjamin Harrison, Ind.; Camp McCoy, Wis.; and Indiantown Gap Military Reservation have been recommended by the Commanding Generals of Continental Army Command and Strategic Communications Command (STRATCOM). As is the case when any new standard automated system is extended, the users seek continually to improve and refine it. Submission of improvements is encouraged from all users as a means of ensuring that the system reaches its full potential. These suggested improvements are reviewed by the Army staff based on cost, leadtime and the availability of scarce programing resources. Some are neither desirable nor cost effective and are disapproved. Others are deferred to follow-on applications to conserve resources, while others are good and resources are expeditiously applied to ensure timely implementation. A recent minor improvement suggestion requested further automation and refinement of information for the "feeder data" from BASOPS for the CSFOR–78 Report. This was approved and will be broadcast to the users after successful test and evaluation. The approval of cost effective suggestions such as this assits in obtaining user confidence and acceptance of the system. These improvement suggestions are a necessary part of standard automated systems and should not be associated with the functional adequacy of the system. BASOPS is working well at CONUS installations today. We feel it imperative that we complete the proliferation of the system during this calendar year.

Postal Rate Increase

Chairman Ellender. Reflected in the total of $230 million is an increase of $6.1 million due to increase in the postal rates. Would you please explain what this increase is all about? I thought the adjustments for the new rates had been made in the 1972 budget.

Colonel Gilham. Yes, sir. The fiscal year 1972 budget included the increase necessary to fully reimburse the U.S. Postal Service for "Postage and Fees Paid" indicia in compliance with Public Law 286 and for free mail under the provisions of Public Law 91–375. The amount of reimbursement required was based on surveys of mail usage conducted in 1969. This amount equated to a cost-per-man-year of $41.89 for indicia mail and $12.24 per-man-year for free mail. Two increases in postage and postal fees announced subsequent to the submission of the fiscal year 1972 budget resulted in an increase of $6.91 per-capita cost for indicia mail and an increase of $4.08 per-capita cost for free mail. These increases are reflected in the fiscal year 1973 budget request and equate the increase of $6.1 million.

EMPLOYEE COMPENSATION FUND

Chairman ELLENDER. There is also an increase of $3.4 million for the reimbursement to the Department of Labor for the Employee Compensation Fund. What is the reason for such a large increase in fiscal year 1973?

Colonel GILHAM. Yes, sir. The reason for such a large increase in fiscal year 1973 is due largely to the higher salary schedule which is the base for the payment of compensation, to cost-of-living increases, and to increasing costs of medical care. In addition, long-term disability and death cases have increased as have new claims for compensation. It should be noted that budget year estimates represent the most recent actual billings, for example, fiscal year 1971 billing becomes the fiscal year 1973 budget estimate.

"BIG PICTURE" DISCONTINUANCE

Chairman ELLENDER. In the decrease category, there is only one that I would like to inquire about and that is the reduction of $376,000 associated with "The Big Picture." I presume that the "Big Picture" you refer to is the radio and television show about the Army. Would you tell us what this reduction is for and why it is being effected? Is the show going to be canceled?

Colonel GILHAM. The reduction of $376,000 was assessed against the "Big Picture" program which was discontinued as of December 31, 1971, after a study revealed that the series was not effectively reaching its primary audience: the soldier. "The Big Picture" was replaced by a reoriented film series especially developed to appeal to an internal audience, youthful soldiers primarily, and will not be produced or distributed for public showings.

PROGRAM 10—SUPPORT OF OTHER NATIONS

General SEARS. This program provides for the support of the Republic of Vietnam Armed Forces (RVNAF), Republic of Korea Army, and Royal Thai Army Volunteer Forces in Vietnam, collectively known as free world military assistance forces. Also included in this program are military/civic action programs, country programs, military groups in Latin America, the U.S. contribution to the support of NATO International Military Headquarters, and support costs for field advisers assigned to the Military Assistance Command, Vietnam (MACV). The $493.6 million requested for this program for fiscal year 1973 represents a net increase of $30.8 million from the fiscal year 1972 level.

(Program 10 follows:)

PROGRAM 10.—SUPPORT OF OTHER NATIONS

[In thousands of dollars]

	Fiscal year 1971	Fiscal year 1972	Fiscal year 1973
Support of allies	425,374	414,413	444,133
International military headquarters and agencies	26,340	29,222	29,717
MAAG's, missions and military groups	18,295	19,143	19,792
Total	470,009	462,778	493,642

Support of Allies

General Sears. This account provides for support of the Free World Military Assistance Forces. Also included in this aggregation are programs previously administered by the Agency for International Development, Military Assistance Program, and certain classified projects. The fiscal year 1973 estimate of $444.1 million reflects an increase of $29.7 million above the revised fiscal year 1972 estimate.

MAAGS and Missions

Chairman Ellender. You referred to military groups in Latin America. How much is included for these groups?

General Sears. The fiscal 1973 request totals $2,539,000 for 14 different military groups. I will submit a list of the groups for the record, along with the amounts for each for fiscal years 1971, 1972, and 1973.

(The information follows:)

PROGRAM 10.—OMA DOLLAR DISTRIBUTION BY COUNTRY IN LATIN AMERICA FOR MILITARY GROUPS

[In thousands of dollars]

Country	Fiscal year 1971	Fiscal year 1972	Fiscal year 1973
Argentina	270	238	250
Bolivia	194	264	274
Brazil	472	521	531
Chile	148	159	164
Colombia	194	213	220
Costa Rica	19	24	25
Ecuador	132	0	0
El Salvador	44	61	63
Guatemala	103	131	134
Honduras	70	90	94
Nicaragua	62	86	89
Panama	46	68	71
Paraguay	107	191	199
Peru	11	0	0
Uruguay	291	239	245
Venezuela	127	174	180
Total	2,290	2,459	2,539

NATO International Headquarters

Chairman Ellender. What is the amount for the NATO International Headquarters?

General Sears. Total is $29,716,000 in the 1973 budget.

Chairman Ellender. Has that amount decreased since you transferred from France to Belgium?

General Sears. The amount is approximately the same as it was in 1972, sir. It is $29 million. In 1971 it was $26 million.

U.S. Contribution to New Headquarters Construction

Chairman Ellender. To what extent did our country contribute to the new headquarters in Belgium?

General Kjellstrom. Sir, the NATO military headquarters in Belgium was constructed with MAP funds and the NATO civil headquarters was constructed with State Department funds.

OPERATING COSTS

Chairman ELLENDER. Is any of the $30 million you referred to used for construction?

General KJELLSTROM. It is not for construction, it is for operating costs of NATO headquarters, pay of civilian personnel, supplies.

Chairman ELLENDER. We occupy a portion of this building, which I visited about a year ago. Is it to maintain our people within the general headquarters?

General SEARS. Yes, sir; that is a portion of the cost, to pay the civilian personnel who are in the headquarters.

Chairman ELLENDER. I understand from Mr. Woodruff that the record shows we pay almost 30 percent of the cost.

General SEARS. That is correct, sir.

FREE WORLD MILITARY ASSISTANCE

Chairman ELLENDER. The total requested includes $444,113,000 for the support of allies, which is an increase of about $29,700,000 over the fiscal 1972 requirement. Give us the countries involved and the amount for each.

General SEARS. The total includes $300.2 million for South Vietnam, $32.7 million for Korea, and $111.2 million for Laos.

Chairman ELLENDER. This is all in program 10—"Support of Other Nations."

General SEARS. That is correct, Mr. Chairman.

TOTAL REQUESTED FOR SUPPORT OF FREE WORLD FORCES

General KJELLSTROM. Mr. Chairman, as you stated earlier in these hearings, the total included in the Army budget for the support of free world forces is $1.4 billion.

Chairman ELLENDER. Yes. According to my figures this $1.4 billion includes $1,048.1 million for South Vietnam, $131.6 million for Korea, and $228 million for Laos. Do these agree with your figures, General?

General KJELLSTROM. Yes, they do, Mr. Chairman.

Chairman ELLENDER. General, I wish you would provide for the record an identification of the total of $1.4 billion by appropriations and budget programs.

General KJELLSTROM. Yes, sir. I have that information here, and I will submit it for the record.

(The information follows:)

The following chart reflects the Army appropriated support of allies in Southeast Asia.

Army appropriated support of allies in Southeast Asia

	Millions
Vietnam	$1,048.1
Military Personnel, Army	55.1
Operation and Maintenance, Army	458.0
Program 7S	(128.2)
Program 7M	(26.4)
Program 8T	(3.2)
Program 10	(300.2)
Ammunition procurement	508.3
Other procurement	26.7

Korea	131.6
Military Personnel, Army	70.8
Operation and Maintenance, Army	45.3
Program 7S	(12.5)
Program 8T	(.1)
Program 10	(32.7)
Ammunition procurement	15.5
Laos	228.3
Military Personnel, Army	19.7
Operation and Maintenance, Army	128.7
Program 7S	(16,3)
Program 8T	(1.2)
Program 10	(111.2)
Ammunition procurement	79.7
Other procurement	.2
Total	1,408.0
Military Personnel, Army	145.6
Operation and Maintenance, Army	632.0
Program 7S	(157.0)
Program 7M	(26.4)
Program 8T	(4.5)
Program 10	(444.1)
Ammunition procurement	603.5
Other procurement	26.9

INTERNATIONAL MILITARY HEADQUARTERS AND AGENCIES

Chairman ELLENDER. All right, you may proceed, General Sears.

General SEARS. Funds in this aggregation provide for the U.S. share and national costs of NATO/SHAPE activities. The NATO Defense Planning Committee, which is composed of representatives of the 14 countries, negotiates what is considered to be an appropriate percentage of each member nation's contribution to the total operating costs of NATO activities. The U.S. contribution is approximately 28 percent of the total operating expenses in fiscal year 1973 and amounts to $25.3 million, an increase of $500,000 over fiscal year 1972. Other International Military Headquarters expenses have been reduced slightly as a result of decreases in civilian personnel support costs.

MAAG's, MISSIONS, AND MILITARY GROUPS

This amount includes funds required to support the military groups in 15 Latin American countries, active Army military personnel assigned to Military Assistance Advisory Groups (MAGS's) and Department of the Army missions worldwide, operational support costs of field advisers of all services assigned to the Military Assistance Command, Vietnam, and to provide better inter-American relations. This program also provides funding for incentives authorized for participants in the province senior adviser/district senior adviser programs.

Chairman ELLENDER. With regard to Vietnam, I see that there is a reduction of $36.5 million reflected in the 1973 budget request, $21.9 million of which is from the AID–DOD program. The lion's share of the AID–DOD reductions is due to a reduction of $19.3 million in

the highway maintenance railway sabotage budget. I would like to ask what the basis is for this reduction?

General Sears. The $19.3 million reduction results from the transfer of construction and maintenance responsibilities of major highway systems in Vietnam to the Republic of Vietnam Armed Forces. The budget request does not include funds for railroad sabotage because this project was terminated when the Government of Vietnam was not willing to furnish dedicated security resources to the railroad system.

Chieu Hoi Program

Chairman Ellender. Another reduction in the AID–DOD program is in the Chieu Hoi program. Would you please bring us up to date and give us an evaluation of that program? Is it effective in the Army's view?

General Sears. The Chieu Hoi program was initiated in January 1963 and was designed to demoralize the enemy, encourage defectors, gain intelligence and reintegrate returnees—Hoi Chanh—into Vietnamese society. Since its inception through February 1972, 194,424 former enemy have returned to the Government of Vietnam through the Chieu Hoi program. The high point of the program was in calendar year 1969 when there were 47,023 Hoi Chanh. The reduction in combat activity with Vietcong forces, general improvement in the security of the population, and the fact that the remaining Vietcong are of the more hard-core-type contribute to the declining returnee rate. The Chieu Hoi program has been both an effective method of reducing the strength of the enemy and a humanitarian effort as well.

Laotian Support

Chairman Ellender. With regard to the increase in the funds for Laos and the recent turn of events there, would you care to qualify the budget forecast in any way, or were adverse events factored into your request?

General Sears. The increase in support for Laos in fiscal year 1973 is attributable to the Department of Defense assuming support for all irregular forces in Laos. These estimates were developed by the Deputy Chief, Joint U.S. Military Advisory Group, Thailand, in accordance with the unified commander. Fiscal year 1971 consumption experience was the basis for these estimates. Although no factors were included in these estimates to allow for the current adverse conditions in Laos, Department of the Army feels that the levels of support in the fiscal year 1973 budget will adequately finance the war effort in Laos.

Rural Development Cadre Services

Chairman Ellender. On page 10–7, I notice again the savings due to the reduction in Rural Development Cadre services. Would you please give a critique of that program, including the total amount spent on it and the results that came out of it?

General Sears. The Rural Development Cadre began in 1966 as a method of providing a channel of communication between the people and the Government of Vietnam. The program involved the insertion of specially trained teams into selected villages and hamlets with the mission to inhibit the activities of the Vietcong among the population

and to develop political leadership and progovernment attitudes among the people. The rural development cadre program reached a peak strength of [deleted] in February 1969. As the villages and hamlets became capable of handling their own security and developed political leadership, the teams were withdrawn and inserted into other less-developed areas or inactivated. From a peak strength of [deleted] in 1969, the total strength has been reduced to [deleted] in January 1972 and is expected to reach [deleted] in fiscal year 1973. With this reduction in personnel, there has been a corresponding decrease in the funding support required. The rural development cadre program funding levels (dollars in millions) :

Fiscal year:	*Amount*
1969	$38.9
1970	41.6
1971	38.4
1972	31.6
1973	15.5

The Rural Development Cadre program has played an important role in the success of the pacification and development programs and can assume a large share of the credit for the myriad improvements in the political, social, economic, and security situation in the rural areas of Vietnam.

U.S. Contributions to NATO

Chairman Ellender. With regard to the U.S. contribution to NATO, I notice on page 10–9 that you indicated the U.S. share was 28.5 percent of the total operating costs for the three supreme commands. Does this distribution differ at all from the distribution last year?

General Sears. No, sir.

Individual soldier support: disciplined, reliable, and competent fighting force

Mr. Chairman and members of the committee, I recognize that I have taken a good deal of your time and have discussed a wide variety of requirements. In concluding my prepared remarks, there is one thing I would emphasize above all others. The program represented by the budget request which I have presented is heavily weighted toward support of the individual soldier. We have chosen this orientation because we believe that the strength of the Army is wholly dependent on the strength of its people. The Army is people, and we are sure that the young Americans in the Army possess the pride, the desire, and the skills necessary to provide the type of Army we must have. The program which I have presented today is designed to support the Army as a disciplined, reliable, and professionally competent fighting force.

At this time, members of the Army staff are prepared to discuss the programs supported by the appropriation in greater detail.

MAAG's and missions

Chairman Ellender. I asked you the other day for details on all the MAAG's and missions we have throughout the world. You recall that?

General Kjellstrom. Yes, sir.

Chairman ELLENDER. When will that information be available?

General KJELLSTROM. We have the detailed list of the MAAG's and missions here. We do not have the numbers of people assigned to it, but it will be available within—well, we have it available back at the Pentagon. The listing is on page 10–11.

PERSONNEL SURPLUS

Chairman ELLENDER. As I remember, I asked for the total personnel, Americans as well as locals, who are paid in the operation of military missions abroad. I believe this to be a costly and duplicative operation, and would like to see it reduced.

General KJELLSTROM. Yes, sir. We will have that listing available within a matter of days, sir. You will probably recall that Public Law 92–226, the Foreign Assistance Act of 1971, required at least a 15-percent reduction in the staffing of the MAAG's and missions throughout the world by September 30, 1972, with every effort to achieve a 25-percent reduction by that date. Action has been directed by Mr. Laird to implement the reduction directed by the Foreign Assistance Act. This data will be reflected in the report which will be submitted to you.

ANTICIPATED REDUCTION

Chairman ELLENDER. For years I have been advocating that we dispense with these missions altogether. If I understand what you have just stated, in the next 2 years they will be reduced by a substantial percentage.

General KJELLSTROM. By at least 15 percent, sir, by September 30 of this year. In addition, the language of the act states every effort should be made to effect an aggregate reduction of 25 percent by the same date.

Chairman ELLENDER. You mean——

General KJELLSTROM. Not cumulative. At least 15 percent, but make every effort to effect a total reduction of 25 percent by September 30, 1972.

(Additional classified information was furnished to the committee.)

PROGRAM FUNDING

Chairman ELLENDER. Can you tell us the amount that you are supplying in O. & M. to those missions abroad?

General SEARS. In 1973 it is $19,792,000.

Chairman ELLENDER. That consists of what?

General SEARS. That is pay of civilian personnel and the operating, supplies, and equipment of the MAAG's and missions.

ORIGINAL PROVISION OF HOUSING AND HEADQUARTERS BY HOST COUNTRIES

Chairman ELLENDER. Does that include rents that are paid?

General KJELLSTROM. It would include rent, sir, for the facilities which are not provided by the host government.

Chairman ELLENDER. When we first started these programs I found out that the housing and even the headquarters were furnished by the host country. Gradually they refused to continue to pay these costs so that in most countries today we are carrying the whole load.

General KJELLSTROM. Sir, several years ago I was the comptroller of the U.S. Strike Command which was responsible for the MAAG's and missions in the Middle East, South Asia, and Africa south of the Sahara. Each country had a little different arrangement on the type of support that they provided to us. This depended on the initial agreement that our State Department was able to work out with the host country. It was not a uniform approach.

Chairman ELLENDER. In the beginning the host country was to furnish headquarters as well as housing for people working in the missions.

General KJELLSTROM. That was the initial agreement. We had a disconnect within the same country in the same localities.

Chairman ELLENDER. I wonder why that understanding was not followed with all countries. If they refuse, why remain there?

General KJELLSTROM. Sir, I am not in a position to respond to that question.

Chairman ELLENDER. On many occasions I noticed that the presence of these missions has had a very bad effect on the neighboring countries of those to whom we furnished these missions, and eventually the military hardware. For that reason I have advocated for many years that we dispense entirely with these missions. I don't see why we should do that. I was not listened to and we still have them, but I am very hopeful that we can do away with them entirely.

Are there any questions, Senator?

Senator ALLOTT. None.

General SEARS. Thank you very much, Mr. Chairman.

ARMY STOCK FUND

Chairman ELLENDER. At this point there will appear a statement by Maj. Gen. Darrie H. Richards on the Army Stock Fund.

(The statement follows:)

STATEMENT BY MAJ. GEN. DARRIE H. RICHARDS, OFFICE OF THE DEPUTY CHIEF OF STAFF FOR LOGISTICS, DEPARTMENT OF THE ARMY

Darrie Hewitt Richards was born at Walter Reed Army Hospital in Washington, D.C. on 31 May 1921. Prior to entering the United States Military Academy in 1939, General Richards attended Brown University for two years.

He graduated from USMA in January 1943 and was commissioned a second lieutenant in the Corps of Engineers. His first assignment was at Fort Belvoir, Virginia, first with the Engineer School and later in the Engineer Training Center there. His first tactical command was with the 14th Armored Division. From September 1943 until July 1945 General Richards served with several combat engineer units both in CONUS and the European Theater of Operations in the capacity as company commander and battalion executive officer. During this period he participated in the Ardennes-Alsace, Rhineland, and Central Europe campaign.

After VE Day, General Richards returned to the United States to attend the Command and General Staff College, Fort Leavenworth, Kansas, graduating in October 1945.

In December 1945, General Richards was assigned to the Operations Division of the War Department General Staff. For two and one-half years he served as a general staff officer and also as a member of a small group who were directed by General of the Army George C. Marshall to research and analyze the operation of the Chief of Staff's Command Post during World War II.

From June 1948 until August 1949, General Richards attended Princeton University and was awarded a degree of Master of Science in Engineering. He

next served in Panama and Mexico with the Army's Inter-American Geodetic Survey until June 1953.

In June 1953 General Richards was selected as an instructor in Civil and Military Engineering at the US Military Academy where he remained until July 1955 when he transferred to the Transportation Corps and was assigned to the New York Port of Embarkation. Through 1961 he filled a variety of command and staff positions in Transportation organizations in Korea, Japan, Hawaii and CONUS. During this periood General Richards also attended and graduated from the Armed Forces Staff College and later, from August 1961 to June 1962, the Industrial College of the Armed Forces (ICAF).

In June 1962, General Richards was assigned to the Army General Staff in the Office of the Peputy Chief of Staff for Logistics. He served successively in Installations, International Logistics, on several special study groups, and then served as Executive to the Deputy Chief of Staff for Logistics, until June 1966.

In July 1966, General Richards reported to the Seventh Army in Germany to command the 1st Support Brigade. This brigade of almost 7000 personnel organized into seven battalions provided logistics support to the field Army. When selected for promotion to Brigadier General, he was assigned as the Assistant Deputy Chief of Staff for Logistics for USAREUR and Seventh Army.

After the 1968 Tet Offensive, General Richards assumed command of the Army's Qui Nhon Support Command in the Northern II Corps Tactical Zone, Vietnam. He retained this command in support of US and Free World Military Forces numbering some 90,000 personnel until his return to the US in June 1969. During this time he received several US and Foreign decorations including the Distinguished Service Medal. General Richards departed Vietnam in June 1969 to command the Western Area of the Military Traffic Management and Terminal Service (MTMTS) with headquarters at Oakland Army Base, California.

Upon his selection for promotion to Major General in July 1970, General Richards returned to Washington to assume his present position as the Assistant Deputy Chief of Staff for Logistics (Supply and Maintenance).

Army Stock Fund

Mr. Chairman and Members of the Committee: I am Major General Richards, Assistant Deputy Chief of Staff for Logistics, Department of the Army. I am responsible for the program management of the Army Stock Fund. This entails both its supply and financial aspects.

The Army Stock Fund encompasses both wholesale and retail operations. The wholesale stock fund, under the direction of the Army Materiel Command, procures Army-managed secondary items from commercial suppliers, and, to some extent, from governmental manufacturing arsenals. Stocks are purchased from the wholesale stock fund by Army operating commands using the retail stock fund. The retail stock fund is also used to purchase supplies from other government sources, such as DSA and GSA. The retail stock fund, in turn, sells supplies to Army users.

FISCAL YEAR 1973 BUDGET ESTIMATE

The Army Stock Fund estimates for fiscal years 1972 and 1973 reflect a continuation of the downward trend from the FY 1969 level of sales activity. Actual sales in FY 71 were 14% lower than FY 70, and estimates for FY 72 and 73 are 21% and 26% respectively, lower than the FY 70 level. As the level of support requirements declines, the need for stock replenishment is reduced since inventory levels can be drawn down accordingly. Actual stock replenishment in fiscal years 70 and 71 were 94% and 90% of gross sales. Estimates for fiscal year 72 provide for a replenishment rate of 88%. As inventories come closer to the level required to support the reduced level of sales, the relationship of purchases to sales comes closer to a one for one ratio. Our estimate for FY 73 includes replenishment of 91% of sales. Our inventories in FY 71 were reduced by $350 million as a result of sales in excess of purchases and other gains and losses such as returns from customers, returns to suppliers, and transfers to PDO.

Inventories are estimated to further decline by $516 million during fiscal years 1972 and 1973. ($630 million through less purchases than sales offset by the net effects of other inventory transactions).

As a result of the drawdown of inventory, through sales without stock replenishment, $160 million in cash will be generated through operations in FY

72. The cash balance at the beginning of FY 72 plus this $160 million cash generation will be sufficient to meet fiscal year cash requirements of $173 million and will provide for a transfer of $95 million to the MPA appropriation.

Army logistic management improvements continue to upgrade the Army Stock Fund posture. For example the Army instituted a direct delivery supply support system to selected using units in oversea commands, with the objective of reducing oversea operating stockage requirements. A cost effective analysis of this system has been completed with the conclusion that the increased cost at the wholesale level of providing direct support can be offset by a significant saving in levels of inventory without degradation of unit readiness, therefore the direct support system is being extended to other areas.

Other logistic improvement efforts have resulted in a significant reduction in the number of items stocked below the CONUS depot level. The number of items authorized for stockage in oversea depots has been reduced from 1,063,000 in June of 1969 to 267,683 at 31 December 1971.

The Army is continuing its intensive management efforts toward the identification and retrograde of redistributable assets in the Pacific area. Since the inception of this program in 1968, $297 million of these assets have been referred for redistribution, and $686 million have been directed for return to the CONUS inventory manager.

My discussion will cover Army Stock Fund Operations for Fiscal Year 1972 and the proposed operations for Fiscal Year 1973.

The following table sets forth in summary the original program for Fiscal Year 1972 as it appeared in the President's Budget for Fiscal Year 1972, the program as currently approved by the Secretary of Defense and the proposed program for Fiscal Year 1973.

	Fiscal year 1972 program (President's budget)	Revised fiscal year 1972 program	Fiscal year 1973 program (President's budget
I. Sales:			
Wholesale	$902.7	$760.8	$666.5
Retail	2,036.5	2,068.8	2,021.6
Total	2,939.2	2,829.6	2,688.1
II. Obligations:			
Wholesale	677.5	505.3	517.4
Retail	1,988.7	1,986.9	2,041.2
Total	2,666.2	2,492.2	2,558.6

In January, the Fiscal Year 1972 program was revised based upon the latest data available on sales, and the status of inventories on hand and on order.

The Fiscal Year 1972 sales program was revised downward as a result of a further decrease in force levels and logistics improvements which enabled the consumer to draw down on his levels of supply.

The reduction in obligational authority resulted from the reduced sales program and a reevaluation of anticipated issues from stocks on hand and from receipts of materiel placed on order in prior fiscal years offset by $25 million in procurement authority for war reserve stocks. Based upon line item computations, our worldwide mobilization reserve requirements are $1,487 million. Applicable assets of $649 million estimated to be on hand and on order as of June 30, 1972 will leave an expected deficiency of $838 million. An additional $58 million in procurement authority is included in FY 73 to finance deficiencies in prepositioned mobilization reserves. No procurement authority has been requested to finance deficiences to our general mobilization reserve requirements. The obligational program considers a continuation in the drawdown of long supply.

The Fiscal Year 1973 program is predicated on a continuation of the decline in demands.

Army Stock Fund inventories are forecast to decline from $2,734 million on June 30, 1971 to $2,218 million by June 30, 1973. The following table provides an analysis of Army Stock Fund inventory transactions included in the Army's estimates for Fiscal Years 1972 and 1973:

ANALYSIS OF ARMY STOCK FUND INVENTORY TRANSACTIONS

[In millions of dollars]

	Fiscal year 1972	Fiscal year 1973
Inventory, beginning of fiscal year	2,734.0	2,423.5
Increases:		
Purchases at standard price	2,662.7	2,582.7
Receipts from capitalized contracts	.3	0
Capitalization	53.1	0
Customer returns and receipts without charge	512.8	418.2
Standard price changes	4.1	0
Total, increases	3,233.0	3,000.9
Decreases:		
Gross issues (sales)	3,022.0	2,852.9
Decapitalization	43.3	25.4
Returns to suppliers	99.5	93.1
Transfers to property disposal officer	325.2	192.8
Issues without reimbursement	48.3	11.6
Physical inventory loss adjustments (net)	5.2	30.5
Total, decreases	3,543.5	3,206.3
Net change in inventory	−310.5	−205.4
Inventory, end of fiscal year	2,423.5	2,218.1

Gross sales in Fiscal Year 1972 are forecast to exceed purchases and receipts from capitalized contracts by $359.0 million. Generally speaking, this means some requirements are being met through issue of materiel in long supply. Customer returns also help satisfy this issue requirement. $140.2 million of the customer returns are forecast to be applicable to the issue or the stockage in support of the approved force.

The drawdown of long supply is forecast to continue through Fiscal Year 1973, during which issues are again estimated to exceed purchases. The drawdown becomes less each year as the stocks in long supply are consumed.

In both Fiscal Years 1972 and 1973 the Army is continuing its effort to reduce inventories to authorized retention levels. Our forecast to transfer some $518 million to property disposal officers during the two-year period reflects the Army's effort to rid the system of excesses, which includes materiel turned in from using units which is worn out beyond repair, or excess to worldwide requirements. The magnitude of this anticipated transfer is partly the result of a deliberately low rate of disposal prior to the deceleration of U.S. troop involvement in South Vietnam. $507 million in excess inventory was transferred to the property disposal officers in FY 1971.

The sale of inventory from long supply generates cash in the Army Stock Fund that can be used to invest in stocks for mobilization reserves or can be transferred to other appropriations. Collections from sales in excess of expenditures for purchases of stocks are expected to generate $160 million in cash, and a transfer of $95 million to the Military Personnel Army Appropriation during Fiscal Year 1972 is planned, reducing the cash balance to support a reduced level of operation. The following table sets forth the expected transactions which affect the cash position of the Army Stock Fund for Fiscal Years 1972 and 1973:

ANALYSIS OF CASH POSITION

[In millions of dollars]

	Fiscal year 1972	Fiscal year 1973
Cash requirement:		
Provision for variation in estimates (2½ percent of estimated collections and expenditures)	137	131
Undelivered provisioning for new principal items of equipment entering the system	11	8
Undelivered war reserves	25	58
Total	173	197
Cash availability:		
Cash balance, beginning of fiscal year	153	218
Collection for the period	2,819	2,700
Expenditures for the period	−2,659	−2,562
Transfer to other accounts	95	0
Cash balance, end of fiscal year	218	356
Cash availability over cash requirement	45	159

The Army has made progress in its objective to reduce stockage requirements below the continental US Army depot system and has a number of intensive management actions underway that have led to a reduction in secondary items requirements. A few of these actions are: a system for improving visibility and control of assets on hand and intransit, economical use of airlift to reduce pipeline investment, the direct exchange of a serviceable item for an unserviceable item at the user level, and the phasedown of oversea depots to advance storage points in conjunction with the direct delivery of materiel from a U.S. depot to the using unit.

A cost effective analysis of the direct delivery was completed FY 72. The increased cost at the wholesale level of providing the direct support can be offset by a significant savings in levels of inventory without degradation of unit readiness, therefore, the procedure is being extended to other areas.

The Defense Supply Agency at the request of and in coordination with the Army, has instituted a similar procedure for supporting commissaries and Subsistence Depots in Europe. Recently this direct delivery system has also been extended to the Pacific theater.

Other logistics improvements have significantly reduced the number of items stocked below the continental Army depot level. The number of items authorized for stockage in overseas depots was reduced from 1,063,000 in June of 1969 to 266,747 in December 1971. Some reductions have also been made to stockage levels in continental Army installations.

The Army is continuing the intensive management effort directed toward the identification and retrograde of redistributable assets in the Pacific area in order to assure the fullest utilization of inventory and to preclude any overprocurement. In this effort to make maximum utilization of our supply resources, $297 million of these assets have been referred for redistribution to users since this project was initiated, and $686 million has been directed for return to the CONUS inventory manager.

Mr. Chairman, this concludes my presentation.

ARMY INDUSTRIAL FUND

Chairman ELLENDER. Maj. Gen. John A. Kjellstrom, director of Army budget, has a statement on the Army Industrial Fund, which will appear in the record at this point.

(The statement follows:)

STATEMENT BY MAJ. GEN. JOHN A. KJELLSTROM, DIRECTOR OF ARMY BUDGET, DEPARTMENT OF THE ARMY

Mr. Chairman and members of the Committee, I am MG John A. Kjellstrom, Director of Army Budget. I am responsible to the Comptroller of the Army for the broad management, including performance analysis of the Army Industrial Fund—a revolving fund used to finance the work performed at 31 industrial and commercial type Army activities. The fund is reimbursed by the various customer appropriations such as Operations and Maintenance, Army, Research, Development, Test and Evaluation and the Procurement appropriations. This presentation is intended to provide you gentlemen with a brief overview. It is not a request for new obligation authority. Basically the Fund is a management control system used to mobilize people, facilities, equipment, inventories and funds to accomplish the assigned mission with minimum expenditure of resources.

The Army Industrial Fund was established under provisions of Title 10 U.S.C. 2208 to provide working capital to finance research and limited quantity production of goods and services needed by the three military departments and other government agencies. The working capital of each industrial or commercial-type facility chartered under the Army Industrial Fund consists of cash allocated from the United States Treasury plus the installation's inventories of materials and supplies. Real and plant property and other types of capital equipment acquired with construction and procurement appropriations are not capitalized under the Fund.

An installation's industrial fund is used initially to pay for civilian labor, materials, overhead and incidental contractual services. The customer appropriation is billed periodically as work progresses, as deliveries are made, and when work is completed, to recoup costs incurred by the AIF.

Costs pertaining to depreciation on Government-owned plants and equipment and military pay are not paid from the Industrial Fund and, therefore, are not included in costs billed to Federal Government customers. Both depreciation and military pay costs are recorded statistically and used as one of the factors considered when making a comparison with commercial production costs and billing non-Federal customers.

USE OF THE ARMY INDUSTRIAL FUND

The Army Industrial Fund financed 31 separate activities in FY 71, 30 in FY 72 and 29 are included in FY 73. On 1 January 1970, the scope of the Army Industrial Fund financing at Lexington Blue Grass Army Depot was extended to cover depot supply activities on a test basis. Further extension to depot supply activities is being considered for FY 1974 pending a complete review of the test by the Army and Department of Defense. The AIF Budget being presented here does not reflect the effects of any planned extension of coverage.

The Army Pictorial Center which operated under the AIF in FY 1970 was inactivated 30 June 1970 and its mission reassigned to other installations within CONUS. The activity reflected in the financial statements for FY 71 was residual and no further activity will occur.

Fort Detrick, Frederick, Maryland, conducted the Army's laboratory research and development program in biological warfare. In accordance with the President's announcement on 25 November 1969, the program was reduced to defensive research. The inactivation of Fort Detrick as an AIF installation is planned for 31 March 1972. The Army Surgeon General will utilize a part of the vacated facilities but the Department of Health, Education and Welfare will occupy the majority of the laboratories in connection with their expanded cancer research program.

The estimates included in the President's Budget for FY 1973 pertain to operations at the 29 activities shown in the list which follows under the "activity group" stratification of depot maintenance, missile, munitions, weapons, transportation and terminal operations and research and development.

DEPOT MAINTENANCE FACILITIES

Anniston Army Depot, Anniston, AL: Repair and overhaul of combat vehicles, automotive equipment and armament; including renovation of ammunition. Also, provides calibration services.

Aeronautical Depot Maintenance Center (ARADMAC), Corpus Christi, TX: Repair and overhaul of basic aircraft, aircraft engines and components. Also, provides calibration services.

Atlanta Army Depot, Forest Park, GA: Repair and overhaul of aircraft, automotive, construction, general and medical equipment.

Letterkenny Army Depot, Chambersburg, PA: Repair and overhaul of automotive equipment, combat vehicles, missile systems, general equipment, and armament; including renovation of ammunition. Also, provides calibration services.

Lexington Blue Grass Army Depot, Lexington, KY: Repair and overhaul of electronics and communication equipment; renovation of ammunition; and calibration services.

New Cumberland Army Depot, Harrisburg, PA: Repair and overhaul of aircraft equipment.

Pueblo Army Depot, Pueblo, CO: Repair and overhaul of automotive equipment, combat vehicles, missile systems, armament (including renovation of ammunition) and general equipment. Also, provides calibration services.

Red River Army Depot, Texarkana, TX: Repair and overhaul of automotive equipment, combat vehicles, missile systems and armament (including renovation of ammunition).

Sacramento Army Depot, Sacramento, CA: Repair and overhaul of electronics and communications equipment. Also, provides calibration services.

Sharpe Army Depot, Lathrop, CA: Repair and overhaul of automotive equipment and aircraft.

Tobyhanna Army Depot, Tobyhanna, PA: Repair and overhaul of construction equipment, electronics and communication equipment and general equipment. Also, provides calibration services.

Tooele Army Depot, Tooele, UT: Repair and overhaul of automotive equipment, combat vehicles, construction equipment, missile systems, armament (including the renovation of ammunition) and general equipment. Also, provides calibration services.

US Army Support Center, Richmond, VA: Repair and overhaul of air support type items (parachutes, air drops, etc.); automotive and general equipment.

Charleston Army Depot, Charleston, SC: Repair and overhaul of ships, rail and general equipment.

MISSILE FACILITIES

Army Missile Command, Redstone Arsenal, AL: Research, development, production and logistical support of missile weapons systems. Also performs scientific projects for other Government agencies.

MUNITION FACILITIES

Edgewood Arsenal, Edgewood, MD: Manufacturing, depot maintenance, research and development of chemical agents and equipment.

Frankford Arsenal, Philadelphia, PA: Industrial engineering, overhaul, pilot and limited manufacturing, research and development of artillery and small arms, ammunition and fire control items.

Picatinny Arsenal, Dover, NJ: Industrial engineering, renovation, pilot and limited manufacturing, research and development of ordnance ammunition, explosives, and atomic munitions.

Pine Bluff Arsenal, Pine Bluff, AR: Manufacture and assembly of chemical munitions.

Rocky Mountain Arsenal, Denver, CO: Demilitarization of toxic munitions.

WEAPONS FACILITIES

Rock Island Arsenal, Rock Island, IL: Industrial engineering, overhaul, pilot and limited manufacturing, research and development of light and medium field artillery carriages and rocket launchers.

Watervliet Arsenal, Watervliet, NY: Industrial engineering, overhaul, pilot and limited manufacturing, research and development of artillery cannons and smaller caliber weapons.

Aberdeen Proving Ground, MD: Testing of ordnance materiel.

TRANSPORTATION AND TERMINAL FACILITIES

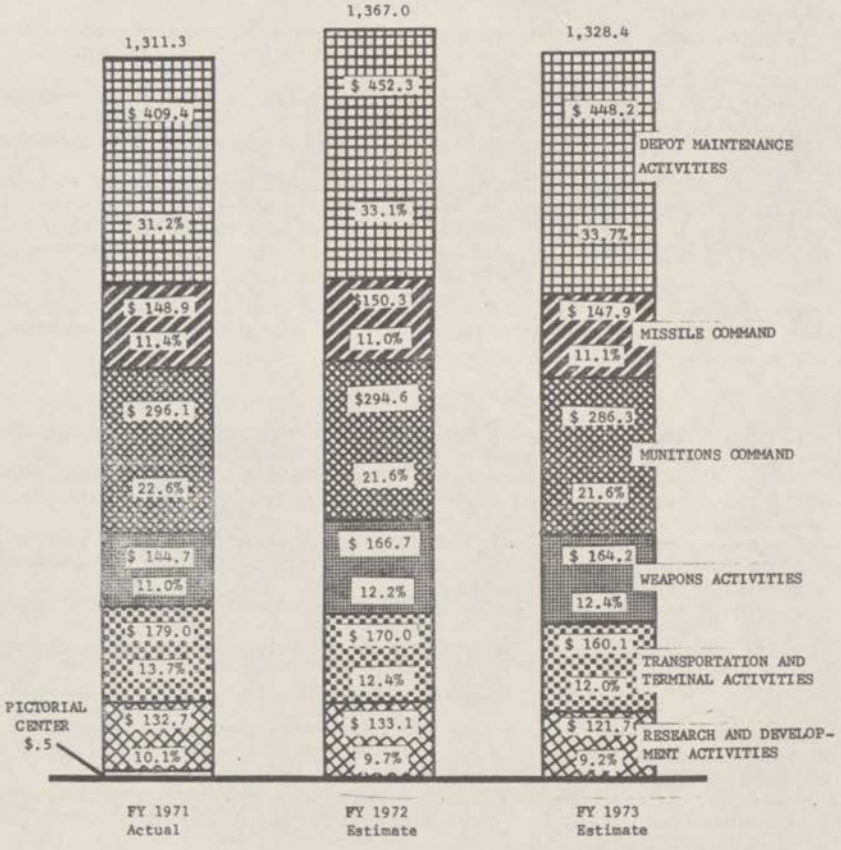
Eastern Area, Military Traffic Management and Terminal Service (MTMTS), Brooklyn, NY: Plan, regulate and control movement of personnel and cargo through waterfront terminals.

Western Area, Military Traffic Management and Terminal Service (MTMTS), Oakland, CA: Plan, regulate and control movement of personnel and cargo through waterfront terminals.

RESEARCH AND DEVELOPMENT FACILITIES (PROVING GROUNDS AND LABORATORIES GROUP)

Aberdeen Research and Development Center, MD: Basic and applied research in weapons technology, ballistics, fuels, lubricants, coatings, nuclear effects and related sciences. Also performs cost effectiveness/systems analysis, human factor research and engineering, and technical studies and evaluations.

ARMY INDUSTRIAL FUND
PROGRAM COSTS BY ACTIVITY GROUPS
June 30 1971 (Estimates for FY 1972, 1973)
(In Millions of Dollars)



Army Materials and Mechanics Research Center, Watertown, MA: Research and exploratory development in materials (metals, plastics, etc.) and mechanics for machining, forging, welding, stamping and other fabrication processes on material used in production of military materiel.

Deseret Test Center, Salt Lake City, UT: Research, development and testing of chemical warfare and defense materiel.

Harry Diamond Laboratories, Washington, DC: Research, development and industrial engineering of fuzes. Also designated as the lead laboratory for fluidics technology and nuclear effects.

PROGRAM AND FINANCING

The bar chart included on the statement furnished the committee reflects the data shown in the program and financing schedule of the President's Budget. The program costs by activity group are actual for FY 1971 and estimated for FY 1972 and FY 1973. The total cost of goods and services produced will increase from $1,311.3 million in FY 71 to $1,367.0 million in FY 72 and decline to $1,328.4 million in FY 73. The increase in FY 72 is primarily in the Depot Maintenance activity; this increase is due to cost escalation, increase in the civilian workforce and a performance rate designed to reduce the backlog of unserviceable equipment. The major portion of the increase in the Weapons Command is due to the consolidation of installation support functions at Edgewood Arsenal with Aberdeen Proving Ground.

Decreases in FY 1973 are attributable to the overall reduction in level of effort as a result of the escalated withdrawal of troops from Southeast Asia. The significant reduction in Research and Development activities is due to the deactivation of Fort Detrick as an AIF facility.

FINANCIAL STATEMENT

Revenue and expense.—The summary statement of revenue and expenses in the President's Budget shows the dollar volume of business increasing in FY 1972 compared to FY 1971 and the down turn occurring in FY 1973. The peak of operations in FY 1972 is due to the major overhaul requirements for materiel returned from Southeast Asia as well as a modernization program to upgrade the readiness of the Reserve Components.

The net operating result for the AIF in FY 1971 was a gain of a little over $1.1 million which is about 8/100 of one percent of the total revenue. The adjusted operating result was a loss of $282 thousand or 2/100 of one percent. The accumulated operating result since the inception of the AIF, as of 30 June 1971 is $5.6 million. The budgets for FY 1972 and FY 1973 have been prepared on the basis of neither gain nor loss.

STATEMENT OF FINANCIAL CONDITIONS, JUNE 30, 1971

[In millions of dollars]

	1970 actual	1971 actual	1972 estimate	1973 estimate
Assets:				
Cash	109.4	155.9	148.1	148.4
Accounts receivables	64.4	48.5	48.6	46.0
Inventories, net	37.7	29.1	33.9	32.8
Other assets	1.6	1.0	1.0	1.0
Total assets	213.1	234.5	231.6	228.2
Liabilities:				
Current liabilities	153.8	149.7	144.2	140.9
Prepayment from customers	.1	.1	.1	.1
Other liabilities	.4	−.9	1.6	1.5
Total liabilities	154.3	148.9	145.9	142.5
Capital:				
Appropriations and reappropriations	56.2	82.2	82.2	82.2
Assets capitalized less liabilities assumed, net	−3.3	−2.2	−2.1	−2.1
Accumulated operating results	5.9	5.6	5.6	5.6
Total capital	58.8	85.6	85.7	85.7
Total liabilities and capital	213.1	234.5	231.6	228.2

Assets increased in FY 1971 by $21.4 million. This increase in assets reflects the transfer of $26 million in cash from the DOD Stock Funds, coupled with a decrease in accounts receivable and net inventories. The reduction in liabilities is reflected in accounts payable. The programed reduction in cash for FY 1972

and FY 1973 is reflected in the decrease in accounts payable and slight increase in net inventories.

The cash transfer will permit a reduction in the billing cycle from twice a month to once a month in many installations.

INVESTMENT OF U.S. GOVERNMENT

The total investment or equity in the fund consists of appropriations and reappropriations, assets capitalized less liabilities assumed and the accumulated operating results. The government equity for Fiscal Years 1970 through 1973 is:

	Millions
June 30, 1970	$58.8
June 30, 1971	85.6
June 30, 1972 (estimated)	85.7
June 30, 1973 (estimated)	85.7

The $26.8 million increase in FY 1971 results primarily from the transfer of $26 million cash from DOD Stock Funds as mentioned earlier and the slight increase in FY 1972 results from cancellation of liabilities.

This concludes my formal presentation. If you gentlemen have any questions, I will attempt to answer them here, but certainly will provide full explanations for the record.

National Board for the Promotion of Rifle Practice

STATEMENT OF MAJ. GEN. JOHN A. KJELLSTROM, DIRECTOR OF ARMY BUDGET, OFFICE, COMPTROLLER OF THE ARMY

BUDGET REQUEST

Chairman Ellender. The next appropriation to be considered is that for the National Board for the Promotion of Rifle Practice for which the fiscal year 1973 request is $126,000. The appropriation for fiscal year 1972 was $122,000.

PROGRAM AND FINANCING

At this point in the record there will appear certain program and financing information from the justifications.

(The information follows:)

NATIONAL BOARD FOR THE PROMOTION OF RIFLE PRACTICE, ARMY PROGRAM AND FINANCING

[In thousands of dollars]

	1971 actual	1972 estimate	1973 estimate
Program by activities: National headquarters (total obligations)	82	122	126
Financing: Unobligated balance lapsing	20		
Budget authority (appropriation)	102	122	126
Budget authority:			
Appropriation	102	122	122
January 1972 pay increase supplemental/amendment			4

Note: The amounts shown as January 1972 pay increase supplemental/amendment are not distributed to each individual appropriation in the fiscal year 1973 President's budget, but are reflected as a 1-line defensewide contingency amount. The amounts shown above are estimates, pending final determination of the amounts to be requested when supplemental and amended estimates are formally transmitted.

CIVILIAN MARKSMANSHIP PROGRAMS

Chairman Ellender. You may proceed.

General Kjellstrom. Yes, sir; the National Board for the Promotion of Rifle Practice was established for the promotion of civilian marksmanship programs throughout the United States.

Chairman Ellender. Is that all we furnish to the program?

General Kjellstrom. Yes, sir; we provide administrative support. We provide eight civilian personnel, one military personnel, and then we provide free ammunition and targets to junior rifle clubs throughout the United States.

PROGRAM TOTAL COST

Chairman Ellender. Is the total cost for all these services $126,000?

General Kjellstrom. The total cost is $126,000, plus approximately $85,000 worth of ammunition provided through the procurement appropriation.

Chairman ELLENDER. That is furnished free of charge?

General KJELLSTROM. It is furnished free of charge to junior rifle and pistol clubs throughout the United States.

BOARD PERSONNEL AND RIFLE CLUBS

Chairman ELLENDER. How many clubs are included in the program?

General KJELLSTROM. We have eight civilian personnel involved in this program to administer the program. There are 3,079 junior rifle clubs throughout the United States, with approximately 175,000 individual members receiving varying degrees of support.

Chairman ELLENDER. Where are those eight people?

General KJELLSTROM. They are in the Washington area, sir, at the board headquarters.

DISTRIBUTION OF AMMUNITION

Chairman ELLENDER. Do you supply this ammunition according to the number of people using it?

General KJELLSTROM. Yes, sir. There are qualifications established for the various clubs to receive the support. Approximately one-third of the clubs receive full support with two-thirds receiving limited support.

Chairman ELLENDER. The only thing you furnish in the ammunition?

General KJELLSTROM. Yes, sir. It is a .22-caliber ammunition and the targets and materials.

Chairman ELLENDER. Are weapons provided?

General KJELLSTROM. The .22-caliber weapons are provided through this program, sir.

(The prepared statement follows:)

NATIONAL BOARD FOR THE PROMOTION OF RIFLE PRACTICE, ARMY

Mr. Chairman and members of the committee, it is my privilege to once again appear before this committee to discuss the activities of the National Board for the Promotion of Rifle Practice and the Civilian Marksmanship Program, and to request funds to support these programs in fiscal year 1973.

In fiscal years 1971 and 1972, Congress substantially increased the funds allocated to these programs. The additional funds were used to finance activities that had been discussed during hearings before this committee, and included hiring three additional office personnel and purchase and issue of qualification medals and badges, as well as small bore rifle targets.

Support by the Director of Civilian Marksmanship is limited to junior marksmanship activities consisting of boys between the ages of 12 and 19 years. The Civilian Marksmanship Program provides newly organized junior rifle clubs 300 rounds of caliber .22 ammunition per member, per year, for at least the first two years of the club's participation in the program. If resources permit, support may be provided beyond the first two years to those clubs most recently enrolled. Clubs no longer eligible to receive free ammunition may purchase ammunition from the Army at cost plus handling and shipping charges. Newly enrolled clubs are also issued caliber .22 target rifles on an indefinite loan basis. No expense to the government or the club is incurred in the loan of this equipment.

As of 30 June 1971, a total of 3,079 clubs with approximately 175,000 individual members were receiving varying degrees of support from the office of the Director of Civilian Marksmanship. During the coming year, we expect to lose some clubs which are presently in the process of disbanding due to loss of range facilities and inability to function effectively without Government support. However, we have reason to believe that new enrollments will substantially off-

set these losses, and that the number of clubs in the program by the end of fiscal year 1973 will probably exceed the present strength. We further believe that the current level of support authorized will be adequate to provide assistance to that number of clubs.

The fiscal year 1973 budget request for the National Board for the Promotion of Rifle Practice is $126,000, which includes the increased funds provided in fiscal year 1972, as well as $4,000 necessitated by the January 1972 pay increase.

In 1971, the National Board for the Promotion of Rifle Practice again authorized the National Rifle Association to conduct four National Trophy Matches at the 1971 NRA National Rifle and Pistol Championships held at Camp Perry, Ohio, following the policy which had been applied in 1969 and 1970. The number of individual civilian competitors and civilian teams participating in the 1971 National Trophy Matches was slightly higher than in 1970, although the total number of participants in these matches was somewhat below the 1971 level.

The National Board for the Promotion of Rifle Practice requests continuation of the general provision to provide ammunition to the Civilian Marksmanship Program on a non-reimbursable basis from stocks of the Department of Defense as proposed in the President's budget.

Gentlemen, this concludes my statement.

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AIRCRAFT PROCUREMENT, ARMY

MISSILE PROCUREMENT, ARMY

PROCUREMENT OF WEAPONS AND TRACKED COMBAT VEHICLES, ARMY

PROCUREMENT OF AMMUNITION, ARMY

OTHER PROCUREMENT, ARMY

STATEMENT OF MAJ. GEN. GEORGE M. BUSH, ASSISTANT DEPUTY CHIEF OF STAFF FOR LOGISTICS (PROGRAMS AND BUDGET)

BUDGET REQUESTS

Chairman ELLENDER. We shall now consider the five Army procurement appropriations for fiscal year 1973 which are as follows:

Aircraft Procurement, Army, $134,500,000; Missile Procurement, Army, $1,153,400,000; Procurement of Weapons and Tracked Combat Vehicles, Army, $259,500,000; Procurement of Ammunition, Army, $1,129,200,000; Other Procurement, Army, $648,800,000.

These total $3,325,400,000 as compared with the fiscal year 1972 appropriations of $3,107,320,000.

PROGRAM AND FINANCING

At this point in the record I shall insert the program and financing information from the justifications for all five of these Procurement Appropriations.

(The information follows:)

AIRCRAFT PROCUREMENT, ARMY
PROGRAM AND FINANCING
[In thousands of dollars]

	Budget plan (amounts for procurement actions programed)			Obligations		
	1971 act	1972 estimate	1973 estimate	1971 act	1972 estimate	1973 estimate
Program by activities:						
Direct:						
1. Aircraft		35,000	20,000		25,000	24,700
2. Modification of aircraft		36,000	60,900		28,000	47,700
3. Spares and repair parts		9,000	16,700		7,500	13,100
4. Support equipment and facilities		25,800	36,100		20,000	29,300
Total direct		106,600	134,500		81,300	114,800
Reimbursable (total)		38,700	45,000		27,200	41,000
Total		145,300	179,500		108,500	155,800
Financing:						
Receipts and reimbursements from—						
Federal funds		−31,000	−36,000		−31,000	−36,000
Trust funds		−7,700	−9,000		−7,700	−9,000
Unobligated balance available, start of year for completion of prior year budget plans						−36,800
Unobligated balance transferred from other accounts		−16,200			−16,200	
Unobligated balance available, end of year for completion of prior year budget plans					36,800	60,500
Budget authority		90,400	134,500		90,400	134,500

MISSILE PROCUREMENT, ARMY
PROGRAM AND FINANCING
[In thousands of dollars]

	Budget plan (amounts for procurement actions programed)			Obligations		
	1971 act	1972 estimate	1973 estimate	1971 act	1972 estimate	1973 estimate
Program by activities:						
Direct:						
1. Antiballistic missile system	612,500	716,400		550,100	692,000	
2. Other missiles	291,600	325,500		267,600	311,500	
3. Modification of missiles	39,600	27,400		25,200	29,200	
4. Spares and repair parts	47,000	62,300		39,300	62,800	
5. Support equipment and facilities	42,600	21,800		35,500	17,400	
Total direct	1,033,300	1,153,400		917,700	1,112,900	
Reimbursable (total)	31,000	36,000		25,100	29,300	
Total	1,064,300	1,189,400		942,800	1,142,200	
Financing:						
Receipts and reimbursements from—						
Federal funds	−24,800	−28,800		−24,800	−28,800	
Trust funds	−6,200	−7,200		−6,200	−7,200	
Unobligated balance available, start of year:						
For completion of prior year budget plans						−121,500
Available to finance new budget plans		−7,520				−7,520
Unobligated balance transferred from other accounts	−100,000			−100,200		
Unobligated balance available, end of year:						
For completion of prior year budget plans				121,500	163,700	
Available to finance subsequent year budget plans	7,520	7,520		7,520	7,520	
Budget authority	940,820	1,153,400		940,820	1,153,440	

PROCUREMENT OF WEAPONS AND TRACKED COMBAT VEHICLES
PROGRAM AND FINANCING
[In thousands of dollars]

	Budget plan (amounts for procurement actions programed)			Obligations		
	1971 actual	1972 estimated	1973 estimated	1971 actual	1972 estimated	1973 estimated
Program by activities:						
Direct:						
1. Tracked combat vehicles	103,300	189,100		101,500	186,000	
2. Weapons and other combat vehicles	42,200	70,000		39,500	59,000	
Total direct	145,500	259,500		141,000	245,000	
Reimbursable (total)	108,500	126,000		76,000	102,400	
Total	254,000	385,500		217,000	347,400	
Financing:						
Receipts and reimbursements from—						
Federal funds	−86,800	−100,800		−86,800	−100,800	
Trust funds	−21,700	−25,200		−21,700	−25,200	
Unobligated balance available, start of year for completion of prior year budget plans						−37,000
Unobligated balance available, end of year for completion of prior year budget plans				37,000	75,100	
Budget authority	145,500	259,500		145,500	259,500	

PROCUREMENT OF AMMUNITION, ARMY
PROGRAM AND FINANCING
[In thousands of dollars]

	Budget plan (amounts for procurement actions programed)			Obligations		
	1971 actual	1972 estimated	1973 estimated	1971 actual	1972 estimated	1973 estimated
Program by activities:						
Direct:						
1. Ammunition	1,488,000	899,500		1,400,000	852,000	
2. Ammunition production base support	230,300	229,700		184,000	240,000	
Total direct	1,718,300	1,129,200		1,584,000	1,092,000	
Reimbursable (total)	472,800	649,000		328,000	566,000	
Total	2,191,100	1,778,200		1,912,000	1,658,000	
Financing:						
Receipts and reimbursements from—						
Federal funds	−483,200	−544,200		−483,200	−544,200	
Trust funds	−89,600	−104,800		−89,600	−104,800	
Unobligated balance available, start of year for completion of prior year budget plans					−279,100	
Unobligated balance transferred from other accounts	−200,000			−200,000		
Unobligated balance available, end of year for completion of prior year budget plans				279,100	399,300	
Budget authority	1,418,300	1,129,200		1,418,300	1,129,200	

OTHER PROCUREMENT, ARMY
PROGRAM AND FINANCING
[In thousands of dollars]

	Budget plan (amounts for procurement actions programed)			Obligations		
	1971 act	1972 estimate	1973 estimate	1971 act	1972 estimate	1973 estimate
Program by activities:						
Direct:						
1. Tactical and support vehicles	202,700	229,900		155,000	211,000	
2. Communications and electronics equipment	152,700	193,100		40,000	125,500	
3. Other support equipment	143,400	225,800		111,200	190,800	
Total, direct	498,800	648,800		306,200	527,300	
Reimbursable (total)	124,000	144,000		86,800	123,700	
Total	622,800	792,000		393,000	651,000	
Financing:						
Receipts and reimbursements from—						
Federal funds	−99,200	−115,200		−99,200	−115,200	
Trust funds	−24,800	−28,800		−24,800	−28,800	
Unobligated balance available, start of year:						
For completion of prior year budget plans					−229,800	
Available to finance new budget plans		−13,500			−13,500	
Unobligated balance available, end of year:						
For completion of prior year budget plans				229,300	371,600	
Available to finance subsequent year budget plans	13,500	13,500		13,500	13,500	
Budget authority	512,300	648,600		512,300	648,800	

SHIFT FROM REPLENISHMENT TO READINESS BUDGET

Chairman ELLENDER. The principal witness on all of these requests will be Maj. Gen. George M. Bush, Assistant Deputy Chief of Staff for Logistics.

General BUSH. Thank you, Mr. Chairman.

I am Major General Bush, Assistant Deputy Chief of Staff for Logistics for Programs and Budget.

It is a privilege to appear before this committee on behalf of the Army's fiscal year 1973 budget request for the procurement of military equipment and ammunition. During the past several years the Army's procurement budgets have been essentially replenishment budgets. The fiscal year 1973 budget shifts more to a readiness-oriented budget. The fiscal year 1973 procurements will, for the most part, replace Vietnam losses and normal peacetime losses; in addition, however, this budget provides improvements in inventory position, particularly for North Atlantic Treaty Organization—NATO—oriented line items.

NATO ORIENTED ITEMS

Chairman ELLENDER. Will you give us an example of the NATO-oriented items?

General BUSH. Yes, sir; we are referring here to items such as the M–60 tanks, the DRAGON and TOW missiles; the HAWK, PERSHING, and LANCE missiles, the TOWED VULCAN; and the MUST, the medical unit self-contained transportable hospital components.

Chairman ELLENDER. These are for our own forces?

General BUSH. These that I have reference to are primarily for our forces. However, we do have some of the same items furnished to other countries on a sales basis.

Chairman ELLENDER. But the amount you are asking for is to cover the cost of such military hardware for use by our own forces?

General BUSH. That is correct.

Chairman ELLENDER. How does your fiscal year 1973 request compare to the fiscal year 1972 program when all the transfers and adjustments are considered?

1973 FUNDING DECREASE

General BUSH. Sir, the amount we are asking for in the fiscal 1973 budget is less than that which was requested for the fiscal year 1972 budget as Congress appropriated money. However, there were some appropriation transfers for the use of prior year funds such that the newly appropriated dollars were actually less than that which we requested. We were directed use $200 million for prior year funds for ammunition, and $100 million in missiles, and $17 million for aircraft, a total in excess of $300 million of prior year funds.

SUPPORT OF FREE WORLD FORCES

Chairman ELLENDER. You were present when General Kjellstrom and I discussed the funds included in the Army budget for the support of free world forces. As I recall the procurement requests include about $630 million for this purpose.

General BUSH. That is correct, Mr. Chairman. I will be covering that later in my statement.

Chairman ELLENDER. Proceed.

COMPARISON OF APPROPRIATIONS

General Bush. Chart 1 places the fiscal year 1973 procurement request of $3.325 billion in perspective with other appropriation estimates and with the overall Direct Army Budget Plan of $22.741 billion. The procurement portion is approximately 15 percent of the Army total.

(Chart 1 follows:)

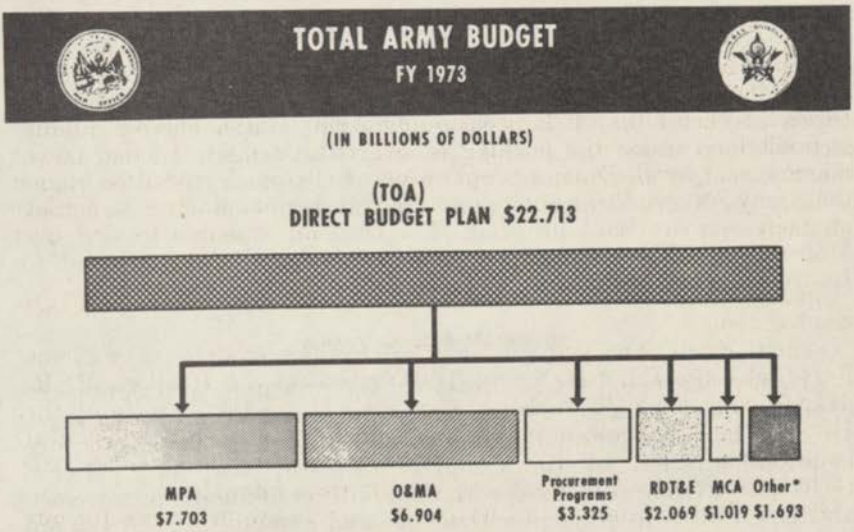


CHART 1

PROCUREMENT—OVERHAUL COMPARISON: READINESS EXPENDITURE

General Bush. In the development of the planned procurements to be included in this fiscal year 1973 budget request, a comparisen was made of individual items against the estimated plan of overhaul for the same items, and adjustments were made between the procurement and overhaul programs to achieve more readiness for the dollars expended.

Chairman Ellender. Is the overhaul program conducted in this country or abroad?

General Bush. Both, sir. As you know, Mr. Chairman, we have been reminded from time to time by the Congress that on the average for 25 percent of the cost of the new item we can get it completely remanufactured. We have been criticized in the past for having what is called an unfunded backlog of overhaul items at the same time we are buying new items. The question was raised, "why are you going out and buying new items when you have an unfunded backlog of items?"

Now, the unfunded backlog that we have had has been not only in Southeast Asia, but in Taiwan, in Okinawa, in Europe and in the continental United States. We have followed a general policy of overhauling wherever it is most economic to do so consistent with the requirements for adequate quality in that overhaul, and consistent with the urgency of the requirement, that is, the turn around time, for example, for shipment of an item back to the continental United States, with the cost of that being included as part of the economics in deciding whether overhaul is to be done.

The overhaul which of course is funded under the O. & M.A. appropriation which you were just addressing is not included as the normal part of the procurement appropriation. But I make the point to emphasize the fact that in its management of overall end items the Department of the Army is giving increasing attention to this requirement for proper balancing between the overhaul and the procurement programs.

Chairman ELLENDER. Proceed.

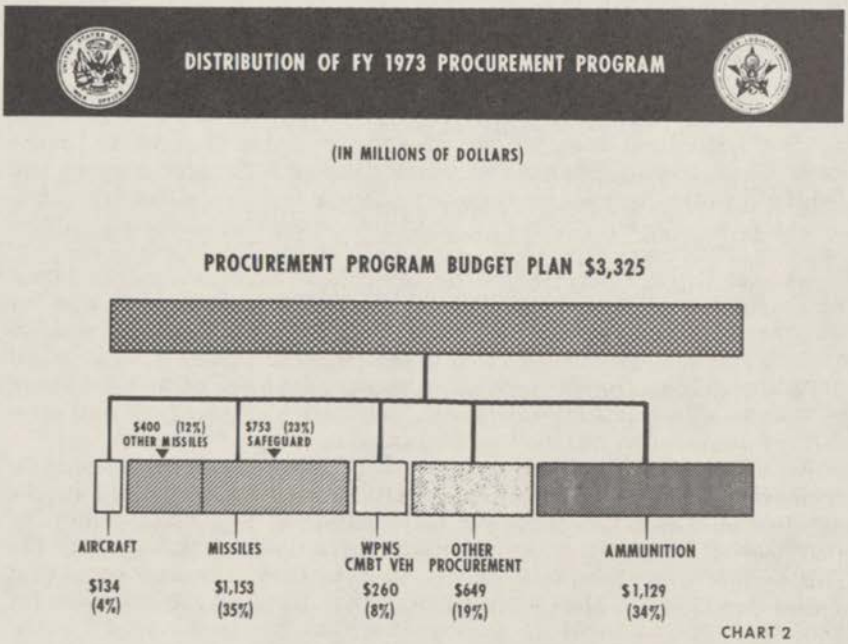
TRADEOFFS BETWEEN FUNDING OVERHAUL BACKLOG AND PROCUREMENT

General BUSH. A proper balance between the procurement of additional quantities of a major item and the overhaul of existing inventories has been a matter for continuing Army study. The basic policy is don't buy unless the backlog of overhaul items is funded to the management level. During preparation of the fiscal year 1973 budget the Army followed this policy and used tradeoff techniques to achieve an increased overhaul program. The tradeoff amounts totaled over $150 million. These techniques will be continued and improved for future budgets as well.

PROGRAM PERCENTAGES

The next chart—Chart 2—breaks out the procurement programs for fiscal year 1973 on a percentage basis by appropriation. Note that we are budgeting this year in accordance with the five procurement appropriations directed by the Congress in fiscal year 1972. SAFEGUARD—$745 million total with $753 million in missile procurement and $1.4 million in other procurement—and ammunition—$1,129 million—account for 57 percent of the total.

(Chart 2 follows:)



1972–1973 APPROPRIATION COMPARISON

General Bush. Chart No. 3 compares, by budget appropriations, our fiscal year 1973 request with the fiscal year 1972 program. I will give you an overview of each appropriation and then later amplify each in detail.

(Chart 3 follows:)

CHART 3

PROCUREMENT ARMY, FISCAL YEAR 1973

[In millions of dollars]

	Fiscal year 1972	Fiscal year 1973	Comparison fiscal year 1972 to fiscal year 1973
1. Aircraft procurement, Army	106.6	134.5	+27.9
2. Missiles procurement, Army	1,033.3	1,153.4	+120.1
3. Procurement of weapons and tracked combat vehicles, Army	145.5	259.5	+114.0
4. Procurement of ammunition, Army	1,718.3	1,129.2	−589.1
5. Other procurement, Army	498.8	648.8	+150.0
Total	3,502.5	3,325.4	−177.1

AIRCRAFT PROCUREMENT

General Bush. First, the Aircraft Procurement, Army appropriation request is for $134.5 million. This is an increase of $27.9 million over the fiscal year 1972 revised request of $106.6 million. Even more significant is the change in emphasis. The fiscal year 1972 program included $35 million for observation helicopter procurement and only $36 million for modification programs. By contrast, the fiscal year 1973 program reflects no Army helicopter procurement other than the six White House helicopters and an approximately 70-percent increase in funds for modifications. Also, the Army will receive 120 UH–1H helicopters as payback from the U.S. Air Force. Previously, the Army had provided UH–1H helicopters to the U.S. Air Force who in turn had used these helicopters to equip the Vietnamese Air Force.

MISSILE PROCUREMENT

The Missile Procurement, Army Appropriation request of $1,153 million is $120 million more than the revised fiscal year 1972 program of $1,033 million. This increased funding requirement is the result of increases in SAFEGUARD, DRAGON, HAWK, and LANCE missiles, and in missile spares and repair parts.

WEAPONS AND TRACKED COMBAT VEHICLES

The Procurement of Weapons and Tracked Combat Vehicles request of $259.5 million is $114 million higher than the revised fiscal year 1972 program of $145.5 million. A major portion of the $114 million increase is attributed to modification costs of the M60A2 tank. We have satisfactorily investigated and engineered corrections in turret stability and system reliability in the M60A2. The fiscal year 1972 modification program for 210 tanks was initiated in December 1971. This budget provides funds for the remaining 316. In addition, the budget provides for the procurement of 166 M60A1 tanks.

Production of the M60A1 tanks, together with the production-retrofit of the M60A2 152-mm. gun tanks, enables the Army to continue its program of converting the tank inventory to those types mounting the 105-mm. gun or better.

Chairman ELLENDER. You referred to the M60A2 tank. Is that the tank you used to refer to as the M60A1E2?

General BUSH. Yes, sir.

Chairman ELLENDER. Have any of the M60A2 tanks been delivered?

General BUSH. Sir, parts of the total of 540 tanks in this program but none of the completely modified ones. As you recall, we had initiated the production of the tanks, and components of this total program of 540. We had difficulty setting through Engineering Test and Service Test. The program was stopped and we then set aside a number of these already assembled tanks and parts.

We directed Chrysler to review the tank and decide what we needed to have done. We retrofited and ran 14 of these tanks through an extended test program. The test program on those tanks resulted in satisfactory completion of the Engineer Test, Service Test, type classification by the Army, standard "A," and go-ahead.

The go-ahead is for modification of the total remaining 526 tanks, 210 of which you authorized and appropriated money for last year, and the remaining 316 we are asking for this year. We awarded the contract to Chrysler for a go-ahead on this retrofit based on the results of the ETST which will result in complete tanks being delivered in the future. So we don't have any of those off the line yet, sir.

Chairman ELLENDER. I recall that your initial effort to produce these tanks was a failure. That is correct, is it not?

General BUSH. Yes, sir. That is correct.

Chairman ELLENDER. Are you requesting funds for the production of the M60A2 tank, or to modifying existing tanks?

General BUSH. We are here merely retrofitting or modifying the tanks which we previously had this difficulty with that you made reference to.

Chairman ELLENDER. You are requesting $102.5 million for the M–60A2 tank program. How many tanks will be modified with these funds?

General BUSH. There are a total of 316 tanks on which we will place the modifications with the money that we are requesting in fiscal year 1973. We will be adding those fiscal year 1973 dollars that we are requesting to the amount that you appropriated for us last year, $32.6 million.

Chairman ELLENDER. Your request includes aboout $50 million for the procurement of additional M60A1 tanks. Will these new tanks have to be modified?

General BUSH. The Chrysler Corp. is operating the Government-owned tank plant in Warren, Mich., will accomplish the M60A1 production with approved modifications installed.

Chairman ELLENDER. That is on the new tanks you are purchasing?

General BUSH. Yes, sir.

SECOND PRODUCT IMPROVEMENT PROGRAM: RETROFIT ITEMS

Chairman ELLENDER. On those that you have in hand, will that be done in-house or will it be done by contract?

General BUSH. Both, sir. There is a M60A1 product improvement program, the dollars for which are not reflected in this total of $102.5 million. This second product improvement program includes a number of the features that we will have on the M60A2 tank. They will, in fact, be applied to the existing M60A1 tank. These include features such as, the improved air cleaners, the add-on stabilization system, and the improved track. These improvements will be applied in retrofit to the existing inventory at such time as the dollars have been appropriated for that purpose. We have initiated action on those product improvements We have not yet begun retrofit, when we do, part will be contract; part in-house.

Chairman ELLENDER. What is the funding request?

General BUSH. We have $9.8 million in this budget request for the initiation of that product improvement program.

FUTURE FUNDING REQUIREMENTS

Chairman ELLENDER. Will that be the total necessary to modernize them?

General BUSH. No, sir. That really will just get the program underway. The amount of dollars necessary to put all of these product improvements under the total fleet, which is, I would say, the upper limit of the potential, would be substantially greater than that. We are probably talking about upgrading the performance of our M60 tank fleet to include all of these elements probably costing $80,000 as an order of magnitude.

Chairman ELLENDER. $80,000?

General BUSH. $80,000 per tank. This is taking the existing tank at the time it goes in for its regular overhaul, instead of putting the old type track on the tanks, for instance, we would put on the new T–142 track. Instead of remanufacturing and reassembling the old air cleaner we will modify it at that time and put on the new air cleaner.

This, Mr. Chairman, is expected to take place over a long period of time. We are currently programing a quantity for this retrofit. It is 540 tanks per year. If we retain that rate it will take us approximately [deleted] years to include this total retrofit of all these elements in the program.

Chairman ELLENDER. Are you utilizing the tank in the meantime?

General BUSH. In the meantime, Mr. Chairman, those that are in the inventory are continuing to be used. At the time of overhaul those tanks will have applied to them those elements of the product improvement program that have been approved, and right now only includes the track and the air cleaner on those units that are being overhauled right now. In the fiscal year 1974 program, we will get into this, again assuming authorization, and appropriation moneys for that purpose, we would expect to get into a considerably increased program. So we are continuing to maintain our readiness with the tanks which we have on hand.

Senator ALLOTT. Mr. Chairman, could I ask just a couple of questions for my own edification.

Chairman ELLENDER. Certainly.

AIR CLEANER COST

Senator ALLOTT. No. 1, why is the air cleaner such an expensive item? Or are the tracks the expensive item in this area? The sum of $80,000 is a large amount of money to me.

General BUSH. The $80,000 is a substantial amount of money to me, too, sir. The $80,000 I was indicating is the total for all improvements for a single tank and not the amount required just for these two increments that I am addressing right now. I was trying to explain that these product improvements as we come up with the engineering necessary to introduce them will be accomplished over a period of time. At such time as we have the total package ready to go there would be an increase in funding required for the product improvement.

ENGINES

Senator ALLOTTT. What kind of engine do these tanks have?

General BUSH. Continental 1790 diesel engines.

Senator ALLOTT. Is that air cooled, radial, or what?

General BUSH. Air-cooled engines.

Senator ALLOTT. Is it radial or horizontal?

General BUSH. Horizontal.

HORSEPOWER

Senator ALLOTT. What is the horsepower of it?

General BUSH. About 750 horsepower.

Senator ALLOTT. What is its adaptability so far as fuel is concerned? Just standard diesel fuel?

General BUSH. Yes, sir. It is not multifuel, if that is what you have reference to.

Senator ALLOTT. Thank you, sir.

OVERHAUL ELEMENTS: PROGRAM REVIEW

Chairman ELLENDER. In making the modifications to the air cleaner and the track, do you expect to come back to the same tanks and put in other modifications later?

General BUSH. Let me first qualify my answer, Mr. Chairman, by stating that the program is under review because the Department of the Army is not entirely satisfied with the total amount of time that it would take to get all of these product improvements added. It is particularly important now because of the additional time necessary to get our followon tank fielded as a result of the termination of the old program and the addition of the new MBT program. Improvement of our existing fleet takes on increasing importance. I would want to qualify my answer to indicate that the rate at which this is to be done is in fact under study. However, the program as we currently have it would envision that at the time of overhaul only those elements of the product improvement program that had been proved and tested would be applied. We normally rebuild our tanks every 5,000 miles. Hence, that tank coming back for repeated overhauls, could be incrementally

improved. Because this is not necessarily either the fastest nor the most economical way to do it, we have this under review to determine if it is the most cost effective way in which this should be accomplished.

Chairman ELLENDER. Proceed.

PROCUREMENT OF AMMUNITION

General BUSH. If there are no further questions on the tank program, I will summarize the ammunition and other procurement programs.

The "Procurement of Ammunition," Army appropriation decrease of $589.1 million is attributed to the phase-down of combat operations of U.S. Forces in Vietnam and the continuation of our long-range plan for sustaining an active production base for ammunition in lieu of more costly procurement and storage of larger mobilization reserve stocks.

OTHER PROCUREMENT

The "Other Procurement," Army appropriation request of $648.8 million is $150 million higher than the revised fiscal year 1972 program of $498.8 million. The increased funding requirements represent increases in commercial vehicles, in communications and electronics equipment, and in other support equipment. The increase in commercial vehicles is directly responsive to congressional suggestions. The tactical vehicle program is soundly based on requirements but constrained by conformance with pollution control regulations. The increase in communications and electronics equipment is for the procurement of defense satellite communications system equipment, Communications Security (COMSEC) equipment, multichannel transmission and termination equipment Army Area Communications Systems (AACOMS), radio set AN/GRC–106, automatic data processing equipment, Southeast Asia operational sensor systems, and advanced production engineering for the Forward Area Tactical Teletype (FATT).

OTHER SUPPORT EQUIPMENT

The increase in "Other Support Equipment," is for procurement of such items as float-ribbon bridges CB—chemical-biological—shelter collective protective system, cranes, floating equipment, materials handling equipment and generators. In addition this appropriation includes funds for medical support equipment which was funded by the O. & M.A. appropriation in fiscal year 1972.

The net decrease in the fiscal year 1973 budget is nearly $200 million.

1972 PROCUREMENT APPROPRIATIONS: PRIOR YEAR FUNDS AND AUGMENTATION AND MODERNIZATION SALE RECEIPT

Chart 4 displays information relative to the current fiscal year 1972 procurement appropriations. Listed under the "Enacted" column are those amounts found in Public Law 92–204, Department of Defense Appropriation Act, 1972. Provisions within the act allow for the transfer of prior year funds in the missile procurement and procurement of ammunition appropriations in the amounts of $100 million and $200 million respectively. In addition, receipts from augmentation and modernization sales in the procurement of ammunition appropriation are to finance $100 million of the fiscal year 1972 program.

Congress also specified in the House of Representatives Report No. 92–666, dated November 11, 1971, the use of $17 million of prior year funds to finance the fiscal year 1972 aircraft procurement program.

(Chart 4 follows:)

CHART 4

BUDGET TRACK FROM ENACTMENT TO FISCAL YEAR 1972 COLUMN OF FISCAL YEAR 1973 BUDGET

FISCAL YEAR 1972

[In thousands of dollars]

Appropriation	Enacted	Prior year fund transfers	OSD adjustments	Fiscal year 1972 column of fiscal year 1973 budget (TOA)
Aircraft procurement, Army	90,400	17,000	−800	106,600
Missile procurement, Army	940,820	100,000	−7,520	1,033,300
Procurement of weapons and tracked combat vehicles, Army	145,500			145,500
Procurement of ammunition, Army	1,418,300	[1] 300,000		1,718,300
Other procurement, Army	512,300		−13,500	498,800
Total	3,107,320	[1] 417,000	−21,820	3,502,500

[1] Includes $100,000,000 in anticipated reimbursements.

DOD REDUCTIONS

General Bush. Finally, the Office of the Secretary of Defense (OSD) has reduced the aircraft procurement appropriation by $800,000, the missile procurement appropriation by $7.5 million, and the other procurement, Army appropriation by $13.5 million.

I will now discuss each appropriation separately.

Aircraft Procurement

BUDGET REQUEST

General Bush. The Army's budget request for "Aircraft procurement, Army," for fiscal year 1973 totals $134.5 million.

(Chart No. 5 follows:)

Fiscal year 1973 aircraft authorization request for U.S. Army aircraft systems

	Millions
Aircraft (quantity):	
Airplane, utility, U–21 (20)	$12.7
Helicopter, utility, VH–1N (6)	8.1
Total	20.8
Modification of aircraft:	
AH–1G, Cobra	10.1
CH–47, Chinook	14.1
OH–58, Kiowa	3.9
OV–1, Mohawk	13.3
UH–1, Iroquois	9.8
Miscellaneous	9.7
Total	60.9
Spares and repair parts	16.7
Support equipment and facilities	36.1
Total Aircraft Procurement, Army	134.5

INVENTORY POSTURE

General BUSH. With the continued withdrawal from Southeast Asia, and because the inventory objectives of our baseline force structure are lower than those of the temporary forces in the structure during the height of SEA, our projected inventory posture on most aircraft does not require additional procurement in fiscal year 1973.

VH–1N HELICOPTER AND U–21F AIRCRAFT

Funds in the amount of $8.1 million for six VH–1N helicopters and $12.7 million for 20 U–21F aircraft are requested. The six helicopters will be used to support the Presidential flight detachment and the 20 aircraft will be used for command and staff transport.

UH–1H HELICOPTER PAYBACK BY AIR FORCE

The Army will receive from the fiscal year 1973 program 120 UH–1H helicopters as a payback from the Air Force. Originally, the Air Force was tasked with providing UH–1H's to the Vietnamese Air Force (VNAF), but the Air Force could not procure the necessary helicopters in the time frame required. The Army agreed to provide UH–1H's from existing assets which would be repaid on a one for one basis by the U.S. Air Force. The paybacks of the UH–1H's to the Army is essential in order to maintain Army readiness.

AIRPLANE, UTILITY, U–21F (UTE)

Chairman ELLENDER. The aircraft data sheet on the U–21 utility aircraft will be included in the record at this point.

(The information follows:)

FISCAL YEAR 1973 PRESIDENT'S BUDGET ESTIMATE—AIRCRAFT DATA SHEET

Nomenclature: Airplane, Utility, U–21—Popular Name: Ute

Description/Mission.—The U–21A is an all metal twin engine, turboprop, low-wing monoplane equipped with a retractable tricycle landing gear. The passenger-cargo compartment is designed to be used under four different arrangements: 1. Liaison transport seating six; 2. Troop transport seating ten; 3. Air ambulance; 4. General cargo. The U–21F is the same basic design as the U–21A; the primary difference is altitude pressurization, a different engine, and a slightly larger fuselage.

COST DATA

[In millions of dollars]

	Fiscal year—								Current estimate total program [1]
	1970 and prior	1971	1972	1973	1974	1975	1976	1977	
Aircraft procurement:									
Quantity	124	0	0	20					
Cost	42.4	0	0	12.7					
Less: Advance procurement—prior year	0	0	0	0					
Net aircraft cost, current year	42.4	0	0	12.7					
Plus: Advance procurement, current year	0	0	0	0					
Total, aircraft cost	42.4	0	0	12.7					
Aircraft program unit cost	.342	0	0	.635	[deleted]				
Initial spares	7.7	0	0	0					
R.D.T. & E	0	0	0	0					
Milcon	0	0	0	0					
Program acquisition cost	50.1	0	0	12.7					
Average program unit cost	.404	0	0	.635					
Total additional costs	3.5	0	.9	.3					

[1] Reflects program through fiscal year 1977.

Basis for FY 1973 Budget Request: The 20 U–21F aircraft are required to provide safe and dependable transportation where minimum enroute altitudes, severe weather, range, and traffic density prohibit or adversely affect flights when non-pressurized aircraft are used. This is a phased procurement to fill the most critical shortages.

Test Data.—U–21A.

a. Engineering Flight Tests completed May 1968.

b. Initial production tests completed June 1968.

c. Initial production tests, desert and high elevation tests completed September 1968—Arctic test waived since aircraft was in use in Alaska.

d. Logistical evaluation test completed November 1968.

e. Type classified Standard A January 1970.

Contract Data.—	*Contractor*
Airframe	Beech Aircraft Corporation, Wichita, Kans.
Engine	Pratt and Whitney, Clarksburg, W. Va.

Characteristics.—

	Item model, series	
	U–21A	U–21F
Maximum takeoff weight	9,650	11,500.
Length wing span	35'6"/45'10.5"	39'11.4"/45'10.5".
Cruising speed (knots)	182	237.
Range (nautical miles)	805	1,380.
Crew/passengers	2/6	2/7
Engines, number/design	2/PT6A–20	2/PT6A–29.

[Deleted.]

COST HISTORY COMPARISON

The Army made a decision in FY 1966 to fill all future shortages of utility fixed wing aircraft with turbine powered aircraft. The FY 1973 procurement will provide 20 pressurized twin engined aircraft to fill the most critical shortages where safe and dependable transportation is adversely affected when non-pressurized aircraft are used due to minimum enroute altitudes, severe weather, range and traffic density. Future buys of utility airplanes will be predicated on filling shortages to authorized acquisition objectives, modernization and replacement of losses to the inventory. No procurement of utility airplanes is programed beyond FY 1974. The last procurement of U–21A/F aircraft was from Beech aircraft and are basically off-the-shelf commercial aircraft. Competitive procurement is planned in FY 1973 with an estimated date of contract award in December 1972.

General Bush. The first item, the U–21F aircraft is an improved version of our U–21A which provides pressurization for sustained operations above 10,000 feet. It also offers increased fuel capacity and a navigation capability which, when coupled with high altitude operation, will result in increased range and endurance over the U–21A. We currently plan to assign these aircraft to various Military Assistance Advisory Groups located in geographic areas where high en route altitudes are needed to overcome difficult terrain or where there is little or no alternate means of transportation, and to certain selected major commands. The U–21F will provide commanders with immediate response for urgent transportation, movement of injured or ill personnel and transport of critical material, including classified documents, under adverse weather conditions.

Chairman Ellender. I note the following statement on the data sheet: "The U–21F is the same basic design as the U–21A; the primary difference is altitude pressurization, a different engine, and a slightly larger fuselage." It is indicated that these aircraft will cost $635,000 each. What was the average cost of the U–21A version of this aircraft, and what is the current estimated cost of the U–21A?

General BUSH. The average program unit cost of the U–21A was $404,000 when the aircraft was last procured during fiscal year 1970. The current estimated cost of the U–21A is $483,743.

Chairman ELLENDER. What is the justification for buying this more expensive aircraft?

General BUSH. The U–21F with its range and pressurization will provide increased capability to traverse greater distances and overcome high enroute terrain and adverse weather encountered during mission performance. The aircraft will be used in providing transportation for Military Assistance Advisory Groups located around the world in remote areas, such as Turkey, where sufficiently responsive commercial transportation is not available to meet our needs. The U–21F will also be provided for Army headquarters where an immediate response for urgent transportation is needed to assure mission accomplishment under most environmental conditions and provide the Army with the ability to transport classified materiel with maximum security.

ASSIGNMENT OF U–21

Chairman ELLENDER. You indicate that you plan to assign these 20 aircraft to various Military Assistance Advisory Groups and to certain major commands. I wish you would provide for the record a statement indicating exactly the Military Assistance Advisory Groups you plan to assign these aircraft to and also the exact major commands you expect to assign these 20 aircraft to.

General BUSH. Yes, sir.

(The information follows:)

MAAGs/Missions:	
Turkey	[Deleted.]
Greece	
Ethiopia	
Iran	
Office of Defense Representative, India	
Office of Defense Representative, Pakistan	
U.S. Army, Europe	
Readiness Command, MacDill AFB, FL	
Army Air Defense Command, Ent AFB, CO	
U.S. Army, South, Canal Zone	
U.S. Army, Alaska	
Military District of Washington	
Continental Army Command:	
First Army, Ft. Meade, MD	
Third Army, Ft. McPherson, GA	
Fifth Army, Ft. Sam Houston, TX	
Sixth Army, Presidio, CA	
Allied Land Forces, Southeast	

Chairman ELLENDER. I note on the data sheet that, at the end of fiscal year 1972, you expect to have [deleted] of these aircraft in your inventory. Please provide a statement for the record indicating where each of these [deleted] aircraft are assigned.

General BUSH. Yes, sir. We have procured [deleted] U–21 utility transport aircraft. Nine of these have been lost, two are nonflyable maintenance trainers located at Fort Eustis, Va. One aircraft, located at Aberdeen Proving Ground is a nonstandard, prototype version of the U–21. The remaining [deleted] U–21's are located as set out on this table I am submitting for the record.

(A classified table was submitted to the committee.)

VH–1N UTILITY HELICOPTER

Chairman ELLENDER. The aircraft data sheet for the VH–1N utility helicopter will be included in the record at this point.

(The information follows:)

FISCAL YEAR 1973 PRESIDENT'S BUDGET ESTIMATE—AIRCRAFT DATA SHEET

Nomenclature: Helicopter, Utility, VH–1N Popular Name: Iroquois

Description/Mission.—A single rotor helicopter, powered by twin gas turbine engines, capable of being quickly air transported without major disassembly. This aircraft will be used to provide executive helicopter service for the President of the United States.

COST DATA

[In millions of dollars]

	Fiscal year—								Current estimate total program [1]
	1970 and prior	1971	1972	1973	1974	1975	1976	1977	
Aircraft procurement:									
Quantity	0	0	0	6	0	0	0	0	6
Cost	0	0	0	8.1	0	0	0	0	8.1
Less: Advance procurement, prior year	0	0	0	0	0	0	0	0	0
Net aircraft cost, current year	0	0	0	8.1	0	0	0	0	8.1
Plus: Advance procurement, current year	0	0	0	0	0	0	0	0	0
Total aircraft cost	0	0	0	8.1	0	0	0	0	8.1
Aircraft program unit cost	0	0	0	1.350	0	0	0	0	1.350
Initial spares	0	0	0	3.5	0	0	0	0	3.5
R.D.T. & E	0	0	0	0	0	0	0	0	0
Milcon	0	0	0	0	0	0	0	0	0
Program acquisition cost	0	0	0	11.6	0	0	0	0	11.6
Average program unit cost	0	0	0	1.933	0	0	0	0	1.933
Total additional costs	0	0	0	0	0	0	0	0	0

[1] This is a one-time buy to provide executive helicopter support.

Bell Helicopter Co., Ft. Worth, Tex.

Basis for Fiscal Year 1973 Budget Request.—The six VH–1N's along with six VH–53's being procured by the Navy are designed to replace the existing fleet of ten VH–3's now performing the Executive Mission. The VH–1N will satisfy the multi-engine requirement and can be rapidly transported by air without the time consuming disassembly and reassembly required for larger helicopters. The VH–1N transportability capability and small size makes it available for rapid worldwide missions and where the size of the landing site is restrictive.

Test data.—VH–1N.

All applicable tests required for Executive Support Helicopters to be completed upon acceptance of aircraft.

Contract data.—

Major subsystem:	*Contractor*
Airframe	Bell Helicopter Co., Ft. Worth, Tex.
Engine	Pratt and Whitney, Clarksburg, W. Va.

Characteristics:	*Item model, series VH–1N*
Max gross weight	10,000 lb.
Rotor diameter	48′
Max. cruise (sea level)	118 Kts.
Max. range (sea level)	277 NM
Hover ceiling (out of ground effect)	17,950
Engines, no./designation	2/T400CP400
Crew	2

INVENTORY/OBJECTIVE

	End fiscal year 1972 FPD	End fiscal year 1973 FDP
Total operating aircraft	0	6
Other active aircraft	0	0
Total active aircraft	0	6
Inactive aircraft	0	0
Total inventory	0	6
Losses	0	0
Inventory objective		6

Production Data.—A one time buy of 6 helicopters to be delivered in 4th Quarter fiscal year 1974.

Cost History Comparisons.—N/A.

General Bush. The VH–1N utility helicopter, is requested for the Presidential flight detachment for use in support of the White House. We are requesting $8.1 million for procurement of six of these aircraft. The VH–1N is basically a UH–1H Huey helicopter with twin turbine engines and will be specially configured for the White House mission.

Chairman Ellender. How many of these White House helicopters are you going to replace?

General Bush. We are going to replace those 10 VH–3's.

Chairman Ellender. How will these helicopters be used?

General Bush. These will be used not only for support of the White House, the key White House staff, primarily the President, the Presidential party, not only here in the Washington area but also are used when the President goes elsewhere, for example, it includes when he goes overseas or when he goes to California or to Florida or elsewhere within the continental United States, and when he visits military installations. These aircraft are quite special in that they have a very rigorous bonded system of inspection and protection of the parts that are involved to insure against sabotage and tampering. They are care-

fully reviewed on a quality-control basis. They have a very high level of maintenance support provided. With this new buy of the VH–1N, which is a twin engine helicopter, we will have the capability, which we did not have with the VH–3, of putting this in one of our C–141 aircraft, for example, and moving it without the disadvantage of a teardown. That larger Sikorsky aircraft requires a teardown of that aircraft in order to transport it. With the twin-engine Bell, we will have both the twin engine capability of the Sikorsky plus the Bell transportability.

NAVY PROGRAM AIRCRAFT

Mr. Chairman, I also point out that the Navy has in their program six VH–53 Sikorsky aircraft which is the follow-on to the VH–3 which we now have. These helicopters will be equally divided, three and three; three of the Sikorsky, three of the Bell at each of the two locations Quantico and Fort Belvoir, with one of those elements charged with the responsibility of providing local support and the other available for movement on a responsive basis to some more distant location for support of the White House.

WHITE HOUSE TRANSPORTATION REQUIREMENTS

Chairman ELLENDER. When you say support, what do you mean?

General BUSH. Transportation.

Chairman ELLENDER. These six that you are requesting will be for the exclusive use of the White House?

General BUSH. Yes, sir.

Chairman ELLENDER. Why so many?

General BUSH. The number is, of course, involved not only with the transportation of a number of people, it is that partly, but it also provides a backup. In view of the fact that with all of our aircraft we don't have a hundred percent availability we would not be able to predetermine exactly when they would be used. There would be some down for maintenance, inspection, repair, and the availability reduces the apparent number.

Chairman ELLENDER. Who else will have the use of the six aircraft other than the President?

General BUSH. Only as the White House determines, Mr. Chairman. It is a Presidential flight detachment.

Chairman ELLENDER. I do not understand the need for six.

General BUSH. The size of the party.

Chairman ELLENDER. You said that the Navy is going to provide some. Are those for the use of the President?

General BUSH. Yes, sir. It is part of a package team.

Chairman ELLENDER. Twelve?

General BUSH. A total of 12.

Chairman ELLENDER. Why is there need for so many?

General Bush. There are really only six available at one time, Mr. Chairman. The other six basically will be for the other detachment that is prepared to move to a more remote location to provide this same support. Of those six that are available, with a normal availability rate I would say only four could reasonably be expected to be available on demand at any single point in time. With that reduced number we have not only the President, but we also have the Secret Service, other members of the White House party.

VH–IN HELICOPTER: STATUS OF HELICOPTERS TO BE REPLACED

Senator Allott. With respect to the helicopters, it is determined that these have had a sufficient amount of service so that they really must be replaced? Or what is the reason they are being replaced?

General Bush. The 10 VH–3s, the Sikorsky aircraft that have been used for this mission, will be approaching the end of their useful life expectancy for this mission at such time as we could get these aircraft authorized, the money appropriated for the procurement and phase-in with the training necessary to introduce them into the system. Therefore, the answer to your question is no, not today they are not worn out, but they will be at such time as these new ones will be phased in.

Senator Allott. What are we talking about in hours per aircraft?

General Bush. 5,000 hours is what the VH–3's will have reached at that time, sir.

U–21F AIRCRAFT: COMPETITIVE BID PURCHASE

Senator Allott. I have one other question. This arose also out of testimony we had with respect to the Air Force. You have 20 U–21's here which, according to the picture we have, is a Kingair, which is a Beechcraft. Do you actually put these out on a competitive bid? And are the competitive bids so structured that there is in fact a true competition?

General Bush. Sir, the aircraft which you see is in fact a Beech aircraft. Let me indicate first that the aircraft category that we are referring to, the U–21, is not the specific model that we are requesting in the fiscal year 1973 budget. The fiscal year 1973 budget includes a request for a pressurized aircraft of the type, as we designated, the U–21F.

Senator Allott. That is pressurized now?

General Bush. Yes, sir. The other models that we have in the U–21 category are not the pressurized models. They are the U–21A model. When we submitted this request to the Department of Defense in our original programing cycle, we were directed to go competitive on it. Hence, this is a request for the U–21 on a competitive basis.

Now as a reader of the congressional testimony, Senator, I did become aware of the fact that the Air Force had a request in for a similar

kind of aircraft. In accordance with the thrust of that testimony, we have coordinated with the Air Force and we do in fact intend a coordinated procurement on a competitive basis. Hence, our photograph of the specific Kingair was misleading in that that would indicate a sole source buy.

Senator ALLOTT. I don't have anything against Beech aircraft. They are very good aircraft and everyone knows that. But it raised a question in my mind. I learned subsequent to our testimony, I believe, that all of the airplanes that the Air Force has in the category are Beechcraft. So are yours, are they not?

General BUSH. Yes, sir; that is correct. The Air Force has one Kingair and we have five. With the quantity that the Air Force is requesting, 14, and our request of 20, it was determined that that number would not in fact preclude a competitive procurement.

COST ELEMENTS CONSIDERED IN COMPETITIVE BIDDING

Senator ALLOTT. Now I come to the $100 question, which is a matter of your opinion. There are other aircraft companies who compete in this general area. Yet if you don't maintain a relatively large fleet of aircraft, would you give weight in your competitive bidding to the fact that it is easier to maintain spare parts and everything else for one aircraft and stay with that aircraft even though there might be a price differential and other things might be equal? It is not a vital matter, but I think it is important.

General BUSH. Yes, sir. I would say that it was consistent with OSD procurement policy to consider all elements of cost. We have received directives within the several services in fact to consider life cycle cost elements. We will consider such things, for example, as transportation. It is within the intent of the Armed Services Procurement Regulations to give weight to such things as that, the introduction of a new system, the cost of the spares, the cost of the transportation from the manufacturer.

AIRCRAFT ADMINISTRATIVE COMMAND ASSIGNMENTS AND RANK OF COMMANDING OFFICER

Senator ALLOTT. The cost of training.

General BUSH. The cost of training, these elements, and I am not stating that each of these elements will be taken into account in this particular procurement. That would be premature at this time to prejudge just how this would occur. I am saying this is consistent with Armed Services Procurement Regulations.

Senator ALLOTT. How many aircraft do you have assigned to generals in the Army in the continental United States?

General BUSH. We have administrative transport provided to headquarters which are located in various places within the United States. These headquarters have general officers assigned. I would not be able to state that there are any specific aircraft assigned to individual generals. However, the level of the command and the rank of the commander would influence the assignment of aircraft to the detachment which support that headquarters.

I have, and I can provide for the record, additional details on the planned assignment of the aircraft which we are requesting in this appropriation request. I don't have specific aircraft by Generals.

Senator ALLOTT. Would you provide this committee with a list of the aircraft assigned to administrative commands, the rank of the man who commands that particular organization and the location? Can that be done?

General BUSH. I believe so, sir.

Senator ALLOTT. I might say that one time when I was returning from Washington after an official visit to a particular command, the commander of that particular facility—which was not yours, but it happened in your command—took off in his own plane with his golf bags for a weekend within 3 minutes after our plane left. I do not believe that the average commanding general of a facility has any more need for a personal plane than I do, and I certainly do not want one. When we are trying very hard to reduce costs, when everyone is being urged to cut Federal expenditures to the bone, and when many thousands of constituents are pleading for sewers, water, hospitals, and many more items, it behooves this committee to look into such items as this very carefully. That is my own feeling and I wanted it to appear in the record.

General BUSH. Yes, sir.

Senator ALLOTT. You will see that that is provided, will you?

General BUSH. It will be provided, sir.

(The information follows:)

The Army has 247 twin engine fixed wing aircraft assigned to military units for the specific role of utility transport. These aircraft are required to satisfy the command-wide requirement for medical evacuation, limited cargo capability and transportation of senior commanders and staffs. Geographic location of the commands, the area of responsibility and travel needs are prime considerations in aircraft assignment. The assignment of sedan and trucks is made under the same philosophy. No aircraft is designated for the primary use of the commander, nor are aircraft utilized in that manner.

One hundred and three of these aircraft are U–21's which are considered prime assets. One hundred and twenty-four are U–8 aircraft which are older models and are considered substitute assets. The C–45 and C–47 aircarft are considered nonstandard to the Army inventory, and are all 25 years old or older.

The information regarding the assignment, location and the commanders managing these assets are shown on this chart.

UTILITY TRANSPORT AIRCRAFT

Command and commanders rank	Location of aircraft	U-21	U-8	C-45	C-47
Military District of Washington: Major general	Washington, D.C.	2	9		
HQ, Continental Army Command: General	Fort Monroe, Va	2	6		
1st Army:					
Lieutenant general	Fort Meade, Md	1	4		
Major general	Fort Eustis, Va		1		
Do	Fort Lee, Va		2		
Do	Fort Knox, Ky		2		
Colonel	Fort Devens, Mass		1	1	
3d Army:					
Lieutenant general	Fort McPherson, Ga	1	2		1
Do	Fort Bragg, N.C	1	1	1	1
Major general	Fort Benning, Ga		1		
Do	Fort Rucker, Ala		1	1	1
Do	Fort Campbell, Ky		1		
Brigadier general	Fort Stewart, Ga		1	1	
Colonel	Fort McClellan, Ala		1		
5th Army:					
Lieutenant general	Fort Sam Houston, Tex	1	6		
Do	Fort Hood, Tex	1			
Major general	Fort Bliss, Tex		2		
Do	Fort Sill, Okla		2		1
Do	Fort Leavenworth, Kans		2		
Do	Fort Riley, Kans		1		
Brigadier general	Fort Wolters, Tex				1
6th Army:					
Lieutenant general	Presidio, Calif	1	4		
Major general	Fort Carson, Colo		2		
Do	Fort Ord, Calif		1		
Do	Fort Lewis, Wash		2		
Military Assistance Command, Vietnam: General.	Vietnam	45			
8th Army: General	Korea	8			
U.S. Army, Hawaii: Major general	Hawaii	4			
US. Army, Ryukus: Lieutenant general	Okinawa	1			
Military Assistance Command, Thailand: Brigadier general.	Thailand	8			
U.S. Army, Japan: Brigadier General	Japan	1			
U.S. Army, Europe: General	Germany	4	29		
MAAG's/Missions:					
Major general	Turkey	1	1		
Brigadier general	India		1		
Do	Pakistan		1		
Do	Ethiopia	2	1		
Major general	Iran	2	2		
Do	Taiwan		1		
Attache:					
Colonel	Laos	1			
Do	Zaire		1		
U.S. Army, Alaska: Major general	Alaska	4			
U S. Army, Southern Command: Major general	Canal Zone	3	3		
Allied Forces, southeast: General	Turkey	1	2		
Readiness Command: General	MacDill AFB, Fla	1	3		
Strategic Communications Command: Major general.	Fort Huachuca, Ariz	1	1		
Army Security Agency: Colonel	Turkey	1	1		
Army National Guard:					
Major general	Michigan National Guard		1		
Do	Connecticut National Guard		2		
Chief of Engineers:					
Colonel	Saudi Arabia	2			
Do	Italy	1			
U.S. Military Academy: Lieutenant general	West Point, N.Y		2		
Army Air Defense Command: Lieutenant general.	Colorado Springs, Colo	0	12		
U.S. Army War College: Major general	Carlisle Barracks, Pa		1		
U.S. Army Materiel Command:					
Aviation Systems Command: Major general.	St. Louis, Mo		1		
Test and Evaluation Command: Major general.	Aberdeen Proving Ground, Md		2		
Munitions Command: Major general	Dover, N.J		1		
Missile Command: Major general	Huntsville, Ala		1		
Weapons Command: Major general	Rock Island Arsenal, Ill			1	
Electronics Command: Major general	U.S. Naval Air Station, N.J			1	
Director of Maintenance: Colonel	Atlanta General Depot, Ga			1	
Do	New Cumberland, Pa			1	1
Lexington Depot: Colonel	Lexington Depot, Ky				2
Red River Depot: Colonel	Red River Army Depot, Tex				1
Director for Services: Colonel	Anniston Army Depot, Ala				1
Total		101	125	8	11

Chairman ELLENDER. The Air Force is requesting $35.9 million for the procurement of 120 UH–1H Iroquois helicopters that will be given to the Army as a pay-back for Army helicopters made available to the South Vietnamese Air Force. The aircraft data sheet for this helicopter will be included in the record at this point.

(The information follows:)

FISCAL YEAR 1973 PRESIDENT'S BUDGET ESTIMATE AIRCRAFT DATA SHEET

Nomenclature: Helicopter UH–1H; popular name: *Iroquois.*

Description/Mission.—The UH–1H "Iroquois" is a low silhouette, high performance helicopter powered by a single T–53 gas turbine engine. It is the standard Army small troop transport carrying 11 personnel.

COST DATA

[In millions of dollars]

	Fiscal year—									
	1970 and prior	1971	1972	1973	1974	1975	1976	1977	Cost to complete	Current estimate, total program
Aircraft procurement:										
Quantity	392	300		120	86					898
Cost	96.3	71.8		35.9	24.8					228.8
Less: Advance procurement										
Net current year program	96.3	71.8		35.9	24.8					228.8
Advance procurement, current year										
Weapon system cost	96.3	71.8		35.9	24.8					228.8
Initial spares	17.0									17.0
R.D.T. & E.										
Milcon										
Program acquisition cost	113.3	71.8		35.9	24.8					245.8
Program unit cost										.274
Total additional cost										

Basis for fiscal year 1973 Budget Request: The Air Force is procuring these aircraft as payback to the Army for in-country assets turned over to the VNAF as part of the Vietnamization program.

Test data.—All flight tests complete (June 1965).

Contract data:

Major subsystem and contractor:	*Type of last contract*
Airframe, Bell Helicopter Co	Fixed price incentive.
Engine, Army GFE	

	Class	Operational requirement	Demonstrated [1]
Performance:			
Maximum gross weight	U	8,000 pounds	9,500 pounds.
Speed: cruise/maximum	U	90/10 knots	105/120 knots.
Cruise range	U	225 nautical miles	284 nautical miles.
Service ceiling	U	12,500 feet	20,000 feet.
		Item model, series, class, etc.	
		UH-1H	
Characteristics:			
Length/Rotor	U	44.91/48 feet.	
Engines: Number—Designation	U	1—T-53-L-13.	
Passenger/crew/litters	U	13/2/6.	

[1] Original specifications of the UH-1 series have improved via state-of-the-art and technology advancements.

	Number	Amount (in millions)
Current estimate total program:		
Fiscal year 1972 budget submission:		
Procurement	692	$194.3
R.D.T. & E.		
Milcon		
Total program costs	692	194.3
Fiscal year 1973 budget submission:		
Procurement	898	245.8
R.D.T. & E.		
Milcon		
Total program costs	898	245.8

DIFFERENCE BETWEEN FISCAL YEAR 1972 BUDGET SUBMISSION AND FISCAL YEAR 1973 BUDGET SUBMISSION

The additional aircraft requested in fiscal year 1973 reflects projection of anticipated VNAF attrition through fiscal year 1974.

HELICOPTER PAYBACK BY AIR FORCE: ARMY REQUIREMENT

Senator ALLOTT. Is this $35.9 million in addition to the $134.51 million requested for the procurement of Army aircraft?

Mr. WOODRUFF. Yes, it is, Senator Allott.

Chairman ELLENDER. General, are you familiar with the request for these helicopters?

General BUSH. Yes, sir.

Chairman ELLENDER. Just what is meant by the term "payback"?

General BUSH. Mr. Chairman, in effect the Air Force borrowed helicopters from the Army to give to the South Vietnamese Air Force, and now the Air Force is requesting funds to replace those helicopters. I would like to explain, sir, that within the Vietnamese Armed Forces the Air Force rather than the Army have the responsibility for flying and performing the missions that are done with the helicopters.

A DOD decision several years back said we want to maintain service identity in the relationships in country such that the U.S. Air

Force will be dealing with the Vietnamese Air Force and will be service funded for those items of equipment that are the Air Force's responsibility. Similarly, the Army with the Army in Vietnam. Since the Vietnamese Air Force flies Hueys, the determination was made that the U.S. Air Force would do the programing and budgeting for those helicopters.

INVENTORY REPLENISHMENT TO INCREASE READINESS

Chairman ELLENDER. What is the function of the replacements?

General BUSH. We are going to put them in our inventory, sir, to replace the ones that you previously appropriated money for us to increase our Army readiness.

Chairman ELLENDER. You have gone without them for some time. What is the necessity for them now?

General BUSH. The authorized acquisition objective, which is the name we give to how many we need, as of the end of the funded delivery period that we are talking about, sir, that is the 1973 funded delivery period, will be [deleted]. At that time, and even with the paybacks which the Department of Defense directed the Air Force to pay back, we will still be approximately [deleted] aircraft short. We will only have [deleted] aircraft of this type on hand as of that time. The failure to achieve that number, Mr. Chairman, represents a shortfall in readiness. That is not entirely the situation or the case in the past in that as the Army acquired assets and began, say, flying Hueys during the Southeast Asia operation the level of our forces was higher. The loss rate on helicopters is also a dynamic circumstance. So that at one point in time all you get is a single photograph. As we project this requirement into the future we will in fact be short. The reason that we will be short is the fact that instead of waiting for the Air Force buy of Hueys to come in and furnish those to the Vietnam Air Force, we took Army assets out of inventory and furnished those to the Air Force for furnishing to the Vietnamese Air Force. In so doing, the Department of Defense made the decision that the shortfall in Army readiness was worth it in order to get those increased numbers of Hueys in the hands of the Vietnamese Air Force.

The helicopter is probably the single most important weapon system in Vietnam today and the Vietnamization program which is an essential element of our SEA policy, that justified or demanded that degradation of Army readiness in order to provide that increase to the Vietnamese Armed Forces. That was the decision that was made.

AUTHORIZED ACQUISITION OBJECTIVE

Chairman ELLENDER. How many did you indicate you required?

General BUSH. [Deleted.]

Chairman ELLENDER. Please describe the readiness requirement.

General BUSH. Sir, our authorized acquisition objective is computed based on several factors, the largest of which is to equip our aviation units with the required number of aircraft and that includes both Active Forces and Reserves.

Chairman ELLENDER. How many of these helicopters did the Army turn over to the South Vietnamese Air Force, how many have been funded for "payback" to the Army, and when do you expect to complete this "payback" program?

General Bush. The VNAF improvement and modernization program was established in February 1969, as a U.S. Air Force MASF program to be funded by the U.S. Air Force. The program consisted of 500 helicopters for assignment in operational units, an additional 50 for repair cycle float and 327 were planned for advanced attrition through fiscal year 1974 for a total of 877 UH–1H helicopters. Of this total, 852 were to be provided from the Army inventory and 25 through Air Force new procurement. As of April 24, 1972, the Army has turned 750 helicopters over to the VNAF, and the Air Force has funded 642 paybacks to the Army prior to fiscal year 1973. The 120 UH–1H's in the Air Force fiscal year 1973 program will enable the Air Force to pay back 762 helicopters to the Army leaving a remaining payback requirement to the Army of 90 helicopters in fiscal year 1974. The payback quantity can vary somewhat based on actual VNAF attrition. Any additional helicopters obtained from the Army by the Air Force to replace attrition losses subsequent to fiscal year 1974 will require replacements on a one-for-one basis.

Chairman Elleder. You indicated that your requirement for this helicopter at the end of the 1973 funded delivery period is [deleted]. Of this total, how many are for the requirements of the Army Reserves, and how many are for the requirements of the Army National Guard?

General Bush. The Active Army requirement is for [deleted] the Army Reserve requirement is [deleted] and the Army National Guard requirement consists of [deleted] helicopters.

Chairman Ellender. Now, with respect to [deleted] helicopters you except to have on hand in the inventory at the end of the 1973 delivery period, how many of those are assigned to the Active Army, how many to the Army Reserves, and how many to the Army National Guard?

General Bush. Mr. Chairman, may I submit that information for the record.

(Classified information was furnished to the committee.)

Chairman Ellender. Senator Allott.

Infantry Unit Lift and Medical Evacuation Capability

Senator Allott. General, am I right in my assumption that the basic use of these 120 helicopters you are talking about is in force mobility? What is the basis of use?

General Bush. Yes, sir, this particular UH–1H model is basically a troop lift helicopter, sir, to support the lift of our infantry units. It also provides a medical evacuation capability.

Senator Allott. And all the other associated things with that?

General Bush. Yes.

General Allott. Not as a gun platform or as a gunship?

General Bush. That is correct, although it does have some secondary armament but it is not primarily a gunship.

Modification of Aircraft

Chairman Ellender. The next item is the request of $60.9 million for the modification of aircraft. Page 13 of the "Justifications" and the tabulation on page 2 of the P–1 exhibit pertaining to modification of aircraft will be included in the record at this point.

(The information follows:)

JUSTIFICATION—ACTIVITY 2—MODIFICATION OF AIRCRAFT
[In thousands of dollars]

	Actual fiscal year 1971	Estimate	
		Fiscal year 1972	Fiscal year 1973
Direct obligations or direct budget plan	49,000	36,000	60,900

Sec. 1—Purpose and scope: These funds provide for modification of aircraft procurement, Army-procured items including modification kits and installation thereof.

Sec. 2—Justification of funds requested: $50,900,000 is requested for modification of inservice aircraft. These funds provide for the cost of modifying currently operational aircraft to improve flight safety, increase their capability, and extend their useful life. Funds are included for major modification programs for the following aircraft: Chinook helicopters, Iroquois helicopters, Cobra helicopters, OH-6/OH-58 observation helicopters, and Mohawk airplanes.

FISCAL YEAR 1973 PROCUREMENT PROGRAM—THE PRESIDENT'S BUDGET

Line No.	Item nomenclature	Identification code	Fiscal year 1973 unit cost (Thousands)	(Millions of dollars) Fiscal year 1971 Quantity	Fiscal year 1971 Cost	Fiscal year 1972 Quantity	Fiscal year 1972 Cost	Fiscal year 1973 Quantity	Fiscal year 1973 Cost
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Budget activity 1: Aircraft:								
1	Airplane, utility, U-21 (UTE)	A	635.0					20	12.7
2	Helicopter, attack, AH-1 (Cobra)	A	404.3	70	28.3				
3	Helicopter, cargo transport CH-47 (Chinook)	A	1,825.0	12	21.9				
4	Helicopter, LOH, observation, OH-58 (Kiowa)	A	87.5	600	51.6	400	35.0		
5	Helicopter, utility, tactical transport, UH-1 (Iroquois)	A	201.7	120	24.2				
6	Helicopter, utility, tactical transport, VH-1N	B	1,350.0					6	8.1
	Total budget activity 1				126.0		35.0		20.8
	Budget activity 2: Modification of aircraft:								
7	Helicopter, attack, AH-1 (Cobra)				9.9		2.3		10.1
8	Helicopter, cargo transport, CH-47 (Chinook)				8.1		14.0		14.1
9	Helicopter, cargo transport, CH-54 (Tarhe)				1.9		.4		1.4
10	Helicopter, observation, OH-6 (Cayuse)				.3		.2		3.3
11	Helicopter, observation, OH-58 (Kiowa)				3.6		2.9		3.9
12	Airplane, observation, STOL, OV-1 (Mohawk)				1.2		1.7		13.3
13	Helicopter, utility, UH-1, (Iroquois)				22.5		12.4		9.8
14	Airplane, utility, U-8 (Seminole)				.1		.2		1.5
15	Airborne armament				.5		.1		.1
16	Airbone avionics				.9		1.0		3.3
17	Modification under $500,000						.8		.1
	Total budget activity 2				49.0		36.0		60.9
18	Budget activity 3: Spares and repair parts				14.0		9.8		16.7
	Budget activity 4: Support equipment and facilities:								
19	Avionics shop, shelter mtd (repair) AN/ASM-146	A	7.9	60	.5	127	1.0		
20	Common ground equipment				2.0		3.1		.9
21	Data link (JIFDATS)	B							3.1
22	Electronic warfare				4.4		3.2		6.8
23	Flight coord central, AN/TSC-61	B	76.2			21	1.6		
24	LF radio beacon, AN/TRN-30	B	(22.9)					(105)	(2.4)
25	Survival radio, AN/PRC-90	B	.5			2,100	1.1	1,000	.5
26	Synthetic flight trainer, GAT-2	B	58.3	24	1.4				
27	Synthetic flight trainer, 2B24	B	(1,825.0)					(4)	(7.3)

General Bush. Increased emphasis is being placed on modification of our operating fleet rather than on procuring new aircraft in fiscal year 1973. These funds will pay for modification kits and depot installation, to provide increased flight safety, improved reliability and maintainability, and increased operational capabilities. One of our continuing major efforts requiring approximately $14.6 million in fiscal year 1973 in the area of flight safety is installation of crashworthy fuel systems in our helicopters to preclude postcrash fires and the resultant loss of life and materiel. The CH–47 CHINOOK and the UH–1 IROQUOIS, OH–58 KIOWA, and the OH–6 CAYUSE and programed to receive crashworthy fuel systems. Provisions for an altitude reporting capability to meet Federal Aviation Administration operational requirements is a program which pertains to most of our aircraft and requires approximately $3 million in fiscal year 1973. We are initiating a program with a first-year cost of $12 million to convert OV–1B and C model surveillance aircraft to the OV–1D. This modification will update our older model aircraft to the latest configuration by providing palletized SLAR (side-looking airborne radar) and IR (infrared) mission equipment, thus increasing flexibility and sensor capability. This modification will permit reduction of the quantity of aircraft per standard company from 18 (six SLAR and 12 IR) to 14 because the interchangeability feature will allow each aircraft to perform with either SLAR or IR.

ADVANCED PRODUCTION ENGINEERING FOR TOW MISSILE SYSTEM ON AH–1G COBRA

Another major program provides for approximately $5.3 million for advanced production engineering for installation of the TOW missile system on the AH–1G COBRA. Of the remaining $26 million, $7 million is for installation of outstanding modification kits and the remaining for miscellaneous modifications on several types of first-line aircraft.

Chairman Ellender. Will all of the $5.3 million requested for the installation of the TOW antitank missile on the COBRA helicopters be used for advanced production engineering?

General Bush. Yes, sir. All of the funds, Mr. Chairman, will be used for advanced production engineering as a phased flow-in to the research and development expenditures of money for the same system to mount the TOW missile on the COBRA gunship. The COBRA gunship, which is the one which has proved so successful in Vietnam, does not in fact have the tank killing capability that we believe it should have for other areas of potential involvement.

Upgunning this on an interim basis, particularly if we continue to lag in the receipt of our advanced attack helicopter, that is the CHEYENNE, the Lockheed helicopter and antitank system, because of that we are modifying the aircraft to put the TOW missile on it. These dollars, the $5.3 million in fiscal year 1973, would do the advanced production engineering to phase in that so as to get that capability as soon as we reasonably can.

ADAPTATION OF MISSILE AND LAUNCHER TO AIRCRAFT

Chairman Ellender. How does advanced production engineering differ from the last stages of R. & D.?

General Bush. Advanced production engineering is the transition program, sir, between research and development and actual production. In order to get the hard tooling, in order to get the technical data package, the drawings, and so on, and the tooling and the test equipment ready for production. If we did not have this particular program element in, once we had approved the research and development there would be a break in that program at the plant until we could get all these things done to start production.

Chairman Ellender. Of course the COBRA is an operational aircraft that has performed well in Southeast Asia, and the TOW antitank missile is operational, even though it has not been proven in combat. What you are doing here is combining two operational systems.

General Bush. That is correct. The TOW missile, sir, is a well proven armament system. The only thing that is really needed here is to adapt that missile and the launcher to the aircraft. This does require some engineering. It is not what would be identified as a high risk area, but it does require the expenditure of money to do this and to test it to make sure you have put it in the right place so that it does not introduce other problems.

Spares and Repair Parts

Chairman Ellender. The next item is the request of $16.7 million for the procurement of aircraft spares and repair parts. The information on page 14 of the justifications on this request will be included in the record at this point.

(The information follows:)

JUSTIFICATION—ACTIVITY 3, SPARES AND REPAIR PARTS

[In thousands of dollars]

	Actual fiscal year 1971	Estimate	
		Fiscal year 1972	Fiscal year 1973
Direct obligations or direct budget plan	$14,000	$9,800	$16,700

Section 1—Purpose and Scope

These funds provide for procurement of depot reparable assemblies and components including provisioning (initial issue) and replenishment.

Section 2—Justification of Funds Requested

This program provides for centrally managed high dollar value depot reparable assemblies, components, and repair parts (for example: engines, transmissions, and gear boxes) not financed by the Army Stock Fund which are essential to aircraft operations. Due to the high dollar value of most of these components, they are intensively managed. The request program of $16.7 million for FY 1973 includes $13.0 million for procurement of replenishment components for all Army aircraft, $3.5 million for initial provisioning for the VH–1N helicopter and $.2 million for provisioning of avionics items.

General Bush. We are requesting $16.7 million for spares and repair parts. These repair parts will support a worldwide inventory of approximately 10,000 aircraft. Of the $16.7 million, $3.5 million is for initial provisioning of the VH–1N helicopter, $0.2 million for avionics provisioning, and the remainder for replenishment spares. This budget reflects the results of the controls which the Army uses in selecting the

range and quantity of initial spares in support of new end items. Initial spares procured concurrently with end items are phased for delivery in increments proportional to end items delivery and procurement is delayed where practicable.

Chairman ELLENDER. I note that $13 million of the total requested is for the procurement of replenishment spares. How much was provided for replenishment spares for fiscal years 1971 and 1972?

General BUSH. $12 million was provided for replenishment spares in fiscal year 1971, and $7.3 million was provided in fiscal year 1972.

Chairman ELLENDER. With the decrease in combat activities in Southeast Asia and a decrease in the strength of the Army, why is there an increased request for replenishment spares?

General BUSH. The increase in the replenishment program is primarily due to depletion of stocks of high cost, finite life CH–47 rotor blades, for example, cost approximately $13,200 each and must be disposed of after 2,400 hours use because of safety-of-flight considerations. They can be overhauled up to the 2,400-hour maximum. The fiscal year 1973 budget request includes approximately $8 million for procurement of CH–47 rotor blades.

SUPPORT EQUIPMENT AND FACILITIES

Chairman ELLENDER. The next item is the request of $36.1 million for the budget activity entitled "Support Equipment and Facilities." The information on page 15 of the justifications and the tabulation on pages 2 and 3 of the P–1 exhibit will be included in the record at this point.

(The information follows:)

JUSTIFICATION—ACTIVITY 4, SUPPORT EQUIPMENT AND FACILITIES

[In thousands of dollars]

	Actual, fiscal year 1971	Estimate	
		Fiscal year 1972	Fiscal year 1973
Direct obligations or direct budget plan	31,000	25,800	36,100

SECTION 1—PURPOSE AND SCOPE

These funds provide for ground support equipment including aircraft maintenance shop sets, avionics support equipment, synthetic flight trainers, first destination transportation and production base support.

SECTION 2—JUSTIFICATION OF FUNDS REQUESTED

Ground Support.—$14.2 million is requested for various types of ground support items. Of the total recommended, $7.3 million is for synthetic flight trainers, $3.1 million for surveillance aircraft/data link ground stations, $2.4 million for low frequency radio beacons, $0.9 million for tool sets, and $0.5 million for survival radios.

Production Base Support.—$7.2 million is requested for a total of fifteen projects. One project in the area of advanced production engineering totals $.052 million. Eight projects totalling $1.4 million are in the field of manufacturing methods and technology. Three projects for military adaptation of commercial items are included for $0.8 million. The remaining three projects—totaling $4.9

million consist of an omnibus project for $0.2 million and two layaway projects for $4.7 million.

Miscellaneous.—$14.7 million is requested for the remainder of items under this budget activity. Of the total, $6.8 million is for electronic warfare radar warning devices, $5.0 million for the component improvement program to improve reliability and performance of aircraft engines, $0.6 million for first destination transportation for items procured under this appropriation and $2.3 million for items less than $500,000.

MODIFICATION OF COBRA HELICOPTERS

Chairman ELLENDER. I note in the P–1 exhibit you are requesting $10.1 million for the modification of COBRA attack helicopters. You referred to a request of $5.3 million for advance production engineering for the installation of the TOW antitank missile on the COBRA. Is that part of the $10.1 million?

General BUSH. Yes, sir. The $5.3 million is a part of the $10.1 million for COBRA modifications.

Chairman ELLENDER. Tell us a little more about this modification to put the TOW on the COBRA helicopter.

General BUSH. The purpose of the COBRA TOW modification is to obtain an urgently needed interim antitank capability at the earliest practicable date. The modification involves the integration of the airborne TOW missile subsystem into the AH–1G COBRA helicopter. The TOW missile is standard issue to the Army ground troops for use against hard point targets. The TOW system has been successfully tested and fired from a UH–1B helicopter and the integration into the AH–1G helicopter will be based on that design. A helmet sight subsystem will be added to the helicopter to aid in acquiring targets and firing of the other onboard weapons systems.

Chairman ELLENDER. How many of these helicopters do you have in your inventory, and how many do you plan to modify to carry the TOW antitank missile?

General BUSH. There were [deleted] Cobras in the Army as of February 29, 1972. The projected inventory at end fiscal year 1973 funded delivery period is [deleted]. Of these [deleted] are to be modified with PEMA funds to carry the TOW missile and eight will be funded by research and development funds.

Chairman ELLENDER. It is my understanding that the estimated cost of modifying these [deleted] COBRAS to carry the TOW missile is approximately $67 million. Is this correct?

General BUSH. Yes, sir; this is correct.

Chairman ELLENDER. I would assume that this total does not include the cost of the TOW missiles. Am I correct about that?

General BUSH. Yes, sir; you are correct.

Chairman ELLENDER. Just what is involved in the balance of $4.8 million for modification to COBRA helicopters?

General BUSH. $4.3 million is for airframe modifications for a canopy removal system to provide emergency excess for crew members, flex beam tail rotor assembly to improve operation and reliability, an improved instrument lighting system for maintainability/reliability, an engine compartment fire detection system, shock mounting to increase navigation light reliability, FM radio homing antenna for increased capability, encoded altimeter to comply with FAA safety

requirements, an absolute ground clearance warning system to prevent target fixation losses, and radio shock mount provisions. The remaining $500,000 is for two avionic modifications and cost escalation.

MODIFICATION OF CHINOOK HELICOPTERS

Chairman ELLENDER. The request includes $14.1 million for the modification of CHINOOK transport helicopters. How much of this total is associated with the program to provide the CHINOOK with the crash worthy fuel system?

General BUSH. There is $4,055,000 identified for the crash worthy fuel system modification.

Chairman ELLENDER. How many CHINOOKS will receive this fuel system modification during fiscal year 1973?

General BUSH. It is planned to modify 181 "C" model aircraft in fiscal year 1973.

Chairman ELLENDER. Give us three or four examples of the other modifications you plan for the CHINOOK during fiscal year 1973.

General BUSH. The T-55-L-11 engines improvement—$2.8 million—AIMS reporting type altimeter—$278,000—AN/ARC-114 and AN/ARC-115 VHF/AM radios—$346,000.

MODIFICATION OF OH-6 AND OH-58 HELICOPTERS

Chairman ELLENDER. I note on lines 11 and 12 of the P-1 exhibit requests totaling $7.2 million for the modification of the OH-6 and OH-58 light observation helicopters. As I recall, these helicopters have not been in the inventory very long. When did these helicopters become operational?

General BUSH. The OH-6A helicopter became operational in October 1966, and the OH-58A helicopter became operational in May 1969.

Chairman ELLENDER. What is the nature of the modifications you plan with $3.3 million for the OH-6 CAYUSE?

General BUSH. Modification and retrofit funds for the OH-6A are for the following: $1.93 million for installation of a crash-resistant fuel system; $930,000 for redesign of the landing gear and associated aircraft structure to reduce tailboom damage; $133,000 for installation of bracketry for IFF altimeter; $177,000 for avionics modifications consisting of procurement of kits for AIMS altimeter and transponder test sets; and $145,000 for cost escalations.

Chairman ELLENDER. Comment on the modifications you plan with the $3.9 million requested for the OH-58 KIOWA.

General BUSH. Modification and retrofit funds for the OH-58A are for the following: $3.55 million for airframe modifications including installation of voice security kit, crash-resistant fuel system, instantaneous vertical speed indicator, and AIMS altimeter; $181,000 for procurement of transponder test set kits (Avionics); and $170,000 for cost escalation.

MODIFICATION OF MOHAWK AIRCRAFT

Chairman ELLENDER. $13.3 million is requested for the modification of OV-1 MOHAWK observation aircraft. As I recall, you indicated

that $12 million of this total is for the conversion of OV–1B and OV–1C aircraft to the OV–1D configuration. Am I correct about this?

General Bush. Yes, sir; you are correct.

Chairman Ellender. Are these funds for the initiation of this conversion program?

General Bush. Yes, sir.

Chairman Ellender. I note on page 96 of the justification that this request of $12 million for this conversion program includes $1.5 million for one prototype, $4.2 million for three conversions, and $6.3 million is for "other support." Just what is included in "other support"?

General Bush. The $6.3 million in "other support" for fiscal year 1973 is for new surveillance sensors, updated navigation systems, and improved airborne avionics needed to make a complete integrated surveillance system plus the necessary ground support equipment for testing and maintaining the complete system.

Chairman Ellender. If I understand the tabulation correctly on page 96 of the justifications, the total program calls for one prototype aircraft and 85 modifications for a total estimated cost of $116 million, which includes $51.7 million for other support. Am I correct about this?

Just why is this other support item included in the request for aircraft modification?

General Bush. Sir, the $51.7 million reflected for other support over the 5-year conversion program, is for procurement of new surveillance sensors, updated navigation systems, and improved airborne avionics. These support items are included in the modifications program because they are required to produce a completely integrated OV–1D surveillance system.

Chairman Ellender. Just what do you plan to do with the balance of $1.3 million requested for MOHAWK aircraft modifications?

General Bush. Sir, the $1.3 million balance in the OV–1 modification program will be used for modifying the airframe to accept the modernized TACAN (AN/ARN–103), a voice warning system and an updated frequency modulated radio (AN/ARC–114). The balance of funds requested are for modifying the T53–L–15/701 engine to increase reliability-maintainability when used with the OV–1 and incorporating a built-in test capability in the AN/APX–72 transponder (IFF).

Iroquois Helicopter Modification

Chairman Ellender. The request includes $9.8 million for the modification of IROQUOIS helicopters. How much of this total program is for the installation of the crash worthy fuel system, and how many IROQUOIS will receive this modification during fiscal year 1973?

General Bush. The $9.8 million in the fiscal year 73 budget for UH–1 modifications includes $5.001 for the crash worthy fuel system. Of the $5.001 million $624,000 is allocated for the installation of 480 kits in fiscal year 1973. The remaining funds are required for the procurement of kits which will be installed during a later funded period.

Chairman Ellender. Please provide a tabulation for the record listing each of the planned modifications for fiscal 1973 for the IRO-

QUOIS, and the amount for each of these modifications and number of helicopters involved in each.

General Bush. Yes, sir.

(The information follows:)

Description of modification	Number of aircraft	Cost (thousands)
Crashworthy		
Fuel system:		
Installation	480	$624
Kit procurement	458	4,377
AN/ARC–114/115 radio:		
Installations	794	556
Kit procurement	1,344	572
KY–28/FM radio:		
Circuitry kits	2,340	70
Installation	530	38
Radio items	250	208
Nonrecurring		60
APX–72 transponder test set	1,304	234
Coded altimeter:		
Kits	1,600	80
Government furnished equipment	1,600	1,440
Update aircraft to 1968 production configuration	33	93
Installation	100	14
Application of outstanding: Model kits		1,000
Escalation		426
Total		9,792

AIRBORNE AVIONICS

Chairman Ellender. Just what is involved in the request of $3.3 million for modifications involving airborne avionics set out on line 16 of the P–1 exhibit?

General Bush. Sir, the $3.3 million for modification of airborne avionics includes such items as modifying the AN/APX–72 Transponder's RT–859 to meet Federal Aviation Agency specifications, modifying the AN/ARN–89 Airborne Direction Finder to increase range and minimize electromagnetic interference and modifying the C–6533 intercommunication system to meet the security test standards on control of compromising emanations—TEMPEST—when one radio is receiving or transmitting secure communications while another radio is simultaneously transmitting in a nonsecure mode.

Details of our request for $36.1 million for "support Equipment and Facilities," are shown on this chart, chart No. 10. The $0.9 million for common ground equipment is requested for shop and tool sets and special support equipment for aircraft. Joint service in-flight data transmission system, or JIFDATS, is a ground data link for data collection from airborne sensor devices installed in the OV–1 surveillance aircraft. The $6.8 million listed under "Electronic Warfare," will procure airborne radar warning devices for installation on both fixed and rotary wing aircraft. [Deleted] million is requested for procurement of low frequency radio beacons for navigational purposes and $0.5 million to continue our programs of replacement of obsolete aircraft survival radios with the AN/PRC–90, the standard military survival radio. [Deleted] million provides for procurement of the 2B24 synthetic flight trainer This trainer, designed to simulate the UH–1 helicopter, is planned for procurement for use initially at the aviation school.

(Chart 10 follows:)

CHART 10

Support equipment and facilities

	Millions
Common ground equipment	$0.9
Data line (JIFDATS)	3.1
Electronic warfare	6.8
Radiobeacon (NSE)	2.4
Survival radio	.5
Synthetic flight trainer (NSE)	7.3
Component improvement	5.0
Items less than $500,000	2.3
First destination transportation	.6
Production base support	7.2
Total	36.1

COMPONENT IMPROVEMENT

General BUSH. We are requesting $5 million for "Component Improvement." The objective of the component improvement program is to improve reliability, maintainability, and safety of flight by revealing the life-limiting features of engines prior to encountering them in field operations. Generally, this testing falls into three categories, each providing a unique set of data, the combination of which describes the engine life cycle capabilities:

(*a*) Mission profile—simulates operation of the engine in an aircraft as typically used in the operational fleet.

(*b*) Accelerated aging—permits rapid accumulation of power cycle data to aid in determining the fatigue life of dynamic components.

(*c*) Forced failure—consists of operation outside the normal use envelopes such as operation at high temperatures, to determine parts life.

ITEMS LESS THAN $500,000

Our request for $2.3 million for the procurement of those items with a line item value of less than $500,000 includes 21 separate line items consisting of avionics maintenance and test equipment and receivers and transmitters for installation in aircraft control towers.

FIRST DESTINATION TRANSPORTATION

The "First Destination Transportation" request for $0.6 million is for transportation of those items procured under this appropriation.

PRODUCTION BASE SUPPORT

Our final item is $7.2 million for "Production Base Support." A total of $4.9 million of this is requested for layaway of industrial facilities.

Senator ALLOTT. What does that mean?

General BUSH. The tools that PEMA buys or pays for that are Government-own as opposed to those that are contractor owned need to be put away in reserve at the termination of a contract. In some

cases this involves physically transporting them to a place where they can be used again. That is the layaway part.

Senator ALLOTT. Thank you.

General BUSH. This includes $2.6 million for layaway of the final increment of Government-owned production equipment at Bell Helicopter Co., Fort Worth, Tex., for the manufacture of the AH–1G, UH–1, and OH–58 helicopters. This also includes $2.1 million for layaway of equipment becoming idle at the Boeing Co., Philadelphia, Pa., for manufacture of the CH–47 helicopter. The remaining $2.3 million is for production engineering measures projects under $500,000 each.

MISSILE PROCUREMENT

Chart No. 11 shows the various missile items and associated equipment for which funds are being requested in fiscal year 1973.

(Chart 11 follows:)

CHART 11.—MISSILE PROCUREMENT, ARMY—FISCAL YEAR 1973 BUDGET REQUEST

Antiballistic missile system (ABM)	Quantity	Fiscal year 1973 program (millions)
Safeguard		$716.4
Other missiles		325.5
Dragon	[Deleted].	56.5
Hawk		106.0
Honest John		.9
Lance		90.1
Pershing		31.3
Tow		40.7
Modification of missiles		27.4
Air defense control and coordination systems		3.1
Nike Hercules		3.2
Pershing		16.1
Miscellaneous missile modifications		5.0
Spares and repair parts		62.3
Safeguard		36.6
All others		25.7
Support equipment and facilities		21.8
Air defense targets		5.1
Interrogator set, AN/TPX–46 (NSE)	122	8.0
Interrogator set, AN/TPX–50 (NSE)	31	1.3
Land-combat support systems (LCSS)		4.0
Items less than $500,000		.4
First destination transportation		.8
Production base support (except Safeguard)		2.2
Total		153.4

SAFEGUARD

General BUSH. The largest single item in our entire fiscal year 1973 budget request is for continued funding for the acquisition of the SAFEGUARD antiballistic missile system. Since you will receive a separation presentation by that SAFEGUARD system manager, I will mention only that this budget request for SAFEGUARD, within

the Army's missile procurement appropriation, amounts to $753 million ($716.4 million for the system itself plus an additional $36.6 million for initial spares). The balance of the fiscal year 1973 program amounting to a total of $400.4 million represents funding requirements for the acquistion of equipment which will provide a steady and progressive rate of improvement toward attainment of the Army's missile inventory objective. Before I discuss each item in our fiscal 1973 request, you will note on the chart before you that the alinement of items is different from that used in previous years. The new alinement is a result of formatting consistency in the five new separate procurement appropriations.

Chairman ELLENDER. General Leber will be here later to discuss the total SAFEGUARD program, and it is suggested that any questions on the procurement of SAFEGUARD be delayed until General Leber is here. We are talking about a total of $716.4 million for the procurement of components for the SAFEGUARD system set out on lines 1 through 5 of the P–1 exhibit and $36.6 million for the procourement of initial spares for the SAFEGUARD components set out on line 24 of the P–1 exhibit.

OTHER MISSILES

General BUSH. In this category we are requesting a total of $325.5 million for six missile systems. The dollar values shown for each line item include amounts for the missile, both tactical and training (where applicable) and such ancillary ground support equipment as launchers, mounts, transporters, and electronic equipment.

DRAGON ANTITANK MISSILE

Chairman ELLENDER. The next item is the request for $56.5 million for the procurement of the DRAGON antitank missile. The missile data sheet will be included in the record at this point.

(The information follows:)

FISCAL YEAR 1973 PRESIDENT'S BUDGET ESTIMATE

MISSILE DATA SHEET

Nomenclature: DRAGON Missile System (XFGM–77A, XFTM–77A)

Popular name: DRAGON

Description/Mission.—DRAGON is a man-portable antitank weapon system utilizing a command to line-of-sight missile that is launched (recoilless) and automatically guided to the target by a tracker which issues electronic commands by wire link to the missile. The weapon is comprised of the "Round" made up of a launcher and a missile, both expendable, and a non-expendable tracker. The Dragon has a high single shot kill probability and a range of [deleted] meters. It will provide the primary antitank capability for infantry rifle platoons. In addition, it can provide assault fire against hardpoint targets such as weapon emplacements and field fortifications.

COST DAT

[Dollars in mill

	Fiscal year—									
	1970 and prior	1971	1972	1973	1974	1975	1976	1977	Cost to complete	Current estimate total program
Missile procurement:										
Quantity	[deleted]	[deleted]	[deleted]	[deleted]	[deleted/]	[deleted]	[deleted]	[deleted]	[deleted]	[deleted]
Cost			$12.4	$31.7	$34.5	$55.8	$51.3	$53.2		$238.9
Less advance procurement	0	0	0	0	0	0	0	0	0	0
Net missile cost			12.4	31.7	34.5	55.8	51.3	53.2		238.9
Plus advance procurement	0	0	0	0	0	0	0	0	0	0
Total missile cost			12.4	31.7	34.5	55.8	51.3	53.2		238.9
Missile program unit cost			[deleted]	[deleted]	[deleted]	[deleted]	[deleted]	[deleted]		[deleted]
Ground equipment			2.9	24.8	28.4	20.9	19.1	22.6	14.7	133.4
Weapons system cost			15.3	55.5	62.9	76.7	70.4	75.8	14.7	372.3
Initial spares			.4	1.4	1.5	.9				4.2
R.D.T. & E	71.9	18.8	12.7	3.4	[2] 1.8	0				108.6
Milcom	0	0	0	0	0	0	0	0	0	0
Program acquisition cost	71.9	18.8	26.0	60.3	66.1	78.2	71.3	75.8	14.7	485.1
Average program unit cost										[deleted]
Total addition cost [1]	38.0	0	0	0	.4	.9	1.4	1.4	1.4	43.5

[1] Includes production base support, 1st destination transportation and replenishment spares.

[2] Includes $1,100,000 currently unprogramed.

Basis for FY 1973 Budget Request.—The quantity of [deleted] missiles, [deleted] trackers and other ground support equipment represents the first full production procurement of the DRAGON System. The FY 1973 procurement will be placed on contract subsequent to successful completion of the engineering/service test planned for [deleted]. These items are required for training, equipping the Training Base and initiation of deployment of DRAGON to USAREUR units which are confronted with the most serious armor threat.

Test Data:

1. Missile and Ground Support Equipment:
   (*a*) Guided Flight Tests completed February 1971.
   (*b*) Prototype Flight Evaluation Tests completed November 1971.
   (*c*) Engineering Test/Expanded Service Tests:
   Start: [Deleted].
   Complete: ET—[deleted]; EST (Temperate)—[deleted]; EST (Environmental Phases)—[deleted].
   (*d*) Type Classification: Limited Procurement—February 1972; Standard A—[deleted].
2. Night Sight Engineering/Service Test—[deleted].
3. Results of Missile firings.

Test	Successes	Failures	No-test	Total
Guided flight test	[Deleted.]			
Engineering analysis test				
Design verification flight test				
Final flight test				
Night sight flight test				
Prototype flight evaluation test				
Total				296
Engineering/expanded service test (to be fired)				340
Total				636

CONTRACT DATA

Major subsystem	Contractor	Type of last contract
Missile	McDonnell-Douglas	FPI
Ground equipment	do	FPI
Warhead components	Unknown—to be competed	
Propellants	To be obtained from Radford Army Depot (GOCO facility operated by Hercules Powder Co.	

	Class	Operational requirement	Demonstrated
Performance:			
Accuracy, fixed targets	C	[Deleted.]	
Accuracy, moving targets	C		
Range, maximum	C		
Range, minimum	C		
		Item model, series, class, etc. BGM (heat)/BTM (trng)	
Characteristics:			
Guidance	U	Wire link.	
Altitude		Not available.	
Diameter [1]	U	5 inches.	
Length [1]	U	29 inches.	
Propulsion	U	Solid.	
Weight w/Whd [1]	U	13.6 pounds.	
Warhead type	U	Heat/inert.	

[1] The round (launcher and missile) is approximately 44 inches long, 5 inches in diameter and weighs 24.4 pounds. The tracker weighs 6.5 pounds and the total system weight ready to fire is 30.9 pounds.

Cost history comparison	Quantity missile/GSE	Amount
Initial planning estimate:		
Procurement	[Deleted]	$342.5
R.D.T. & E		61.7
Milcon		
Total, program costs		404.2
Current estimate total program (fiscal year 1972 budget submission):		
Procurement	[Deleted]	161.7
R.D.T. & E		95.8
Milcon		
Total, program costs		257.5
Current estimate total program (fiscal year 1973 budget submission):		
Procurement	[Deleted]	376.5
R.D.T. & E		108.6
Milcon		
Total, program costs		485.1

Procurement quantities in the FY 72 Budget Submission reflect a then current program designed to equip USAREUR [deleted] and the Training Base and was considered as an initial procurement objective to meet our highest priority requirements only.

The procurement quantities in the FY 73 Budget Submission reflect a revised program based on the following factors:

(*a*) An increase in the authorization of DRAGON trackers for European and European-oriented battalions from [deleted] and an expanded distribution of DRAGON systems within the Army as a whole. Missile quantities, however, are based on a lower predicted combat consumption factor derived by refinement of wargaming techniques.

(*b*) Reduced peacetime training missile expenditures based on experience gained in the training of gunners in the field in the TOW program which utilizes a similar training technique.

DRAGON MISSILE

General BUSH. The DRAGON is a man-portable antitank weapon system utilizing a command to line-of-sight guided missile that is launched and automatically guided to the target by a tracker which issues electronic commands by a wire link to the missile. The system is comprised of a "round" made up of a launcher and missile, both of which are expendable, and a nonexpendable tracker. With its high single shot kill probability, range of [deleted] meters, highly lethal warhead and reduced weight, its employment at the infantry platoon level, as a replacement for the obsolete 90-mm. recoilless rifle, will give the infantryman on the front line an unprecedented tank killing capability. We are requesting $56.5 million for the procurement of [deleted] missiles, [deleted] trackers, other ground support equipment, such as test sets and training sets, and for Advance Production Engineering for the Night sight. The fiscal year 1973 buy will be the second year of procurement and will provide for equipping the training base and will permit initial distribution to U.S. forces in Europe who face the greatest tank threat from the Warsaw Pact forces. This fiscal year 1973 buy will provide for attainment of a [deleted] percent inventory posture against the Army's current Authorized Acquisition Objective and will require continued funding under current plans through fiscal year 1979.

MISSILE UNIT COST

Chairman ELLENDER. What do those DRAGON missiles cost? I notice you are buying [deleted] plus.

General BUSH. The unit cost in the fiscal year 1973 increment is [deleted]. However, the total program unit cost is about [deleted] for the missile.

Chairman ELLENDER. That includes R. & D.?

General BUSH. A little over [deleted] for the total program, Mr. Chairman, including the R. & D. and MCA.

Chairman ELLENDER. [Deleted] per unit?

General BUSH. Yes, sir.

TOTAL PROGRAM

Chairman ELLENDER. You are asking to buy [deleted]?

General BUSH. Yes, sir; total of [deleted]. That is the total program, Mr. Chairman. The fiscal year 1973 increment is $56.5 million.

Chairman ELLENDER. This is to be bought over a period of how many years?

General BUSH. The total missile program will run out through the fiscal year 1977 program. Our first increment started in fiscal year 1972. Last year you authorized and appropriated money for the first [deleted] missiles.

Chairman ELLENDER. Of the [deleted] that you require?

General BUSH. Yes, sir; that we have in our total program; that is right, sir.

INITIAL PROCUREMENT

Chairman ELLENDER. You indicated that funds were provided in fiscal year 1972 for the initial procurement of [deleted] DRAGON missiles. Do you consider this an operational buy or a pilot production buy?

General BUSH. The fiscal year 1972 quantity of [deleted] missiles is a pilot production buy. The fiscal year 1973 buy will provide the first significant operational quantity.

Chairman ELLENDER. When will these first [deleted] missiles be delivered?

General BUSH. Sir, the [deleted] missiles in the fiscal year 1972 procurement will be delivered during the period [deleted].

Chairman ELLENDER. When do you expect this missile to become operational with the troops?

General BUSH. The Army plans to equip the first unit in CONUS with DRAGON in [deleted] and the first unit in USAREUR in [deleted].

OPERATIONAL PERFORMANCE CHARACTERISTICS

Chairman ELLENDER. Have all of the major operational performance requirements for the DRAGON missile been demonstrated to date in the test program?

General BUSH. The only operational performance requirement that has not been met is reliability. Reliability is currently [deleted] versus a [deleted] requirement. We are confident that the reliability will meet

the requirement by the time the engineering test and expanded service test are completed.

Chairman ELLENDER. I note that the DRAGON will provide the primary antitank capability for infantry rifle platoons. How does this deployment differ from the deployment for the TOW antitank missile?

General BUSH. DRAGON is an individual weapon with a range of [deleted] meters and is designed for use by the frontline soldier. The TOW, which is a much heavier weapon served by a crew of four and with a range of 3,000 meters, provides depth to the antitank defense. The DRAGON is employed at platoon level whereas the TOW will be employed at company and battalion level. These two weapon systems complement one another in their employment roles.

Chairman ELLENDER. The total current estimated cost of this program is $485.1 million, which includes $108.6 million for R. & D. How does this compare to the initial planning estimate for the acquisition of this weapon system?

General BUSH. The initial planning estimate was $404.2 million, of which $342.5 million was for procurement and $61.7 million was for Research, Development, Test, and Evaluation.

DRAGON VERSUS 90MM. RECOILLESS RIFLE

Chairman ELLENDER. In your statement, you indicated that the DRAGON will replace the obsolete 90-mm. recoilless rifle. Generally speaking, just what additional capabilities will the DRAGON provide that you did not have with the 90-mm. recoilless rifle?

General BUSH. The DRAGON will provide significantly increased first round hit probability; greater effective range, and increased lethality as shown in this comparison which I will submit for the record.

[Deleted.]

(Classified information was submitted.)

Chairman ELLENDER. Will this improvement in technology result in a decrease in manpower requirements?

General BUSH. No, sir. The improvement in technology will not, in itself, result in a decrease in manpower requirements.

HAWK AIR DEFENSE MISSILE

Chairman ELLENDER. The next item is the request of $106 million for the procurement of [deleted] HAWK air defense missiles. The missile data sheet will be included in the record at this point.

(The information follows:)

FISCAL YEAR 1973 PRESIDENT'S BUDGET ESTIMATE MISSILE DATA SHEET

Nomenclature: HAWK (NIM 23–B) POPULAR NAME: Improved HAWK

Description/Mission.—HAWK is the Army's primary low and medium altitude air-defense system. It is used in the corps areas, as well as for defense of airbases and rear area logistical complexes. A pulse radar is used to acquire medium altitude targets, and a continuous wave (CW) radar is used for low altitude target acquisition. A CW illuminating radar tracks the target and provides reflected energy for use by the missile's semi-active homing guidance system. The system is designed to defend against aircraft, to include slow-speed targets (helicopters), flying at radial speeds from [deleted] to [deleted] meters per second, altitudes up to [deleted] km, and slant ranges from [deleted] km.

COST DATA

[Dollars in millions]

	Fiscal year—									
	1970 and prior	1971	1972	1973	1974	1975	1976	1977	Cost to complete	Current estimate total program
Missile procurement:										
Quantity	[deleted]	0	[deleted]	[deleted]	[deleted]	[deleted]	[deleted]	0	0	[deleted]
Cost	$71.2	$22.5	$49.5	$51.1	$57.6	$52.6	$25.3	0	0	329.8
Less advance procurement	0	0	0	0	0	0	0	0	0	0
Net missile cost	71.2	22.5	49.5	51.1	57.6	52.6	25.3	0	0	329.8
Plus advance procurement	0	0	0	0	0	0	0	0	0	0
Total missile cost	71.2	22.5	49.5	51.1	57.6	52.6	25.3	0	0	329.8
Missile program unit cost	[deleted]	N/A	[deleted]	[deleted]	[deleted]	[deleted]	[deleted]	N/A	N/A	[deleted]
Ground equipment	90.5	35.7	39.0	54.9	61.1	18.8	4.3	0	0	304.3
Weapons system cost	161.7	58.2	88.5	106.0	118.7	71.4	29.6	0	0	634.1
Initial spares	4.7	3.8	1.6	5.3	1.6	0	0	0	0	17.0
R.D.T. & E	84.4	9.9	6.0	5.6	.7	0	0	0	0	106.6
MILCON	1.3	0	0	0	0	0	0	0	0	1.3
Program acquisition cost	252.1	71.9	96.1	116.9	121.0	71.4	29.6	0	0	759.1
Average program unit cost										[deleted]
Total additional cost[1]	60.8	.9	2.2	8.8	5.9	6.7	6.6	$6.4	0	98.3

[1] Includes replenishment spares, modifications, production base support, and first destination transportation.

Basis for fiscal year 1973 Budget Request.—This procurement is required to activate [deleted] Improved HAWK batteries of a programmed total [deleted] batteries. These batteries will be located in [deleted] and [deleted]. The budget request includes [deleted] missiles and [deleted] battery sets of ground support equipment modification kits. This program will permit achievement of a readiness posture of approximately [deleted] of the missile inventory objective. Full production release for the Improved HAWK was granted in January 1972. This release was withheld until after reliability problems encountered in earlier tests were investigated and the solutions verified in the Reliability Demonstration Test. Reliability demonstrated in this test was [deleted], which satisfied the requirement. These results and other factors were then evaluated, resulting in type classification Standard A for the system in December 1971. These events led to the full production release. The FY 1973 budget request represents continued build-up to the planned production level.

Test Data:[1]

(*a*) Engineering Design Tests completed in October 1968. [Deleted.]
(*b*) Engineering Tests completed in September 1971. [Deleted.]
(*c*) Temperate Zone Service Test completed in November 1969.
(*d*) Arctic Zone Service Test (non-firing) completed in January 1971.
(*e*) Core Flight Test completed in July 1970. [Deleted.]
(*f*) Performance Demonstration Test completed in April 1971. [Deleted.]
(*g*) Reliability Demonstration Test completed in September 1971. [Deleted.]
(*h*) System type classified Standard A in December 1971.
(*i*) Initial Production Tests scheduled for completion in [deleted] Quarter, FY [deleted].
(*j*) Tropic Zone Service Test scheduled for FY [deleted].
(*k*) Operational Test and Evaluation/Intensified Confirmatory Troop Test to be scheduled, probably in FY [deleted].

[1] Numbers in parentheses reflect the following (Number of Test Flights/Successes/Failures/No Tests). Number of test flights, as opposed to number of missile flights, is used because certain test flights satisfied more than one test objective. Test data is as of 31 Dec. 71.
[2] Includes [deleted] partial successes.
[3] Includes [deleted] special boundary firings, which account for [deleted] of the failures.

CONTRACT DATA

Major subsystem	Contractor	Type of last contract
Missile	Raytheon Co., Andover, Mass	FPI
Ground equipment	do	FPI
Warhead shells	Metal Masters Co., Baldwin, Miss	FPI

Performance	Class	Operational requirement	Demonstrated
[Deleted.]			

Characteristics		Item model, series, class, etc. (MIM–23–B).
Guidance	U	Semiactive homing.
Length	U	16.5 ft.
Diameter	U	14 in.
Propulsion	U	Dual-thrust solid propellant.
Weight w/whd	U	1,538 lb.
Warhead type	U	High explosive blast fragmentation.
Warhead weight	U	163 lb.

[1] Tests limited by drone target speed capability.

Cost history comparison	Quantity of minute/GSE	Amount
Initial planning estimate (development):		
Procurement	[Deleted.	$491.4
R.D.T. & E.		95.5
MILCON		1.3
Total, program costs		588.2
Current estimate total program (fiscal year 1972 budget submission):		
Procurement	[Deleted.]	639.9
R.D.T. & E.		92.3
MILCON		1.2
Total, program costs		733.4
Current estimate total program (fiscal year 1973 budget submission):		
Procurement	[Deleted.]	651.1
R.D.T. & E.		106.6
MILCON		1.3
Total, program costs		759.0

The increased number of missiles and battery sets since the FY 1972 Budget Submission will convert existing units in Europe from Basic to Improved HAWK. At the time of the FY 1972 Budget Submission, these units were planned for inactivation due to sale of their equipment to the Federal Republic of Germany under the REDCOSTE programs. These units are now planned for retention in the U.S. force structure.

General BUSH. The improved HAWK system provides for low and medium altitude, all weather air defense and is capable of destroying targets ranging from a hovering helicopter to high speed aircraft [deleted].

This system is used in the corps area as well as for defense of air bases and rear area logistical complexes. Full production release for the improved HAWK was granted in January 1972. This release was based on an [deleted] percent demonstrated reliability in tests which were completed in December 1971. In addition, the successes of these tests resulted in the type classification of the improved HAWK system as standard A in December 1971. We are requesting $106 million for the procurement of [deleted] missiles and [deleted] sets of ground support equipment modification kits. This procurement will provide for attainment of [deleted] percent of the present missile authorized acquisition objectives. Under current planning, procurement of the improved HAWK system will continue through fiscal year 1976.

Chairman ELLENDER. I note that we refer to this as the improved HAWK system. What are the capabilities that you get in the improved HAWK that are not available in the original HAWK missile system?

General BUSH. The improved HAWK missile system has greater range and altitude capability than the basic HAWK and can engage targets traveling at much higher speeds. Reaction time is significantly better with the improved HAWK, which also has greatly improved capability against single targets in multiple target formation and targets using [deleted]. In the latter area, basic HAWK has a [deleted] capability.

Chairman ELLENDER. In your statement, you indicated that the $106 million was for the procurement of [deleted] missiles and [deleted] sets of ground support equipment modification kits. How much of this total is for the procurement of missiles, and how much is for ground support equipment?

General BUSH. Sir, $51.1 million is for procurement of the missiles, and $54.9 million is for procurement of the ground support equipment.

Chairman ELLENDER. Just what is the nature of this ground support equipment?

General BUSH. The ground support equipment consists of all the items required to detect, acquire, and successfully engage a hostile target. The typical basic HAWK battery consists of two acquisition radars, two illuminator radars, a range only radar, a battery control central, and six launchers. To convert this battery to an improved HAWK battery we modify this equipment by the installation of approximately 500 separate modifications and by the addition of a new item of equipment, the information coordination central, which is essentially an automatic data processor. In this way, we achieve the increased capability of this system.

Chairman ELLENDER. Do you consider the fiscal year 1972 procurement of [deleted] improved HAWK missiles as the initiation of operational procurement of this system?

General BUSH. No, sir; the fiscal year 1970 procurement was the initial operational procurement of this system. However, the fiscal year 1972 procurement was the initial procurement under the full production release for the improved HAWK system granted by the Secretary of Defense in January 1972.

Chairman ELLENDER. When will the missiles funded in fiscal year 1972 be delivered?

General BUSH. The fiscal year 1972 deliveries are scheduled to begin in [deleted] and are scheduled for completion in [deleted].

Chairman ELLENDER. When do you expect the improved HAWK system to be operational in the field?

General BUSH. Sir, the initial operational capability date is scheduled for [deleted] in Europe.

Chairman ELLENDER. I note that the current total program acquisition cost for the improved HAWK system is $759 million, which includes $106.6 million for R. & D. How does this compare to the initial planning estimate for the acquisition of this system?

General BUSH. The initial planning estimate—development—for the improved HAWK system was $588.2 million, which included $95.5 million for R.D.T. & E.

Chairman ELLENDER. How much is included in the request for missile spares for the procurement of initial spares to support the HAWK missile?

General BUSH. $5.3 million, sir.

REDEYE MISSILE

Senator ALLOTT. Several years ago, we were persuaded to appropriate funds for an individually launched aircraft missile called the REDEYE. Is it operational now?

General BUSH. Yes, sir; it is in our inventory.

Senator ALLOTT. Has it been effective at all?

General BUSH. The REDEYE is in fact an effective system. I can only, of course, relate that effectiveness to our testing and training since in Vietnam, of course, we were very fortunate in operating without enemy air and, hence, there was no requirement for us to use it.

Senator ALLOTT. As I recall that particular missile, it was only effective against relatively low-speed aircraft of [deleted] knots.

HAWK MISSILE

Would the HAWK be effective against a plane coming in at supersonic speeds?

General BUSH. The improved HAWK system addresses a different part of the air defense than does the REDEYE. The REDEYE, of course, addresses that part of our air defense, the individual soldier, short range, lower flying, slower flying, and in general those which the individual gunner can identify.

The HAWK runs to a higher, considerably higher, altitude up to [deleted] feet and a range of [deleted] kilometers. It is in fact a more sophisticated system, has a greater kill capability and is in fact a part of a more sophisticated command and control, identification friend and foe system.

REDEYE II R. & D. REQUEST

Senator ALLOTT. I am told you have an R. & D. request for REDEYE II.

General BUSH. Yes, sir; that is correct.

In order to overcome some of the limitations or weaknesses of the REDEYE, we do have a follow-on program which we call MANPADS. MANPADS is an acronym for the manned portable air defense system which is what the REDEYE is. That manned portable air defense system has as a portable piece of hardware, the REDEYE II, which is the followon to the REDEYE. It is essentially the same except that it uses a different kind of seeker element. It will use [deleted] instead of the [deleted] currently used in REDEYE. It increases the range of speed. Instead of being limited to [deleted] knots, it would go up to [deleted] knots.

HAWK–REDEYE COMPARISON

Senator ALLOTT. Basically, to clear up my mind, No. 1, the functions of the HAWK and the REDEYE are completely different?

General BUSH. Completely different.

Senator ALLOTT. The REDEYE will still be a heat seeker?

General BUSH. Yes, sir.

Senator ALLOTT. How does the HAWK fix on its target?

General BUSH. By radar.

Senator ALLOTT. Thank you very much.

General KJELLSTROM. If I may, the current REDEYE can [deleted] from the jet. The improved REDEYE is going to be [deleted].

Senator ALLOTT. It still works on the heat seeking principle?

General KJELLSTROM. It is still on the heat principle but it will be able to [deleted].

HAWK MISSILE DEPLOYMENT

Chairman ELLENDER. Where will these HAWKS be used?

General BUSH. The basic HAWK missile right now is deployed with our forces on the worldwide basis. The improved HAWK as the replacement or follow on to the system will be similarly so deployed. It

will have deployment with our forces in Europe. It will have deployment with our forces in the Pacific. It will also be part of the equipment of our strategic and tactical Reserve forces that are in CONUS, that are available to move the Reserves we might deploy.

Chairman ELLENDER. Are any of these missiles in the hands of our allies in western Europe?

General BUSH. We have on the basic HAWK a total of about [deleted] batteries in Belgium, Denmark, Federal Republic of Germany, Greece, Italy, and the Netherlands. All have basic HAWK. The improved HAWK, of course, is just coming in. There are a number of countries that have expressed an interest and intent to acquire the improved HAWK.

Chairman ELLENDER. You mean by purchase?

General BUSH. Yes, sir. Greece, Iran, Norway, and Brazil, for example, those will all be handled, Mr. Chairman, under the foreign military sales applicable regulations.

HONEST JOHN

We are requesting $0.9 million for HONEST JOHN to procure flash smoke warheads required for annual service practice and to conduct stockpile reliability testing. The conduct of annual service practice is mandatory to maintain crew proficiency and confidence is employment of this system.

LANCE SURFACE-TO-SURFACE MISSILE SYSTEM

Chairman ELLENDER. The next item is the request of $90.1 million for the procurement of the LANCE division support missile system. The missile data sheet will be included in the record at this point.

General BUSH. Yes, sir.

(The information follows:)

FISCAL YEAR 1973 PRESIDENT'S BUDGET ESTIMATE MISSILE DATA SHEET

Service: Army—Nomenclature: LANCE (XMGM-52C) P-1 Line Item No. 10: Popuar Name: LANCE

Description/Mission.—LANCE is a surface-to-surface ballistic missile system. The system is deployed at the corps level and provides midrange fire support to corps and divisional forces. The system is composed of an inertially guided missile with pre-packaged liquid propellants, self-propelled full track launcher, transporter-loader and miscellaneous test and handling equipment.

Cost Data

[In millions of dollars]

	Fiscal year—									
	1970 and prior	1971	1972	1973	1974	1975	1976	1977	Cost to complete	Current estimate total program
Missile procurement:										
Quantity	0	55		[Deleted]		0	0	0	0	[Deleted]
Cost	11.2	25.9	56.5	75.6	72.5	0	0	0	0	241.7
Less: Advance procurement	0	0	0	0	0	0	0	0	0	0
Net missile cost	11.2	25.9	56.5	75.6	72.5	0	0	0	0	241.7
Plus: Advance procurement	0	0	0	0	0	0	0	0	0	0
Total missile cost	11.2	25.9	56.5	75.6	72.5	0	0	0	0	241.7
Missile program unit cost	(1)	.470		[Deleted]		(1)	(1)	(1)	(1)	[Deleted]
Ground equipment	17.2	5.8	19.7	14.5	3.0	0	0	0	0	60.2
Weapons system cost	28.4	31.7	76.2	90.1	75.5	0	0	0	0	301.9
Initial spares	2.9	0	7.6	7.2	2.3	0	0	0	0	19.9
R.D.T. & E	365.5	51.1	28.3	7.7	0	0	0	0	0	452.6
MILCON	0	0	0	0	0	0	0	0	0	0
Program acquisition cost	396.8	82.8	112.1	104.9	77.8	0	0	0	0	774.4
Average program unit cost (battalion)										[Deleted]
Total Additional Cost[2]	69.1	4.4	1.3	.3	6.4	6.9	2.9	0	0	91.3

[1] Not available.
[2] Includes replenishment spares, modifications, and production base support.

Basis for FY 1973 Budget Request.—The FY 1973 request will provide for the missiles and ground support equipment necessary to meet scheduled unit activations and deployments. The quantity of [deleted] missiles will continue the planned [deleted] per month production rate attained in the FY 72 procurement. The FY 72 procurement of [deleted] missiles will be contracted for in [deleted] after the system is Type Classified Standard A. Long leadtime items only are now being procured for the FY 72 program. In meeting the scheduled deployments of the LANCE system the scheduled inactivations of HONEST JOHN and SERGEANT Battalions will be met.

TEST DATA

a. The engineering/service flight tests are scheduled for completion in [deleted]. Nineteen of the thirty-six scheduled flights have been conducted as of 31 December 1971. Eighteen flights have been successful and one has been unsuccessful. The cause of failure of this flight was a defective (chattering) relay in the adaption kit. Design changes to prevent recurrence have been made and successfully flight tested.

b. Four R&D air defense suppression flight test demonstrations were conducted in 1971 using a non-nuclear warhead filled with [deleted] live Air Force BLU–26 antimateriel grenades. Three tests were successful in defeating the target, [deleted]. The one failure was caused by a malfunction in the explosive train that opens the warhead for distribution of the grenades.

c. Type classification Standard-A for the nuclear system is scheduled for [deleted] System was type classified Limited Procurement in January 1971.

CONTRACT DATA

Major subsystem	Contractor	Type of last contract
Missile less engine	Ling-Temco-Vought, Inc	FPI
Engine	Rocketdyne, North American Rockwell	FPI
Ground equipment	Ling-Temco-Vought, Inc	FPI
	FMC	FPI
	Orenda, Ltd	FPI
Warhead	Picatinny Arsenal (competitive bids)	FFP

Performance	Class	Operational requirement	Demonstrated
Accuracy	C	[Deleted].	
Range	C	[Deleted].	
Characteristics		Item model, series, class, etc. (Missile XMGM–52C)	
Guidance	U	Inertial.	
Altitude	U	150,000 ft. (at maximum range.)	
Diameter	U	22.3 in.	
Length	U	243 in.	
Propulsion	U	Storable liquids.	
Weight w/Whd	U	2825 lbs.	
Warhead type	U	Nuclear.	

[Dollar amounts in millions]

Cost history comparison	Quantity missile/GSE	Amount
Initial planning estimate:		
Procurement	[Deleted]	$232.5
R.D.T. & E	154/0	420.4
MILCON	N/A	0
Total, program costs		652.9
Current estimate, total program (fiscal year 1972 budget submission):		
Procurement	[Deleted]	310.8
R.D.T. & E	162/0	447.9
MILCON	N/A	0
Total, program costs		758.7
Current estimate, total program (fiscal year 1973 budget submission):		
Procurement	[Deleted]	321.8
R.D.T. & E	165/0	452.6
MILCON	N/A	0
Total, program costs		774.4

The increase from the FY72 to FY73 budget submission is due to including escalation and minor increases for initial spares, production base support, and repricing in the procurement estimates. RDT&E increases are due to stretch-out of the R&D missiles production, required due to delay in Procurement, and for [deleted] testing.

General BUSH. A surface-to-surface ballistic missile system. The system is composed of an inertially guided missile with prepackaged liquid propellants, self-propelled full-track launcher, transport-loader, and miscellaneous test and handling equipment. The LANCE provides medium range nuclear fire support in the corps area and will replace HONEST JOHN and SERGEANT missile systems in Europe.

The fiscal year 1973 request will continue quantity procurement of the LANCE nuclear missile system. Our request of $90.1 million is for [deleted] missiles and [deleted] sets of ground support equipment. These quantities are requested so that our LANCE unit activations and deployments can proceed as scheduled and our planned deactivations of the older HONEST JOHN and SERGEANT Battalions can proceed as planned. The planned production rate of [deleted] missiles per month attained in the fiscal year 1972 program will be continued in the fiscal year 1973 program. The engineering service flight tests have been highly successful and no problems are anticipated in meeting current schedules. We are planning one more year of procurement which will buy out the Army's current Authorized Acquisition Objective.

With regard to the LANCE nonnuclear warhead, you will recall that the Congress deleted our fiscal year 1972 request of $2.9 million to initiate production. The Army continues to support the need for the LANCE nonnuclear warhead and is in the process of developing a prior approval repragroming action for continuation of the development effort which would ultimately lead to procurement funds being requested. I have this to add that the fiscal year 1973 budget request before you does not contain funds for the nonnuclear warhead in either fiscal year 1972 or 1973. We have, however, programed a quantity of practice warheads at a cost of $4.1 million ($3.3 for the warhead and $.8 for support costs) in the fiscal year 1973 request which are now required in the absence of the nonnuclear warhead.

GROUND EQUIPMENT

Chairman ELLENDER. Of the $90.1 million requested for LANCE, how much is for the procurement of missiles and how much is for the procurement of ground equipment?

General BUSH. $75.6 million is for the procurement of missiles and $14.5 million is for the procurement of ground equipment.

INITIAL SPARES

Chairman ELLENDER. How much is included in the request for missile spares for the procurement of initial spares to support the LANCE?

General BUSH. $7.1 million, sir.

DELIVERY

Chairman ELLENDER. When will the missiles funded in fiscal years 1971 and 1972 be delivered?

General BUSH. The missiles funded in fiscal year 1971 will be delivered from March 1972 through [deleted] and the missiles funded in fiscal year 1972 will be delivered from [deleted] through [deleted].

Chairman ELLENDER. On page 1 of the missile data sheet, I note the following statement: "In meeting the scheduled deployments of the LANCE system the scheduled inactivations of HONEST JOHN and SERGEANT battalions will be met." When do you expect the LANCE missile to become operational with the troops?

General BUSH. The CONUS LANCE Battalion will be operational in [deleted] and the U.S. Army Europe LANCE Battalions will become operational at a rate of one each [deleted] beginning in [deleted].

Chairman ELLENDER. Will the replacement of the HONEST JOHN and SERGEANT systems with the LANCE result in a reduced manpower requirement?

General BUSH. Yes, sir. By the end of [deleted] LANCE Battalions will have replaced [deleted] SERGEANT, [deleted] HONEST JOHN, and [deleted] LITTLE JOHN battalions with a total net savings of over [deleted] personnel.

NONNUCLEAR WARHEAD FOR LANCE

Chairman ELLENDER. In your statement, you referred to the Army's support for the need for a nonnuclear warhead for the LANCE system. Why does the Army feel that such a warhead is needed for the LANCE missile?

General BUSH. Lance is replacing the dual capable (nuclear/nonnuclear) HONEST JOHN rocket system as well as the nuclear-only SERGEANT missile system. Without a LANCE nonnuclear warhead, the capability provided by HONEST JOHN cannot be replaced.

The primary requirement for nonnuclear LANCE is to provide the field commander a tactical flexibility to defeat high threat [deleted] targets prior to release of nuclear weapons. The targets are those beyond cannon artillery range, [deleted] kilometers into enemy territory; included are [deleted]. A nonnuclear capability for LANCE is critical during the first [deleted] of a conventional war when tactical aircraft will be committed to the defeat of enemy air power. Lance will complement tactical aircraft by assisting in opening penetration corridors through enemy air defenses, thereby reducing aircraft attrition. Further, LANCE is an all-weather, day/night, quick response system which can support the field commander when such conditions impair operations of tactical aircraft.

PERSHING MISSILE

Chairman ELLENDER. The next item is the request of $31.3 million for the PERSHING surface-to-surface missile system. The missile data sheet will be included in the record at this point.

General BUSH. Yes, sir.

(The information follows:)

FISCAL YEAR 1973 PRESIDENT'S BUDGET ESTIMATE MISSILE DATA SHEET

Service: Army—Nomenclature: PERSHING (MGM–31A) P–1 Line Item No. 11: Popular name: PERSHING 1a

Description/Mission.—PERSHING is a ground mobile, air transportable, surface-to-surface, two-stage solid propellant, inertially guided ballistic missile system. The system is deployed at theater level and has the primary mission of providing nuclear fire support to [deleted] in the Quick Reaction Alert (QRA) role. The system is also designed for the mission of general support of the Field Army to be executed upon completion of the QRA role.

COST DATA

[In millions of dollars]

	Fiscal year—									
	1970 and prior	1971	1972	1973	1974	1975	1976	1977	Cost to complete	Current estimate total program
Missile procurement:										
Quantity	[Deleted]	0	[Deleted]	[Deleted]	[Deleted]	0	0	0	N/A	[Deleted]
Cost	367.0	10.9	37.3	26.1	31.9	0	0	0	0	473.2
Less: Advance procurement	0	0	0	0	0	0	0	0	0	0
Net missile cost	367.0	10.9	37.3	26.1	31.9	0	0	0	0	473.2
Plus: Advance procurement	0	0	0	0	0	0	0	0	0	0
Total missile cost	367.0	10.9	37.3	26.1	31.9	0	0	0	0	473.2
Missile program unit cost	[Deleted]	N/A	[Deleted]	[Deleted]	[Deleted]	N/A	N/A	N/A	N/A	[Deleted
Ground equipment	[1] 117.0	0	6.4	5.2	0	0	0	0	0	128.6
Weapons system cost	484.0	10.9	43.7	31.3	31.9	0	0	0	0	601.8
Initial spares	[3] 14.8	.1	2.7	1.0	3.5	1.0	.1	.71	0	24.0
R.D.T. & E	615.1	15.3	4.6	8.2	4.0	15.6	0	0	0	662.8
MILCON	0	0	0	0	0	0	0	0	0	0
Program acquisition cost	1,113.9	26.3	51.0	40.5	39.4	16.6	.7	.2	0	1,288.6
Average program unit cost (missile)										[Deleted]
Total additional cost [4]	[3] 43.4	5.3	18.3	16.1	21.6	23.0	14.3	5.4	0	147.4

[1] Excludes $200.9 for Pershing P1 equipment.
[2] Excludes $29.6 for Pershing P1 spares.
[3] Excludes $27.0 for Pershing P1 modifications and P1 production base support.
[4] Includes replenishment spares, modifications, and production base support.

Basis for FY 1973 Budget Request.—The FY 1973 request will provide for the procurement of [deleted] missiles and the repackaging of the remaining forty of [deleted] power stations. The planned procurement of [deleted] missiles will maintain the Authorized Acquisition Objective thru [deleted] while supporting the annual expenditure of [deleted] missiles. The FY 1972 and FY 1973 U.S. missile procurement and the Federal Republic of Germany (FRG) missile procurement of [deleted] will be produced at the minimum sustaining rate of [deleted] per month. This will permit a planned FY 1974 U.S. program and additional probable FRG buy of [deleted] missiles to be effected without a break in production. The repackaging of the Power Stations will complete this effort started in FY 1972 and increase the maintainability and reliability of this item of equipment.

TEST DATA

a. System Type Classified Standard-A 26 Jul 1971.

b. Engineering Design Flight Tests (Phase I) for the missile improved components were completed in November 1971. Four of six flights were successful and two were considered "no test" for the improved components. One of the "no test" flights was destroyed by range safety due to lack of positional information (range safety equipment failure) and the other was "no test" due to a failure caused by faulty assembly procedures.

c. Product Improvement Flight Tests (Phase II) for the improved components are to be completed in April 1972.

CONTRACT DATA

Major subsystem	Contractor	Type of last contract
Missile:		
G. & C	Martin & Bendix	FPI
Propulsion	Thiokol	FPI
Ground equipment	Martin	FPI
Warhead	Picatinny Arsenal (competitive bids)	FFP

Performance	Class	Operational requirement	Predicted	Demonstrated
Range	U	100-400 NM		100-400 NM
Accuracy:				
200-300 NM	C			(1)
100-200 and 300-400 NM		[Deleted]		[Deleted].

Characteristics		Item model (missile MGM-31A)
Guidance	U	Inertial/stable-platform.
Altitude	C	[Deleted.]
Diameter	U	40 in.
Length	U	34 ft., 7 in.
Propulsion	U	Solid propellants, 2-satge.
Weight w/whd	C	[Deleted.]
Warhead type	U	Nuclear.

1 Insufficient sample due to geographic limitation imposed by firing ranges.

[Dollar amount in millions]

Cost history comparison	Quantity Msl/GSE [1] [2]	Amount
Initial planning estimate:		
Procurement	[deleted]	$602.5
R.D.T. & E.	(3)	641.4
MILCON	(3)	0
Total program costs		1,243.9
Current estimate total program (fiscal year 1972 budget submission):		
Procurement	[deleted]	602.5
R.D.T. & E.	(3)	641.4
MILCON	(3)	0
Total program costs		1,243.9
Current estimate total program (fiscal year 1973 budget submission):		
Procurement	[deleted]	625.8
R.D.T. & E.	(3)	662.8
MILCON	(3)	0
Total program costs		1,288.6

[1] On hand assets equivalent to 3 additional battery sets used in training, maintenance evaluation, and as maintenance float items identified.
[2] Increased by 13 missiles to maintain the Authorized Acquisition Objective until [deleted].
[3] Not available.

The increase from the FY 72 to FY 73 budget submission is due to escalation and the programming of thirteen additional missiles in the procurement estimates. RDT&E increases are for the development of automatic azimuth laying capability, programmer test station switching kits, new count down tapes with a shorter count down time, and engineering development of [deleted]. The latter development, programmed in FY 75, is dependent upon success in the advance development of this [deleted] technique.

PERSHING

General BUSH. PERSHING is a mobile, air transportable, surface-to-surface, two-stage propellant inertially guided ballistic missile system. The system is deployed at theater level with the primary mission of providing nuclear fire support in the quick reaction alert role.

Chairman ELLENDER. Please explain.

General BUSH. That, Mr. Chairman, refers to the timing, an instant response or instant reaction within the overall plans for our forces in Europe. The QRA, quick reaction alert, role is consistent and compatible with our total employment of strategic weapons but refers to that which is within the European increment. We are requesting $31.3 million for the procurement of [deleted] PERSHING missiles and repackaging of the remaining 40 power stations. The fiscal year 1972 production, awarded in December 1971, is being planned at a minimum sustaining rate of [deleted] per month in conjunction with a foreign sales program for [deleted] missiles. The [deleted] missiles in the fiscal year 1973 program, produced at the sustaining rate, will permit a planned fiscal year 1974 U.S. program and a probable additional foreign buy of [deleted] missiles to be effected without a break in production. The repackaging of the power stations will complete the effort started in fiscal year 1972 and increase the reliability and maintainability of this item of equipment.

GROUND EQUIPMENT

Chairman ELLENDER. How much of the $31.3 million requested for the PERSHING is for the procurement of missiles, and how much is for the procurement of ground equipment?

General BUSH. $26.1 million is for the procurement of missiles and $5.2 million is for the procurement of ground equipment.

Chairman ELLENDER. What is the nature of the PERSHING ground equipment?

General BUSH. Sir, the ground equipment funding requirement is for the repackaging of the final increment of 40 power stations into a configuration to improve maintainability and reliability.

INITIAL SPARES

Chairman ELLENDER. How much is included in your request for missile spares for the procurement of initial spares for the support of the PERSHING missile system?

General BUSH. $1 million.

TOW ANTITANK MISSILE

Chairman ELLENDER. The next item to be considered is the request of $40.7 million for the TOW missile system. The missile data sheet will be included in the record at this point.

(The information follows:)

FISCAL YEAR 1973, PRESIDENT'S BUDGET ESTIMATE, MISSILE DATA SHEET

Service: Army—Nomenclature: TOW Missile System (BGM–71A, (BTM–71A) P–1 Line Item No. 14: Popular Name: TOW

Description/Mission.—TOW is a tube launched, optically tracked, wire command link guided antitank missile system. The system has a minimum range of 65 meters and a maximum range of 3000 meters. The warhead will defeat the heaviest known armor. TOW can be manpacked and employed from the ground on a tripod and also can be mounted on the Mechanical Mule, the Jeep, the Armored Personnel Carrier and on a helicopter. To engage the enemy, the TOW gunner has only to acquire and track the target by aligning the cross-hairs of the optical sight on the target. Deviations of the missile from the intended line-of-sight trajectory are sensed automatically by an infrared sensor in the launcher, and correcting commands are sent to the missile over a wire command link dispensed by the missile. TOW will be the principal antitank weapon in infantry battalions and will be used primarily to attack armored vehicles but may be employed in the assault of bunkers or other hard point targets.

COST DATA

[Dollar amounts in millions]

	Fiscal year—									
	1970 and prior	1971	1972	1973	1974	1975	1976	1977	Cost to complete	Current estimate total program
Missile procurement:										
Quantity	[deleted]	[deleted]	[deleted]	[deleted]	[deleted]	[deleted]	[deleted]	[deleted]	[deleted]	[deleted]
Cost	141.9	79.0	43.3	37.6	36.1	33.9				371.8
Less advance procurement	0	0	0	0	0	0				0
Net missile cost	141.9	79.0	43.3	37.6	36.1	33.9				371.8
Plus advance procurement	0	0	0	0	0	0				0
Total missile cost	141.9	79.0	43.3	37.6	36.1	33.9				371.8
Missile program unit cost	[deleted]	[deleted]	[deleted]	[deleted]	[deleted]	[deleted]	[deleted]	[deleted]	[deleted]	[deleted]
Ground equipment	48.8	19.9	18.7	3.1	34.3	41.9	23.4			190.1
Weapons system cost	190.7	98.9	62.0	40.7	70.4	75.8	23.4			561.9
Inital spares	15.0									15.0
R.D.T. & E	100.6	1.4	.7	.2						102.9
MILCON	0	0	0							
Program acquisition cost	306.3	100.3	62.7	40.9	70.4	75.8	23.4			679.8
Average program unit cost										[Deleted]
Total additional cost [1]	14.2	.9	.6	.8	1.1	1.0	.7	.7		20.0

[1] Contains production base support, 1st destination transportation, and replenishment spares.

Basis for FY 1973 Budget Request.—The quantity of [deleted] missiles and associated ground support equipment is required to provide for training and for the continued equipping of the U.S. Active Army Forces with the TOW system. Distribution of the FY 1973 buy is planned to be made primarily to [deleted]. The training base, USAREUR, [deleted], will have been equipped by prior year's procurements. The FY 1973 procurement is the fifth year of procurement of the TOW system. The FY 73 missile procurement is the second increment of a multi-year contract awarded after full competition between the two current missile producers.

TEST DATA

a. Engineering/Service Test, except for environmental tests, completed July 1969.

b. Initial Production Tests completed April 1970.

c. Confirmatory Test completed September 1970.

d. Both Missiles and the Launcher were type classified as Standard-A in September 1970.

e. Remaining Tests: Environmental tests will be completed February 1972.

f. Results of Missile Firing: [Deleted.]

[Deleted.]

R&D Missile Summary: Fired—326; destroyed in Miscellaneous Tests—21; tested to destruction in contractor facility—39; on hand—6; yet to be delivered—80: Total—472.

CONTRACT DATA

Major subsystem	Contractor	Type of last contract
Missile	Hughes Aircraft Co	FFP
Ground equipment	do	FPI
Warhead:		
Heat	Parts—Firestone and Zenith (LAP by Iowa Ammunition Plant).	FFP
Training	Engineering Tech, Inc	FFP

Performance	CLAS	Operational requirement	Demonstrated
Accuracy:			
Fixed targets	C	[Deleted]	
Moving targets	C		
Range:			
Maximum	U	2,000 meters	3,000 meters
Minimum	U	Min safe arming distance	65 meters

Characteristics		Item model, series, class, etc. BGM (HEAT) / BTM (Training)
Guidance	U	Wire Link
Altitude		N/A
Diameter[4]	U	5.8 in
Length[4]	U	46.5 in
Propulsion	U	Solid
Weight w/warhead[4]	U	40 lbs
Warhead type	U	Heat/Inert

[4] W/O container; container is 50.5 in long, 8.6 in. in diameter and weighs 14 lbs.

Cost history comparison	Quantity missile/ GSE	(Millions)
Initial planning estimate:		
Procurement		$629.4
R.D.T. & E	[Deleted]	97.9
MILCON		0
Total program costs		727.3
Current estimate total program (fiscal year 1972 budget submission):		
Procurement		621.1
R.D.T. & E	[Deleted]	103.0
MILCON		0
Total program costs		724.1
Current estimate total program (fiscal year 1973 budget submission):		
Procurement		576.9
R.D.T. & E	[Deleted]	102.9
MILCON		0
Total program costs		769.8

Procurement quantities in the FY 72 Budget Submission were based on a then current plan for equipping USAREUR. [Deleted] in CONUS as an initial procurement objective only.

The procurement quantities in the FY 73 Budget Submission reflect a revised program based on the following factors:

a. Reduced total missile requirements resulting from lower predicted combat consumption factors derived by refinement of wargaming techniques.

b. Reduced peacetime training missile expenditures based on experience in the training of TOW gunners in the field.

c. An increase in the authorization of launchers for European and European oriented battalions from [deleted] and an expanded distribution of TOW systems witthin the Army as a whole.

General Bush. TOW is a tube-launched, optically tracked, wire guided missile designed for use against heavily armored vehicles and fortifications. It will be carried on a variety of standard vehicles such as the M–113 armored personnel carrier, and the truck, platform, utility, one-half ton, 4 by 4, M–274 series—more popularly known as the "Mule"—and, in addition, is being adapted as one of the weapons systems on helicopter gunships. The TOW ground support equipment consists of a tripod, launch tube, sight sensor, traversing unit, and electronic unit, as well as mounting kits for vehicle adaptation, battery chargers, and training sets. TOW is being phased into the Army inventory as a replacement for the 106-mm. recoilless rifle in the heavy antitank assault weapon role.

For fiscal year 1973, the Army is requesting $40.7 million for the procurement of [deleted] missiles and ground support equipment. This fiscal year 1973 procurement is the second year of a planned 4-year multiyear procurement of missiles. This multiyear procurement for missiles was awarded after the competition between the two current producers on a winner-take-all basis. The fiscal year 1973 program will provide a [deleted] percent missile inventory posture against the currently Authorized Acquisition Objective. The Army's current plans are to continue procurement of this system through fiscal year 1976.

Ground Support Equipment

Chairman Ellender. How much of this $40.7 million is for the procurement of missiles, and how much is for ground equipment?

General BUSH. The fiscal year 1973 request for TOW contains $37.6 million for [deleted] missiles and $3.1 million for ground equipment.

Chairman ELLENDER. When do you expect the TOW missile to become operational with the field troops, and when do you expect you will complete the replacement of the 106-mm. recoilless rifle with the TOW?

General BUSH. The first unit was operational with TOW in December 1970. Current schedules call for equipage of the Active Army and seelcted high priority reserve units to be completed in calendar year [deleted].

ACQUISITION AND ACQUISITION COST

Chairman ELLENDER. On page 5 of the data sheet, I note that the total current estimated acquisition cost for the TOW missile system is $679.8 million, including $102.9 million for R. & D. What was the original estimated acquisition cost of the TOW missile, and how much of that total was for R. & D?

General BUSH. The initial planning estimate for TOW was $727.3 million of which $629.4 million was for procurement and $97.9 million was for Research, Development, Test and Evaluation.

Chairman ELLENDER. On page 1 of the data sheet, I note that the current program is based on the acquisition of [deleted] TOW missiles. Does this total requirement include those missiles that will be required for the Cobra helicopter-TOW missile modification program?

General BUSH. Yes, sir.

MODIFICATION OF MISSILES

General BUSH. We are requesting $27.4 million to modify seven of our systems.

Chairman ELLENDER. The next item is the request of $27.4 million for the budget activity entitled "Modification of Missiles." Pages 15 and 16 of the justification will be included in the record at this point.

(The information follows:)

JUSTIFICATION—ACTIVITY 3—MODIFICATION OF MISSILES

[In thousands of dollars]

	Actual, fiscal year 1971	Estimate	
		Fiscal year 1972	Fiscal year 1973
Direct obligations or direct budget plan	$21,500	$39,600	$27,400

SECTION 1—PURPOSE AND SCOPE

These funds provide for the conversion/modification of surface-to-air, surface-to-surface, and antitank missile systems, air defense control and coordination systems, air defense targets, and related ground support equipment.

SECTION 2—JUSTIFICATION OF FUNDS REQUESTED

The requested level of funding is required for conversions/modifications to air defense control and coordination systems, the CHAPARRAL missile, the Forward Area Alerting Radar, the Land Combat Support System and the HAWK, LANCE, NIKE HERCULES and PERSHING missile systems. Included in the

program are major improvements to the PERSHING missile to improve tactical and strategic capability and extend the life of the system.

Funds are requested for the procurment of the following conversions/modifications.

Air Defense Control & Coordination Systems.—$3.1 million is requested for modification of air defense control and coordination systems. These modifications are required to improve system operation, eliminate safety problems, increase reliability, and improve maintainability. This program is mandatory in order to enhance the use of essential air defense control and coordination systems already in the inventory.

CHAPARRAL.—$1.6 million is required for modification of the CHAPARRAL Air Defense System. These funds will be used to increase reliability and improve maintainability of various items of ground support equipment.

Forward Area Alerting Radar (FAAR).—$1.6 million is requested for modification of the FAAR. These funds will provide for a modification to electronically eliminate a target portrayal ambiguity in the radar scope. This modification will lead to increased effectiveness of the system.

HAWK.—$.5 million is requested for modification of the HAWK Air Defense System. The funds will provide for modifications to increase reliability, eliminate safety hazards, and improve the effectiveness of the system.

Land Combat Support System (LCSS).—$1.3 million is requested for changes designed to increase the reliability, maintainability and performance of the system.

NIKE HERCULES.—Modifications.—$3.2 is requested for modification of the Nike Hercules air defense system. This system provides air defense both overseas and in the United States against medium and high altitude, high performance enemy bombers and air-to-surface missiles. This program is mandatory in order to provide modifications to ground equipment which will reduce maintenance costs and increase system reliability. Improvements will also be made which will allow the Army to conduct more realistic training and increase operator proficiency.

PERSHING.—$16.1 million is requested for the procurement of the second and final increment of the missile improvements and installation of the improvements on the initial increment of missiles. These improvements will extend the life of the system, increase reliability, and improve maintainability of the missile. The improved components are of the latest technology and designed to stand up under the operating conditions imposed on the missiles by its adoption to the Quick Reaction Alert role.

General BUSH. For the air defense control and coordination system and NIKE HERCULES, we are requesting $3.1 million and $3.2 million, respectively, for modifications to increase systems reliability, reduce maintenance costs, improve maintainability, and eliminate safety hazards. For the PERSHING missile system, we are requesting $16.1 million to continue procurement of missile improvements, started in fiscal year 1972, and to initiate installation of these improvements. These improvements update critical components to current technology which will extend the life of the system to [deleted].

Chairman ELLENDER. I have difficulty in understanding why so much is required for the modification of missiles, aircraft, and other weapons we have in our operational inventory. You mentioned $16.1 million for the modification of PERSHING missiles. Does this represent an improvement resulting from an R. & D. effort?

General BUSH. Yes, sir; that is correct. This missile which has been in the inventory for quite some time represents about a 15-year-old technology. As you are aware, Mr. Chairman, the electronics and the missile industries have moved on at a rapid pace, putting some missile systems not only out of date but with the reliability and accuracy that are questionable. Rather than coming up with an extremely expensive new replacement system and in order to obtain maximum use of that which we have, we elected to have a modification program. This amount continues that modification program.

Chairman ELLENDER. Will that modification be done where the missiles are now located, or will they have to be brought back to the manufacturing facility where the modification will be done?

General BUSH. Mr. Chairman, I believe the answer to your question is that they will be brought back. The plant modifications will be done by a contractor installation team. For those missiles that are in the continental United States, they will be brought back to the plant. For those that will be in Europe, I believe that the contractor team will go over to Europe and it will be done there. I would like to verify that and I will insert in the record, if I may, Mr. Chairman, the precise locations for those.

Chairman ELLENDER. I am not interested in the location, but just whether or not the missiles you have in Europe will have to be transferred here and then sent back.

General BUSH. Not for those that are in Europe, Mr. Chairman.

Chairman ELLENDER. This seems to be a continuous, unending process.

General BUSH. Yes, sir.

Chairman ELLENDER. Such modification is very costly.

Proceed.

General BUSH. A total of $5.0 million is requested for modifications to the HAWK and CHAPARRAL missile systems, the forward area alerting radar, and the Land Combat Support System.

HAWK MODIFICATIONS

Chairman ELLENDER. Just what is involved in the $500,000 requested for HAWK missile modifications?

General BUSH. In the supporting data furnished to the Congress for exhibit P–1 line number 18. HAWK modifications, $70,000 was requested for application of already procured modification kits to the basic HAWK missile. Since the time of budget preparation, these kits have been placed in the supply system as modified component parts, thus allowing application on a replacement basis, as opposed to installation as a modification kit. The $70,000 is now planned to be used for emergency equipment improvements involving safety. Other modifications planned include $430,000 for depot-level application of miscellaneous modification kits to basic HAWK ground support equipment for improved safety and reliability. All modifications are fully compatible with improved HAWK.

CHAPARRAL MODIFICATIONS

Chairman ELLENDER. What do you plan to do with the $1.6 million you are requesting for modification of CHAPARRAL for air defense missiles?

General BUSH. This amount will provide for modification of in-service ground support equipment. $952,000 will cover procurement and installation of modification kits to include $650,000 for the main power unit of the fire unit; $39,000 for the AN/DSM–79 missile tester; and $263,000 for the generator control box. In addition, procurement of an alternate power source modification kit for the fire unit at a cost of $677,000 is planned.

Forward Area Alerting Radar Modifications

Chairman Ellender. You are requesting $1.6 million for the modifications of the Forward Area Alerting Radar. What is the nature of these modifications?

General Bush. This request is for the automatic ambiguity modification, which will be placed on the initial procurement quantity of radars procured with fiscal year 1969 funding. The radar now displays false targets on the scope because of its extreme sensitivity. Targets outside the range of the scope are displayed on the scope at one-half the actual range. This causes the operator to manually check for ambiguity, thus delaying system reaction time. The proposed modification will accomplish the check automatically so that false targets are not displayed.

Land Combat Support System Modifications

Chairman Ellender. What do you plan to do with the $1.3 million you are requesting for modifications of the Land Combat Support System?

General Bush. The $1.3 million will be used to modify the optics bench, cabling, power supply, signal generator, and LCSS, TOW and SHILLELAGH patchboards to improve the accuracy, reliability and maintainability of the system. Also planned are modifications to improve the storage capacity, including provision of microfiche readers, miscellaneous minor modifications and installation costs.

Spares and Repair Parts

Chairman Ellender. The next item is $62.3 million requested for the procurement of missile spares and repair parts. Page 17 of the justifications will be included in the record at this point.

(The information follows:)

JUSTIFICATION—ACTIVITY 4—SPARES AND REPAIR PARTS

[In thousands of dollars]

	Actual, fiscal year 1971	Estimate	
		Fiscal year 1972	Fiscal year 1973
Direct obligations or direct budget plan	20,200	47,000	62,300

Section 1.—Purpose and Scope

These funds provide for the procurement of depot reparable major assemblies and repair parts for surface-to-air and surface-to-surface missile systems, including initial provisioning and replenishment.

Section 2.—Justification of Funds Requested

This funding level is necessary for the initial and replenishment procurement of centrally managed, high dollar value depot reparable components, assemblies, and repair parts to support the authorized missile systems. Parts and support materiel covered by these funds are not carried in the Army Stock Fund.

The $62.3 million requested for fiscal year 1973 includes $36.6 million for SAFEGUARD System.

SAFEGUARD.—**$36.6 million is requested for procurement of initial spares to support the SAFEGUARD 4-site program.**

Other.—$25.7 million is requested for spares to support the major item procurements requested and for spares to replenish inventory levels of selected high unit cost repair parts. Inventories will be replenished to levels determined by demand data.

General BUSH. We are requesting a total of $62.3 million. Of this amount, $36.6 million for SAFEGUARD initial spares and $25.7 million is for initial and replenishment spares for all other missile systems.

INITIAL SPARES

Chairman ELLENDER. How much of this total of $25.7 million for spares for missile systems other than SAFEGUARD is for procurement of initial spares, and how much is for replenishment pares?

General BUSH. $18.8 million is for initial spares and $6.9 million is for replenishment spares.

Chairman ELLENDER. Please provide a tabulation for the record listing each of the systems that are included in the total requested for initial spares.

General BUSH. May I provide this information for the record?

(The information follows:)

	Millions
Chaparral guided missile system	$0.211
Forward area alerting radar	4.000
HAWK guided missile system	5.269
NIKE HERCULES missile system	.215
PERSHING missile system	1.000
LANCE missile system	7.111
Land Combat Support System	.290
DRAGON missile system	.436
Interrogator set AN/TPX–46	.075
Air Defense Command and control system	.120
TOW missile system	.037
Total	18.764

SUPPORT EQUIPMENT AND FACILITIES

Chairman ELLENDER. The next item is a request of $21.8 million for the budget activity entitled "Support Equipment and Facilities." Pages 18 and 19 of the justifications will be included in the record at this point.

(The information follows:)

JUSTIFICATION—ACTIVITY 5, SUPPORT EQUIPMENT AND FACILITIES

[In thousands of dollars]

	Actual, fiscal year 1971	Estimate	
		Fiscal year 1972	Fiscal year 1973
Direct obligations or direct budget plan	27,900	42,600	21,800

SECTION 1. PURPOSE AND SCOPE

These funds provide for procurement of missile system support equipment, items less than $500,000, first destination transportation, and production in support of the Army missile programs.

SECTION 2.—JUSTIFICATION OF FUNDS REQUESTED

The requested level of funding is required for procurement of air defense targets, interrogator sets, automated test and checkout equipment, and items less than $500,000. These funds also provide for first destination transportation and production base support requirements in support of missile systems.

Air Defense Targets.— $5.1 million is requested for procurement of target missiles, tow targets, and ground support equipment. This program is mandatory to provide target missiles for training of air defense personnel and evaluation of air defense weapons systems.

Interrogator Set, AN/TPX–46.—$8.0 million is requested for the continued procurement of this item in order to field the Army portion of the Mark XII IFF System. The AN/TPX–46 will be used with HAWK, NIKE HERCULES, Air Defense Control and Coordination systems, and ground control approach radars.

Interrogator Set, AN/TPX–50.—$1.3 million is requested for continued procurement of this item in order to field the Army portion of the Mark XII IFF System. The AN/TPX–50 is used with the Forward Area Alerting Radar (FAAR), which provides information to the CHAPARRAL, VULCAN, and REDEYE air defense systems.

Land Combat Support System (LCSS).—$4.0 million is requested for procurement of DRAGON Supplementary Kits. These kits provide for interface between the components of the DRAGON Missile System and the basic LCSS test station and are necessary for LCSS maintenance support to the DRAGON Missile System.

Items Less Than $500,000.—$0.4 million is requested for stockpile reliability testing and tool kits for missile systems.

First Destination Transportation.—$0.8 million is requested for the first destination transportation of missiles and related equipment procured under this appropriation.

Production Base Support.—$2.2 million is requested. Seven projects totalling $1.1 million are in the area of manufacturing methods and technology and deal with the advancement of manufacturing techniques for various missile components. Four projects totalling $0.7 million are related to annual support of the Michigan Army Missile Plant, the Guided Missile Systems Acceptance Control Facility at Redstone Arsenal, and the Red River Army Depot. Four projects totalling $0.4 million pertain to the layaway of industrial facilities.

SUPPORT EQUIPMENT AND FACILITIES

General BUSH. Within this category amounting to a total of $21.8 million, $5.1 million is requested for air defense targets. These funds are for procurement of target missiles, tow targets, and ground support, and control equipment. These items are required for training of air defense personnel and evaluation of air defense weapons systems.

Chairman ELLENDER. With respect to the $5.1 million requested for air defense targets, I note in the P–1 exhibit that $3.6 million was provided for these targets in fiscal year 1971 and only $1.6 million in fiscal year 1972. What accounts for the rather substantial increase in the fund requested for the procurement of air defense targets?

General BUSH. The increase in fiscal year 1973 funds is due almost entirely to two items. It reflects a new start on procurement of the Ballistic Aerial Target System—BATS—for approximately $3 million. This item was procured initially with fiscal years 1970 and 1971 funds, but was not procured in fiscal 1972. Also included in the fiscal year 1973 program is approximately $1.3 million to continue procurement of the Integrated Target Control System—ITCS—which began in the fiscal year 1972 program for approximately $500,000.

AN/TPX INTERRAGATOR SETS

A total of $8 million is requested for [122] AN/TPX–46 interrogator sets and [$1.3] million for [31] AN/TPX–50 interrogator sets.

These items serve as the ground units used in the triservice Mark XII identification friend-or-foe—IFF—system. These requests represent continued procurement of the AN/TPX–46—with final procurement planned for fiscal year 1974—and final procurement of the AN/TPX–50.

Chairman ELLENDER. As I understand, one of these interrogators is used in connection with the HAWK and NIKE-HERCULES air defense systems, and the other one is used in connection with the CHAPARRAL-VULCAN air defense system. Am I correct about this?

General BUSH. Yes, sir. The AN/TPX–46 interrogator set is used with the HAWK and NIKE HERCULES and the AN/TPX–50 interrogator is used with the CHAPARRAL/VULCAN air defense system.

The last four items represent $4 million for procurement of the Land Combat Support System supplementary kits for the DRAGON missile system; $0.4 million for items less than $500,000; $0.8 million for first destination transportation; and $2.2 million for 15 production-base support projects.

	Each	Amoun
Shop equipment, rocket maintenance	23	$64, 000
Tool kit, guided missile, HAWK	6	19, 000
Shop set, guided missile, NIKE	8	57, 000

Chairman ELLENDER. You indicate that $2.2 million requested for production base support is for 15 separate projects. Would you provide a statement for the record listing each of these projects?

General BUSH. I would be happy to.

(The information follows:)

	Millions
1. Rehabilitation of Government-owned metal working machine tools at the Michigan Army Missile Plant	$0.052
2. Acquisition of equipment for the Guided Missile Systems Acceptance Control Center, Redstone Arsenal	.295
3. Annual Support of the Red River Army Depot	.046
4. Annual Support of the Michigan Army Missile Plant	.298
5. A project to develop lightweight, low-cost plastic missile containers	.183
6. A project to improve techniques for application to various types of welding	.109
7. A project to develop improved ceramics manufacturing methods for missile nose cones	.188
8. A project to develop an improved high temperature solid propellant motor nozzle	.131
9. A project to develop an advanced method of joining processes in the assembly of hardware	.183
10. A project to develop a new processing technique for the production of oxide coated cathode electron tubes	.050
11. A project to develop a standarized automated calibration measurement system	.226
12. Plant clearance of a Government-owned industrial plant at Huntsville, Ala	.056
13. Plant clearance of a Government-furnished equipment from a contractor-owned plant at Burlington, Mass	.150
14. Plant clearence of Government-furnished equipment from a contractor-owned plant at Anaheim, Calif	.081
15. A omnibus project to provide funding for packing, crating, handling, and transportation of small quantities of contractor excess equipment that may be generated during the year	.118
Total	2.166

EQUIPMENT AND SUPPORT COSTS FOR WEAPONS AND TRACKED COMBAT VEHICLE

General BUSH. Chart No. 12 shows the equipment and supporting costs included in our request for weapons and tracked combat vehicles which totals $259.5 million. This program represents steady progress in improving readiness to support the North Atlantic Treaty Organization (NATO) oriented strategy.

CHART 12

FISCAL YEAR 1973 BUDGET REQUEST FOR WEAPONS AND TRACKED COMBAT VEHICLES

[Dollar amounts in millions]

	Quantity	Fiscal year 1973 program
Tracked combat vehicles		($58.4)
Chassis, carrier, full tracked (Vulcan) XM741	32	2.6
Tank, combat, full tracked, 105 mm. gun, M60A1	166	[1] 55.8
Weapons and other combat vehicles		(29.3)
Gun, AAA, SP, 20 mm. XM163 (Vulcan)	32	6.7
Gun, AAA, towed, 20 mm. XM167 (Vulcan)	31	5.9
Howitzer, medium, towed, 155 mm., XM198 (APE)		3.6
Launcher, grenade, 40 mm. M203, F/M16A1 rifle	33,396	2.5
Rangefinder, fire control (Laser) AN/GVS-3	1,020	6.8
Target selector group, fire control, XM-10 (Vulcan)	60	3.8
Modification of in-service equipment		(140.1)
Tank, combat, full tracked, 152 mm. gun, M60A2	316	102.5
Howitzer, medium, armored, SP, full tracked, 155 mm. M109A1		12.4
Other modifications		25.2
Other support costs		(31.7)
Components for special tests		.7
Items less than $500,000		1.5
Spares and repair parts		9.0
First destination transportation		3.2
Production base support		17.3
Total		259.5

[1] Includes $6.9 for long-leadtime components.

Chairman ELLENDER. It is my understanding that the total amount requested for this appropriation requires 412 authorization. Am I correct about this?

General BUSH. That is correct, Mr. Chairman. We are requesting authorization of $259.5 million for this appropriation.

VULCAN 20-MILLIMETER AIR DEFENSE GUN CARRIERS

Chairman ELLENDER. The first item is a request of $2.6 million for the procurement of 32 VULCAN 20 millimeter air defense gun carriers. The vehicle data sheet will be included in the record at this point.

(The information follows:)

Nomenclature: Chassis, Carrier, FT, (Vulcan) X-M741, Popular Name: Vulcan Carrier

Description/mission.—An Armored full tracked vehicle using the chassis of M113A1 modified to mount X-M163, VULCAN Gun System.

FISCAL YEAR 1973 PRESIDENT'S BUDGET ESTIMATE—DATA SHEET

NOMENCLATURE: CHASSIS, CARRIER, FT, (VULCAN) XM741—POPULAR NAME: VULCAN CARRIER

[Description/Mission: An Armored full tracked vehicle using the chassis of M113A1 modified to mount the XM163, VULCAN Gun System]

[In millions of dollars]

	Fiscal year—									
	1970 and prior	1971	1972	1973	1974	1975	1976	1977	Cost to complete	Current estimate total program
Item procurement:										
Quantity	[Deleted]			32						[Deleted]
Cost	[1] 15.4			2.600						18.0
Less: Advance Procurement	0			0						0
Net cost	15.4			2.600						18.0
Plus: Advance procurement	0			0						0
Weapon system—Total cost	15.4			2.600						18.0
Weapon system—Unit cost	[Deleted]			.080						[Deleted]
Initial spares	0			0						0
R.D.T. & E	0			0						0
MILCON	0			0						0
Program acquisition cost	15.4			2.600						18.0
Program unit cost	[Deleted]			.080						[Deleted]
Total additional costs										0

[1] Fiscal year 1969 program procured 111 each XM741 chassis. All prior year procurement of carriers ([deleted] total, were M113A1's, (Personnel carriers), modified to mount the XM163 gun. The cost displayed includes cost of basic M113A1 plus cost of modification.

Basis for fiscal year 1973 request: The fiscal year 1973 procurement of 32 permits the Army to fill the maintenance float and post D-day consumption level to [deleted].

TEST DATA

(a) Development Acceptance Test completed June 1967.
(b) Engineering/Service Test completed January 1969.

ENVIRONMENTAL TEST

(1) Artic completed February 1969.
(2) Tropic completed September 1968.
(c) Initial Production Test completed October 1968.
(d) Type Classification STD–A forecast third quarter fiscal year 1972.

CONTRACT DATA

Major subsystem	Contractor	Type of last contract
Chassis	FMC Corp	FFP
Engine	General Motors Corp	FFP
Transmission	General Motors Corp	FFP

Characteristics	Class	Item model, series, class, etc. (XM741)
Speed—land/water	U	43/3.5 miles per hour.
Range	U	305 miles.
Engine:		
Fuel	U	Diesel.
Horsepower	U	215.
Cylinders	U	V–6.
Weight	U	23,713 lbs.
Armor	U	Aluminum.
Crew	U	4.
Air transportable	U	Phase II.

Cost history comparison	Quantity	Amount (In millions)
Initial plannng estimate:		
Procurement	[Deleted]	$21.4
R.D.T. & E	N/A	
MILCON		
Total program cost		21.4
Current estimate total program (fiscal year 1972 budget submission):		
Procurement		
R.D.T. & E	N/A	
MILCON		
Total program cost		
Current estimate total program (fiscal year 1973 budget submission):		
Procurement	[Deleted]	18.0
R.D.T. & E	N/A	
MILCON		
Total program cost		18.0

General BUSH. We are requesting $2.6 million for the procurement of 32 XM–741 chassis, carrier, an armored full tracked vehicle, which uses the chassis of the M–113 modified to mount the 20-millimeter, Vulcan, XM–163 gun.

Chairman ELLENDER. How is this request related to the request for $6.7 million for the procurement of 32 20-millimeter VULCAN guns set out in line 21 of the P–1 exhibit?

General BUSH The request for $2.6 million to procure 32 chassis, XM741, provides the required number of carriers to install 32 20-millimeter guns, XM163, being requested on line 21 of the P–1.

Chairman ELLENDER. Why do you request funds for the carrier and the gun separately?

General BUSH. In fiscal year 1968 and prior years the VULCAN carrier was programed and procured as an armored personnel carrier. M–113A1, and modified in production to accommodate installation of the VULCAN gun system, XM163. The M113A1 line, in the exhibit P–1 at that time did not indicate how much of the request was being sought for VULCAN, nor was there any reference to VULCAN. Frequently, the VULCAN gun line, in the P–1 was misinterpreted, as representing total system cost, when in reality total cost could only be determined by the sum of, cost to procure, and modify the basic M113A1, plus cost to procure the armament system. Subsequent to the fiscal year 1968 program the Army assigned a model designator XM–741 to the carrier, without changing the method of production, vehicle characteristics or performances. The exhibit P–1 now displays separate lines for the armament system XM163 and carrier, XM741, with cost to modify in production being borne by this line.

Chairman ELLENDER. Will the 32 carriers you are requesting for fiscal year 1973 complete your procurement objective for this vehicle?

General BUSH. Procurement of 32 carriers in fiscal year 1973 will achieve a total asset position of [deleted]. This asset position would attain [deleted] percent of the Army acquisition objective. Although the Army does not intend to make additional procurement of the current model of the VULCAN, there is an R. & D. program which will study future product improvements to the VULCAN system to make it more effective; and there are air defense studies under way to reevaluate the total mix of systems needed in the 1980's. The outcome of such studies could result in a request for more improved VULCAN systems.

Chairman ELLENDER. I note on the vehicle data sheet that the fiscal year 1973 program is based on a unit cost of $80,000 per vehicle, and that the unit cost for fiscal year 1970 and prior years was [deleted] per vehicle. What accounts for this difference?

General BUSH. During the budget formulation period, it was anticipated that the armored personnel carrier family would be out of production during fiscal year 1973 and would therefore require reopening the line to produce 32 chassis XM741. Production startup was estimated to cost approximately $0.5 million. Additionally, it was anticipated that a high production unit cost would result from the low production quantity. These two assemblies coupled with normal escalation over a 4-year span, resulted in a program unit cost estimate of $80,000 per vehicle. Subsequent to submission of the fiscal year 1973 President's budget, foreign customer sales of armed personnel carriers have been received for approximately 700 vehicles. The Army is planning award of a contract in April 1972 to satisfy this requirement, which will keep the production line open throughout 1973. As a result of continuing production of the armored personnel carrier family the unit cost for XM–741 is now anticipated to be reduced to approximately $65,700.

M–60A1 TANKS

Chairman ELLENDER. The next item is the request of $48.9 million for the procurement of 166 M–60A1 tanks. The vehicle data sheet will be included in the record at this point.

(The information follows:)

Nomenclature. Tank, Combat, FT, 105MM Gun, M60A1, Popular Name: None

Description/Mission.—The M60A1 tank is an armored full track vehicle, diesel engine powered, and mounting a 105mm gun system as its primary armament. Secondary Armament of one .50 cal M85 machine mounted turret cupola and a 7.62 mm M73 machine gun coaxially mounted alongside the 105 mm gun. Special kits provide for extreme weather operations and a fording potential up to 13.5 ft. It has improved ballistic protection over the M60 tank, an earlier model. The M60A1 tank is normally employed as the primary weapons system in a combined arms force assigned a land combat mission.

COST DATA

[In millions of dollars]

	Fiscal year—			
	1970 [1] and prior	1971	1972	1973
Item procurement:				
Quantity	[2] [deleted]	300	90	166
Cost	[2][3] 864.6	66.4	30.7	50.9
Less: Advance procurement	0	1.9	1.0	2.0
Net cost	864.6	64.5	29.7	48.9
Plus: Advance procurement	1.9	1.0	2.0	6.9
Weapons system, total cost	866.5	65.5	31.7	55.8
Weapons system, unit cost	[deleted]	.218	.352	.336
Initial spares	.5	0	0	0
R.D.T. & E	2.9	0	0	0
MILCON	0	0	0	0
Program acquisition costs	869.9	65.5	31.7	55.8
Average program unit cost	.171	.218	.352	.336
Total additional cost [4]				

[1] Includes programs back through fiscal year 1959.
[2] Includes M-60 tank program [deleted].
[3] Includes $29.5 (value of chassis) transferred from M60A2 program.
[4] Includes production base and replenishment spares.

Basis for FY 73 Request—The fiscal year 1973 procurement is required to continue the Army's program to provide increased mobility and firepower in armor units. Prior to the FY–73 procurement only [Deleted] of the tank authorized acquisition objective is filled with tanks with diesel engines and 105mm guns or better. This quantity of 166 M60A1 tanks in conjunction with the production retrofit of 316 M60A2 tanks maintains a warm production base. A reduction in this program would cause increased costs and could result in shutting down our only operational tank production base.

TEST DATA

Not available.

CONTRACT DATA

Major subsystem	Contractor	Type of last contract
Vehicle	Chrysler Corp., Detroit, Mich	FFP
Engine	Continental Motors, Muskegan, Mich	FFP
Transmission	Allison Division, GMC Indianapolis, Ind	FFP

Characteristics	Class	Item model, series, class, etc. M60A1	M60
Crew	U	4	4.
Engine HP/fuel	U	750/diesel	750/diesel.
Length	U	273 inches	273 inches.
Width	U	143 inches	143 inches.
Height	U	128 inches	126 inches.
Range (vehicle)	U	310 miles	310 miles.
Speed, land	U	30 miles per hour	30 miles per hour.
Weight, combat loaded	U	105,000 pounds	101,000 pounds.

COST HISTORY COMPARISON

[In millions]

	Quantity	Amount
Initial planning estimate:[1]		
Procurement	(1)	(1)
R.D.T. & E	(1)	(1)
MILCON	(1)	(1)
Current estimate total program (fiscal year 1972 budget submission):		
Procurement	[Deleted].[2]	$1,080.6
R.D.T. & E		2.9
MILCON		0
Total program cost		1,083.5
Current estimate total program (fiscal year 1973 budget submission):		
Procurement	[Deleted].[2]	1,550.3
R.D.T. & E		2.9
MILCON		0
Total program cost		1,553.2

[1] The M60/M60A1 was planned for procurement to modernize the M48 tank fleet and therefore a planning/development estimate is not appropriate.
[2] Difference between fiscal year 1972 and fiscal year 1973 budget submission quantities is due to program decision changes caused by termination of the XM803 program.

General BUSH. Our request for $55.8 million to procure 166 M60A1 tanks and long leadtime components for fiscal year 74 tank production is in support of the Army program to upgrade the M60 series inventory with tanks mounting the 105 millimeter gun or better.

Chairman ELLENDER. Let me be sure that I understand your request. The 166 tanks you are requesting are estimated to cost $50.9 million, which is offset by $2 million for advance procurement provided in prior years, for a net requirement of $48.9 million for these 166 tanks. Am I correct about this?

General BUSH Yes, sir.

Chairman ELLENDER. And in addition, you are requesting $6.9 million for advance procurement to support the procurement of these tanks in fiscal year 1974 which gives you the total of $55.8 million referred to in your statement. Is that correct?

General BUSH. Yes, sir.

Chairman ELLENDER. It is my understanding that the production of these 166 tanks, along with the retrofit of M60A2 tanks, provides the minimum program to sustain our tank production line. Am I correct about this?

General BUSH. That is essentially correct. The production of 166 M60A1 tanks in conjunction with the production/retrofit of 316 M60A2 tanks maintains a warm tank production base at Detroit and at the production facilities at our major subcontractors for the fabrication of turret and hull castings, fire control, and armament.

Chairman ELLENDER. I have a note indicating these tanks cost about $300,000 apiece; is that correct?

General BUSH. Yes, sir; approximately. I have a unit cost for this year for that tank of $307,000

Chairman ELLENDER. Proceed.

XM163 20-MILLIMETER GUN SYSTEM

General BUSH. We are requesting $6.7 million for the procurement of 32 XM163 20-millimeter gun systems. This gun is mounted on the XM741 carrier to complete the highly mobile, full-tracked Vulcan system.

XM167 20-MILLIMETER GUNS

In addition, we have requested $5.9 million for procurement of 31 XM167 20-millimeter guns for the towed VULCAN system. The XM163 and XM167 procurements will fulfill the requirements for forward area, air defense gun systems. The self-propelled version is used by the mechanized, armored and infantry divisions while the towed gun is used by the airborne division.

Chairman ELLENDER. Are the 32 VULCAN guns for which you are requesting the $6.7 million on line 21 of the P-1 exhibit for installation on the VULCAN gun carriers that we discussed previously?

General BUSH. Yes, sir, that is correct.

Chairman ELLENDER. On line 22 of the P-1 exhibit, there is a request of $5.9 million for the procurement of 31 additional VULCAN guns. Is this the towed VULCAN gun you referred to in your statement?

General BUSH. Yes, sir; that is correct.

Chairman ELLENDER. As I understand your statement, the 1973 program for both these systems will complete your planned procurement of these guns. Am I correct about this?

General BUSH. Essentially you are correct since the asset position with the fiscal year 1973 buy, attains [deleted] of the current Army acquisition objective. The Army is considering selected Reserve units with the Vulcan gun; should this consideration result in an approved plan, additional procurement of the improved VULCAN would be requested.

115-MILLIMETER XM198 HOWITZER

Our request for $3.6 million for the 155-millimeter XM198 Howitzer is to initiate the development of a technical data package and provide funds for starting four preproduction prototypes.

Chairman ELLENDER. Is this a new gun?

General BUSH. Yes, sir.

Chairman ELLENDER. It is still in research and development?

General BUSH. Yes, sir, it is under development within the Army programs, specifically the Weapons Command at Rock Island, Ill.

Chairman ELLENDER. You are requesting prototypes for testing?

General BUSH. Yes, sir. As I mentioned to you earlier, we sometimes have a hard time figuring out who is going to pay for what. This is in that transition stage. These costs are properly charged to Procurement Appropriations. Mr. Chairman, I think that this particular gun is an exceedingly important one to us and this chart that I have asked Colonel Heffner to place in front of you shows the enormous

degree to which this howitzer will be an improvement over the current M–114A.

GUN CAPABILITY

The Soviet Union has an ability to bring fire to bear on us at a range of 27 kilometers. This howitzer has the capability shown on the chart. Our current M114 Howitzer is only able to reach out 14 kilometers.

This new XM198 with the rocket assisted projectile will be able to reach out to a range of between [deleted] kilometers. It is a considerable increase and one that we attach high importance to. The importance of this advanced production engineering increment, Mr. Chairman, is in order to insure the production in fiscal year [deleted]. We have to get this part of that program going.

The current engineering development phase for this item is scheduled for completion in 1973. The XM198 replaces the M114A1 which dates back to World War II. It will possess considerably greater range capability than the towed version it replaces.

Chairman ELLENDER. As I understand your request for this new howitzer, $3.6 million is for advance production engineering and the fabrication of four preproduction prototypes of this weapon. Am I correct about this?

General BUSH. No, sir, not entirely. The $3.6 million in fiscal year 1973 will provide for procurement of hard tooling fixtures, convert drawings and procure long-leadtime components for four preproduction prototypes which will be fabricated using fiscal year 1974 funds.

40-MILLIMETER GRENADE LAUNCHER M203

We are requesting $2.5 million for the procurement of 33,396 launchers, grenade, 400 millimeters, M203. The launcher when attached to the M16A1 rifle, provides infantry rifle squads with the capability of engaging enemy forces with a high explosive, fragmentation projectile.

Chairman ELLENDER. I note that the M203 grenade launcher will replace the M79 grenade launcher. How does the M203 differ from the earlier grenade launcher, and just why are they being replaced?

General BUSH. Mr. Chairman, the M203 grenade launcher is attached to the M16A1 rifle. The M79 grenade launcher is an individual weapon. Both launchers fire the same ammunition. The M79 launcher was developed and fielded to provide an improved grenade launch capability within the rifle squad. The M79 however offered the grenadier no capability of engaging close-in targets. When the XM148, 40-millimeter grenade launcher was proven unsuccessful as an attachment to the M16A1 rifle, the M203 was developed. The M79 launcher is being replaced because of the greater advantages afforded by the M203 launcher. For example, the rifle strength of the infantry rifle squad equipped with the M203 is increased by two, while maintaining the same grenade launching capability as the squad in which two grenadiers are equipped with the M79, as their basic individual weapon. Additionally, the M16A1 rifle with the M203 attached provides the grenadier with a weapon for self-defense more effective than the caliber .45 pistol, currently authorized the grenadier armed with the M79.

Chairman ELLENDER. As I understand what you are saying, this new device is an adapter that goes on the basic M16 rifle, whereas the earlier M79 was an individual weapon. Am I correct about this?

General BUSH. Yes, sir.

Chairman ELLENDER. Do you intend to buy one of these grenade launchers for each of the M16 rifles that you have bought?

General BUSH. No, sir; the current authorized acquisition objective for the M203 launcher is approximately 5 percent of the authorized acquisition of the M16A1 rifle.

Chairman ELLENDER. What is the cost of this grenade launcher?

General BUSH. Sir, the current procurement cost of the M203 launcher is $75.00.

AN/GVS-3 LASER RANGEFINDER

The $6.8 million for procurement of 1,020 AN/GVS-3 laser rangefinders is scheduled as the final buy of a 3-year multiprocurement contract. Our request for $3.8 million for the procurement of 60 XM10 target selector group, fire control, is for a trainer item which will enable an evaluating officer to monitor and analyze the VULCAN gunner's performance and proficiency during training operations.

Chairman ELLENDER. Please describe this Laser Rangefinder, and tell us how it is used with combat troops.

General BUSH. The laser rangefinder AN/GVS-3 is an independent item of fire control equipment used by the artillery forward observer and other combat arms observers to provide precise target location data in the form of range, azimuth, and elevation. The rangefinder utilizes a single pulse of light obtained from a ruby laser cavity to determine target range by measuring lapsed time required for the light pulse to reach the target and return to the rangefinder. The system weighs 36.2 pounds and can be carried on a backpack by one man. It is mounted on a tripod for normal operations.

Chairman ELLENDER. As I understand the data sheet, your request for fiscal year 1973 will complete the procurement objective for this specific laser rangefinder, and will not procure any more until the second generation laser rangefinder is developed. Am I correct about this?

General BUSH. Yes, sir.

Chairman ELLENDER. From your statement, I get the impression that the "target selector group" is strictly a training device. Is this correct?

General BUSH. Yes, sir; that is correct.

Chairman ELLENDER. Are the 60 you are requesting for fiscal year 1973 your total requirement for this training device?

General BUSH. Yes, sir; that is correct.

MODIFICATION PROGRAM

Our request for funds to accomplish the modification program for items in the inventory totals $140.1 million, and includes $102.5 million for the production/retrofit of 316 M60A2 tanks in order to correct deficiencies in turret stability and system reliability. This is the final procurement year for the retrofit of this item. We are requesting $12.4 million to continue procurement and installation of modification kits for the M109A1 medium armored, self-propelled, full tracked 105-millimeter howitzer. The modification enables this howitzer to take advantage of increased range developments. Other modification costs included in our request total $25.2 million. This provides $10.5 million for procurement and application of a laser rangefinder for the M551 Gen-

eral Sheridan; $9.8 million is requested for engineering, procurement, and application of modifications which will provide improvements in combat effectiveness, reliability and maintainability of the M60 series tanks. The remaining modification funds we are requesting include $1.1 million for increasing the ammunition stowage capacity on the XM163 20-millimeter gun system and $3.8 million for the procurement of various modification kits under $500,000.

Chairman ELLENDER. You refer to the request totaling $140.1 million for your planned modification program. I assume that this includes the $124.1 million for the modification of tracked combat vehicles set out in lines 10–16 of the P–1 exhibit and the $16 million for the modification of weapons set out on lines 30, 31, and 32 of the P–1 exhibit. Am I correct about this?

General BUSH. Yes, sir; that is correct.

Chairman ELLENDER. As you indicated, the request includes $102.5 million for the production and retrofit of the M60A2 combat tanks. The weapons data sheet will be included in the record at this point.

(The information follows:)

Service: Army—P–1 Line Item No. 15

Nomenclature.—Tank, Combat, Full Tracked, 152mm Gun, M60A2, Popular Name: None.

Description/Mission.—The M60A2 Tank combines the proven performance of the M60A1 chassis with a new compact turret. Primary armament is the 152mm gun/launcher firing either the Shillelagh Missile or the 152mm HEAT and APERS round. The turret, gun and cupola can be operated in a fully stabilized mode permitting the vehicle to shoot on the move. The Laser Rangefinder and M19 Ballistics Computer combine to provide exceptionally accurate fire control for the conventional round. This tank will be employed as one of the primary weapon systems of tank units, combining effective fire power with maximum crew protection and mobility. It will be a primary weapon of U.S. Army armor and mechanized divisions in Europe.

FISCAL YEAR 1973 PRESIDENT'S BUDGET ESTIMATE DATA SHEET

COST DATA

[Dollar amounts in millions]

	Fiscal year—									
	1970[1] and prior	1971	1972	1973	1974	1975	1976	1977	Cost to complete	Current estimate total program
Item procurement:										
Quantity	543									543
Cost	[2] 225.2	12.1	[3] 34.7	[4] 102.5						374.5
Less advance procurement	0	0	0	0						0
Net cost	225.2	12.1	34.7	102.5						374.5
Plus advance procurement calendar year	0	0	0	0						0
Weapon system, total cost	225.2	12.1	34.7	102.5						374.5
Weapons system, unit cost	.415									.6
Initial spares	3.5		4.8	2.3						10.6
R.D.T. & E	17.6	0	0	0						17.6
MILCON										0
Program acquisition cost	246.3	12.1	39.5	104.8						402.7
Average program unit cost[5]	.451	N/A	N/A	N/A						.738
Total additional cost[6]	15.3			.4	0.1	6.1				16.4

[1] Includes programs back through fiscal year 1965.
[2] Does not include $29,500,000 in materiel which was applied to the M60A1 program.
[3] Funding for retrofit of 210 on-hand M60A2 tanks.
[4] Funding for production/retrofit of 316 M60A2 tanks. Includes production of 287 chassis previously diverted to M60A1 program. (See note 2.)
[5] Total program cost of $402,700,000 divided by 546 (includes three R. & D. models). Does not include cost of machineguns, radios, and intercoms, searchlights, and CBR kits. (Approximately $15,000 per tank.) These items are programed under separate budget lines.
[6] Includes production base support, trainers, and first destination transportation.

Basis for fiscal year 1973 request. Fiscal year 1972 funds are required for the production/retrofit of 316 M60A2 tanks in order to correct deficiencies in turret stability system reliability, thereby enabling the Army to deploy this tank. This is the last programed buy of this item and when added to the 210 tanks retrofit in fiscal year 1972 and 14 in prior years, will allow the Army to field 540 interim missile firing tanks. This quantity of 316 M60A2 tanks in conjunction with the production of 166 M60A1 tanks maintains a warm tank production base.

Test Data:

(*a*) Contractor tests completed November 1970.

(*b*) ET/ST completed September 1971. Type classified Standard A November 1971.

(*c*) Initial Production Tests scheduled for completion May 1973.

(*d*) Intensified confirmatory Troop Test scheduled for completion June 1973.

CONTRACT DATA

Major subsystem	Contractor	Type of last contract
Vehicle	Chrysler Corp., Detroit, Mich	FFP/CPFF
Engine	Continental Motors, Muskegon, Mich	FFP
Transmission	Allison Division, GMC, Indianapolis, Ind	FFP

M60A2

Characteristics	Class	Item model, series, class, etc.
Crew	U	4.
Engine horsepower/fuel	U	750/diesel.
Length	U	289 inches.
Width	U	143 inches.
Height	U	130 inches.
Range (Vehicle)	U	280 miles.
Speed land/water	U	30 m.p.h./NA.
Weight combat loaded	U	114,400 pounds.
Primary armament	U	152mm Gun/launcher capable of firing the Shillelagh missile or conventional ammunition.

[Dollar amounts in millions]

	Quantity	Amount
Cost history comparison:		
Initial planning estimate:		
Procurement	600	$156.0
R.D.T. & E		0
MILCON		0
Total program cost		156.0
Current estimate total program:		
Fiscal year 1972 budget submission:		
Procurement	543	367.0
R.D.T. & E		17.6
MILCON		0
Total program cost		384.6
Fiscal year 1973 budget submission:		
Procurement	543	385.1
R.D.T. & E		17.6
MILCON		0
Total program cost		402.7

Note: Differences in program quantities reflect program decision changes. Major program increases from the fiscal year 1972 to the fiscal year 1973 budget submission are escalation ($10,800,000), additional initial spares and test equipment requirements ($6,400,000), and a net increase due to engineering and estimate changes ($900,000). Details are provided in March 1971, September 1971, and December 1971 selected acquisition reports.

Chairman ELLENDER. We discussed this program earlier. Technically, what is the difference between the M60A2 designation and the former designation of M60A1E2?

General BUSH. The M60A2 designation identifies the standard A configuration of the developmental M60A1E2. This tank successfully completed engineering tests and service tests in September 1971 and was type classified Standard A during November 1971.

Chairman ELLENDER. I know that the basic difference between the M60A2 and the M60A1 tank is the 152-millimeter/Shillelagh weapon system. Are there any other significant differences in the two versions of this tank?

General BUSH. The M60A2 tank has a new compact turret which mounts the 152-millimeter gun/launcher as its primary armament. The gun/launcher is capable of firing either the [deleted] meter range Shillelagh missile or the 152-millimeter combustible case conventional ammunition; but not the kinetic energy round. The turret gun and commander's cupola can be operated in a fully stabilized mode permitting the vehicle to fire its conventional ammunition on the move. The laser rangefinder and M19 ballistics computer combine to improve the accuracy of the conventional 152-millimeter round. The commander's designation capability permits automatic alinement of the gun and gunner's sight with a target the commander has acquired. The M60A1 tank does not have the [deleted] meter range; or the stabilized turret; or the laser rangefinder and computer; or the commander's automatic designation capability; however, the rapid-firing, high-velocity, 105-millimeter gun using a kinetic energy round is superior for engagement of multiple armor targets at mid and close ranges. In the battlefield, the two tanks are complementary. The excellent mid- and short-range firepower of the M60A1 is complemented by the long-range kill capability of the M60A2.

Chairman ELLENDER. In discussing this $102.5 million request, you refer to the "production/retrofit" of 316 M60A2 tanks. It is my understanding that, of the 316 tanks to be retrofit, 287 are new chassis that are being procured to offset a like number that were previously diverted to the M60A1 program. Am I correct about this?

General BUSH. Yes, sir. The 316 M60A2's in the fiscal year 1973 program includes retrofit of turret and chassis on 29 tanks, retrofit of 287 more turrets and procurement of 287 chassis.

Chairman ELLENDER. If I understand the data sheet, the retrofit of these 316 tanks, along with the 210 retrofitted in fiscal year 1972 and 14 of the earlier retrofits, will give you a total of 540 M60A2 tanks. Is this correct?

General BUSH. Yes, sir.

Chairman ELLENDER. Is this your total requirement for the M60A2's?

General BUSH. Yes, Mr. Chairman. The Army has no plans to procure any additional M60A2 tanks.

Chairman ELLENDER. On page 3 of the data sheet, I note the following statement: "This program represents the retrofit of a total of 540 M60A2 (formerly M60A1E2) tanks which were initially produced during fiscal years 1967 and 1969. Turret stabilization plus other technical problems necessitated suspension of the operational deployment of these tanks pending correction of these problems." Are you

convinced that these problems have been solved and that this current program is going to give you a deployable weapon system?

General BUSH. Yes, Mr. Chairman. The M60A2 successfully completed engineering tests and service tests in September 1971 and was type classified standard A during November 1971. A production decision was made to continue the M60A2 retrofit program based on the favorable results of those tests.

Chairman ELLENDER. In your statement, you referred to the $10.5 million for procurement and application of laser rangefinders for the M551 General Sheridan armored reconnaissance vehicle. Just what additional capabilities do you obtain by modifying these vehicles with this laser rangefinder?

General BUSH. The AN/VVG–1 Laser Rangefinder is designed to determine accurately the range of enemy targets. This accurate determination of range significantly increases first round hit probability for the 152 millimeters conventional round against point targets.

Chairman ELLENDER. How many vehicles can you modify with the $10.5 million you are requesting for fiscal year 1973?

General BUSH. Approximately 330.

Chairman ELLENDER. How many of these vehicles do you plan to modify, and what is the total estimated cost of this program, and how much has been provided through fiscal year 1972 for this program?

General BUSH. The current Army plan calls for procurement and installation of [deleted] rangefinders, sufficient to equip U.S. forces that are NATO positioned and/or oriented. The total PEMA program is estimated to cost $41.5 million over a 4-year span. The current program is $10.9 million in fiscal year 1971, $0.2 million in fiscal year 1972, $10.5 million requested for fiscal year 1973, and $19.9 million more required to complete the program.

M60 TANK MODIFICATIONS

Chairman ELLENDER. As you indicated in your statement, the request includes $9.8 million for modification of existing M–60 tanks. What additional capabilities are we seeking through this modification program?

General BUSH. The $9.8 million in fiscal year 1973 will be used for engineering, procurement, and application of modifications which will provide improvements in combat effectiveness, reliability, and maintainability. These funds will be used as set out in this tabulation which I will provide for the record.

(The information follows:)

[In millions]

Item	Quantity	Cost
Air cleaner kits (reliability/maintainability)	540	$1.3
Accelerator control box kits (reliability/safety)	1,142	.3
Emergency firing mechanism kits (reliability)	1,045	.2
Improved reliability engine engineering (reliability and maintainability)		2.0
Improved electrical system engineering (reliability and maintainability)		.5
Engineering and other activities related to systems integration and configuration management of the product improvement program		5.5
Total		9.8

Chairman ELLENDER. I note that $7.1 million was provided for this program in fiscal year 1972. What do you expect to accomplish in the 1972 modification program?

General BUSH. The fiscal year 1972 procurement funds are required for engineering, overhaul application studies and tests, procurement, and application of modifications to M60 series tanks which will improve combat effectiveness and extend the useful life of our current tanks in the most cost effective manner. The $7.1 million in fiscal year 1972 will be used as set out in this table which I will also supply for the record.

(The information follows:)

[In millions]

Item	Quantity	Cost
Add-on-stabilization kits (shoot-on-the-move capability)	10	$0.4
Air cleaner kits	540	1.0
Accelerator contro box kits	1,142	.5
Emergency firing mechanism kits	1,045	.2
Improved reliability engine engineering		2.5
Improved electrical system engineering		.5
Engineering and other aciviti es related to systems integration and configuration management of the product improvement program		2.0
Total		7.1

Chairman ELLENDER. How many of these existing M–60 tanks do you expect to go through this modification program, what is the total estimated cost of this program, and how many have been modified through fiscal year 1972?

General BUSH. The M60A1 product improvement program envisions the improvement of approximately [deleted] M–60A1 tanks and [deleted] M–60 tanks at an estimated cost of $80,000 per tank in fiscal year 1972 constant dollars.

Time required to improve the entire M–60 series tank fleet is estimated [deleted] years under the current plan of applying the product improvements during overhaul. For planning purposes, the assumed overhaul rate is 540 tanks per year. Alternative methods of application are now under study. No operational tanks have as yet been retrofitted with these improvements through fiscal year 1972 except for the accelerator control box and emergency firing mechanism kits which are included in a multiyear modification work order (MWO) program.

Chairman ELLENDER. Just what is involved in the modification to give the existing M60A1 tank a capability to shoot on the move?

General BUSH. The basic modification that will provide the existing M–60A1 tank a capability to shoot on the move is the addon stabilization system. This system provides stabilization control for both gun elevation and turret traverse and provides the gunner with the capability of aiming and target tracking while the tank is moving. Installation of the addon stabilization system requires the application of additional mounting brackets, cables, and hydraulic tubing within the tank.

In conjunction with the addon stabilization system, the Army has a R.D.T. & E. funded program to develop the solid-state computer, laser rangefinder and tube-over-bar suspension system which will increase the first round hit probability while firing on the move. These improvements when fully integrated will increase the overall combat effectiveness of this tank.

MISCELLANEOUS MODIFICATION OF TRACKED COMBAT VEHICLES

Chairman ELLENDER. On line 16 of the P–1 exhibit, there is a request of $1.3 million for "Modifications under $500,000." Give us some examples of the types of modifications you contemplate making with these funds.

General BUSH. Sir, some examples are: Installation of a newly developed obturator pad—breech-sealing mechanism to prevent gas leakage during firing—on the 165-millimeter cannon mounted on the combat engineer vehicle. The current pad is unsatisfactory at extreme temperatures. The new pad will correct this deficiency and will last for many more rounds than the current pad.

Replacement of the existing plywood buoyant trim vane on the M113A1 carrier family with aluminum forms filled with low-density foam to increase freeboard during water operations. Existing freeboard is marginal because of the weight added by other modifications since these items entered the system.

Installation of sidewall braces in the M548 cargo carriers to eliminate sidewall vibrations which are causing cracks between the sidewalls and the sponson.

Product improvement program for working parts of the M–60 machinegun which will be in the system for a long time. Purpose is to reduce malfunctions, the cost of maintenance and replacement parts. This requires engineering redesign and reliability tests to assure product improvement.

SELF-PROPELLED VULCAN GUN MODIFICATIONS

Chairman ELLENDER. In your statement, you refer to $1.1 million for the modification of the XM163 20-millimeter gun system. Is this the item that is set out as line 30 of the P–1 exhibit?

General BUSH. Yes, sir.

Chairman ELLENDER. Is this total effort involved with the modification to increase the ammunition storage capacity of the self-propelled VULCAN gun?

General BUSH. Yes, sir.

Chairman ELLENDER. How many of these vehicles do you plan to modify, what is the estimated cost of this effort, and have any funds been provided through fiscal year 1972 for this effort?

General BUSH. The product improvement plan calls for modification of the total VULCAN self-propelled tactical inventory currently produced, a quantity of [deleted] vehicles. The estimated PEMA cost to achieve this objective is $1.8 million, $1.1 million in fiscal year 1973 and $700,000 in fiscal year 1974. Operation and Maintenance, Army, funds in the amount of $200,000 were programed in fiscal year 1972, to finance redesign, test and evaluation of prototype hardware prior to procurement and installation of an approved kit.

Chairman ELLENDER. I note that this modification will provide for the additional storage of 230 link rounds on the self-propelled Vulcan. What is the storage capability of the existing VULCAN vehicles?

General BUSH. The onboard ammunition storage capacity of the unmodified self-propelled VULCAN is 800 rounds.

Modification of M109A1 155-Millimeter Howitzers

Chairman Ellender. In your statement, you referred to the request of $12.4 million to continue procurement and installation of modification kits for M109A1 medium armored, self-propelled, full tracked 155-millimeter howitzer. Is this the item set out on line 31 of the P–1 exhibit?

General Bush. Yes, sir.

Chairman Ellender. What additional capabilities do we achieve through the modifications of these Howitzers?

General Bush. The M–109A1 will have an increased range from 14,600 to 18,000 meters with the M119 propelling charge and [deleted] meters with rocket assisted projectiles.

Chairman Ellender. I note that $3.8 million was provided for this effort in 1971, and $9.3 million was provided in fiscal year 1972. How many of these guns do you expect to modify, what is the total cost of this effort, how many have been funded through fiscal year 1972?

General Bush. We expect to modify a total of [deleted] M109 howitzers. Total procurement and application cost will be [deleted] million. A total of [deleted] have been funded through fiscal year 1972.

Chairman Ellender. Is this the gun that is to be replaced by the XM–198 155-millimeter towed howitzer that we discussed earlier?

General Bush. No, sir; the M109A1 is a self-propelled 155-millimeter howitzer and the XM198 is a towed 155-millimeter howitzer. The XM198 will replace the M114A1 towed 155-millimeter howitzer.

Miscellaneous Modifications of Other Combat Vehicles

Chairman Ellender. I note on page 32 of the P–1 exhibit a request of $2.5 million for modifications of weapons and other combat vehicles "under $500,000." Give us several examples of the modifications you contemplate with these funds.

General Bush. Some examples are: Product improvement of the M37 recoil mechanism on the M102, 105-millimeter howitzer. This improvement will eliminate the existing method of manually draining recoil system oil which reaches high temperatures during sustained fire. Draining the oil manually is not only time consuming, it allows the possibility of air or foreign matter to enter the recoil system.

Modification of the XM167 towed 20-millimeter antiaircraft gun to increase ammunition storage capacity from 300 to 500 rounds.

Product improvement of the obturator pad for the 175-millimeter gun. The existing pad is unsatisfactory at very low temperatures which could cause damage to the tube. The new pad will seal the breech down to temperatures as low as 50° F.

Installation of a cab fresh air vent on the carrier, cargo, tracked, 6-ton, M548. This vent will eliminate dust, stirred by the vehicle movement, being drawn into the crew compartment via the cab closure and door windows. The modification will reduce crew fatigue and improve crew efficiency.

Appropriation Components

The balance of our request for this budget appropriation includes $700,000 for components for special tests, $1.5 million for items less than $500,000, $9 million for spares and repair parts, $3.2 million

for first destination transportation, and $17.3 million for production base support.

AMMUNITION

The total procurement of ammunition, Army fiscal year 1973 request amounts to $1,129.2 million, representing a decrease of 34 percent—$589.1 million—from the approved fiscal year 1972 program. The total request is divided into two separate activities; that is, (a) budget activity I, ammunition, and (b) budget activity II, production base support.

Chairman ELLENDER. Before you proceed with your discussion of the $899.5 million requested for the procurement of ammunition, I would like to have page 12 of the justification included in the record.

(The information follows:)

JUSTIFICATION—ACTIVITY 1—AMMUNITION

[In thousands of dollars]

	Actual, fiscal year 1971	Estimate	
		Fiscal year 1972	Fiscal year 1973
Direct obligations or direct budget plan	1,146,600	1,488,000	899,500

SECTION 1—PURPOSE AND SCOPE

These funds provide for procurement, manufacture, and conversion of ammunition and associated equipment and for procurement of repairable major components for special ammunition. The program includes artillery, tank, mortar and small arms ammunition as well as fuzes, mines, demolitions, grenades, pyrotechnic signals, incendiaries, and rockets.

SECTION 2—JUSTIFICATION OF FUNDS REQUESTED

The fiscal year 1973 program provides for worldwide consumption and losses to inventory through the fiscal year 1973 funded delivery period: assures meeting pipeline requirements for SEA allies and PACOM forces; provides for NATO requirements; maintains an active ammunition production base in fiscal year 1973 and protects base continuity in fiscal year 1974–1977 timeframe; and maximizes competitive procurement. The fiscal year 1973 program includes funds for over 80 different types of ammunition. Some of the major items included in the program are: Cartridge 5.56mm All Types Except Blank, $70.0 million; Cartridge 40mm HE Low Velocity Launched, $22.4 million; Cartridge 60mm HE, $50.2 million; Rocket 66mm HEAT, $19.5 million; Cartridge 81mm HE w/wo Fuze, $95.3 million; Cartridge 105mm HE w/o Fuze f/105 How, $170.0 million; Cartridge 105mm TP–T f/Tank Gun, $23.3 million; Projectile 155mm HE, $43.0 million; Charge Propelling 155mm White Bag, $22.5 million; Fuze PD f/artillery and 4.2'' mortar, $27.6 million; and First Destination Transportation, $47.5 million.

ACTIVITY I

General BUSH. The fiscal year 1973 request for hardware procurement amounts to $899.5 million. This represents a decrease of 40 percent or $588.5 million from the approved fiscal year 1972 program. The fiscal year 1973 estimate is an austere program which provides for forecasted Southeast Asia consumption and training requirements. The program is further designed to maintain an active ammunition production base for key rounds of ammunition in fiscal year 1973 with the additional goal of maintaining this minimum active base through subquent program years. We are continuing to stress maximum competition in our fiscal year 1973 ammunition procurement.

CHART 13

FISCAL YEAR 1973 BUDGET REQUEST FOR PROCUREMENT OF AMMUNITION, ARMY

Activity I: Ammunition:	Cost (millions)
Cartridge, 5.56mm. all types (except blank)	$70.0
Cartridge, 40mm., HE. low velocity launched	22.4
Cartridge, 60mm., mortar, HE	50.2
Cartridge, 81mm., mortar, HE	95.3
Cartridge, 105mm., HE, f/how	170.0
Cartridge, 105mm., TP–T, f/tank gun	23.3
Projectile, 155mm., HE w/prop charges	70.6
Fuze, PD, f/artillery and 4.2-inch mortar	27.6
All other	370.1
Total budget activity I	899.5
Activity II: Production base support:	
Provision of industrial facilities	173.2
Layaway of industrial facilities	16.5
Production engineering measures	40.0
Total budget activity II	229.7
Total procurement of ammunition, Army	1,129.2

AMMUNITION

General BUSH. As is shown on chart No. 13, eight items account for over 59 percent of the total activity I, ammunition request. These are: 5.56-mm. cartridge for the M16 rifle, the 40-mm. cartridge used with the M79 grenade launcher, cartridges for the 60-mm and 81-mm. mortars and for the 105-mm. howitzer, and 105mm. tank gun, the projectile and propellant charges for the 155-mm. howitzer, and the point detonating fuse for artillery and the 4.2-inch mortar.

Ammunition continues to be an intensively managed commodity. We continuously monitor consumption requirements and adjust production schedules, where required, to assure we buy only what we need while still maintaining a warm production base.

Chairman ELLENDER. In looking over the P–1 exhibit, I note that the $899.5 million requested for ammunition includes funds for some 60 to 65 different ammunition items. Does your request for fiscal year 1973 include funds for the procurement of any ammunition item which has not been procured in previous fiscal years, and if so, please comment on these new ammunition items.

General BUSH. Sir, the fiscal year 1973 ammunition request does not include funds for any new items that have not been procured in previous fiscal years.

SUPPORT OF FREE WORLD FORCES

Chairman ELLENDER. How much of this total request of $899.5 million is for the procurement of ammunition for the support of free world forces?

General BUSH. $603.5 million of the total request is for the support of free world forces.

Chairman ELLENDER. Could you give us a breakdown of the $603.5 million by the countries involved?

General BUSH. Yes, sir; may I provide this breakdown for the record.

(The information follows:)

	Millions
South Vietnam	$508.3
Korea	15.6
Laos	79.6
Total	603.5

Chairman ELLENDER. Give us some examples of some of the major types of ammunition that we are procuring for the free world forces.

General BUSH. Major types include: 5.56 millimeter cartridge, all types; 40 millimeter HE cartridge low velocity launched cartridge; 60 millimeter HE cartridge for mortar; 81 millimeter HE cartridge for mortar; 105 millimeter HE cartridge for howitzer; 155 millimeter HE projectile for howitzer; charge propellant, 155 millimeter white bag; and PD fuze for artillery and 4.2-inch mortar.

Chairman ELLENDER. Before you proceed with your discussion of the request of $229.7 million for production base support, I want to include pages 13, 14, and 15 of the justifications in the record at this point.

(The information follows:)

JUSTIFICATION—ACTIVITY 2—PRODUCTION BASE SUPPORT

[In thousands of dollars]

		Estimate	
	Actual fiscal year 1971	Fiscal year 1972	Fiscal year 1973
Direct obligations or direct budget plan	218,100	230,300	229,700

SECTION 1—PURPOSE AND SCOPE

The funds provide for the establishment, augmentation, and improvement of production capability; layaway of industrial plants and equipment; and production engineering in advance of quantity production to facilitate the production of ammunition.

SECTION 2—JUSTIFICATION OF FUNDS REQUESTED

The funding level requested is essential for (1) production support and replacement of government-owned and contractor-owned facilities and equipment, including machine tool replacement, required in direct support of the scheduled end item procurement program; (2) providing those engineering measures and pilot production lines necessary for both planning and facility prove-out of production lines for components and end items, and for the basic data required to develop competitive procurement packages when items are released from RDT&E; (3) layaway of those Army-owned production facilities for which current production has been completed but where established future requirements exist for peacetime or mobilization procurement; and (4) the accomplishment of the fourth increment of a multiyear effort to rehabilitate and improve the most critical deteriorated and obsolete portion of the Army's industrial base. The fiscal year 1972 and fiscal year 1973 requests are compared below:

[In millions]

	Fiscal year 1972	Fiscal year 1973
Provision of industrial facilities	$194.5	$173.2
Annual support	37.9	40.2
Modernization	144.3	133.0
Expansion	12.3	
Layaway of industrial facilities	14.0	16.5
Production engineering measures	21.8	40.0
Total, PBS ammunition	230.3	22.9

JUSTIFICATION

Appropriation—Procurement of Ammunition, Army.
Budget program or budget project account—Activity 2—Production base support.

As indicated, the primary effort in fiscal year 1973 will be in ammunition facilities modernizaton. This fourth year increment of $133.0 million in the Production Base Modernization Program provides only the most essential projects. These projects were selected as being the most promising in terms of improving pollution abatement, decreasing costs and improving safety, quality and efficiency. Primarily, these projects relate to the modernization of our explosive and load, assemble and pack facilities for major ammunition production. The small arms projects are particularly promising in providing a high dollar return on capital investment. Future projects planned over the next eight years will provide for continuation of these efforts, in order of priority, as well as additional efforts in propellants; load, assemble and pack plants; and metal parts or components plants.

Included in the fiscal year 1973 request is $45.9 million for construction. Military Construction Project Data (DD Form 1391) will be furnished under separate cover. A listing of this construction, by projects, is as follows:

[In millions]

Project No.	Nomenclature and plant	Cost	Construction cost
	Production support and equipment replacement:		
55312	Volunteer AAP	$2.3	$1.4
55313	Joliet AAP	3.6	2.1
55314	Louisiana AAP	2.6	.7
55315	Twin Cities AAP	2.3	1.2
55316	Lone Star AAP	2.4	.9
55317	Milan AAP	1.0	.3
55323	Badger AAP	3.4	1.4
55326	Radford AAP	2.9	.4
55327	Longhorn AAP	1.5	.6
55328	Holston AAP	4.9	3.6
55330	Indiana AAP	1.5	.7
55332	Lake City AAP	2.5	1.1
55333	Iowa AAP	1.6	.6
55342	Scranton AAP	.4	.3
52074	Mod-acetic anhydride plant, pt. II—Installation: Holston AAP	6.2	1.3

JUSTIFICATION—ACTIVITY 2—PRODUCTION BASE SUPPORT

[In millions]

Project No.	Plant	Nomenclature	Cost	Construction cost
52076	Holston AAP	Modernize lacquer preparation facility	$2.3	$1.7
52383	Sunflower AAP	Modernize continuous paste prep facility	12.6	5.6
52468	Radford AAP	Modernization automated increment line	12.6	7.2
52606	Badger AAP	Modernize construct 1.5m. lb./mo mechanized roll facility	13.4	7.9
52608	Volunteer AAP	Modernize TNT bulk handling	7.1	1.7
52633	Badger AAP	Modernize construct 4m. lb./mo. nitrocellulose purification facility	7.0	5.2
	Total		94.1	45.9

ACTIVITY II

General BUSH. Included in the fiscal year 1973 ammunition production base support request of $229.7 million is $173.2 million for industrial facilities, $16.5 million for layaway of facilities, and $40 million for production engineering measures.

INDUSTRIAL FACILITIES

The industrial facilities request is reduced $21.3 million from the fiscal year 1972 program; however, a signicant effort, $133 million, is still being directed toward modernization of the ammunition production base.

Chairman ELLENDER. Is this Government production?

General BUSH. Yes, sir, these are Government-owned plants but they are all contractor-operated.

We are proceeding in the fourth year of a 12-year $3.2 billion plan to modernize the base. The total to be committed to this modernization effort through fiscal year 1973 is $615 million.

The layaway effort included is equivalent to that of fiscal year 1972 program—$14 million in fiscal year 1972 compared to $16.5 million this year.

A significant increase is seen in the production engineering measures area, with the effort almost doubling, $21.8 million in fiscal year 1972 and $40 million requested this year. A significant effort of $6.3 million is planned for development of methods to minimize environmental contamination. We are making this "investment in technology" to support the overall plan for modernization of the ammunition production base.

Chairman ELLENDER. What was the cost last year?

General BUSH. Last year it was $1.6 million.

Chairman ELLENDER. We are still talking about ammunition being manufactured in Government plants?

General BUSH. That is correct.

Chairman ELLENDER. It is under contract by somebody who operates it?

General BUSH. Yes, sir.

CONTRACTURAL PROCEDURE

Chairman ELLENDER. How are those contracts made?

General BUSH. Mr. Chairman, we have on a semiannual basis a rather complicated machine program which exactly spells out what kind of ammunition will be required to support all of the weapons that we have under the required strategy and force structure we discussed a little while ago. Then taking a look at the requirement we subtract from it the existing inventory, and add the changes in the expenditures to arrive at a deficit.

Looking at that deficit, we have again a rather complicated machine study process which identifies the most cost effective way to go about acquiring that ammunition over a period of time.

Normally, this would be presented to the decisionmakers in the form of a list of plants that manufacture different calibers of ammunition and how they might be selected by quantities in order to do this on a cost effective basis.

Chairman ELLENDER. In Government-owned plants?

General BUSH. In Government-owned plants.

LOUISIANA ARMY AMMUNITION PLANT AT MINDEN

Chairman ELLENDER. You have one in Minden, La., I think.

General BUSH. Yes; there is the Louisiana Army ammunition plant, Mr. Chairman. I have it identified at Shreveport.

Chairman ELLENDER. It is in a little town called Minden. I remember when it was constructed.

General BUSH. That particular plant, Mr. Chairman, right now is operated under contract to Sperry-Rand Corp. They are the operators of that plant. They have a certain number of lines which are active and certain ones which are passive.

Chairman ELLENDER. In administering the plant in Louisiana by Sperry-Rand, do they hire the people who will work in the plant, and do you pay for it?

General BUSH. That is right.

PLANT CONTRACT

Chairman ELLENDER. What kind of contract have you entered into?

General BUSH. There are different kinds of contracts.

Chairman ELLENDER. Let us take the one in Minden. Give me an example of one you know about, if you don't have that one available.

General BUSH. I think I may have it. Most of these are on a cost-plus-fixed-fee (CPFF) or cost-plus-award-fee (CPAF).

In the past, Mr. Chairman, almost all of them were on a CPFF. Lately, we have been going into improved management programs whereby in order to give greater incentive to the contractor and insure that we get more for our dollar, we are entering into firm fixed price contracts, where we give him an indication of what we want produced for the year, hold to that, and have him bid. We have even begun to increase competition among various producers.

Chairman ELLENDER. You mean contractors?

General BUSH. Instead of giving him a kind of continuation because he is in, we have competed and gotten a considerable reduction in prices. To answer your earlier question about the Louisiana plant, Mr. Chairman, we have three different contracts. For the metal parts portion, they are under a firm-fixed price. For the load, assemble and pack portion, they are under a cost-plus-award fee. On the facilities part, they are on a cost-plus-fixed fee. There are three different kinds of contract types for that one plant.

Chairman ELLENDER. I note on page 13 of the justifications that, of the $229.7 million requested for ammunition base support, $173.2 million is for provision of industrial facilities. How much was provided for this program for fiscal years 1971 and 1972?

General BUSH. The fiscal year 1971 program funds for $180.8 million for provision of industrial facilities while the fiscal year 1972 program is funded at $194.5 million.

Chairman ELLENDER. In your statement, you referred to a 12-year, $3.2 billion plan to modernize the ammunition production base. I wish you would provide a statement for the record describing this 12-year modernization plan, indicating the specific facilities involved, and the status of this modernization plan through fiscal year 1972.

General BUSH. I will provide such a statement for the record, Mr. Chairman.

(The information follows:)

In 1968 it was recognized that the Army's Government-owned ammunition production base was grossly inefficient, relatively unsafe, and failed to meet even the minimum pollution standards. The major portion of the ammunition base was constructed early in World War II under emergency conditions using existing processes and techniques. The facilities which include propellants and explosives plants, small caliber ammunition manufacturing facilities, facilities for manufacturing metal components of ammunition and plants for loading, assembling and packing of ammunition are completely antiquated by today's

standards. A 12-year, $3.2 billion, program was developed to modernize the ammunition production base. This program, which covers the fiscal years 1970 through 1981, is designed to provide a responsive, efficient, and automated production base ready to meet future contingencies, improve working and safety conditions, to significantly reduce environmental pollution, and to lower manufacturing costs.

Initial efforts of the 12-year program were devoted primarily to upgrading the propellants and explosives facilities since technoogy in this area was more readily available and air and water pollution from these facilities was quite severe. During the middle period of the program new technology to be used in the Load, Assemble, and Pack plants will become available and then over the latter half of the program there will be considerable expenditure for these facilities. A large investment in upgrading our small caliber ammunition plants began with the fiscal year 1972 program as technology was developed. Plants producing the metal parts for our ammunition will be modernized at a relatively constant rate throughout the 12-year program.

General BUSH. The list of specific facilities included in the modernization plan are shown on this list which I will provide for the record.

(The information follows:)

Badger Army Ammunition Plant, Burlington Army Ammunition Plant, Cornhusker Army Ammunition Plant, Frankford Arsenal, Hays Army Ammunition Plant, Holston Army Ammunition Plant, Indiana Army Ammunition Plant, Iowa Army Ammunition Plant, Kansas Army Ammunition Plant, Lake City Army Ammunition Plant, Lone Star Army Ammunition Plant, Longhorn Army Ammunition Plant, Milan Army Ammunition Plant, Picatinny Arsenal, Pine Bluff Arsenal, Radford Army Ammunition Plant, Ravenna Army Ammunition Plant, Riverbank Army Ammunition Plant, Scranton Army Ammunition Plant, St. Louis Army Ammunition Plant, Sunflower Army Ammunition Plant, Twin Cities Army Ammunition Plant, and Volunteer Army Ammunition Plant.

General BUSH. The total funding allocated to this effort through fiscal year 1972 is $482 million or 15 percent of the total program.

Chairman ELLENDER. Of the $173.2 million requested for provision of industrial facilities, I note that $40.2 million is for "annual support." Just what do you do with this $40.2 million?

General BUSH. The $40.2 million will be used to maintain production capability at the Army's Government-owned, contractor-operated plants (GOCO's) and Government-owned, Government-operated arsenals (GOGO's). These funds will be expended at our active facilities to support current production requirements. Direct production support is provided by online repair and replacement and/or rehabilitation of worn out industrial and general plant equipment such as pumps, motors, and specialized production machinery. Additionally, indirect production support is provided by the replacement, rehabilitation or acquisition of facilities items which are not directly productive in nature but are required to support production lines such as laboratory, testing and maintenance equipment. Included in this latter category are real property improvements necessary for immediate as well as continuing indirect production support such as railroad rehabilitation, explosive magazine improvements and chemical storage tank replacement.

Chairman ELLENDER. Comment generally on the types of improvements you will make with the $133 million requested for modernization.

General BUSH. The types of improvements we will make with the $133 million requested for modernization include: the completion of the procurement of eight modules of new small caliber ammunition

production equipment for $36.9 million; modernization of a continuous paste preparation facility for solventless propellant for $12.6 million; the replacement of a deteriorated nitrocellulose purification facility for $7 million; automation of a rocket propellant roll facility for $13.4 million; modernization of propellant bag manufacturing, loading, and assembly operations at $11.2 million; and an automated line for mortar increment production at $12.6 million.

Chairman ELLENDER. Please provide for the record a tabulation listing each of the projects included in the request of $133 million for modernization.

General BUSH. Yes, sir. There are 32 modernization projects totaling $133 million included in the fiscal year 1973 budget.

(The information follows:)

Project No.	Plant	Description	Amount (millions)
5730263	Pine Bluff Arsenal	Automates the materials handling system for the white phosphorous dry fill lines.	$1.6
5730315	Edgewood Arsenal	Provides facility of new design for clothing impregnation	.5
5730264	Pine Bluff Arsenal	Automation of line-C for the assembly operations of the white phosphorous load, assemble, and pack facility.	.5
5730267	do	Modernizes the filling assembly facility for pyrotechnic munitions.	.6
5732074	Holston Army ammunition plant (AAP).	Modernizes the acetic anhydride production facilities	6.2
5732076	Holston AAP	Provides a modernized lacquer preparation facility	2.3
5732168	Kansas AAP	Automates the load, assemble and pack facilities for 105 mm., M1 cartridges.	1.0
5732194	Lake City AAP	Provides new automated equipment for the production of 7.62 mm., small caliber ammunition.	5.6
5732205	do	Modernizes the 5.56 mm. production facilities based on new concepts for manufacture of small caliber ammunition.	9.1
5732290	Milan AAP	Automates the assembly facilities for the 81 mm. cartridge, M374.	2.4
5732346	Riverbank AAP	Modernizes the manufacturing facilities for the production of the 81 mm. shell, HE, M374A2, metal parts.	3.1
5732383	Sunflower AAP	This project will provide a modern continuous solventless paste preparation facility.	12.6
5732396	Twin Cities AAP	5.56 mm. small arms ammunition continuous production equipment.	22.2
5732468	Radford AAP	Automated mortar increment line	12.6
5732601	Iowa AAP	Automated equipment for load, assemble and pack of major caliber projectiles.	1.1
5732603	Louisiana AAP	Replacement of heat treatment furnace	3.1
5732606	Badger AAP	Construct a 1,500,000-pound solventless propellant roll facility.	13.4
5732608	Volunteer AAP	Provide TNT bulk handling facilities	7.1
5732609	Indiana AAP	Modernize 155 mm. and 8 inch charge assembly facility	1.8
5732610	do	Automate 155 mm. and 8 inch propellant charge bag loading Operations.	4.9
5732612	do	Automates the sewing and defect detection equipment for the manufacture of 105 mm. 155 mm/8 inch/175 mm. cloth propellant charge bags.	4.5
5732613	do	Upgrades facility for additive liner manufacturing operations	.4
5732633	Badger AAP	Modernizes the 4,000,000 pounds per month nitrocellulose purification facility.	7.0
5732640	Milan AAP	Modernization of assembly equipment for medium caliber ammunition and components.	.6
5732641	Iowa AAP	Automates assembly equipment for major caliber projectiles	.2
5733046	U.S. Army Munitions Command	Design criteria for construction and equipment design	3.1
5734804	Picatinny Arsenal	Modernization of pyrotechnic munitions equipment	.5
5734806	do	Modernization of solventless rocket propellant processing equipment.	1.0
5734823	do	Upgrading detonator handling, sealing inspection, and packing facility.	.2
5734825	do	Modernize pelleting equipment	.4
5734826	do	Upgrading process testing eqiupment (281 area)	.6
(1)	Corps of Engineers	Preliminary design of facilities	2.8
Total			133.0

[1] No number.

Chairman ELLENDER. I note on page 14 of the justifications that, of the total requested, $45.9 million is for projects that we customarily consider to be military construction. Why are those projects funded in this bill rather than being funded in the military construction bill?

General Bush. The $45.9 million for the construction portion of those ammunition production base support projects are included for funding in this bill because of the close relationship of this construction to the funding for the production and operation of the Government-owned ammunition production facilities. As such, funding for this construction should be an integral part of the appropriation for ammunition procurement. Of the total of $45.9 million for construction, $30.6 million is directly related to the proposed fiscal year 1973 ammunition facilities modernization effort at our Government-owned, contractor-operated (GOCO) plants. This particular construction is not closely related to that customarily found in the military construction program in that its design, funding and execution are closely tied to that of the production process equipment. This relationship must consider the peculiar requirements for explosives safety and environmental control features which are unique to the ammunition production process. These efforts are being pioneered to a large extent by the Government in our modernization program. The remainder of the total of $45.9 million requested for construction projects, $15.3 million, is for production support and equipment replacement projects which will enable the active ammunition GOCO plants to respond to their production workloads. It is considered essential that the present method of funding be continued to make it possible to review and program total package costs of industrial facilities projects, and to permit the production base to respond on a timely and economic basis to both peacetime and emergency ammunition requirements.

LAYAWAY OF INDUSTRIAL FACILITIES

Chairman Ellender. Could you be more specific with what you plan to do with the $16.5 million you are requesting for the category entitled "Layaway of industrial facilities."

General Bush. The $16.5 million for layway of ammunition facilities represents four omnibus projects. Two projects for $418,000 each are for layaway or disposal of industrial items of Government-owned production equipment which become excess to current production requirements at Government-owned or contractor-owned plants respectively. The other two projects are for plant clearance, layaway or disposal of complete production lines for the entire facility. Of these latter two projects, one for $10.5 million is for layaway or disposal at Government-owned installations while another for $5.2 million is for layaway or disposal of Government-furnished equipment at contractor-owned facilities.

Specific projects for layaway of Government facilities at Government-owned or contractor-operated plants will be developed and executed as awards for the fiscal year 1973 ammunition program are made and the specific layaway requirements are identified.

PRODUCTION ENGINEERING

Chairman Ellender. You discussed the request of $40 million for production engineering measures in your statement. I wish you would provide for the record a more detailed statement on exactly what you plan to do with this $40 million you are requesting for fiscal year 1973, and include a paragraph on the need for the increase that is requested for production engineering measures.

General BUSH. Production engineering measures (PEM) consist of three types of projects. These are advanced production engineering (APE), manufacturing methods and technology (M.M. & T.) and military adaptation of commercial items (MACI). The APE measures will provide procurement data packages which will allow competitive procurement for several new items programed to enter the logistics system. The M.M. & T. projects will provide production process improvements which are vitally necessary to the production base modernization program. The fiscal year 1973 M.M. & T. effort will support the modernization effort in fiscal year 1974 and beyond. The third type of production engineering measures, MACI, will provide for the evaluation, testing, and modification of a number of commercial items to be adopted to satisfy a special military requirement. All of the PEM projects are monitored by a Government arsenal. In most cases, part of the work is accomplished at a Government-owned, contractor-operated plant or by a contract with a private firm. Here is a list of the PEM projects in the proposed fiscal year 1973 ammunition production base program for the record.

(The information follows:)

Project No.	Title	Monitoring arsenal/contractor	Value (millions)
5731225	APE: Projectile, 155 mm., GB2, XM687	Edgewood Arsenal/private contractor.	$0.7
5733037	APE: Mine, dispersing, subsystem aircraft, XM56	Picatinny Arsenal/private contractor.	1.3
	M.M. & T.		
5734012	Continuous final roll mill and pad makeup machine for mortar increments.	Picatinny Arsenal/Radford AAP	1.4
5734013	Nitrocellulose purification	do	2.3
5734016	Convert batch filter to continuous RDX filtration and washing	Picatinny Arsenal/Holston AAP	.5
5734114	Development of methods to minimize environmental contamination.	Picatinny Arsenal/Frankford Arsenal.	6.3
5734136	Improved test and evaluation methodology	Picatinny Arsenal/private contractor.	.5
5734144	Bulk handling of high explosives	Picatinny Arsenal/volunteer, Holston and Radford AAP's.	1.0
5734162	Automated line for the melt pour processing of high explosives	Picatinny Arsenal/various GOCO plants, not assigned.	1.1
5734165	Prototype facility for recovery of HMX from RDX spent slurries	Picatinny Arsenal/Holston AAP	1.6
5734172	Pilot line, high explosives	Picatinny Arsenal	1.2
5734186	Acceptance of propellant produced by the continuous process	Picatinny Arsenal/Radford AAP	.5
5734201	Safety engineering in support of ammunition plants	Picatinny Arsenal	1.4
5734202	Prototype equipment for continuous automated production of solvent type multibase cannon propellant.	Picatinny Arsenal/Radford AAP	.5
5734213	Primer M61/M54	Picatinny Arsenal/Iowa AAP	.6
5734218	Materials handling	Picatinny Arsenal/Milan, Lone Star, Cornhusker, Iowa, Joliet, Ravenna and Kansas AAPs.	.8
5734220	Establishment of prototype continuous RDX recrystallization	Picatinny Arsenal/Holston AAP	.8
5734222	APE: Cartridge, 40 mm., high explosive dual purpose M433	Picatinny Arsenal/private contractor.	1.3
5734230	APE: Cartridge, 40 mm., high explosive dual purpose XM430	do	1.5
5734600	APE: Projectile 105 mm., antipersonal-tracer, XM603E1 with fuze mechanical time, XM571E3.	Picatinny Arsenal/Frankford arsenal.	.8
5736200	M.M. & T.: Small caliber ammunition process improvement program.	Frankford Arsenal/Twin Cities AAP.	3.7
5736494	M.M. & T.: Small caliber ammunition process improvement module B.	Frankford Arsenal/Lake City AAP.	.8
	Projects under $500,000 each	Various	9.4
	There are a total of 43 projects in this category ranging in value from $42,000 to $497,000. There are 2 APE, 3 MACI and 38 M.M. & T. projects. 3 of the M.M. & T. projects concern the RDX explosive process and 5 are related to quality assurance/quality control. A variety of other projects covering many fields in the metal parts; load, assemble, and pack (LAP); and propellants and explosives fields are included. Most of the M.M. & T. effort is directly related to the modernization program.		
	Total		40.0

General Bush. There are three prime causes for the increase in the production engineering measures (PEM) portion of the ammunition appropriation, from $21.8 million in fiscal year 1972 to $40 million in fiscal year 1973. First, there is an increase of $4.7 million in our project for the development of methods to minimize environmental contamination. The total project is now $6.3 million as opposed to $1.6 million in fiscal year 1972. This effort reflects the policy that the Government will be the leader in the field of pollution abatement. Another area of significant increase is in advanced production engineering. This has increased by $5.5 million, from $0.6 million to $6.1 million. This increase simply reflects the fact that a greater number of ammunition end items are now making the transition from the R.D.T. & E. phase to the production phase. Items included are new 40 mm. cartridges, an aircraft mine dispersing subsystem and two new artillery projectiles. The final reason for increased effort in this portion of the program is that an increased number of new ammunition production processes are being developed to support the future efforts associated with the Army's ammunition production base modernization program. Examples of the types of projects which are being accomplished in support of the modernization program are a $3.7 million project which provides for integration and run-in of modernized small caliber ammunition modules and associated Government engineering efforts; a project for developing and establishing a prototype line for continuous final roll and pad makeup of mortar increments at a cost of $1.4 million which supports further modernization planned in fiscal year 1976; a project for $1.1 million continuing efforts of prior years for the design and development of new techniques in melt-pour loading of ammunition with the technology to be used as the basis for modernization beginning in fiscal year 1975 of a critical portion of our load, assemble, and pack facilities; and, valued at $0.5 million, a project to develop manufacturing methods for modernization of RDX and composition B facilities at Holston AAP beginning in fiscal year 1975.

Chairman Ellender. Proceed.

Other Procurement

BUDGET REQUEST

General Bush. The total appropriation requested for "Other procurement, Army," amounts to $648.8 million.

APPROPRIATION COMPONENTS

This appropriation provides funds for: (a) tactical and commercial vehicles including trucks, semitrailers, and trailers of all types to provide mobility and utility support to field forces and the worldwide logistical system; (b) communications and electronics equipment of all types to provide fixed, semifixed, and mobile strategic and tactical communications equipment to achieve reliable and responsive functioning for operational command and control over widely dispersed areas for the forces and for strategic, worldwide defense communications systems; (c) other support equipment such as mobile assault bridges, construction equipment, material handling equipment, generators, rail,

and floating equipment. In each of these activities funds are also included for modification of in-service equipment, spares and repair parts, related first destination transportation, and production base support.

ACTIVITY 1, TACTICAL AND SUPPORT VEHICLES

Chairman ELLENDER. Before you proceed with your discussion of the request for $229.9 million for the procurement of tactical and support vehicles, I would like to include in the record page 12 of the justifications.

(The information follows:)

JUSTIFICATION—ACTIVITY 1, TACTICAL AND SUPPORT VEHICLES

[In thousands of dollars]

	Actual fiscal year 1971	Estimate	
		Fiscal year 1972	Fiscal year 1973
Direct obligations or direct budget plan	397,900	202,700	229,900

SECTION 1—PURPOSE AND SCOPE

These funds provide for procurement, manufacture, and conversion of tactical and support vehicles and associated equipment including purchase and installation of modification kits, and depot reparable assemblies and components. The tactical vehicles are of the type used by operating and supporting forces and include prime movers and general purpose vehicles usually equipped with multi-wheel drive. The support vehicles include administrative type which generally are two-wheel drive, commercial or quasi-commercial in nature used in support of operations; included are sedans, buses, truck tractors, or associated vehicles.

SECTION 2—JUSTIFICATION OF FUNDS REQUESTED

The funding level of this activity has been restricted by the Army in order that vehicles, which are procured, meet Federal Emission Control Standards in the year of delivery. The major impact is in the deletion of procurement programs for the 1¼ ton and 5 ton trucks, which, in past years, constituted more than one-third of the annual funding requirement. The requested fiscal year 1973 funding level is essential for replacement of combat and peacetime losses of tactical vehicles, limited replacement of overage commercial vehicles, and gradual achievement towards improvement of inventory levels required to support the Army's Authorized Acquisition Objective. Replacement procurement of commercial vehicles is included to support those Army operations and activities which do not require the more expensive tactical vehicles. Due to the large number of overage vehicles currently in the inventory, a failure to achieve required inventory levels with newer vehicles will magnify the overage problems and will be detrimental to readiness. The requested program includes procurement for the following major items: $40.9 million for ¼ ton utility trucks; $63.4 million for 2½ ton trucks; $4.4 million for a 5 ton truck product improvement program; $21.1 million for 8 ton series GOER trucks; $13.0 million for the new heavy equipment transporter truck tractor; $5.0 million for the ½ ton truck; $11.8 million for various semitrailers; $2.7 million for various trailers and trailer chassis; $42.2 million for various commercial vehicles; $.2 million for modification of in-service equipment; $1.3 million for repair parts and support materiel for the various tactical and support vehicles in the Army inventory; $6.8 million for first destination transportation; $10.3 million for the procurement of items, each having a procurement value of less than $500,000 and which are necessary to meet essential requirements for Army units; $3.2 million for production base support is required for two advance production engineering projects ($2.14 million), four military adaptation of commercial items projects ($.84 million) and one layaway project ($.2 million); and $3.6 million for pollution control to reduce emissions and the control of air pollution on the ¼ ton hybrid engine ($1.4 million) and the 10 ton truck tractor engine ($2.2 million).

General Bush. Chart No. 14 displays the items we are requesting in budget activity 1, tactical and support vehicles.

(Chart 14 follows:)

FISCAL YEAR 1973 BUDGET REQUEST FOR U.S. ARMY TACTICAL AND SUPPORT VEHICLES ACTIVITY 1

	Quantity	Cost (In millions)
Tactical vehicles:		
¼ ton	10,078	$40.9
½ ton	1,000	5.0
2½ ton	4,270	63.4
5 ton	0	4.4
8 ton	364	21.1
22½ ton	125	13.0
Chassis, trailer, 3½ ton	300	1.1
Semi-trailer 6T M373A2	400	4.9
Semi-trailer 6T M348A2	50	.7
Semi-trailer 6T M313	161	3.2
Semi-trailer 6T M750	200	3.0
Trailer, bolster, 4 ton	400	1.6
Commercial vehicles	11,879	42.2
Modifications		.2
Pollution control		3.6
Items less than $500,000		10.3
Spares and repair parts		1.3
First-destination transportation		6.8
Production base support		3.2
Total		229.9

¼-Ton Truck

General Bush. Our request includes $40.9 million for 10,078 ¼-ton trucks which is approximately the size of the normal annual washout rate for this vehicle.

½-Ton Truck

The procurement of 1,000 trucks, platform ½-ton for $5 million is required to replace peacetime losses and to meet new requirements for 344 trucks associated with the TOW missile system.

Chairman Ellender. Are those being purchased to replace existing ones?

General Bush. Yes, sir; 162 of those that are worn out, Mr. Chairman.

Chairman Ellender. What is the principal area of deterioration—mileage?

General Bush. Mileage or damage, Mr. Chairman, beyond economic repair.

Chairman Ellender. What do you do with those? Are they reduced to junk?

General Bush. Property disposal. To the degree that parts from it are usable, those parts are salvaged.

There is no procurement program for the 1¼-ton truck. We plan to competitively procure a follow-on 1¼-ton designated the XM852 series which meets 1975 emission standards.

2½-Ton and 5-Ton Trucks

Our procurement requests for the 2½- and 5-ton trucks are $63.4 million and $4.4 million respectively. The 2½-ton request represents a

new 2-year multiyear contract and the 5-ton request is required to improve power train components of the current M809 series trucks. The planning improvements will save an estimated $100 annually per vehicle during its life cycle.

GOER Vehicles

We are requesting $21.1 million for the procurement of 364 GOER vehicles which represents the second increment of a total of 1,300 vehicles on a 4-year multiyear contract.

Heavy Equipment Transporters

The request for acquisition of 125 new Heavy Equipment Transporters at $13 million is based upon a new multiyear program to acquire a total of 625 trucks. This new vehicle will replace a mixed and overaged fleet. Trailers and trailer chassis are included in the request at $2.7 million. The 300 3½-ton trailer chassis at $1.1 million and the 400 4-ton trailers at $1.6 million are required to replace peacetime losses and to achieve an increased readiness posture.

6-Ton Semitrailer Van

Four different models of the 6-ton semitrailer vans are requested at $11.8 million—M313, 161 at $3.2; M348, 50 at $.7; M373, 400 at $4.9; and M–750, 200 at $3. These semitrailer vans are required to replace peacetime losses and to increase the readiness posture of our semitrailer fleet.

Chairman Ellender. You referred in your statement to the request of $4.9 for the procurement of 400 6-ton electronic van semitrailers. Selected paragraphs from the vehicle data sheet on page 21 of the justifications will be included in the record at this point.

(The information follows:)

Tactical Vehicle Data Sheet

Service: Army—P–1 Line Item: 4; Nomenclature: Semitrailer, Van, Electronic, 6 Ton, 2 W, M373A2, W/E.

Description/Mission.—The M373A2 Semitrailer is a wheeled tactical transport vehicle of the special equipment category. It is towed by a 2½ ton truck-tractor. It consists essentially of an integral insulated van body and frame, a single rear dual-wheeled axle with spring leaf suspension and a fifth wheel upper plate on the front underside of the vehicle. The van body is 30 feet long, 8 feet wide and 7½ feet high. It is designed to transport and house sensitive electronic type equipment.

[In millions of dollars]

Cost data	Fiscal year 1971		Fiscal year 1972		Fiscal year 1973	
	Quantity	Amount	Quantity	Amount	Quantity	Amount
Weapon system cost.....	0	0	55	.7	400	4.9

Basis for fiscal year 1973 Request.—The fiscal year 1973 program is required to replace peacetime losses and achieve a readiness posture wherein 73% of all Active Army and Reserves requirements are filled. Elimination of the fiscal year 1973 program will require repair and retention of assets which exceed repair expenditure limits and reduce readiness to a point where only [deleted] of Active Army and Reserve requirements are filled.

CONTRACT DATA

Major subsystem	Contractor	Type of last contract
Semitrailer	Southwest Body Co	Advertised, firm fixed price

PRODUCTION DATA

	Fiscal year 1971	Fiscal year 1972	Fiscal year 1973	Fiscal year 1974	Fiscal year 1975
Funded	0	55	(400)		
Delivered	104	(68)	(55)	(400)	(0)

INVENTORY/OBJECTIVES

	End fiscal year 1971 [1]	End fiscal year 1972 [1]	End fiscal year 1973
Force units (Division force equivalent)			21
Inventory objective	[Deleted]	[Deleted]	[Deleted]
On hand/on order			
Percent inventory objective achieved			

[1] Funded delivery period.

Chairman ELLENDER. Just what is this particular piece of equipment used for and what is the need for the 400 you are requesting for fiscal year 1973?

General BUSH. This vehicle is used to transport and house sensitive electronic-type equipment. The fiscal year 1973 program is required to replace peacetime losses and achieve a readiness posture of [deleted] of all Active Army and Reserve requirements.

Chairman ELLENDER. When was this vehicle first procured?

General BUSH. This vehicle was initially procured in fiscal year 1967.

Chairman ELLENDER. On the vehicle data sheet, I note a reference to the replacement of peacetime losses. How many of these semitrailers would you lose in an average year?

General BUSH. Peacetime losses are projected at 22 per year.

Chairman ELLENDER. What is your total requirement for this semitrailer?

General BUSH. The Authorized Acquisition Objective for this vehicle is [deleted].

SIX-TON EXPANSIBLE VANS

Chairman ELLENDER. You referred to the request of $3.2 million for the procurement of 161 6-ton expansible van semitrailers. Selected paragraphs from the vehicle data sheet on page 23 of the justifications will be included in the record at this point.

(The information follows:)

TACTICAL VEHICLE DATA SHEET

Service: Army—P–1 Line Item: 6; Nomenclature: Semitrailer, Van, Expansible, 6 Ton, 4W, 313, W/E.

Description/Mission.—The M313 Semitrailer is a wheeled tactical transport vehicle of the special equipment category. It is towed by a 5 ton truck-tractor. It consists primarily of an insulated, expansible van body mounted on a military design semitrailer chassis Model M295A1. It has two dual wheeled rear axles with spring leaf suspension. It is designed to transport and house bulky tech-

nical equipment and allow sufficient space to accommodate operating personnel. It will expand to approximately twice the volume it encloses when in the retracted or traveling position. Retracted, the body is 17 feet long and 8 feet wide. It is used as a mobile facility to house and transport technical equipment for administrative operational tasks and for field maintenance and repair functions.

COST DATA

[In millions of dollars]

	Fiscal year 1971		Fiscal year 1972		Fiscal year 1973	
	Quantity	Amount	Quantity	Amount	Quantity	Amount
Weapon system cost	0	0	0	0	161	3.2

Basis for fiscal year 1973 Request.—The fiscal year 1973 program is required to replace peacetime losses and fill all Active Army and almost all Reserve requirements. The quantity programmed will insure an adequate inflow of modern assets to replace those lost through attrition and age/mileage. Elimination of the fiscal year 1973 program will require repair and retention of assets which exceed repair expenditure limits and reduce readiness to a point where only [deleted]. Active Army and Reserve requirements are filled.

CONTRACT DATA

Major subsystem	Contractor	Type of last contract
Semitrailer	Stevens Manufacturing Co	Advertised, firm fixed price.

PRODUCTION DATA

	Fiscal year—				
	1971	1972	1973	1974	1975
Funded	0	0	(161)		
Delivered	0	(110)	(0)	(161)	(0)

	End fiscal year 1971 FDP	End fiscal year 1972 FDP	End fiscal year 1973 FDP
Inventory/objectives:			
Force units—DFE			21
Inventory objective	[Deleted]		
On hand/on order			
Percent inventory objective achieved			

Note: FDP—funded delivery period. DFE—division force equivalent.

Chairman ELLENDER. Is this the item set out on line 6 of the P–1 exhibit?

General BUSH. Yes, sir.

Chairman ELLENDER. Please describe this piece of equipment and give us some examples of its uses.

General BUSH. The M313 semitrailer is a wheeled tactical transport vehicle of the special equipment category. It is towed by a 5-ton truck tractor. It consists primarily of an insulated, expansible van body mounted on a military design semitrailer chassis model M295A1. It has two dual wheeled rear axles with spring leaf suspensions. It is designed to transport and house bulky technical equipment and allow sufficient space to accommodate operating personnel. It will expand

to approximately twice the volume it encloses when in the retracted or traveling position. Retracted, the body is 17 feet long and 8 feet wide. It is used as a mobile facility to house and transport technical equipment for administrative operational tasks and for field maintenance and repair functions.

Chirman ELLENDER. I note that this particular piece of equipment was not funded in fiscal years 1971 and 1972. Is this the initial procurement of this piece of equipment?

General BUSH. No, sir. The initial procurement on this particular vehicle was made in fiscal year 1966.

Chairman ELLENDER. Just what is your need for the 161 semitrailers you are requesting for fiscal year 1973?

General BUSH. The fiscal year 1973 program is required to replace peacetime losses and fill all Active Army and almost all Reserve requirements.

FOUR-TON BOLSTER TRAILERS

Chairman ELLENDER. On line 9 of the P–1 exhibit, I notice a request of $1.6 million for the procurement of 400 4-ton bolster trailers. Please describe this piece of equipment, and comment on your need for the 400 you are requesting for fiscal year 1973.

General BUSH. The M796 4-ton bolster trailer is a wheeled, tactical transport vehicle of the general purpose category. It is towed by a 5-ton truck. It consists primarily of a frame mounted over a tandem axle, four wheel suspension. The tongue may be extended up to 48 inches. The M796 is used to transport bridging equipment, telephone poles and invasion pipe.

The fiscal year 1973 buy of 400 represents an economical procurement quantity and will insure an adequate inflow of modern assets to replace vehicles being lost through attrition and age/mileage and to achieve an increased readiness posture.

REPAIR PARTS STORAGE VANS

Chairman ELLENDER. $3 million is requested for the procurement of 200 6-ton repair parts storage vans. Selected paragraphs from the tactical vehicle data sheet on page 25 of the justifications will be included in the record at this point.

(The information follows:)

TACTICAL VEHICLE DATA SHEET

Service: Army—P–1 Line Item: 8; Nomenclature: Semitrailer, Van, Repair Parts Storage, 6 Ton, 4W, M750, W/E.

Description/Mission.—The M750 Semitrailer is a wheeled tactical transport vehicle of the special equipment category. It is towed by a 5 ton truck-tractor. It consists essentially of a folding side van body, equipped with integral storage bins mounted on a standard military semitrailer chassis Model M295A1. It has dual tires and a tandem axle. The van body side panels are bisected and form a working floor area. The upper half, which contains windows, pivots upward to form a roof section over the expanded floor section. The rear panel is equipped with side hinged doors. Protection from the weather is achieved when weatherproof canvas side curtains are attached. The van body is provided with a heating and electrical system, leveling jacks, guardrails and ladders and is temperature insulated. It is used as a mobile spart parts storage facility.

COST DATA

[Dollar amounts in millions]

	Fiscal year 1971		Fiscal year 1972		Fiscal year 1973	
	Quantity	Amount	Quantity	Amount	Quantity	Amount
Weapon system cost	0	0	0	0	200	3

Basis for fiscal year 1973 Request.—The fiscal year 1973 program is required to replace peacetime losses and to improve the readiness posture. The quantity programed is the economic order quantity for this item. Elimination of the fiscal year 1973 program will require repair and retention of assets which exceed repair expenditure limits and reduce readiness to a point where [Deleted] of the Active Army and Reserve requirements are filled.

CONTRACT DATA

Major subsystem	Contractor	Type of last contract
Semitrailer (fiscal year 1968)	Theurer Inc.	Advertised, firm fixed price.

PRODUCTION DATA

	Fiscal year—				
	1971	1972	1973	1974	1975
Funded	0	0	(200)		
Delivered	230	0	0	(200)	0

INVENTORY/OBJECTIVES

	End fiscal year—			
	1971 [1]	1972 [1]	1973 [1]	
Force units (Division force equivalent)				21
Inventory objective	[Deleted]			[Deleted]
On hand/on order				
Percent inventory objective achieved				

[1] Funded delivery period.

Chairman ELLENDER. Describe this vehicle and give us several examples of its uses.

General BUSH. The M750 semitrailer is a wheeled tactical transport vehicle of the special equipment category. It is towed by a 5-ton truck-tractor. It consists essentially of a folding side van body, equipped with integral storage bins mounted on a standard military semitrailer chassis model M295A1. It has dual tires and a tandem axle. The van body side panels are bisected and form a working floor area. The upper half, which contains windows, pivots upward to form a roof section over the expanded floor section. The rear panel is equipped with side-hinged doors. Protection from the weather is achieved when weather-proof canvas side curtains are attached. The van body is provided with a heating and electrical system, leveling jacks, guardrails, and ladders and is temperature insulated. It is used as a mobile spare parts storage facility.

Chairman ELLENDER. Please comment on your need for the 200 of these vans you are requesting for fiscal year 1973.

General BUSH. The fiscal year 1973 program is required to replace peacetime losses and to improve the readiness posture. The quantity programed is the economic order quantity for this item.

Chairman ELLENDER. I note a reference to the replacement of peacetime losses. How many of these vans would you lose in an average year?

General BUSH. Peacetime losses are projected at 28 per average year.

ONE-QUARTER-TON UTILITY TRUCKS

Chairman ELLENDER. On line 10 of the P–1 exhibit, there is a request of $40.9 million for the procurement of 10,078 one-quarter-ton utility trucks. Selected paragraphs from the vehicle data sheet will be included in the record at this point.

(The information follows:)

TACTICAL VEHICLE DATA SHEET

Service: Army—P–1 Line Item: 10, Nomenclature: Truck, Utility, ¼ Ton, 4x4 ABT.

Description/Mission.—The ¼ ton truck is a wheeled, lightweight, transport vehicle powered by a 4-cylinder liquid cooled, overhead valve, spark ignition, gasoline engine capable of cross-country travel by 4-wheel drive and incorporating an improved suspension system. It is produced in three body configurations: Utility, Ambulance, and Weapons Carrier. The Utility version is a general purpose vehicle designed to transport general cargo or personnel, with space for four men and equipment, and to carry the TOW Launcher System. It is a command and control vehicle when equipped with radio. The Ambulance version is designed for front line evacuation of ill or wounded personnel and is capable of transporting two litter patients with a medical aid man, three ambulatory patients with a medical aid man, or three litter patients. The Weapons Carrier is a special equipment vehicle designed to provide a stable firing platform for the Rifle, Recoilless, 106mm. A combat load is approximately 2000 lbs including the weapon and four man crew. The ¼ ton truck is widely used throughout the Army in combat, combat support and combat service support units.

COST DATA

[In millions of dollars]

	Fiscal year 1971		Fiscal year 1972		Fiscal year 1973	
	Quantity	Amount	Quantity	Amount	Quantity	Amount
Weapons system cost	12,071	42.3	7,250	27.3	10,078	40.9

Basis for fiscal year 1973 Request.—Program is required to replace peacetime and combat losses, to meet RVNAF Improvement and Modernization requirements and to increase readiness posture. Any reduction in the fiscal year 1973 program will severely constrain the Army's ability to attain an adequate readiness posture preparatory to discontinuation of production in this payload vehicle in 1975 due to the inability to acquire an engine meeting emission standards until 1976. Elimination of the fiscal year 1973 program will require RVNAF requirements to be met from existing assets in the hands of U.S. Forces and will reduce overall readiness from [deleted] of AAO, of which 10% will be overage.

CONTRACT DATA

Major subsystem	Contractor	Type of last contract
Vehicle with engine and transmission, fiscal year 1971–73.	AM General Corp	Advertised, 2-step, fixed price with escalation (3-year, multi-year).

PRODUCTION DATA

	Fiscal year 1971	Fiscal year 1972	Fiscal year 1973	Fiscal year 1974	Fiscal year 1975
Funded	12,071	7,250	(10,078)		
Delivered	14,499	(1,125)	(19,215)	(12,218)	0

INVENTORY/OBJECTIVES

	End fiscal year 1971 [1]	End fiscal year 1972 [1]	End fiscal year 1973 [1]
Force units (Division force equivalent)			21
Inventory objective	[Deleted.]	[Deleted.]	[Deleted.]
On hand/on order			
Percent inventory objective achieved			

[1] Funded delivery period.

Chairman ELLENDER. How many of these particular trucks are programed for the support of free world forces, and what countries are involved?

General BUSH. There are [deleted] trucks programed for support of free world forces. [Deleted] of these are for [deleted] and [deleted] for [deleted].

Chairman ELLENDER. I note on the vehicle data sheet that this vehicle is procured in three separate configurations, utility, ambulance, and weapons carrier. How many of each of these configurations are included in the 10,078 you are planning to buy in fiscal year 1973?

General BUSH. Of the 10,078 fiscal year 1973 buy, 9,953 are utility trucks, 80 are ambulances, and 45 are weapons carriers.

Chairman ELLENDER. I note on the vehicle data sheet the following statement: "Program is required to replace peacetime and combat losses, to meet RVNAF improvement and modernization requirements, and to increase readiness posture." How many of these 10,078 vehicles do you estimate are required to replace peacetime and combat losses?

General BUSH. It is estimated 3,835 are required to replace peacetime and combat losses.

Chairman ELLENDER. Are any of these vehicles associated with the TOW antitank weapon?

General BUSH. Yes, sir. Included in the overall requirement for one-fourth-ton trucks is a requirement for approximately [deleted] trucks in support of the TOW antitank weapon system. The TOW requirements will be supplied within distribution priorities as their time-phased requirements are generated between now and the end of fiscal year 1976.

Chairman ELLENDER. I note that the unit cost of this vehicle for fiscal year 1973 is estimated at $4,060. How does this compare to the cost in previous fiscal years?

General BUSH. The fiscal year 1973 cost of $4,060 per vehicle compares favorably with the fiscal year 1971 cost of $3,504 and that for fiscal year 1972 of $3,770. The increase of $266 between fiscal year 1971 and 1972 is due to a $53 increase caused by the application of fixed support costs over a smaller vehicle quantity, $205 for product im-

provement and $8 for other miscellaneous increases. The $290 increase between fiscal year 1972 and 1973 is caused by $208 escalation and $88 additional for product improvement partially, offset by a decrease in miscellaneous support and hardware cost changes.

Chairman ELLENDER. As I indicated earlier, you are requesting 10,078 of these vehicles for 1973. Only 7,250 were funded in fiscal year 1972. What is the need for the increase in the number of these vehicles being procured?

General BUSH. The increase over fiscal year 1972 is required to attain a better asset position to offset a projected no buy period after January 1, 1975.

TRUCKS—2½-TON

Chairman ELLENDER. You referred to the request of $63.4 million for the procurement of 4,270 2½-ton trucks. Selected paragraphs from the vehicle data sheet on page 29 of the justifications will be included in the record at this point.

(The information follows:)

TACTICAL VEHICLE DATA SHEET

Service: Army—P–1 Line Item: 12; Nomenclature: Truck, 2½ Ton, 6x6, ABT.

Description/Mission.—The 2½ ton truck is a wheeled tactical transport vehicle powered by a liquid cooled, six cylinder, compression-ignition engine. It has six wheel drive for rough terrain maneuverability and a water fording capability of up to 30 inches. It is produced in seven body types—Bolster, Cargo, Dump, Maintenance, Tank, Tractor and Van. The Bolster truck is used to transport long beams, pipes, etc. The Cargo truck is used to transport general cargo, personnel and equipment. The Dump truck is used to transport and dump earth, sand, gravel, etc. The Maintenance truck is used to transport special tools and/or equipment required in telephone construction and repair work. The Tank truck is used to transport and dispense liquids. The Tractor is used to tow semitrailers. The Van is used as a mobile shop or office facility.

COST DATA

[In millions of dollars]

	Fiscal year 1971		Fiscal year 1972		Fiscal year 1973	
	Quantity	Amount	Quantity	Amount	Quantity	Amount
Weapon system cost	9,294	102.0	4,400	54.9	4,270	63.4

Basis for fiscal year 1973 request.—The fiscal year 1973 program is required to meet FWMAF & RVNAF Modernization requirements and replace peacetime losses. The quantity is based upon procuring [deleted] of the Authorized Acquisition Objective (AAO) as reduced due to it being planned as the first year of a new two year, multi-year procurement. Elimination of the fiscal year 1973 program will require FWMAF & RVNAF requirements to be met from assets in the hands of U.S. troops and delay initiation of a new multi-year procurement.

CONTRACT DATA

Major subsystem	Contractor	Type of last contract
Vehicle without engine (Government furnished equipment) fiscal years 1970–72.	AM General Corp	Advertised, 2-step, fixed price with escalation (2 year, multi-year).

PRODUCTION DATA

	Fiscal year 1971	Fiscal year 1972	Fiscal year 1973	Fiscal year 1974	Fiscal year 1975
Funded	9,294	4,400	(4,270)		
Delivered	14,935	(8,791)	(4,400)	(2,345)	(1,925)

INVENTORY/OBJECTIVES

	End fiscal year 1971 [1]	End fiscal year 1972 [1]	End fiscal year 1973 [1]
Force units (Division force equivalent)			21
Inventory objective	[Deleted]	[Deleted]	[Deleted]
On hand/on order			
Percent inventory objective achieved			

[1] Funded delivery period.

Chairman ELLENDER. How many of these trucks are being procured for transfer to the free world forces, and what countries are involved?

General BUSH. The fiscal year 1973 program includes [deleted] vehicles for free world forces. [Deleted] are for [deleted] and [deleted] for [deleted].

Chairman ELLENDER. What are your estimated peacetime losses of this truck?

General BUSH. The estimated peacetime losses for fiscal year 1973 are 4,706.

Chairman ELLENDER. I note that the fiscal year 1973 program is based on a unit cost of $14,840 for this truck. How does this compare to the cost in previous years?

General BUSH. The fiscal year 1973 program unit cost of $14,837 represents an increase of $2,357 over the fiscal year 1972 program unit cost. The increase is mainly attributable to escalation and the requirement for a low slow production build up. A low slow production build up is required to minimize the concurrency between production and testing. This increases the unit cost because it requires the contractor to produce below his capability until the vehicle has satisfactorily passed initial production tests; however, the corrections required by the tests can thus be made before a large number of vehicles are produced and accepted by the Army. This procedure results in the lowest total cost for the vehicle.

8 TON GOER TRUCKS

Chairman ELLENDER. The next item is the request for $21.1 million for the procurement of 364 of the 8-ton GOER vehicles. Selected paragraphs from the vehicle data sheet on page 33 of the justifications will be included in the record at this point.

(The information follows:)

TACTICAL VEHICLE DATA SHEET

Service: Army—P-1 Line Item: 15; Nomenclature: Truck, 8 ton 4x4, ABT, GOER.

Description/Mission.—The GOER vehicle is a high mobility all wheel drive vehicle designed along the lines of commercial, earth-moving, construction equipment. It is characterized by large diameter, low pressure tires, wagon steering and articulated vehicle/body design. These features enable it to "duck walk" over soft or wet underfooting or deep snow. It "duck walks" by using its wagon steering feature in the form of two hydraulic cylinders, that respond to steering wheel motion, by moving the entire front unit to the left or right in relation to the rear unit. Each side-to-side swing of the front unit draws the rear unit forward and is continued until the vehicle reaches firm footing. This vehicle will also swim inland waterways, fully loaded, without preparation or special kits. Three body types—cargo, tank and wrecker—comprise the GOER vehicle family. These vehicles have a rated payload capability in the 8 ton range. GOERs are designed to provide support/transport vehicles which are compatible with the mobility of combat vehicles and operate in the same combat environment.

COST DATA

[In millions of dollars]

	Fiscal year 1971		Fiscal year 1972		Fiscal year 1973	
	Quantity	Amount	Quantity	Amount	Quantity	Amount
Weapon system cost	0	0	0	0	364	21.1

Basic for fiscal year 1973 Request.—The fiscal year 1973 program is the second increment of a total of 1300 GOER vehicles planned to be procured over a four-year period to meet "hard core" petroleum, ammunition and vehicle recovery transportation requirements in specific high mobility tank and self-propelled artillery units. This planned procurement has permitted a reduction in requirements for existing trucks (specifically 5 ton cargoes and wreckers, 2½ ton tankers and 1½ ton cargo and ammunition trailers) in selected units. Elimination of this program will preclude continuation of the multi-year contract, result in a termination fee of $3.0 million and delay fulfilling "hard core" requirements.

CONTRACT DATA

Major subsystem	Contractor	Type of last contract
Vehicle with engine and transmission, fiscal year 1970, 1973–75.	Caterpillar Tractor Co.	Advertised, 2-step firm fixed price (4-year multiyear).

PRODUCTION DATA

	Fiscal year 1971	Fiscal year 1972	Fiscal year 1973	Fiscal year 1974	Fiscal yea 1975
Funded[1]	0	0	(364)		
Delivered	0	0	(164)	(300)	(0)

[1] 100 each procured with fiscal year 1970 funds are delivered in fiscal year 1973.

INVENTORY/OBJECTIVES

	End fiscal year 1971 FDP[1]	End fiscal year 1972 FDP[1]	End fiscal year 1973 FDP
Force units (division force equivalent)			21
Inventory objective			[deleted]
On-hand/On-order	[deleted]	[deleted]	[deleted]
Percent inventory objective achieved	[deleted]	[deleted]	[deleted]

[1] Funded delivery period.

Chairman ELLENDER. I remember some testimony on this vehicle involving a reprograming action several years ago. When was the procurement of these particular vehicles initially funded?

General BUSH. The initial procurement on this vehicle was funded in fiscal year 1970 and it was accomplished by reprograming action.

Chairman ELLENDER. Have those vehicles been delivered yet?

General BUSH. No, sir. Delivery of the fiscal year 1970 program is not scheduled to begin until July 1972.

Chairman ELLENDER. I note on page 33 of the data sheet that the 364 requested for fiscal year 1973 is a separate increment of a total of 1,300 GOER vhicles planned to be procured. Was the first increment of these vehicles funded in 1970?

General BUSH. Yes, sir.

Chairman ELLENDER. On the vehicle data sheet, I note the following statement: "Elimination of this program will preclude continuation of the multiyear contract, result in a termination fee of $3 million, and delay fulfilling hard-core requirements." Just how was this termination fee of $3 million computed?

General BUSH. The termination fee is computed based on a percentage of the total contract cost. These percentages are stipulated in the contract cancellation clause and are in terms of program years of production.

Chairman ELLENDER. As I recall, the original vehicles approved in 1970 were for the support of a test to determine the desirability of procuring this vehicle. Briefly, what were the results of those tests?

General BUSH. The Army plans to procure 1,300 GOER vehicles to meet "hard core" petroleum, ammunition and vehicle recovery transportation requirements in specific high mobility tank and self-propelled artillery units. The initial increment is earmarked to participate in a ground mobility test. However this test will not determine the desirability of procuring this vehicle. It will assist the Army in validating, quantitatively and qualitatively, the Army's need for additional high mobility GOER vehicles over and above the 1,300. This test is currently scheduled to begin in the first quarter of fiscal year 1974 and it is anticipated that the approved results will become available in the fourth quarter of fiscal year 1974.

Chairman ELLENDER. I note that this vehicle comes in three body types—cargo, tank, and wrecker. How many of each are included in the 364 you are requesting for fiscal year 1973?

General BUSH. The Army plans to procure 232 cargoes, 99 tankers and 33 wreckers within the fiscal year 1973 program for 364 GOER vehicles.

FIVE-TON TRUCKS

Chairman ELLENDER. On line 14 of the P–1 exhibit, there is a request of $4.4 million for 5-ton trucks. The vehicle data sheet for this item will be included in the record at this point.

(The information follows:)

TACTICAL VEHICLE DATA SHEET

Service: Army—P–1 Line Item: 14; Nomenclature: Truck, 5 Ton 6x6, ABT.

Description/Mission.—The 5 ton truck is a wheeled tactical transport vehicle powered by a liquid cooled, six cylinder, compression-ignition engine. It has six wheel drive for rough terrain maneuverability and a water fording capability of up to 30 inches. It is produced in seven body types—Cargo, Dump, Tractor, Wrecker, Van, Stake and Bolster. The Cargo truck is used to transport general cargo, personnel or equipment. The Dump truck is used to transport and dump earth, sand, gravel, etc. The Tractor is used to tow semitrailers. The Wrecker is used as a recovery vehicle and as a crane to perform lifting operations. The Van is used as a mobile shop or office facility. The Stake truck is used to transport bridging equipment. The Bolster truck is used in conjunction with a bolster type trailer to transport logs in forestry operations.

COST DATA

[Dollar amounts in millions]

	Fiscal year 1971		Fiscal year 1972		Fiscal year 1973	
	Quantity	Amount	Quantity	Amount	Quantity	Amount
Weapon system cost	4,660	$85.7	3,500	$66.0	0	$4.4

Basis for fiscal year 1973 request: The fiscal year 1973 program is required to fund the third year of the current Product Improvement Program (PIP). The PIP is designed to improve the reliability, availability and maintainability of the vehicle as well as to acquire an engine which will meet the emission control standards anticipated for 1975. Elimination of the fiscal year 1973 program will require termination of the product improvement effort necessary before the next quantity procurement of 5 ton trucks.

CONTRACT DATA

Major subsystem	Contractor	Type of last contract
Vehicle with engine and transmission, fiscal years 1969–72.	AM General Corp	Advertised, 2-step, fixed price with escalation (4-year Multi-year).

Production DATA

	Fiscal year 1971	Fiscal year 1972	Fiscal year 1973	Fiscal year 1974	Fiscal year 1975
Funded	4,660	3,500	0		
Delivered	6,435	(5,688)	(2,285)	(0)	(0)

INVENTORY/OBJECTIVES

	End fiscal year 1971 FDP[1]	End fiscal year 1972 FDP[1]	End fiscal year 1973 FDP[1]
Force units (division force equivalent)			21
Inventory objective	[Deleted]		
On-hand/on-order	[Deleted]		
Percent inventory objective achieved			

[1] Funded delivery period.

Chairman ELLENDER. On the vehicle data sheet, I note the following statement: "The fiscal year 1973 program is required to fund the third year of the current product improvement program." As I understand this request, you are not requesting funds for the procurement of any additional trucks and this $4.4 million is associated with the improvement of existing trucks. Am I correct about this?

General BUSH. Sir, the request for $4.4 does not provide funds for the procurement of any additional trucks, however this request is associated with the product improvement of future production trucks, not existing trucks. The Army has no plans at this time to retrofit the current fleet with the product improvements.

Chairman ELLENDER. Just what is the nature of these improvements?

General BUSH. The product improvement program will improve the reliability, availability, and maintainability of the transmission, transfer case, brakes, clutch and suspension. The cab will be redesigned to comply with human factors engineering design standards for wheeled vehicles. It also incorporates measures to assure compliance with Federal emission standards.

Chairman ELLENDER. How many of these trucks will be improved with the $4.4 million you are requesting?

General BUSH. All future production will incorporate the product improvements and will also comply with Federal Emission Standards.

ONE-HALF TON PLATFORM TRUCKS

Chairman ELLENDER. You referred to the request of $5 million for the procurement of 1,000 one-half ton platform trucks in your statement. The vehicle data sheet for this vehicle will be included in the record at this point.

(The information follows:)

TACTICAL VEHICLE DATA SHEET

Service: Army—P–1 Line Item: 16; Nomenclature: Truck, Platform, Utility, ½ Ton, M274 Series.

Description/Mission.—Item is a wheeled, tactical transport vehicle designed as a light-weight cargo carrier and known as the "Army Mule." It consists essentially of a platform mounted on two axles and 4 wheels with a power plant mounted under and to the rear of the vehicle. The low silhouette low-speed vehicle possesses a variable position steering column for dismounted control and is designed to carry light cargo over rough terrain keeping pace with dismounted riflemen in combat. In addition to its cargo carrying role it serves as a weapons firing platform and ambulance in airmobile and airborne units.

COST DATA

[Dollar amounts in millions]

	Fiscal year 1971		Fiscal year 1972		Fiscal year 1973	
	Quantity	Amount	Quantity	Amount	Quantity	Amount
Weapons system cost....	0	0	0	0	1,000	5.0

Basis for fiscal year 1973 request.—Program is required to replace combat and peacetime losses, to meet new requirements associated with the TOW missile system, and to achieve a higher state of readiness. Quantity programed is economic procurement quantity based upon experience. Elimination of the fiscal year 1973 program will require losses and new requirements to be absorbed out of existing assets, there by reducing readiness from [deleted] of Authorized Acquisi-

tion Objectives and achieve only [deleted] of Active Army initial issue requirements.

CONTRACT DATA

Major subsystem	Contractor	Type of last contract
Fiscal year 1967: Vehicle	Baifield Co	Advertised, firm fixed price.
Fiscal year 1973: Vehicle engine	To be selected (Government furnished equipment).	

PRODUCTION DATA

	Fiscal year—				
	1971	1972	1973	1974	1975
Funded	0	0	(1,000)		
Delivered	0	0	0	(760)	(240)

INVENTORY/OBJECTIVES

	End fiscal year 1971[1]	End fiscal year 1972[1]	End fiscal year 1973[1]
Force units (division force equivalents)			21
Inventory objective	[Deleted]		[Deleted]
On hand/on order			
Percent inventory objective achieved			

[1] Funded delivery period.

Chairman ELLENDER. How many of these 1,000 platform trucks are to replace combat and peacetime losses, and how many are to meet new requirements associated with TOW missile system?

General BUSH. Included in the fiscal year 1973 are 162 trucks to replace combat and peacetime losses and [deleted] trucks in support of the TOW missile system.

Chairman ELLENDER. When was this particular vehicle last procured, and what was its cost at that time?

General BUSH. The last Army procurement of this item was made with fiscal year 1967 funds at a program unit cost of $3,736. The increase of $1,300 per vehicle is caused by $652 hardware escalation; $256 for Federal excise tax, start-up, loading and blocking; $533 for escalation other than hardware; and $903 for the engine. These increased costs are partially offset by decreases of $949 retrofit and $95 in other support costs per vehicle.

XM746 22½-TON TRACTOR TRUCKS

Chairman ELLENDER. The next item is the request of $13 million for the procurement of 125 22½-ton tractor trucks. Selected paragraphs from the vehicle data sheet will be included in the record at this point.

(The information follows:)

TACTICAL VEHICLE DATA SHEET

Service: Army—P-1 Line Item: 17; Nomenclature: Truck, Tractor, 22½ Ton, 8x8, XM746.

Description/Mission.—The Heavy Equipment Transporter (HET) Truck Tractor, XM746 is a 22½ ton, 8x8 wheeled tactical transport vehicle of the general purpose category, designed as the prime mover for the HET Semi-

trailer M747. Together they are required and designed to support mechanized, armored and other Army units by: transporting tanks and other armored vehicles from receiving ports and depots to using units; removing disabled tanks and other heavy equipment from collecting points on the battlefield to repair facilities; and providing units with capability of moving general heavy equipment weighing between 25 and 60 tons and other high density cargo. In its operational role it must be capable of being used in various operational environments throughout the world. It will be required to operate on primary and secondary roads in various state of repair. In addition to an on-road capability, it is essential that the transporter be capable of operating to a limited extent off-roads in order to reach vehicle parks and areas for concealment when required; on occasion, to evacuate vehicles from point of disablement, provided there is a reduced danger from enemy fires; and to make short detours to avoid road obstructions.

COST DATA

[In millions of dollars]

	Fiscal year 1971		Fiscal year 1972		Fiscal year 1973	
	Quantity	Amount	Quantity	Amount	Quantity	Amount
Weapons system cost	0	1.9	0	0	125	13.0

Basis for fiscal year 1973 request.—Program is required to initiate acquisition of a standard Heavy Equipment Transporter designed specifically to meet the Army's requirements in this area. The fiscal year 1973 quantity is based upon an initial economic procurement quantity for a multi-year program to acquire a total of 625 vehicles over a three-year, skip year basis to achieve [deleted] of the Army's requirements. This standard vehicle is required to replace a mixture of military and modified commercial tractors which are overage or acquired on an interim basis. Elimination of this program requires retention of overage and interim vehicles at additional high maintenance costs and reduced vehicle availability and reliability for mission accomplishment, especially in support of NATO.

	Major subsystem	Contractor	Type of last contract
Contract data	Vehicle with engine and transmission	To be selected	Not available.

	Fiscal year—				
	1971	1972	1973	1974	1975
Production data:					
Funded	0	0	125		
Delivered	0	0	0	(25)	(100)

	End fiscal year funded delivery period—		
	1971	1972	1973
Inventory objectives:			
Force units-DFE			21
Inventory objective	[Deleted.]		
On hand/on order			
Percent inventory objective achieved			

Chairman ELLENDER. Is this the initial procurement of this particular vehicle?

General BUSH. Yes, sir. This is the initial procurement of the production model of the XM746 tractor truck. Several early prototype

models were procured for testing using R.D.T. & E. and advance production engineering funds.

Chairman ELLENDER. Give us a brief description of this vehicle, and cite several examples of its use.

General BUSH. The heavy equipment transporter truck tractor, XM 746 is a 22½-ton, 8 by 8 wheeled tactical transport vehicle of the general purpose category, designed as the prime mover for the semitrailer M747. Together they are required and designed to support mechanized, armored, and other Army units by transporting tanks and other armored vehicles from receiving ports and depots to using units; removing disabled tanks and other heavy equipment from collecting points on the battlefield to repair facilities; and providing units with capability of moving general heavy equipment weighing between 25 and 60 tons and other high-density cargo. In its operational role it must be capable of being used in various operational environments throughout the world. It will be required to operate on primary and secondary roads in various state of repair. In addition to an on-road capability, it is essential that the transporter be capable of operating to a limited extent off roads.

Chairman ELLENDER. I note that this is the first year of a multiyear program to acquire 625 of these vehicles over a 3-year period. Does the existing contract provide that you acquire all 625 of these vehicles at a cost of not to exceed $104,100 per vehicle?

General BUSH. No, sir. The contract for these vehicles has not been awarded. The average program unit cost for the total multiyear program of 625 is now estimated to be $102,240. This cost estimate includes costs of Government in-house support, escalation, and engineering support to production.

Chairman ELLENDER. What vehicles will be replaced by this new truck?

General BUSH. Sir, the XM746 truck tractor will replace a variety of interim standard B and commercial vehicles which do not fully meet military requirements, are overage, and are rapidly becoming uneconomically repairable. The trucks being replaced include the 12-ton M–26 series, the dual winch 10-ton M123, the 25-ton XM523E2, and several commercial makes and models.

Chairman ELLENDER. Proceed, General.

COMMERCIAL VEHICLES

General BUSH. Our request includes $42.2 million for approximately 11,879 commercial vehicles of various types, ranging from light sedans to 45-passenger buses. This represents an increase in commercial vehicle purchases which is directly responsive to congressional suggestions and will permit attainment of greater readiness in the commercial fleet thereby minimizing use of tactical vehicles. In addition, there are a number of other actions being taken to reduce tactical vehicle requirements and to replace tactical with commercial vehicles.

Chairman ELLENDER. Please provide a P–1 type tabulation listing each of the commercial vehicles included in the request of $42.2 million for the procurement of these 11,879 vehicles.

General BUSH. I will be glad to do so.

(The information follows:)

Item	Unit cost	Quantity	Amount (millions)
Automobile, ambulance metropolitan	9.7	61	$0.6
Automobile, sedan, light	2.5	3,077	7.8
Automobile, station wagon	2.7	215	.6
Bus, 25 passenger	9.2	462	4.3
Bus, 45 passenger	16.6	60	1.0
Semitrailer, van, refrigerator	10.1	37	.4
Semitrailer, van, stake	5.0	414	2.1
Truck, ambulance	4.7	142	.7
Truck, cargo, pickup, 4 x 2	2.3	3,749	8.6
Truck, cargo, pickup, 4 x 4	3.7	464	1.7
Truck, carryall	3.4	688	2.3
Truck, panel	3.1	539	1.7
Truck, stake, 19,000 GVW, 4 x 2	4.0	561	2.2
Truck, stake, 7,000 GVW	2.8	411	1.2
Truck, tractor 4 x 2	14.3	162	2.3
Truck, tractor, 6 x 4	17.7	122	2.2
Truck, utility	2.7	503	1.4
Truck, van	5.1	212	1.1
Total		11,879	42.2

Chairman ELLENDER. How many of these are being purchased to replace existing vehicles, or are you providing for more than you now have? Eleven thousand is a large number.

General BUSH. Yes, sir. There has been and there is a specific requirement to buy and replace certain categories of commercial vehicles, specifically on a replacement basis. In every case, Mr. Chairman, I can assure you that where we are buying new vehicles, let us say to meet an increased requirement, there is a greater than offsetting value in the reduction of what otherwise would be a tactical vehicle. We have two parallel programs going.

Chairman ELLENDER. From whom do you buy this equipment, regular commercial sources?

General BUSH. All straight commercial. We buy it mostly from the Big Three.

SPECIFICATION REQUIREMENTS

Chairman ELLENDER. Do you specify the requirements for those that you order?

General BUSH. Yes, sir. Both the GSA and the Army prepare specifications and both the GSA and the Army are involved in the procurement. The Army prepares the specifications for all of the commercial vehicles that are used by the DOD. GSA buys those vehicles that are in a light category, less than 2½ tons.

Chairman ELLENDER. You say many of them are bought directly from stock? For those that you write out specifications, I presume you are charged extra for that?

General BUSH. Yes.

Chairman ELLENDER. Could you use the same chassis and equip it with what is desired?

General BUSH. Mr. Chairman, we pay extra for any extras that we get, but I would like to clarify the use of the term specification as I have used it. In order to go out and procure competitively we are required to write a specification for the vehicle. We may write one for a medium sedan, for example, that could be met by Ford, General Motors, or by a Chrysler Corp. product and refer to that as a specification.

If we ask for something, if we specify air conditioning on the vehicle, we pay more for it, just as you do, Mr. Chairman. We do not, on those items, specify new design requirements. We are just picking options that are available to anybody in the market.

Chairman ELLENDER. It is on bid, I presume?

General BUSH. Yes, sir.

Chairman ELLENDER. Using the same specifications?

General BUSH. The specifications on the bid and whoever gives the low bid gets the contract. We do in fact buy our sedans, for example, from different manufacturers from year to year.

METROPOLITAN AMBULANCES

Chairman ELLENDER. The request includes $600,000 for the procurement of 61 metropolitan ambulances. Are these 61 for the replacement of existing vehicles? If not, what is the need for an increase in the number of these vehicles you now have in the inventory?

General BUSH. Sir, the 61 metropolitan ambulances are to replace existing ambulances in the Army inventory.

LIGHT SEDANS

Chairman ELLENDER. $7.8 million is requested for the procurement of 3,077 light sedans. Are all of these for the replacement of existing vehicles?

General BUSH. The 3,077 light sedans are replacements for vehicles which exceed the replacement criteria of 6 years, 72,000 miles, or economical repair costs. These vehicles will replace only 38 percent of the vehicles which meet the replacement criteria.

STATION WAGONS

Chairman ELLENDER. Are the 215 station wagons you are requesting at a cost of $600,000 for the replacement of existing station wagons?

General BUSH. Yes, sir; these station wagons are replacing existing station wagons which exceed the replacement criteria of 6 years, 72,000 miles, or economical repair costs. The 215 station wagons will replace only 40 percent of the vehicles which meet the replacement criteria.

TWENTY-FIVE-PASSENGER BUSES

Chairman ELLENDER. Just what is your need for the 462 25-passenger buses for which you are requesting $4.3 million?

General BUSH. Sir, the 462 25-passenger buses are required as replacements for buses which meet or exceed the replacement criteria of 8 years, 84,000 miles, or economical repair costs. The 462 buses will replace only 60 percent of vehicles which meet the replacement criteria.

FORTY-FIVE-PASSENGER BUSES

Chairman ELLENDER. I note that you are requesting $1 million for the procurement of 60 45-passenger buses at a cost of $16,600 per bus. Just what is your need for these large buses?

General BUSH. These buses are required for replacement of like type buses which exceed the replacement criteria of 10 years, 150,000 miles,

or economical repair costs. The requested buses replace 17 percent of the buses which are eligible for replacement. The buses are required worldwide for mass transportation of troops, dependent schoolchildren, and scheduled bus service at posts, camps, and stations. When converted to the ambulance configuration, it is used for transport of litter patients.

Chairman ELLENDER. I note that in fiscal year 1971, you procured a 36-passenger bus at a cost of $7,600 per bus. What requirements do you have for this expensive 45-passenger bus that could not be met by the less expensive 36-passenger bus?

General BUSH. Economical group transportation of troops and schoolchildren and the movement of litter patients are the primary requirements for the 45-passenger bus which cannot be met by the less expensive 36-passenger bus. The 45-passenger bus is a forward control configuration providing good visibility with heavy construction for longer life and better riding qualities to meet current and continuing mass transportation of troops and patients. The life expectancy of the 45-passenger bus is 10 years or 150,000 miles compared to a life expectancy of 8 years or 84,000 miles for the 36-passenger bus. The 36-passenger bus is used primarily for transportation of schoolchildren and scheduled bus service within a post, camp, or station.

TWELVE-TON VAN SEMITRAILERS

Chairman ELLENDER. On line 25 of the P–1 exhibit, there is a request of $2.1 million for the procurement of 414 12-ton van semitrailers. Please describe this piece of equipment and comment on your need for 414.

General BUSH. The semitrailer, Van, 12-ton, is a standard production closed van used for the transportation, protection, and security of cargo. The semitrailers requested are required as replacements of like type semitrailers which exceed the replacement criteria of 15 years or economical repair costs.

TRUCK AMBULANCES

Chairman ELLENDER. Comment on the need for the 142 truck ambulances for which you are requesting $700,000.

General BUSH. The 142 ambulance trucks are required to replace ambulances which exceed the replacement criteria of 8 years, 84,000 miles, or economical repair costs. The requested vehicles will replace only 47 percent of the ambulances eligible for replacement.

Chairman ELLENDER. How does the truck ambulance for which you pay $4,700 differ from the metropolitan ambulance for which you pay $9,700?

General BUSH. The truck ambulance is a standard commercial light duty truck converted to an ambulance, whereas the metropolitan ambulance is a commercial ambulance with a specially reinforced automobile chassis and cowl with an integrated ambulance body.

PICKUP TRUCKS

Chairman ELLENDER. On line 27 of the P–1 exhibit, there is a request of $8.6 million for the procurement of 3,749 pickup trucks. Please comment on the need for these trucks.

General Bush. The 3,749 trucks will replace a like number and type of trucks which exceed the replacement criteria of 6 years, 72,000 miles, or economical repair costs. The 3,749 trucks will replace only 44 percent of the vehicles eligible for replacement.

Chairman Ellender. On line 28 of the P–1 exhibit, there is a request of $1.7 million for the procurement of 464 pickup trucks designated "4 by 4." Please describe this particular vehicle and comment on your need for the 464 you are requesting.

General Bush. The truck, cargo, pickup, 4 by 4 is a standard production, four-wheel drive vehicle used for the transport of light cargo, and occasionally personnel. This vehicle may be operated off-highway; 464 of these vehicles are required to replace a like number and type of vehicles which exceed the replacement criteria of 6 years, 72,000 miles, or economical repair costs. The requested vehicles will replace only 51 percent of the vehicles which meet or exceed the replacement criteria.

CARRYALL TRUCKS

Chairman Ellender. Just what is the need for the 688 carryall trucks for which you are requesting $2.3 million?

General Bush. The 688 carryall trucks are required to replace a like number and type of vehicles which exceed the replacement criteria of 6 years, 72,000 miles, or economical repair costs. The requested vehicles will replace only 41 percent of the vehicles which meet or exceed the replacement criteria.

PANEL TRUCKS

Chairman Ellender. You are requesting $1.7 million for the procurement of 539 panel trucks. Please comment on the need for these trucks.

General Bush. The 539 panel trucks are required for the replacement of a like number and type of vehicles which exceed the replacement criteria of 6 years, 72,000 miles, or economical repair costs. The vehicles will replace 64 percent of the vehicles which meet or exceed the replacement criteria.

STAKE TRUCKS

Chairman Ellender. On line 31 of the P–1 exhibit, there is a request of $2.2 million for the procurement of 561 stake trucks designated "19,000 g.v.w. 4 by 2". Please describe this truck, cite some of its uses, and comment on your need for the 561 you are requesting.

General Bush. The stake truck 19,000 G.V.W., 4 by 2 is a standard production two-wheel drive vehicle used for the transport of general cargo over improved roads and highways. This vehicle is not intended for off-highway use; 561 of these trucks are required to replace a like number and type of vehicles which exceed the replacement criteria of 8 years, 84,000 miles, or economical repair costs. The requested number of vehicles will replace only 25 percent of those vehicles eligible for replacement.

Chairman Ellender. On line 32 of the P–1 exhibit, there is a request of $1.2 million for the procurement of 411 stake trucks designated "7,000 g.v.w." Just what is needed for these 411 trucks?

General Bush. The 411 trucks are required to replace a like number and type of vehicles which exceed the replacement criteria of 6 years, 72,000 miles, or economical repair costs. The requested trucks will replace 59 percent of the vehicles eligible for replacement.

Tractor Trucks

Chairman Ellender. Comment on the need for the 162 tractor trucks 4 by 2 for which you are requesting $2.3 million.

General Bush. The 162 tractor trucks 4 by 2 are required to replace a like number and type of vehicles which exceed the replacement criteria of 10 years, 150,000 miles or economical repair costs. All tractors are to be supplied to the 37th Transportation Group, U.S. Army, Europe, which is utilizing commercial tractors in lieu of tactical tractors in line haul operations.

Chairman Ellender. Line 34 of the P–1 exhibit contains a request of $2.2 million for the procurement of 122 6 by 4 tractor trucks. What is your need for these 122 trucks?

General Bush. 122 6 by 4 tractor trucks are required for replacement of 4 by 2 truck tractors with less tow capability to be used by the 37th Transportation Group, U.S. Army, Europe, in line-haul operation and movement of military and commercial van containers which exceed the capability of existing commercial tractors in the European Command.

Utility Trucks

Chairman Ellender. Comment on the need for the 503 utility trucks for which you are requesting $1.9 million.

General Busch. The 503 utility trucks are required to replace a like number and type of vehicles which exceed the replacement criteria of 6 years, 72,000 miles, or economical repair costs. The requested vehicles will replace only 39 percent of the vehicles eligible for replacement.

Truck Vans

Chairman Ellender. On line 36 of the P–1 exhibit, there is a request of $1.1 million for the procurement of 212 truck vans. Please describe this particular vehicle, give us some examples of its uses, and comment on the need for the 212 you are requesting.

General Bush. The truck van is a standard production vehicle used for the transportation, protection, and security of general cargo at posts, camps, and stations. The 212 vehicles are required as replacement for vehicles which exceed the replacement criteria of 7 years, 84,000 miles, or economical repair costs. The requested vehicles will replace 22 percent of those vehicles which meet the replacement criteria.

Pollution Abatement

Chairman Ellender. I notice in one paragraph you have $3.6 million for pollution abatement. How will that be used?

General Bush. Mr. Chairman, that will be used for the production engineering increment as opposed to the research and development increment for the engines. I believe these two are the one-quarter ton and 10-ton vehicles for this particular year.

Chairman Ellender. Do you have those on hand?

General Bush. Of those that we will be buying, Mr. Chairman.

Chairman ELLENDER. Couldn't you include that in the contract specifications when you ask bids for them?

General BUSH. That would be possible, Mr. Chairman, to include that within the specification. However, there is some advance production engineering work required on these particular systems before we go out and specify exactly what we want.

Chairman ELLENDER. This is for in-house work?

General BUSH. Yes, sir. This is for the in-house work. It is relatively small. As soon as we develop the knowledge of what we require, we will be able to specify to the bidders what we need to meet both our performance requirements and to meet the Environmental Protective Agency requirements.

ITEMS LESS THAN $500,000

Chairman ELLENDER. On line 43 of the P–1 exhibit, there is a request of $10.3 million for "Items less than $500,000." I note that only $2.3 million was provided for this category in fiscal year 1972. Comment generally on the nature of the items you expect to procure with this $10.3 million, and provide a more detailed statement for the record on the specific items included.

General BUSH. The $10.3 million in "Items less than $500,000" are required for miscellaneous commercial and tactical vehicles, automotive sets and kits, engineering service vehicles, and miscellaneous tactical hardware for support of military assistance service funded programs for Southeast Asia. These programs have a total program value of less than $500,000 and are required to replace normal losses and items eligible for replacement due to age, mileage, or uneconomical repair cost criteria. Of the total, $3.2 million is required for various commercial vehicles to include 21 medium sedans, 23 12-passenger buses, 85 multistop delivery trucks, 67 stake trucks, 51 tank trucks, 35 motorcycles, 168 scooters, 67 dump trucks, 51 wrecker trucks, and 55 fuel servicing trucks; $1.4 million is required for various automotive repair shop sets and kits required for replenishment purposes.

There is $3.7 million required for replenishment procurement of 13 types of engineering service vehicles utilized in repair and utility activities in posts, camps, and stations. Two million dollars is required for various vehicles and supporting equipment for support of the military assistance service funded program in Southeast Asia.

MISCELLANEOUS ITEMS

Chairman ELLENDER. On line 44 of the P–1 exhibit, there is a request of $1.3 million for spares and repair parts. Is this for initial spares or replenishment spares?

General BUSH. The $1.3 million covers both initial and replenishment spares. Of the total $339,000 is required for initial spares.

Chairman ELLENDER. Just what systems are supported with these spare parts?

General BUSH. Of the total of $1.3 million, $1 million is required for recurring requirements for the major four payload trucks and other tactical vehicles. These replenishment funds cannot be directly assigned to specific components and/or end items at this time since they represent parts common to more than one vehicle and support the vehicles in use rather than those required for procurement this year.

The balance of $0.3 million covers initial spares for the truck, 8-ton series, 4 by 4, GOER and the truck, tractor, 22½-ton, XM746.

Chairman ELLENDER. I note that $6.8 million is requested for first destination transportation. How much was required for this purpose for fiscal years 1971 and 1972?

General BUSH. $8.7 million and $9.7 million were required for first destination transportation in fiscal years 1971 and 1972, respectively.

Chairman ELLENDER. On line 46 of the P–1 exhibit, there is a request of $3.2 million for production base support. Please provide a statement for the record setting out exactly what you plan to do with this $3.2 million.

General BUSH. I will be glad to do so.

(The information follows:)

The $3.2 million for production base support is required for seven projects including layaway, advance production engineering, and military adaptation of commercial items. One layaway project for $0.2 million is required to cover costs of packaging, crating, handling and transporting equipment which is excess to production and has been selected for retention in Department of Defense Industrial Equipment Reserve. Two advance production engineering projects are required for establishment of a computer aided advance production engineering model at $0.2 million and completion of a technical data package for the automatic test equipment program at $1.9 million. An additional $0.9 million is required for four projects, each of which is under $500,000, for procurement and testing of commercially available engines, fuel tanks, trailers, and automotive generating systems to determine if they can be adapted for military use.

ACTIVITY 2—COMMUNICATIONS AND ELECTRONICS EQUIPMENT

Chairman ELLENDER. General, before you proceed with your discussion of the request of $193.1 million for communications and electronics equipment, I would like to have page 13 of the justifications included in the record at this point.

(The information follows:)

JUSTIFICATION—ACTIVITY 2—COMMUNICATIONS AND ELECTRONICS EQUIPMENT

[In thousands of dollars]

		Estimate	
	Actual fiscal year 1971	Fiscal year 1972	Fiscal year 1973
Direct obligations or direct budget plan	$204,300	$152,700	$193,100

SECTION 1—PURPOSE AND SCOPE

These funds provide for the procurement, manufacture, first destination transportation, modification and production base support of communications and electronics equipment and high dollar value depot reparable assemblies/components for initial provisioning and replenishment requirements. Funds are included for radio, radar, countermeasures, combat wire communications, meteorological, night vision, photographic, combat surveillance, target acquisition, strategic and other tactical and security communications and electronics equipment.

SECTION 2—JUSTIFICATION OF FUNDS REQUESTED

The requested program includes $43.6 million for support of the Army's strategic communications system including $3.1 million for selected improvements to the Defense Communications System to ensure optimum systems efficiency and $14.0 million to procure heavy transportable terminals and associated equipment for Phase II Defense Satellite Communications System; $13.6 million for com-

munications security (COMSEC) equipment; ———million for Army Security Agency equipment to provide facilities for secure transmission and receipt of classified communications; $33.9 million for Automatic Data Processing Equipment (ADPE); $3.1 million for the Army's General Defense Intelligence Program (GDIP); $12.0 million in support of COMUSMACV-validated SEA Operational Sensor Systems and related devices; $42.7 million for tactical communications and electronics equipment that provides the means of rapid and reliable communications for command and control by senior field commanders; $4.5 million for Audio Visual Systems; $2.1 million for the procurement of repair parts and support materiel for the various equipment items and $2.9 million for the establishment, augmentation and layaway of industrial plants and equipment to facilitate the production of electronics equipment. This program includes advanced production engineering on new electronics forward area teletypewriters and the continued production of second generation tactical Army communications equipment that is more reliable, lighter in weight, easier to maintain and provides a greatly increased capacity. Throughout the range of the Army's communications and electronics equipment programmed, maximum effort continues to exploit the latest technological developments in miniaturization, solid state circuitry and modular fabrication. The $2.9 million for production base support is requested for a total of twelve projects. Eight projects totalling $2.4 million are in the field of manufacturing methods and technology. The area of advanced production engineering totals $0.1 million for one project. One project of $0.1 million for the annual support of Carbonyl Iron and Carbonyl Nickel Plant at Redstone Arsenal. The remaining two projects $0.3 million are for layaway.

Chart No. 15 displays the communications and electronics equipment items included in our request.

CHART 15.—FISCAL YEAR 1973 BUDGET REQUEST FOR U.S. ARMY COMMUNICATIONS AND ELECTRONICS EQUIPMENT

Activity 2	Quantity	Cost (in millions)
Starcom and related items		$43.9
COMSEC		13.6
ADPE		35.4
Sea operational sensor system		12.0
Tactical communications:		
Forward area tactical teletypewriter (APE)		7.4
Multichannel transmission and termination equipment		10.3
AN/GRC–106	1,800	8.2
AN/MYQ–2	3	7.0
Other items		22.9
Audiovisual systems/equipment		4.5
Modification of in-service equipment		2.6
Production base support		2.9
Items less than $500,000		8.3
First-destination transportation		2.2
Other electronics and repair parts		11.9
Total		193.1

Strategic Communications (STARCOM) and Related Items

General Bush. Strategic communications (STARCOM) and STARCOM-related items account for $43.9 million of our request; $13.6 million is for communications security items; $35.4 million is requested for the procurement of automatic data processing equipment; and $12 million is for the Southeast Asia operational sensor system.

Tactical Communications

The principal items of tactical communications equipment for which we are requesting funds are multichannel transmission and termination equipment, the AN/GRC–106 high-frequency single sideband radio set, three AN/MYQ–2 tactical automatic digital switches, two of which

are currently on lease for use by the Army in Europe and funds for the advanced production-engineering for a new tactical teletypewriter.

Chairman ELLENDER. These that you require for Southeast Asia are for use in Vietnam?

General BUSH. Yes, sir; not for U.S. forces. This is part of our Military Assistance Service Funding. These will be furnished to the Vietnamese Armed Forces.

AUDIO VISUAL SYSTEMS AND EQUIPMENT

Our request includes $4.5 million for audio visual systems and equipment in support of the U.S. Army's educational/training television, Armed Forces radio and television service and public address/distribution systems having an acquisition cost of $1,000 or more per individual item. The balance of the request includes $2.6 million for modification of inservice equipment; $2.9 million for production base support; $8.3 million for items less than $500,000, excluding communications security (COMSEC) and Army Security Agency (ASA); $2.2 million for first destination transportation; and $11.9 million for other electronics equipment and repair parts which excludes communications security (COMSEC).

STARCOM AND OTHER NONTACTICAL SYSTEMS

Chairman ELLENDER. As you indicated in your statement, the request includes $43.9 million for the procurement of a wide variety of electronics equipment for the Strategic Army Communications System and other nontactical systems. These items are set out in lines 47 through 73 of the P–1 exhibit. Selected paragraphs from the data sheet on page 40 of the justifications will be included in the record at this point.

(The information follows:)

OTHER PROCUREMENT, ARMY COMMUNICATIONS AND ELECTRONICS EQUIPMENT

Service: Army

P–1 Line Item: 47 thru 73

Nomenclature: STARCOM and Other Non-Tactical Systems/Equipment

Mission/Description.—Strategic Army Communications (STARCOM) consists of all long-haul, point-to-point continental or global Defense Communications Systems (DCS) or non-DCS telecommunications systems, facilities and services for which the Army has operational responsibility, including fixed and transportable configurations. These systems provide communications by satellites, long and medium range radios, submarine cables, and leased land lines. Other nontactical systems/equipment include the National Military Command System, the Alternate National Command & Control systems, Department of the Army Command and Control System, Switching Equipment for Non-tactical posts, camps and stations and communications for the SAFEGUARD System.

COST DATA

[Dollar amounts in millions]

	Fiscal year 1971		Fiscal year 1972		Fiscal year 1973	
	Quantity	Amount	Quantity	Amount	Quantity	Amount
Weapon system cost		$37.7		$36.6		$43.9

Basis for fiscal year 1973 request.—The FY 73 program includes $11.3 million for the engineering, procurement, and installation of equipment required to upgrade existing major telecommunications networks to insure optimum operational availability and/or conform to Defense Communication Agency (DCS) specifications. These funds will provide equipment for the Automatic Digital Network (AUTODIN), Automatic Secure Voice Communications (AUTOSEVOCOM), Presidential Communications, Technical Control Improvement and Transmission Media Improvement. $10.4 million is required for procurement of equipment for Army telecommunications projects which are directly related to separate STARCOM major communications systems and to procure major end item replacements of Communications-Electronics (C-E) equipment used in the STARCOM system. $22.2 million is required for command and control telecommunications, the Defense Satellite Communications System, the Minimum Essential Emergency Communications Network and SAFEGUARD as well as Post Camp & Station Communications Terminal & Switching Equipment. Should the FY 73 request be denied, the Army will be unable to sustain the STARCOM & DCS programs. This would cause degradation to the world-wide systems necessary for effective and timely command and control.

Chairman ELLENDER. Of this total, $11.3 million is for the direct support of the strategic Army communications system. Briefly describe this system and tell us how it is related to the overall defense communications system managed by the Defense Communications Agency.

General BUSH. The STARCOM (DCS) portion, amounting to $11.3 million consists of the Army's portion of the worldwide defense communication systems. These systems include the automatic digital network. (AUTODIN) which handles record traffic (teletype) for DOD agencies; the automatic voice network (AUTOVON) which handles telephone traffic, along with all the transmission and control facilities necessary to interconnect and operate the various switches and systems. The systems within this category receive technical-operation direction and management from the Defense Communications Agency (DCA).

Chairman ELLENDER. How much of this $11.3 million for the support of the Starcom system would you say is to improve existing capabilities?

General BUSH. All of it, sir.

Chairman ELLENDER. On line 56 of the P–1 exhibit, I note a request of $700,000 for Presidential communications. Please comment on this item.

General BUSH. This is a continuing sensitive program to procure and install communications equipment to enable the Army and the White House Communications Agency (WHCA) to provide the President with reliable, fast, secure, and survivable communications under all conditions. The fiscal year 1973 funds will procure miniaturized transportable satellite terminals which will interface with the existing worldwide communications systems.

Chairman ELLENDER. Just what is involved in the $1 million request on line 57 for transmission media?

General BUSH. The $1 million for transmission media will be utilized to engineer, procure, and install selected improvements on 150 link order wire terminals in Germany, six microwave sites between Germany and Italy and the provision of improved power amplifiers between Japan and Korea, in accordance with defense communications systems subsystem project plans.

Chairman ELLENDER. Tell us exactly what you plan to do with the

$3.1 million requested on line 58 for worldwide technical control improvement program.

General BUSH. The worldwide technical control improvement program is a Defense Communications Agency managed effort to technically upgrade and automate technical control facilities (TCF) which provide the coordination and management of the defense communications systems. Manual upgrade is scheduled, based on priorities as an on-going effort to provide the technical specifications required to insure responsiveness. The $3.1 million is required to manually upgrade selected technical control facilities (TCF's) at 10 worldwide sites to meet military standard criteria. Types of equipment that will be procured to accomplish the upgrade are patch bays, line-conditioning equipment, test equipment, and signaling equipment.

Chairman ELLENDER. Of this $43.9 million, $10.4 million is for the support of that portion of the strategic Army communications system that is not a part of the defense communications system. Just how does this differ from that part of STARCOM that is a part of the defense communications system?

General BUSH. Non-DCS STARCOM provides the means to support that part of the Army's command and control systems and terminals which is not part of the defense communications system. Communications-emergency equipment in support of the civil defense program is also included within the non-DCS scope.

Chairman ELLENDER. On line 61 of the P–1 exhibit, I note what seems to be new effort entitled "Civil Defense" for which you are requesting $4.3 million. Tell us exactly what you plan to do with these funds.

General BUSH. The funds requested for civil defense will be used to rebuild the primary high frequency (HF) backup radio system for the Office of Civil Defense and provide expansion of the single attack warning system to serve the Washington, D.C., metropolitan area, covering the political subdivisions in Maryland, Virginia, and other geographical areas. The expansion effort is in consonance with the area's population growth. The $4.3 million program will be utilized as follows: Rebuild of the national communications system No. 2 which will include new transmitters, receivers, survivable antennas, in the Washington, D.C., and Maryland-Virginia areas. In addition new survivable and quick erect antennas will be installed in seven regions and 12 States; the Washington, D.C., areas will be expanded with new sirens and associated activation equipment.

Chairman ELLENDER. On line 60 of the P–1 exhibit, there is a request of $3.4 million for communications/electronics facilities and projects. What will these funds be used for?

General BUSH. The objective of the C–E communications facilities/projects is to provide resources for equipment support for those telecommunications facilties not funded for under major identifiable communication systems, projects or facilities such as AUTOVON, AUTODIN, AUTOSEVOCOM, and so forth. This program specifically supports rehabilitation, upgrade or modification of communications centers, terminal equipment and military affiliate radio system (MARS) facilities. A few of the larger projects which the fiscal year 1973 funds will support are as follows: Relocation of Headquarters, Army Material Command secure command and control teletype and

telecommunications equipment; various microwave upgrades in the Panama Canal Zone; various microwave upgrades for sites in Korea; upgrade of military affiliate radio system at Headquarters, Department of Army, and other areas; upgrade Satellited Dial Central exchanges at various Army installations throughout CONUS; provision of television distribution facilities for U.S. Army personnel in Germany.

OTHER NON-TACTICAL SYSTEMS

Chairman ELLENDER. The total of $43.9 million includes $22.2 million for the category entitled "Other Nontactical Systems/Equipment." Generally speaking, what is the nature of these systems?

General BUSH. The other nontactical systems/equipment consists of eight major functional areas. These areas include command and control facilities of the various primary, alternate and emergency command posts at the department and national level; communications support of the general defense intelligence program; local Communications Terminal Facilities/Equipment at various installations in the United States and intrasite, intrasite communications support for the SAFEGUARD program. This $22.2 million program includes the $14 million defense satellite communications system that the Secretary of Defense approved.

Chairman ELLENDER. What is involved in the request of $1.4 million set out on line 66 of the P–1 exhibit for the Alternate National Military Command Center?

General BUSH. The request of $1.4 million for the Alternate National Military Command Center (ANMCC) involves the following upgrading actions: Replacement of the aged existing telephone switching system which has become uneconomical to repair with reliable electromechanical equipment; improve the command centers low frequency capability to operate in the emergency communications network; install a manually operated electronic display which will visually provide intelligence and other data; and install a data transmission link in the emergency airborne command post to maintian an updated data base between the ground and air facilities.

Chairman ELLENDER. On line 68 of the P–1 exhibit, there is a request of $14 million for the defense satellite communications system. Generally speaking, what will these funds be used for, and I wish you would provide a detailed statement for the record on the various items included in this $14 million.

General BUSH. The $14 million for the Defense Satellite Communications system (DSCS) is the Army portion of a Secretary of Defense approved, fiscal year 1973 Tri-Service DSCS program of $25 million. It is for limited procurement of a heavy transportable terminal and associated equipment to determine terminal and system reliability prior to complete procurement of the full system contemplated in the phase II DSCS. Fiscal year 1973 is the initial phase II increment to the phase I DSCS which was approved in fiscal years 1969–72 and included funds to procure, modify and upgrade 29 ground terminals. The fiscal year 1973 funds will provide for:

Heavy transportables, $6 million; digital equipment, $4 million; interconnect facilities, $2 million; system control equipment, $0.5 million; and logistics support, $1.5 million.

Chairman ELLENDER. What is involved in the request of $3.7 million set out on line 70 of the P–1 exhibit for the minimum essential emergency communications network?

General BUSH. The fiscal year 1973 $3.7 million for Minimum Essential Emergency Communications Network (MEECN) will be used to procure radio receiver equipment with an [deleted] capability. It will be used by [deleted].

Chairman ELLENDER. Comment on the request of $1 million for the support of the national military command system worldwide support, set out in line 71 of the P–1 exhibit.

General BUSH. This program is a continuation of a prior fiscal year program to provide a computer controlled system for the direct and simultaneous electrical distribution of messages which will reduce writer to reader time. These funds will include scheduled modifications and improvements. The fiscal year 1973 $1 million program will provide standard "off-the-shelf" equipment which will include a mass storage device, high speed printers, and programing software to implement this operation.

Chairman ELLENDER. Give us some examples of the types of equipment you expect to procure with the $1.4 million requested on line 72 of the P–1 exhibit for post, camp and station communications terminal and switching equipment.

General BUSH. The fiscal year 1973 $1.4 million for post, camp and station communications terminal and switching equipment is programed as follows: The upgrading of nine AUTOVON access switches in Conus with electronic signaling devices, trunking selector equipment, switching equipment and line finding equipment. the procurement of AUTOVON PBX connector conversion kits for 10 Conus installations which will permit direct dial access into the AUTOVON system; and procurement of traffic recording devices which assist in the analysis of traffic loads and in determining the traffic handling capacity of switchboards.

Chairman ELLENDER. Just what is involved in the request of $200,000 for the support of the SAFEGUARD ABM system set out in line 73 of the P–1 exhibit?

General BUSH. The $200,000 is required to provide terminal equipment such as racks, ducting, and multiline switches in support of the crypto devices that are located at SAFEGUARD sites.

COMMUNICATIONS SECURITY

Chairman ELLENDER. The next request is for $13.6 million for a variety of items under the category of communications security. The communications equipment data sheet on page 41 of the justifications will be included in the record at this point.

(The information follows:)

OTHER PROCUREMENT, ARMY COMMUNICATIONS AND ELECTRONICS EQUIPMENT

Service: Army—P–1 Line Item: 74 through 84; *Nomenclature:* COMSEC.

Mission/Description.—COMSEC includes funds for the procurement of the communications security equipment required to secure Army Communications Systems, including tactical equipment, the Army portion of the common-user Defense Communications System, and other assigned missions requiring secure communications. It provides off-line and/or on-line capability to crytographic systems to encrypt and decrypt electronic message traffic.

COST DATA

[Dollar amounts in millions]

	Fiscal year 1971		Fiscal year 1972		Fiscal year 1973	
	Quantity	Amount	Quantity	Amount	Quantity	Amount
Weapon system cost		$12.8		$7.8		$13.6

Basis for FY 1973 Request.—$2.5 million of the FY 1973 request is required for the procurement of electronic key generators (TSEC/KG–30) to secure military communications systems, $5.6 million for the procurement of equipment (KIR–1A and KIT–1A/TSEC) for the Army's portion of the AIMS program (MARK XII IFF) and $5.5 million for the initial supply and replacements of COMSEC repair parts, interface equipment and modifications as directed by the National Security Agency.

Chairman ELLENDER. I note that only $7.8 million was provided for the procurement of this type of equipment in fiscal year 1972, and as I stated, you are requesting $13.6 million for fiscal year 1973. What is the need for this increase of $5.8 million?

General BUSH. This increase over the fiscal year 1972 budget is due to requirements for items that could not be procured in fiscal year 1972, increased estimated costs over fiscal year 1972 prices and additional repair parts requirements. The HN–12 interface device ($700,000) and KY–65 speech security equipment ($800,000) are new items that were not ready for procurement in fiscal year 1972 because total DOD requirements did not support an economical procurement. Estimated costs of the KIR–1A and the KIT–1A computers have been increased by $600,000 over the fiscal year 1972 prices and increased requirements for spare parts has added $1.3 million to that line. Requirements for items less than $500,000 have been reduced $100,000, resulting in a net increase of $5.8 million.

ARMY SECURITY AGENCY

Chairman ELLENDER. The total requested for this activity includes $13.1 million for equipment for the support of the Army Security Agency, as set out in lines 85 through 89 and 114 through 128 of the P–1 exhibit. Has the committee been furnished with details of these requests?

General BUSH. Yes, sir.

TACTICAL COMMUNICATIONS AND ELECTRONICS

Chairman ELLENDER. The next request is $42.7 million for the procurement of wide variety of equipment under the category entitled "Tactical communications and electronics." How much was required for this category for fiscal years 1971 and 1972?

General BUSH. Sir, $39.4 million was required for the category "Tactical communications and electronics" in fiscal year 1971 and $32.9 million in fiscal year 1972.

FORWARD AREA TACTICAL TELETYPE

Chairman ELLENDER. On line 92 of the P–1 exhibit, there is a request of $7.4 million for the forward area tactical teletypewriter. The data sheet on this system will be included in the record at this point.

(The information follows:)

OTHER PROCUREMENT, ARMY COMMUNICATIONS AND ELECTRONICS EQUIPMENT

Service: Army.—*P–1 Line Item:* 92; *Nomenclature: Forward Area Tactical* Teletypewriter (FATT), (APE)

Mission/Description.—A family of lightweight electronic teletypewriter sets which will operate separately or in various combinations over tactical AM and SSB radio, field wire, and radio relay equipment down to battalions and separate company levels.

COST DATA

[Dollar amounts in millions]

	Fiscal year 1971		Fiscal year 1972		Fiscal year 1973	
	Quantity	Amount	Quantity	Amount	Quantity	Amount
Weapon system cost				[1] $1.0		[1] $7.4

[1] Funding required for advance production engineering.

Basis for FY 1973 Request.—The FY 73 funds are required to obtain engineering efforts and the preparation of a production package for subsequent competitive procurement.

CONTRACT DATA

Major items:	*Contractor*
AN/UGC–72 teletypewriter, distributor-transmitter	To be selected.
AN/UGC–73 teletypewriter-reperforator	Do.
AN/UGC–74 teletypewriter-page printer	Do.
AN/UGC–75 teletypewriter-tape relay	Do.
AN/UGC–76 teletypewriter-auto send receive	Do.

Type of last contract: None.

PRODUCTION DATA

	Fiscal year—				
	1971	1972	1973	1974	1975
Funded	0	0	0	0	3,810
Delivered	0	0	0	0	0

	End fiscal year—		
Inventory/objective	1971 FDP[1]	1972 FDP	1973 FDP
Force units DFE[2]			21
Inventory objective			28,381
On hand/on order	0	0	0
Percent inventory objective achieved	0	0	0

[1] FDP=Funded delivery period.
[2] DFE=Division force equivalent.

Chairman ELLENDER. As I understand this request, it does not involve the procurement of any of these new teletypewriters, but it is for advanced production engineering prior to the production of these items. I would assume the same is true with respect to the $1 million provided in fiscal year 1972. Am I correct about this?

General BUSH. Yes, sir.

Chairman ELLENDER. When do you expect to request funds for the production of this new family of teletypewriters?

General BUSH. We expect to request fiscal year 1974 funds for the production of the new family of teletypewriters.

Chairman ELLENDER. Just what is the need for this new family of electronic teletypewriters?

General BUSH. The new family of electronic teletypewriters is needed to replace 20-year-old mechanically operated equipment that is unreliable, slow, and does not possess the capability of interfacing with more modern equipments which have resulted from other communications developments. The new family of teletypewriters has about a 10-to-1 improvement ratio in reliability, a 2-to-1 increase ratio in speed and operates quietly, which is a necessity in operation centers.

MULTICHANNEL TRANSMISSION AND TERMINATION EQUIPMENT

Chairman ELLENDER. On line 95 of the P–1 exhibit, there is a request of $10.3 million for "Multichannel Transmission and Termination Equipment." The data sheet on this equipment on page 46 of the justifications will be included in the record at this point.

(The information follows:)

OTHER PROCUREMENT, ARMY COMMUNICATIONS AND ELECTRONICS EQUIPMENT

Service: Army—P–1 Line Item: 95; Nomenclature: Multichannel Transmission and Termination Equipment (AACOMS), formerly Low, Med, High Capacity and Tropo Sub-System

Mission/Description.—The Multichannel Transmission and Termination Equipment consists of 22 major radio relay, telephone terminal and radio-telephone assemblages that are made up of a mix of 17 unique and common components mounted in shelter facilities. These assemblages are employed throughout the Field Army and COMMZ to provide command/control, common user and specialized communications links. The end item assemblages are categorized by their communications channel capacity capability with groupings extending from 6 to 96 channels; the assemblages are shelter mounted on standard military vehicles ranging in size from ¼ ton to 2½ ton.

COST DATA

	Amount
Fiscal year 1971	18.5
Fiscal year 1972	0
Fiscal year 1973	10.3

Basis for FY 1973 Request.—The FY 1973 Funds request will complete a program which equips a total of 8 signal battalions with 24/48 channel transmission and termination assemblages. The equipping of these battalions will allow the Army to field within its current force structure balanced multichannel communications systems which provide reliable high capacity multichannel communications means for rapid dissemination of command/control, logistical and administrative traffic. The funds will be used to procure electronic components such as multiplexers and combiners, assemblage shelter facilities and fund the depot set assembly of components into the end item assemblages. Denial of these funds will impose a serious imbalance in the common user high capacity (48/96 channel) Army Area Communications System. This imbalance would result in degradation of tactical multichannel communications services provided to combat, combat support and combat service support units in the Field Army as well as negate the electronic interface with selected reserve forces when integrated into the Field Army under mobilization conditions.

Chairman ELLENDER. Comment on the nature of this equipment and the need for the $10.3 million that is requested.

General BUSH. Multichannel transmission and termination equipment encompasses a family of tactical, vehicular mounted communica-

tions assemblages which are designed to process a variable number of telephone conversations, Teletype messages or data traffic simultaneously. Electronic components within these assemblages combine the communications traffic into a stream which is suitable for transmission over a single radio frequency or cable circuit. These assemblages provide both command and control and administrative and logistics communication means from brigade level through field Army and the COMMZ. The fiscal year 1973 funds will procure electronic components and shelter facilities for major multichannel assemblages which provide 24/48 channel capability. This procurement completes a program to upgrade eight signal battalions.

AN/GRC–106 Radio Sets

Chairman Ellender. On line 98 of the P–1 exhibit, there is a request of $8.2 million for the procurement of 1,800 radio sets designated the AN/GRC–106. The data sheet on this equipment will be included in the record at this point.

(The information follows:)

Other Procurement, Army Communications and Electronics Equipment

Service: Army—P–1 Line Item: 98; Nomenclature: AN/GRC–106 Radio Set, HF Single Side Band, Vehicular Mounted, 50 Mile Range

Mission/Description.—A high frequency, medium powered single side band radio set. A member of the forward area tactical radio family and used primarily as a mobile station. When used by itself, is a voice/CW radio but when reconfigured with additional equipment, becomes a radio teletypewriter terminal (RTT). Used in units of battalion or larger size.

COST DATA

	Quantity	Amount
Fiscal year 1971		
Fiscal year 1972		
Fiscal year 1973	1,800	8.2

Basis for FY 1973 Request.—The FY 73 funds are required to continue providing the active Army and reserve units with this preferred item. Denial of the FY 73 budget quantity will further delay furnishing this preferred Radio Set, deny funding of the second year (and last) current multi-year contract, causing termination cost and a production break. Replacement of the older radios would be delayed by approximately three years requiring additional funds for maintenance.

CONTRACT DATA

Major subsystem	Contractor	Type of last contract
RT–834/GRC receiver transmitter	Futuronics Corp., Port Washington, N.Y.	FFP

PRODUCTION DATA

	Fiscal year—				
	1971	1972	1973	1974	1975
Funded	0	0	1,800	620	600
Delivered	2,396	0	2,265	1,035	0

Chairman ELLENDER. I note that this particular item was not procured in fiscal years 1971 and 1972. When was the last year funds were provided for the procurement of this particular radio set?

General BUSH. Fiscal year 1970, sir.

Chairman ELLENDER. On the data sheet, I note the following statement: "The fiscal year 1973 funds are required to continue providing the Active Army and Reserve units with this preferred item." What is your total inventory objective for this particular radio, and how many of those represent a requirement of the Reserve components?

General BUSH. The total inventory objective for this radio is [deleted] including a Reserve component requirement of [deleted].

Chairman ELLENDER. How many of these particular radios will you have on hand at the end of fiscal year 1972?

General BUSH. We project to have on hand at the end of fiscal year 1972 a quantity of [deleted] AN/GRC–106 radios.

TACTICAL AUTOMATIC DIGITAL SWITCH

Chairman ELLENDER. On line 106 of the P–1 exhibit, there is a request of $7 million for the procurement of three tactical automatic digital switches. The data sheet on this piece of equipment will be included in the record at this point.

(The information follows:)

OTHER PROCUREMENT, ARMY COMMUNICATIONS AND ELECTRONIC EQUIPMENT

Service: Army—P–1 Line Item: 106; *Nomenclature:* Tactical Automatic Digital Switch, AN/MYQ–2

Mission/Description.—The Tactical Automatic Digital Switch (TADS) is a fully automatic store and forward message switching facility which uses solid state electronic stored program data processing. The facility is contained within 6 expandable vans and is currently employed in 7th Army for operational testing to include processing of a portion of the 7th Army administrative and logistical traffic.

COST DATA

[Dollar amount in millions]

	Fiscal year 1971		Fiscal year 1972		Fiscal year 1973	
	Quantity	Amount	Quantity	Amount	Quantity	Amount
Weapon system cost					3	$7

Basis for FY 1973 Request.—The FY 1973 funds are required to procure 3 switches, 2 of which are currently leased plus 1 additional switch which meets a portion of the operational message switching requirements in Europe. Information available to date confirms that the TADS meets USAREUR's needs for automated switching of teletype and data message communications traffic.

CONTRACT DATA

Major subsystem	Contractor	Type of last contract
Electronics, data processing, and peripherial equipment	Burroughs	O. & M.A. lease with option to buy.
Vehicles/Generators	GFE	Not available.
COMSEC	GFE	Do.

PRODUCTION DATA

FY 1971—Two each leased and delivered for test and operational use.
FY 1972—Two each (from FY 1971 above) O&MA leased for operational testing in 7th Army.
FY 1973—Procurement of two each (from FY 1971/1972 above) plus one additional to be delivered in FY 1974.
Inventory/Objective.—Five each Tactical Automatic Digital Switches to meet limited operational requirements of USAREUR pending development and introduction of more advanced tactical data switching capability (TRI-TAC) for worldwide application.

Chairman ELLENDER. I note that this piece of equipment is designated "B" in the P-1 exhibit. What is the significance of this designation?

General BUSH. The designator "B" indicates that this item has not been type classified standard A or B under the Army's type classification system. Data required to finalize type classification for this item is now underway and we expect to process the classification action in the fourth quarter fiscal year 1973.

Chairman ELLENDER. I note the following statement on the data sheet: "The fiscal year 1973 funds are required to procure three switches, two of which are currently leased plus one additional switch which meets a portion of the operational message switching requirements in Europe." How much of this total is for the procurement of the two switches which are now under lease?

General BUSH. The current lease contract for the two switches cites a lease credit of approximately $1 million. Considering this credit, the balance of funds required for the two switches is $3.4 million.

MODIFICATION OF TELECOMMUNICATIONS EQUIPMENT

Chairman ELLENDER. There is a request of $1.8 million set out on lines 109 and 110 of the P-1 exhibit for the modification of telecommunications equipment. Generally speaking, what is the nature of the modifications you plan with these funds?

General BUSH. The nature of the modifications of telecommunications equipment making up the fiscal year 1973 request of $1.8 million contained in lines 109 and 110 of the P-1 exhibit are to apply technological improvements to increase equipment reliability and reduce maintenance costs of equipment currently in use and to incorporate these improvements in future production quantities. Modifications are planned for the AN/TSC-26, Communications Central for $1.4 million to enhance the operational effectiveness of this Special Force base radio equipment by replacing receivers, synthesizers, power units and air conditioners with more reliable up-to-date equipment. Also included is $216,000 for the modification of the channel selector and redesign of the filament source of the AN/GRC-103 radio set and $146,000 for prototype shelter configuration of the AN/MSC-32, operations control center for the integration of new teletypewriter equipment.

SUPPORT EQUIPMENT AND FACILITIES

Chairman ELLENDER. The next request is $6 million for the category entitled "Support Equipment and Facilities." Of the total request, $4.2 million is for "Items less than $500,000," as set out on line 111 of the P-1 exhibit. Give us several examples of the types of equipment you expect to procure with these funds.

General Bush. Several examples of the type of equipment that will be procured with the $4.2 million in line 111 of the P–1 exhibit are: AN/GRA–50, Antenna Group; AN/MRC–69 Radio Terminal Set; AN/USM–181 Telephone Test Set; CV–425 signal converter; and the MK–1070/GRC test facility. There are a total of 14 different telecommunications items, each totaling less than $500,000, planned for procurement with these funds.

Chairman Ellender. The total requested for "Support equipment and facilities" includes $1.7 million for first destination transportation. How much was required for this purpose for fiscal years 1971 and 1972?

General Bush. The amount required for first destination transportation for telecommunications equipment in fiscal year 1971 was $1.5 million and in fiscal year 1972 $1 million.

Automatic Data Processing Equipment

Chairman Ellender. The next item is the request of $35.4 million for the procurement of automatic data processing equipment as set out lines 129 through 133 of P–1 exhibit. The data sheet for this equipment will be included in the record at this point.

(The information follows:)

Other Procurement, Army Communications and Electronics Equipment

Service: Army—P–1 Line Item: 129–133; Nomenclature: ADPE—Automatic Data Processing Equipment

Mission/Description.—To provide major equipment/systems in support of the Army's Automatic Data Processing Equipment program.

[Millions of dollars]

	Fiscal year 1971		Fiscal year 1972		Fiscal year 1973	
	Quantity	Amount	Quantity	Amount	Quantity	Amount
Automatic data processing equipment		(20.0)		(16.3)		(35.4)
AMC 5-year ADP program		2.5		9.9		28.9
Intelligence Data Handling System (IDHS)				1.8		1.5
Other Nontactical ADPE				.1		
Tactical Fire Direction System (TACFIRE), AN/GSG–10		17.5				
Worldwide Military Command and Control System (WWMCCS)				4.5		5.0

Basis for FY 1973 Request.—The FY 1973 request provides for computer equipment to support the AMC 5 Yr ADP Program ($28.9 million), Intelligence Data Handling System (IDHS) ($1.5 million), and the Worldwide Military Command and Control System (WWMCCS) ($5.0 million).

a. AMC 5 Yr ADP Program—These funds will provide seven IBM 360/65 for the Mobility, Electronics, Tank Automotive and Missile Commands; two IBM 360/40's for Electronics Command and Edgewood Arsenal; one UNIVAC 1106 for the Army Materiel and Mechanical Research Center; one UNIVAC 1108 for Munitions Command; one Control Data Corporation 6600 for Missile Command and various peripheral equipment. If the FY 1973 buy of $28.9 million is not approved, approximately $8.4 million additional operating funds will be required to lease the computers each year for five years. With the present value of leasing these computers at $43.5 million and the purchase price of $28.9 million, a net savings of $14.6 million would be realized by the purchase.

b. IDHS—These funds will provide systems and/or peripheral equipment for the United States European Command, Continental Army Command Intelligence Center, United States Army Europe, Missile Intelligence Agency, Foreign Science and Technical Center, United States Intelligence System Support Detachment,

Defense Central Index of Investigations (formerly United States Army Intelligence Command), and the European Electronics Intelligence Center, as approved by the Secretary of Defense in Program Decision Memorandum 71–1, dated August 1971. Purchase of these components will eliminate long term rental costs for Army leased equipment. Failure to effect timely purchase of IDHS ADPE as projected in FY 1973 will require increased OMA funding, not presently programmed. A resultant closure of IDHS facilities in the field will deprive operational planning and mission execution.

c. WWMCCS—The purchase schedule identified as the First Alternative in JCS 2414/95–1 dated 6 Dec 71 and approved by the Secretary of Defense on 3 Jan 1972, calls for purchase, not lease, of seven (7) Medium Scale Computers (Honeywell H–6050) for the United States European Command, Eastern and Western Military Traffic Management and Terminal Service, United States Army War College, US Army Europe, Continental Army Command and United States Army Pacific. The computers will be used to provide a multi-programming and multi-processing system which meets the Command and Control requirements of the Secretary of the Army, Chief of Staff, Army Staff Agencies, and the Joint Chiefs of Staff (JCS). If this request is not approved, the JCS program will not be supported and the Army would be limited in its ability to respond to the WWMCCS.

AUTOMATIC DATA PROCESSING EQUIPMENT

Chairman ELLENDER. The $35.4 million requested for automatic data processing equipment includes $28.9 million for the Army Materiel Command 5-year automatic data processing program. How many computers and associated equipment are involved in this request?

General BUSH. The computers and associated equipment are set out on this tabulation which I will submit for the record.

(The information follows:)

[In millions of dollars]

Equipment	Location	Estimated cost
UNIVAC 1106	Army Materiel and Mechancis Research Center, Watertown, Mass	1.3
CDC 6600	Missile Command Laboratory, Huntsville Ala	4.0
IBM 360/65	Mobility Equipment Command, St. Louis, Mo	2.3
IBM/360/65 (2)	Electronics Command, Fort Monmouth, N.J	4.7
IBM 360/65 (2)	Tactical Automoitve Command, Warren, Mich	5.0
IBM 360/65 (2)	Missile Command, Huntsville, Ala	5.0
UNIVAC 1108	Munitions Command, Frankford Arsenal, Pa	2.8
IBM 360/40	Electronics Command, Philadelphia, Pa	.8
IBM 360/40	Edgewood Arsenal, Baltimore, Md	1.2
Various peripheral	Various locations	1.8

Chairman ELLENDER. Is all of this equipment now being leased?

General BUSH. The Univac–1106 and 1108, CDC–6600, one IBM–360/65 at Missile Command, IBM–360/40 at Edgewood Arsenal and the various peripheral equipment are all currently on lease. The remainder are scheduled to be leased on a phased basis, prior to procurement.

Chairman ELLENDER. It is my understanding that the lease cost of this equipment is approximately $8.4 million annually. Am I correct?

General BUSH. Yes, sir.

Chairman ELLENDER. On the data sheet, I note the following statement: "With the present value of leasing these computers at $43.5 million and the purchase price of $28.9 million, a net savings of $14.6 million would be realized by the purchase." Are these figures based on a 5-year utilization of this equipment?

General BUSH. Yes, sir.

Chairman ELLENDER. The $35.4 million requested for automatic data processing equipment includes $1.5 million for the Intelligence Data Handling System. Exactly what will you be doing with these funds?

General BUSH. The funds requested for the Intelligence Data Handling System (JDHS) are required to procure peripheral equipment for IBM–360/40 and IBM–36/50 computers currently owned by the Army. The equipment is required to receive, process, and disseminate intelligence products to enable the production of usable intelligence data through the media of computers.

Chairman ELLENDER. $5 million of the total requested for automatic data processing equipment is for the support of the Worldwide Military Command and control system. Is this part of the program to procure 35 computers for the support of this system?

General BUSH. Yes, sir.

Chairman ELLENDER. It is my understanding that, of the 35 computers in this system, the Army will procure nine. Am I correct?

General BUSH. Yes, sir.

Chairman ELLENDER. Of the nine computers that the Army is going to procure, how many were procured with $4.5 million provided in fiscal year 1972, and how many will be procured with the funds you are requesting for fiscal year 1973?

General BUSH. The $4.5 million in fiscal year 1972 was required to procure one Honeywell computer model H–6050/large for the Army Operations Center in the Pentagon. Subsequent to fiscal year 1973 budget preparation additional requirements increased the planned program to a total of nine computers affecting both fiscal years 1972 and 1973. The Army is now in the process of reducing the total requirement by three computers and this action is pending approval by the Secretary of Defense. Procurement of the five remaining in fiscal year 1973 will require reprograming $3.4 million from lower priority programs in addition to the $5 million reflected in the Army's budget request.

Chairman ELLENDER. I note that one of the nine computers the Army is to procure is for the U.S. Army War College. Just what is the need for one these expensive computers at this installation?

General BUSH. The computer is required for the [deleted] located at the U.S. Army War College. It is the [deleted].

GENERAL DEFENSE INTELLIGENCE PROGRAM

Chairman ELLENDER. On line 135 of the P–1 exhibit, I note a request for $1.3 million under the heading "General Defense Intelligence Program." Just what is involved in this request?

General BUSH. The general defense intelligence program requiring this $1.3 million encompasses imagery intelligence; electronics intelligence centers; intelligence production; scientific and technical intelligence; and mapping, charting and geodesy equipment required. Defense Intelligence Agency is the proponent agency for this program, establishes national intelligence priorities, and tasks the military services, unified and specified commands with requirements. The items required are unique intelligence equipment required to develop, process, publish and disseminate finished intelligence products from the best evaluation of raw data.

AUDIOVISUAL SYSTEMS

Chairman ELLENDER. The request includes $4.5 million of the procurement of audiovisual systems equipment. The data sheet on this equipment will be included in the record at this point.

(The information follows:)

OTHER PROCUREMENT, ARMY COMMUNICATIONS AND ELECTRONICS EQUIPMENT

Service: Army—P–1 Line Item: 136; *Nomenlature: Audio Visual Systems/ Equipment*

Mission/Description.—This program provides for procurement of commercially available, portable, mobile and fixed station, *non*-tactical audio-visual media, systems and equipment in support of the U.S. Army's educational/training television, Armed Forces Radio and Television Service (AFRTS), photographic laboratories and public address/distribution systems having an acquisition cost of $1,000 or more per individual item, project or system.

COST DATA

[Millions of dollars]

	Quantity	Amount
Fiscal year 1971		
Fiscal year 1972		1.9
Fiscal year 1973		4.5

Basis for FY 1973 Request.—The FY 73 request provides for the engineering, procurement and installation of five projects: *The Surgeon General* (video trainer/operating room overhead TV, closed circuit TV receivers for hospital wards at Brooke, Walter Reed, Fitzsimmons General Hospitals and the Army's Institute of Medical Research); *CONARC* (upgrade of educational TV facilities at the Infantry, Armor, and Signal Schools); *CINCUSAREUR* (Armed Forces Radio Network modifications in Germany); *The Military District of Washington* (Audio-visual support of assigned governmental activities/events); *The U.S. Army Photographic Agency* (Audio-visual support of DA activities within the Pentagon).

Chairman ELLENDER. I note this $4.5 million is for five projects: the Surgeon General, the Continental Army Command, Commander in Chief, U.S. Army, Europe, the Military District of Washington, and U.S. Army Photographic Agency. I wish you would provide a statement for the record describing each of these projects and the amounts included in the request for each.

General BUSH. Yes, sir. I will cite the project, the amount, and a description of the equipment to be procured.

(The information follows:)

The SURGEON GENERAL. Amount $1.75 million. Funds provide color television systems for Brooke Army Medical Center, Walter Reed Hospital, Fitzsimmons Hospital and the Army's Institute of Medical Research. The U.S. Army Photographic Agency. Amount $.599 million. Funds provide audio-visual equipments such as audio tape recorders, video tape reproduction devices, and photo laboratory equipment to support the Pentagon still photographic operations and the Army's command information displays.

The Military District of Washington. Amount $.032 million. Funds provide for film processor systems, color print systems and public address equipments to support Army activities related to the White House, State Department, DOD and foreign dignitaries.

Chief, U.S. Army Europe. Amount $.402 million. Funds provide for replacement and systems expansion in support of command and troop information requirements; consists of upgrading Armed Forces Radio network stations in Nurenberg, Bremerhaven, Kaiserslautern, Berlin, Frankfurt and Stuttgart.

Continental Army Command. Amount $1.676 million. Funds support an Army program to improve educational and training objectives and provide color television equipments such as conversion kits, video switches, video tape recorder and processes at the Infantry School, Armor School and Signal School.

OPERATIONAL SENSOR SYSTEMS

Chairman ELLENDER. On line 138 of the P–1 exhibit, there is a request of $12 million for the Southeast Asia operational sensor systems. The data sheet on this equipment will be included in the record at this point.

(The information follows:)

OTHER PROCUREMENT, ARMY COMMUNICATIONS AND ELECTRONICS EQUIPMENT

Service: Army— *P–1 Line Item:* 137 and 138; *Nomenclature:* DCPG Projects (FY 72 and Prior) SEA Operational Sensor System (SEAOPSS) (FY 73)

Mission/Description.—The Defense Special Projects Group (DSPG), (formerly DCPG), developed, released for operational use and supported unattended ground sensors (UGS) and relay/readout equipment for SEA. On 1 April 1971, the Army assumed responsibility for support of the UGS capability for SEA ground forces. The system continues to facilitate the surveillance, monitoring and targeting of enemy troop locations, base areas, and infiltration routes by friendly ground forces, and to provide security for remaining U.S. advisory forces/installations.

COST DATA

[Dollar amounts in millions]

	Fiscal year 1971		Fiscal year 1972		Fiscal year 1973	
	Quantity	Amount	Quantity	Amount	Quantity	Amount
DCPG		22.9		13.5		
SEAOPSS						12.0

Basis for fiscal year 1973 request.—The fiscal year 1973 funds are required to insure that the active UGS and ancillary equipment requirements in support of the COMUSMACV—validated SEAOPSS are met and provide for continued support to the US and Republic of Vietnam Armed Forces (RVNAF) UGS programs. Should these funds be denied, a serious degradation of in-ground UGS density will result, seriously impacting on the RVNAF and residual US combat intelligence capabilities.

Chairman ELLENDER. As I understand this request, it is for items formerly managed by the defense communications planning group. Am I correct about this?

General BUSH. Yes, sir. This program was formerly managed by the defense communications planning group (DCPG). The Army assumed responsibility for managing these items on April 1, 1971.

Chairman ELLENDER. I wish you would provide a statement for the record describing in detail the items that you plan to procure with this $12 million.

General BUSH. I will be glad to do so.

(The information follows:)

AN/GSQ–151, PSID.—A self-contained, hand emplaced, seismic detection alarm set consisting of 1 receiver & 4 detector/transmitters for patrol level deployment.

AN/GSQ–154, MINISID.—A miniature seismic intrusion detector, hand emplanted, to isolate moving personnel & vehicle targets.

AN/GSQ–159, DSID.—Inexpensive, non-recoverable seismic intrusion detector, hand-emplaced along trails/roadways to monitor troop/vehicle movements.

AN/GSQ–160, EMID.—A hand-emplaced electromagnetic intrusion detector used along trails/roads or waterways for detection of targets.

AN/GSQ–716, ADSID.—An air delivered (helicopter or slow speed fixed wing aircraft) seismic intrusion detector used to identify movement of ground intruders (personnel/vehicles).

DT383/GSQ, AAU.—An add-on audio unit used with the MINISID to provide optional acoustic transmission capability.

DT509/GSQ, MAGID T–4.—An ancillary device to MINISID, providing hand-emplaced combination seismic/magnetic detection.

MX9056/T4, Coil.—An auxiliary coil device used to extend the range and sensitivity of the MAGID T–4. Permits "magnetic only" detection using MINISID as a relay.

AN/USQ–46, PORTATALE.—A portable VHF receiver designed to receive, decode, and display sensor identification and audio transmission for operational use/fire support coordination. Also provides signal data (commands) and power to ancillary devices. Manpack, vehicle, boat, helicopter mounted.

RO–376/USQ, Recorder.—An ancillary item to the AN/USQ–46 (above) which provides, in chart form, a permanent record of sensor activations as detected by the VHF receiver sets.

AN/USA–32 Antenna Group.—A PORTATALE antenna system which extends the range from a sensor field or relay to the monitoring (AN/USQ–46) facility.

TACTICAL ELECTRONICS

Chairman ELLENDER. The request includes $4 million for four separate items under the category entitled "Tactical electronics." Of this total, $400,000 is for advance production engineering for the atmospheric meteorological probe designated AN/AMQ–23. Please comment on this item.

General BUSH. The AN/AMQ–23 Atmospheric Meteorological probe is a balloon borne atmospheric sensing device capable of measuring temperature and humidity and transmitting the data to a ground processing facility. The probe is a major subsystem of the AN/UMQ–7(V) meteorological data sounding system being developed by the Army to obtain reliable and timely meteorological data required to support the weapons and surveillance systems in the field Army. The $400,000 requested for advanced production engineering is to obtain a proven technical data package for a subsequent competitive procurement of the AN/AMQ–23 probe subsystem.

Chairman ELLENDER. On line 141 of the P–1 exhibit, there is a request of $1.6 million for advance production engineering for the automatic atmosphere sounding set designated AN/TMQ–19. Please comment on this request.

General BUSH. The AN/TMQ–19 automatic atmospheric sounding set is a ground acquisition and processing facility which is the principal subsystem of the AN/UMQ–7(V) meteorological data sounding system being developed by the Army to obtain reliable and timely meteorological data required to support the field Army. The $1.6 million for the AN/TMQ–19 Advanced Production Engineering effort includes the production engineering necessary for the preparation of a procurement package which will enable subsequent competitive procurement of this item.

Chairman ELLENDER. On line 148 of the P–1 exhibit, there is a request of $1.5 million for the procurement of 70 radar chronographs designated M–36. Please comment on this item.

General BUSH. The radar chronograph, M–36, is a doppler radar system with extrapolation tables designed to measure the muzzle velocities of various field artillery pieces and is used by field artillery calibration teams. The request of $1.5 million to procure 70 M–36,

radar chronographs will allow the Army to achieve its acquisition objective of 142 systems.

Chairman ELLENDER. On line 150 of the P–1 exhibit, there is a request of $500,000 for advance production engineering for the radar set designated AN/PPS–15. Please comment on this request.

General BUSH. The request of $500,000 for advanced production engineering for the AN/PPS–15 radar set is to obtain a proven technical data package for a subsequent competitive procurement of this equipment.

MODIFICATION OF OTHER ELECTRONICS SYSTEMS

CHAIRMAN ELLENDER. On lines 154 and 155 of the P–1 exhibit, there is a request of $800,000 for the modification of other electronics systems equipment. Please comment on the nature of the modifications contemplated with these funds.

General BUSH. Sir, the $800,000 requested in lines 154 and 155 of the P–1 exhibit for the modification of other electronics systems equipment provides funds to modify existing AN/PPS–5 radar sets by replacing the existing local oscillator with a solid state device for improved reliability and maintainability. Also included is $0.18 million for modification of the M–44 gunner's periscope to improve range performance and eliminate "whiteout" due to gun flash.

SUPPORT EQUIPMENT AND FACILITIES

Chairman ELLENDER. The last request in this budget activity is $9.5 million for the category entitled "Support equipment and facilities." Of this total, $4.1 million is for "items less than $500,000." Give us several examples of the types of equipment you plan to procure with these funds.

General BUSH. Examples include the AN/UDM–2 calibration device; the TS–716/U test set; the TS–723/U spectrum analyzer; the ZM–21A/U ohmeter; and the AS–21 motion picture projection set. There are a total of 14 different items, each totaling less than $500,000 planned for procurement with these funds.

Chairman ELLENDER. On line 157 of the P–1 exhibit, there is a request of $2 million for spares and repair parts. What systems are supported with these spares and repair parts?

General BUSH. The $2 million on line 457 of the P–1 exhibit is for procurement of repair part replenishment requirements of all fielded electronic and communication equipment and systems and does not relate to items under procurement this year. Since many of these repair parts are common to more than one system, the quantities required cannot be readily assignable to a particular end item or system. Examples are: all nontactical communications systems; tactical radio and switchboard equipment; radars; and night vision equipment.

Chairman ELLENDER. $2.9 million is requested for production base support. Exactly what do you plan to do with this $2.9 million?

General BUSH. The $2.9 million for the production base support program consists of three areas: Provision of industrial facilities (PIF), layaway, and production engineering measures; $325,000 of the request is for two industrial layaway projects and $94,000 is for

a PIF project. The remainder, $2.46 million is divided among nine production engineering measures tasks. Each of these production engineering measures tasks is designed to establish the production processes and techniques necessary for the regular factory production of the particular item involved.

ACTIVITY 3—OTHER SUPPORT EQUIPMENT

Chairman ELLENDER. Before you proceed with your discussion of the $225.8 million recommended for the budget activity entitled "Other Support Equipment," I want to have included in the record page 14 of the justifications.

(The information follows:)

JUSTIFICATION—ACTIVITY-3—OTHER SUPPORT EQUIPMENT

[In thousands of dollars]

	Actual fiscal year 1971	Estimate	
		Fiscal year 1972	Fiscal year 1973
Direct obligations or direct budget plan	131,700	143,400	225,800

SECTION 1—PURPOSE AND SCOPE

These funds provide for procurements, manufacture and conversion of construction, materials handling and other heavy equipment and initial and replenishment spares parts and support materiel. The program includes items such as excavating and grading equipment, fork lift trucks, generator sets, assault bridges and bridge components, mine detection equipment and other major support equipment. The funds also provide for the procurement and installation of modification kits.

SECTION 2—JUSTIFICATION OF FUNDS REQUESTED

The funding requested is required to replace combat losses and provide for a modest improvement to the Authorized Acquisition Objective (AAO). The requested program includes $7.7 million for a new float ribbon bridge; $10.7 million for chemical/biological defense items; $27.0 million for cranes and crane attachments; $25.3 million for a number of different types of generating equipment: $13.4 million for Medical Unit Self-contained Transportable (MUST) hospital components; $29.2 million for fork lift trucks of different types; $15.1 million for various construction items; $22.6 million for marine equipment; $4.4 million for repair parts and support materiel for the various equipment items: $4.8 million for first destination transportation; $16.5 million for the procurement of medical support equipment previously funded under the OMA Appropriation. $9.2 million modification of in-service equipment; $14.2 million production base support and $18.5 million for other miscellaneous items less than $500,000. The $14.2 million for production base support is requested for twenty-three projects. Five projects totalling $0.5 million are in the area of manufacturing methods and technology. The area of advanced engineering totals $8.2 million for seven projects. Five projects for military adaptation of commercial items are included for $4.2 million. Five projects totalling $1.2 million are included for annual support. Layaway consists of one project totalling $0.1 million.

The fiscal year 1973 budget request for other support equipment totals $225.8 million. This request for other support equipment is $82.4 million greater than the fiscal year 1972 program. It provides for an improvement in the readiness posture for those items on which procurement was deferred during the Southeast Asia consumption oriented budgets of the past years.

FISCAL YEAR 1973 BUDGET REQUEST FOR U.S. ARMY OTHER SUPPORT EQUIPMENT
ACTIVITY 3

	Cost (millions)
Combat support	$36.1
Construction equipment	42.1
Floating equipment	22.6
Generators and associated equipment	25.3
Materials handling equipment	29.2
Medical support equipment	16.5
Modification of other support equipment	9.2
Support equipment and facilities	44.8
Total budget activity 3	225.8

Chart No. 16 displays the other support equipment included in our request.

COMBAT SUPPORT

General BUSH. Included in the combat support category total of $36.1 million is $7.7 million for the initial procurement of a new ribbon bridge which was reverse engineered from a Union of Soviet Socialist Republic (U.S.S.R.) floating bridge. The $13.4 million for MUST—Medical Unit Self-contained Transportable—hospital components will equip six hospitals—three evacuation hospitals and three mobile surgical hospitals. Chemical support items total $10.7 million. The remainder of items in this category total $4.3 million. The construction equipment category total of $42.1 million includes $26.2 million for the procurement of two different crane units and attachments—a standard 20-ton crane and a rough terrain military crane. Also included are the road grader at $6.2 million, the scoop-loader at $1.5 million, the 250 c.f.m. compressor at $2 million, and the lubricating and servicing unit at $1.5 million. Other items in this category total $4.7 million.

WATERCRAFT

The Army's watercraft are overage and urgently in need of replacement. This program totals $22.6 million which consists of $4 million for the bridge erection boats, $3.4 million for the landing craft mechanized, and $15.2 million for the landing craft utility.

BRIDGE ERECTION BOATS

Chairman ELLENDER. What do you mean by bridge erection boats?

General BUSH. Mr. Chairman, in assembling a floating bridge we use a boat to maneuver those portions which go into the water into position for assembly. For example, on the new ribbon bridge the bridge sections must be pushed around by a pusher boat to get into position for construction. Those boats are bridge erection boats.

Chairman ELLENDER. Where would you use these? In Europe?

General BUSH. Again, Mr. Chairman, they could be used in Europe and would be used in Europe for those which are required to support Europe oriented forces. Forces that are deployed elsewhere would also have them.

Chairman ELLENDER. Where do you use these now?

General BUSH. Right now, Mr. Chairman, we have them for our forces that are in the continental United States. We had them for our

forces that were in Southeast Asia, although I believe the bulk of those, perhaps all of those, have been phased out. We do have them, also, in Europe.

Chairman ELLENDER. Proceed.

GENERATORS

General BUSH. Funding for generators totals $25.3 million. This request provides for the procurement of five different size generators for the Army and DOD standardization program.

MATERIALS HANDLING EQUIPMENT

The "Material Handling Equipment" category totals $29.2 million. Of this amount, $25.8 million is for procurement of the two military type rough terrain forklift trucks.

MEDICAL SUPPORT EQUIPMENT

"Medical Support Equipment" represents a new category of equipment. This requirement, formerly budgeted under O. & M.A. has been transferred to this appropriation effective with the fiscal year 1973 budget and $16.5 million is being requested.

IN-SERVICE EQUIPMENT MODIFICATION

The request for "Modification of In-Service Equipment" totals $9.2 million. Of this amount, $6.8 million is for the modification of calibration equipment.

SUPPORT EQUIPMENT AND FACILITIES

The request for "Support Equipment and Facilities" totals $44.8 million, including $2.4 million for pollution control, $18.5 million for items less than $500,000, and $14.2 million for 23 production base support projects. Other items in this category total $9.7 million.

READINESS STATUS

In summary, this budget is a readiness oriented budget. If approved, it will assist in modernizing the Army's inventory and improving its readiness posture. Chart 17 is a graphical portrayal of the progress we have made and the progress we are planning to make as we narrow the gap between what we need the AAO—Authorized Acquisition Objective—and what we have on hand—assets. By the fiscal year 1977 period, the Army will have reached [deleted] percent of its objective, assuming that the planned 5-year procurement programs are approved.

COMBAT SUPPORT EQUIPMENT

Chairman ELLENDER. As you indicated in your statement, the total requested for this activity includes $36.1 million for the category entitled "Combat Support". Please provide a P–1 type tabulation setting out each of the items included in this request of $36.1 million.

General BUSH. Yes, sir; I will be glad to do so.

(The information follows:)

	Quantity	Cost (millions)
Alarm, chemical agent, automatic, portable M8	500	$2.1
Bridge, float-ribbon, interior bay	90	3.5
Bridge, float-ribbon, ramp	18	1.4
Bridge, float-ribbon, transporter	108	2.8
Decontaminating apparatus, skid-mounted, 500 gal., M12A1	135	1.0
Detecting set, mine portable, metallic/nonmetallic, AN/PRS-7	2,075	.7
Mask, CBR, protective, tank M25A1/M14A2 (thousand)	20	1.0
Medical unit self-contained, transportable (MUST), hospital components:		
Container, ward	133	1.8
Shelter, expandable, self-contained	60	3.4
Shelter, inflatable	105	4.9
Utility element, self-contained, type A	33	3.3
Shelter system, collective protective, CB, M51	203	6.6
Tank and pump unit, liquid dispensing f/truck mounting	500	1.8
Water purification set, diatomite filter, 1,500 g.p.h., truck-mounted	50	1.8

Bridge Equipment

Chairman Ellender. In your statement, you referred to $7.7 million for the initial procurement of a new bridge system which was reverse engineered from the Soviet Union. Is this $7.7 million composed of the items listed in lines 163, 164, and 165 of the P–1 exhibit?

General Bush. Yes, sir.

Chairman Ellender. I note that this system is composed of three different units, the interior bay, the ramp, and the transporter. Tell us a little bit how this system works.

General Bush. The new ribbon bridge is a class 60 aluminum floating bridge comprised of a combination of interior units and ramp sections used with a 5-ton truck which transports, launches, and retrieves the ribbon bridge. The name "Ribbon Bridge" comes from the ribbon of steel appearance the bridge portrays when floating in the water across a water obstacle. When employed, the interior bay and ramp elements are launched from the transporter, and connected longitudinally by bridge erection crews, with bridge erection boat assistance to form the bridge. The bridge is anchored by conventional anchorage systems now used for standard float bridging. The interior bay and ramp units are capable of being assembled into rafts and propelled by bridge erection boats. The ribbon bridge components, when assembled, provide 13′6″ wide roadways and are suitable to support a class 60 load for normal crossings in currents up to 8 feet per second. This new bridge will provide an improved float bridge system that will significantly increase the U.S. capability to rapidly cross tactical vehicles over nonfordable wet gaps with minimum loss of momentum.

Chairman Ellender. I note this system is type classified "B". When would you expect a new system like this to be type classified "A"?

General Bush. Sir, the "B" under identification code indicates that the bridge has not yet been type classified. The bridge is scheduled for type classification, standard A, in June of 1972.

Decontaminating Equipment

Chairman Ellender. On line 171 of the P–1 exhibit, I note a request of $1 million for the procurement of decontaminating apparatus. Please comment on this request.

General Bush. This equipment, which can be truck mounted, is used

to wash away chemical agent contamination from personnel, materiel or ground areas. This is a defensive piece of equipment which is being proceured for NATO-oriented forces.

MUST Hospital Components

Chairman Ellender. In your statement, you referred to $13.4 million for the procurement of components for the medical unit self-contained transportable hospital. Are these the items set out in lines 178 through 181 of the P–1 exhibit?

General Bush. Yes, sir.

Chairman Ellender. To what extent was this mobile hospital unit used in Southeast Asia?

General Bush. Sir, prototypes were combat tested in Vietnam beginning in November 1966. Eventually, a total of five U.S. Army surgical hospitals utilizing MUST components operated in Vietnam. These units were highly successful in providing medical support to the Army in a combat area.

Protective Shelter System

Chairman Ellender. Please comment on the request of $6.6 million for the procurement of the protective shelter system set out in line 182 of the P–1 exhibit.

General Bush. Sir, this is a self-contained, trailer transported, inflatable shelter which is intended to provide protection against chemical and biological agents. It has an air circulating system which contains heating and cooling elements. This item is presently authorized for use in battalion aid stations for NATO-oriented U.S. forces.

Tank, Pump, and Purification Units

Chairman Ellender. I note that you are requesting $1.8 million for the procurement of 500 tank and pump units. Please describe this piece of equipment, give us some examples of its uses, and comment on your need for the 500.

General Bush. This item is comprised of three major components: Two 600-gallon tanks; a filter separator unit; and a 50-gallon-per-minute pump which is powered by a 3-horsepower gasoline engine. This item is skid mounted and can be operated on the ground or from a 2½- or 5-ton cargo truck. It is used as a bulk fuel and lubricant carrier and dispenser for routine and emergency refueling of vehicles, light aircraft, and other gasoline engine driven support equipment.

The purpose of 500 units provides for a partial phaseout of over 100 of the 1,008 overage assets, as well as improving the authorized objective level to cover 100 percent of the Active Army requirements and 76 percent of the Reserve requirements.

Chairman Ellender. What is the need for the 50 water purification sets you are requesting at a total cost of $1.8 million?

General Bush. Sir, these sets will be utilized to replace 33 losses to the inventory, and to achieve a modest improvement towards attainment of the Army's inventory objective.

Construction Equipment

Chairman Ellender. The next category is construction equipment, for which you are requesting $42.1 million. Please provide a P–1 type

tabulation setting out each of the items included in this request of $42.1 million.

General Bush. Yes, sir; I will be glad to do so.

	Quantity	Cost (millions)
Compressor, air rotary, trailer-mounted, 250 c.f.m., 100 p.s.i.	155	$2.0
Crane attachments		.8
Crane-shovel, truck mounting, 20T, ¾ cu. yd	181	14.2
Crane, wheel-mounted, 20T, ¾ cu. yd., RT	119	12.0
Distributor, bituminous material, truck-mounted, 800 gal	30	.9
Grader, road, motorized, heavy, 6x4	269	6.2
Loader, scoop type, DD, 4 wheels 2½ cu. yd	59	1.5
Lubricating and servicing units, trailer-mounted	200	1.5
Tractor, full tracked, universal (UET) APE		2.0
Welding machine, electric arc, 300 amp., constant current—constant potential (CC–CP)	237	1.0

Cranes, Shovels, and Road Graders

Chairman Ellender. The total request includes $14.2 million for the procurement of 181 crane/shovels at a cost of $78,300 each. What is the need for these 181 crane/shovels?

General Bush. Sir, the 181 crane-shovel units we are requesting will be used to replace forecast losses totaling 132 and to achieve a modest improvement toward attainment of the Army's inventory objective. With this requested quantity, approximately 87 percent of our inventory objective will be reached by the end of the fiscal year 1973 funded delivery period.

Chairman Ellender. Comment on the need for the 119 wheel-mounted 20-ton cranes for which you are requesting $12 million.

General Bush. Sir, the 119 wheel-mounted 20-ton cranes we are requesting will be used to replace forecast losses totaling 19 and to achieve a modest improvement toward attainment of the Army's inventory objective. With this requested quantity, approximately 74 percent of our inventory objective will be reached by the end of the fiscal year 1973 funding delivery period.

Chairman Ellender. On line 194 of the P–1 exhibit, there is a request of $6.2 million for the procurement of 269 road graders. What is your need for this equipment?

General Bush. The 269 road graders we are requesting will be used to replace overage assets and forecast losses totaling 243 and to achieve a modest improvement toward attainment of the Army's inventory objective. With this requested quantity, approximately 90 percent of our inventory objectives will be reached by the end of the fiscal year 1973 funding delivery period.

Chairman Ellender. With respect to the crane/shovels we discussed earlier, none of these were procured in 1971, 98 were funded in 1972, and as I indicated, you are requesting 181 for fiscal year 1973. You are requesting 119 of the 20-ton wheel-mounted cranes; for 1971, 23 were funded, and for 1972, 62 were funded. With respect to the road graders, none were funded in 1971, 90 were funded in 1972, and as I indicated you are requesting 269 for 1973. Why the big increase in the numbers of these items to be procured?

General Bush. The fiscal year 1971 and the fiscal year 1972 buys were not sufficient to accommodate the projected losses and overage assets and still provide a modest increase to the Army's inventory objective. Therefore, the programed buys for these items were increased to a level

where the buy does provide for a replacement of losses forecast and overage assets and still achieves a modest increase toward attainment of the Army's inventory objective.

LUBRICATING AND SERVICING UNITS

Chairman ELLENDER. On line 197 of the P–1 exhibit, there is a request of $1.5 million for the procurement of 200 lubricating and servicing units. None of these were funded in fiscal year 1971 and 1972. Please comment on the need for this equipment.

General BUSH. The 200 lubrication and service units we are requesting will be used to replace forecast losses totaling 102 and to achieve a modest improvement toward attainment of the Army's inventory objective. With this requested quantity, approximately 91 percent of our inventory objective will be reached by the end of the fiscal year 1973 funding delivery period.

FULL-TRACKED UNIVERSAL TRACTOR

Chairman ELLENDER. On line 199 of the P–1 exhibit, there is a request of $2 million for the advance production engineering for a full-tracked universal tractor. I note that $1.9 million was provided for this purpose in fiscal year 1972. I wish you would comment on the need for this particular piece of equipment.

General BUSH. The Army has a need for an armored, amphibious, multipurpose, combat engineer earthmover capable of providing combat engineers in divisional and nondivisional combat engineer battalions with a high-speed tractor having mobility equivalent to that of supported units. The tractor is expected to replace the medium crawler dozer and some of the low-bed trailer, prime movers. The new tractor will have troop carrying, bulldozing, grading, excavating, hauling, and winching capabilities.

FLOATING EQUIPMENT

Chairman ELLENDER. As you indicated in your statement, the total requested includes $22.6 million for the category entitled "Floating Equipment." Of this total, $4 million is for the procurement of 132 27-foot bridge erection boats. Please describe this piece of equipment and comment on the need for the 132 for which you are requesting funds.

General BUSH. Sir, this aluminum alloy boat built in two sections for ease of handling is used to move sections of floating bridge into position for assembly, ferry raft sections, and accomplish other necessary work in the water during bridge construction. The 132 bridge erection boats included in our request will be used to replace 12 forecast losses to the inventory and to achieve a modest improvement toward attainment of the Army's inventory objective. A new boat designed to handle the ribbon bridge is scheduled for type classification in the next few years. We are studying the possibility of deferring this buy. If such a decision is made, the committee will be notified.

Chairman ELLENDER. $3.4 million is requested for the procurement of 16 69-foot mechanized landing craft. What is the need for these 16 craft?

General BUSH. Sir, the 16 mechanized landing craft included in our request will be used to replace 15 losses to the inventory and to achieve a slight improvement toward attainment of the Army's inventory objective.

Chairman ELLENDER. The total request for floating equipment includes $15.2 million for the procurement of 10 utility landing craft. Just what is the need for the craft?

General BUSH. Sir, the 10 landing craft included in our request will be used to replace three losses to the inventory and to achieve a modest improvement toward attainment of the Army's inventory objective.

GENERATORS AND ASSOCIATED EQUIPMENT

Chairman ELLENDER. The next category is generators and associated equipment, for which you are requesting $25.3 million. Please provide a P–1 type tabulation setting out each of the items included in this request of $25.3 million for inclusion in the record.

General BUSH. Yes, sir. I will be glad to do so.

(The information follows:)

	Quantity	Cost (millions)
Generator set, GE, 1.5 kw., 60 Hz	4,765	4.3
Generator set, GE, 1.5 kw., 28 v	720	.7
Generator set, GE, 3 kw., 60 hz	2,411	.3
Generator set, GE, 3 kw., 28 v	751	.4
Generator set, GE, 5 kw., 60 hz	2,304	(4.8)
Less: Advance procurement in prior years		(−1.8)
Total		3.0
Generator set, DE, 60 kw., 60 Hz	892	10.3
Generator set, DE, 200 kw., 60 Hz	46	1.3

Chairman ELLENDER. As I read the P–1 exhibit, only $3.1 million was provided for this type of equipment in 1971, and only $6.8 million was provided for fiscal year 1972. Am I right about this?

General BUSH. Yes, sir.

Chairman ELLENDER. Generally speaking, just what is the need for the tremendous increase in the funds being requested for this type of equipment?

General BUSH. Generators were in heavy use during the Vietnam war and losses were high. Because of other higher priority equipment requirements in prior years, the generator program was limited to essential support on nonstandard items. The increase in our fiscal year 1973 request represents the Army's implementation of the DOD standardization program. As of now we are a long way from achieving our inventory objective on almost all generators.

Chairman ELLENDER. In commenting on this category in your statement, you said, "This request provides for the procurement of five different size generators for the Army and DOD standardization program." Just what do you mean by the "DOD standardization program"?

General BUSH. The DOD standardization program established in 1967 is a program to develop a standard family of mobile electric power generators capable of meeting the requirements of all services; thus greatly reducing the quantity and variety of generator sets currently

in the inventory. To date this program has been highly successful. In 1966 the Army had 375 makes and models of generators. Today the Army is down to 22 makes and models that meet the Army's requirements; a vast improvement in the few years since the start of the program.

MATERIALS HANDLING EQUIPMENT

Chairman ELLENDER. The total requested includes $29.2 million for materials handling equipment. Please provide a P–1 type tabulation for the record listing each of the items included in the request of $29.2 million.

General BUSH. I will be glad to.

(The information follows:)

	Quantity	Cost (millions)
Tractor, wheeled, warehouse, gas engine, pneumatic tired, 4,000 lbs	298	$1.3
Truck, forklift, diesel engine, pneumatic tired, rough terrain, 6,000 lbs	413	15.4
Truck, forklift, diesel engine, pneumatic tired, rough terrain, 10,000 lbs	233	10.4
Truck, forklift, electric, solid rubbered tired, 4,000 lbs	200	2.1

Chairman ELLENDER. Again, we have a big increase requested. For fiscal year 1971, $7.7 million was provided for the procurement of this type of equipment, and for fiscal year 1972, only $9.3 million. As I indicated, you are requesting $29.2 million for fiscal year 1973. What accounts for this very large increase for funds for the procurement of materials handling equipment?

General BUSH. During the war in Vietnam, materials handling equipment was heavily used; losses were high. Because of other higher priority equipment requirements in prior years, materials handling equipment programs were restricted to smaller amounts. The increase in our fiscal year 1973 request represents the Army's attempt to start, on a selective item basis, a limited improvement and replacement program of materials handling equipment. The items which primarily account for these increases are the 6,000- and 10,000-pound rough terrain forklift trucks, plus the inclusion of programs for the 4,000-pound warehouse tractor and the electric forklift truck. We are still a long way from achieving our inventory objective on all items.

WAREHOUSE TRACTORS

Chairman ELLENDER. The request includes $1.3 million for the procurement of 298 4,000-pound warehouse tractors. I note that this item was not found in fiscal years 1971 and 1972. Is this a new piece of equipment?

General BUSH. No, sir. The latest procurements were for 330 in fiscal year 1969 and 579 in fiscal year 1970.

Chairman ELLENDER. Comment on the need for these 298 tractors.

General BUSH. Sir, these warehouse tractors are required to replace 127 losses, and to provide a modest improvement toward attainment of the Army's inventory objective.

FORKLIFT TRUCKS

Chairman ELLENDER. $15.4 million is requested for the procurement of 413 6,000-pound forklift trucks at a cost of $37,200 per truck. None

of these were funded in fiscal year 1971, and only 158 in fiscal year 1972. Are all of these trucks for the replacement of existing worklift trucks?

General BUSH. No, sir. Of the 413 6,000-pound forklift trucks contained in our fiscal year 1973 request, only 80 are required for replacement of additional losses. The balance of 333 will replace prior losses and will improve the readiness posture providing attainment of 78 percent of the Army's inventory objective.

Chairman ELLENDER. What accounts for the big increase in the number of these trucks you are requesting in fiscal year 1973?

General BUSH. Sir, the fiscal year 1971 and 1972 programs were not sufficient to accommodate losses and still provide any substantial increase to the inventory. Therefore, the 6,000-pound forklift trucks contained in our fiscal year 1973 request were increased to 413, a level where the buy does provide for replacement of losses and permits the Army to increase its readiness posture from 67 to 78 percent.

Chairman ELLENDER. Just what is the need for the 233 10,000-pound forklift trucks for which you are requesting $10.4 million?

General BUSH. Sir, of the 233 10,000-pound forklift trucks contained in our fiscal year 1973 request, 59 are required for replacement of losses and worn-out equipment. The balance of 174 will improve the readiness posture providing attainment of 67 percent of the Army's inventory objective.

Chairman ELLENDER. $2.1 million is requested for the procurement of 200 4,000-pound electric forklift trucks at a cost of $10,400 each. I note that this item was not funded in fiscal years 1971 and 1972. Is this a new piece of equipment?

General BUSH. No, sir. The latest procurements were for 486 in fiscal year 1969 and 468 in fiscal year 1970.

Chairman ELLENDER. Please comment on the need for these 200 trucks.

General BUSH. Sir, these 200 electric forklift trucks are required to replace 132 losses and to provide a modest improvement toward attainment of the Army's inventory objective.

MEDICAL SUPPORT EQUIPMENT

Chairman ELLENDER. The next category is medical support equipment for which $16.5 million is requested. As I recall, you indicated in your statement that funds for the procurement of this type equipment had previously been bought with operation and maintenance funds. Just why this change in source of funding?

General BUSH. Sir, a large amount of the medical support equipment being purchased costs more than $1,000 for each item and in accordance with established policy is more appropriately classified in the other procurement appropriation than in the Army's operation and maintenance appropriation.

Chairman ELLENDER. The total requested for medical equipment includes $2.7 million for "expansion and new installation." Tell us exactly what you plan to do with this $2.7 million.

General BUSH. Sir, the $2.7 million contained in our request for expansion and new installation will be used to procure equipment for patient administration, medical, food, laboratory and dental service in newly constructed medical facilities in support of patient care.

Chairman ELLENDER. What is involved in the request of $600,000 for pollution control under medical support equipment?

General BUSH. Sir, the $600,000 contained in our request for pollution control will provide for mobile air monitoring stations and shelters, mobile support laboratories for air monitoring support and evaluation of stack emissions, base laboratory support and training equipment, mobile water monitoring stations and water quality bioassay laboratories, waste treatment mobile pilot plants with field laboratories for field evaluation, laboratory equipment for Army medical laboratory for determinations of heavy metals in water, mobile and base noise pollution evaluation and pesticide laboratories.

Chairman ELLENDER. $13.2 million of the total requested for medical support equipment is for replacement and modernization. Just how was this requirement computed?

General BUSH. The equipment requirement relating to the $13.2 million for replacement and modernization category is based upon actual item requirements submitted by fixed medical facilities worldwide and reviewed for professional propriety and need. This equipment requested will replace equipment which is worn out, not economically repairable and obsolete, and is required to keep abreast of technological advances in the practice of medicine.

MODIFICATION OF OTHER SUPPORT EQUIPMENT

Chairman ELLENDER. The request includes $9.2 million for the modification of other support equipment. Of this total, $6.8 million is associated with the modification of calibration sets. Please comment on this item.

General BUSH. Sir, the successful employment of Army missile/rocket systems, and other sophisticated materiel, is dependent on the equipment performing in accordance with established specifications. To insure that Army materiel meets these established specifications, appropriate calibration equipment continually modified to insure adequacy, changing techniques and standards must be fielded to provide timely support for metrology and certification service requirements worldwide. These funds provide for the modification of existing calibration equipment which in turn prevents obsolescence of the large inventory of calibration equipment.

Chairman ELLENDER. What is involved in the request of $1.9 million for marine craft electronics?

General BUSH. These funds will support the replacement of communications-electronics equipment now installed on Army marine craft. Present equipment is aged, as well as obsolete in many instances, and fails to meet minimum safety standards established by the Maritime and Federal Communications Commissions.

SUPPORT EQUIPMENT AND FACILITIES

Chairman ELLENDER. The last category is the $44.8 million requested for support equipment and facilities. Please provide a P–1 type tabulation for inclusion in the record setting out each of the items included in this request of $44.8 million.

General BUSH. Yes, sir. I will be glad to do so.

(The information follows:)

	Cost (millions)
Pollution control	$2.4
Nuclear core	.5
Items less than $500,000	18.5
Spare and repair parts	4.4
First destination transportation	4.8
Production base support	14.2

POLLUTION CONTROL

Chairman ELLENDER. On line 228 of the P–1 exhibit, I note what appears to be a new item of $2.4 million for pollution control. Exactly what type of equipment do you plan to procure with these funds?

General BUSH. These funds are required to support our pollution control/abatement program through product improvement of equipment. Facets of the program include liquid waste disposal, noise reduction, and control of air pollution for the following types of equipment: laundry units, watercraft, construction equipment, power generating equipment, and materials handling equipment.

NUCLEAR CORES

Chairman ELLENDER. What is involved in the request of $500,000 set out on line 229 for nuclear cores?

General BUSH. Sir, the request for the nuclear cores will provide fuel for the stationary medium-one (SM–1) nuclear reactor plant located at Fort Belvoir, Va., which is operated by an engineer power group under the Chief of Engineers. The SM–1 plant initially served as a research and development facility in the furtherance of the Army nuclear power program mission of developing land-based nuclear powerplants for the military services. Its present mission is to provide operating experience for training of land-based nuclear powerplant operators, and maintenance and supervisory personnel for the military services. The electrical energy produced by the plant during training exercises is fed into the Fort Belvoir power distribution system and consumed by post tenants. Since the submission of this requirement for the nuclear core, a decision was made by the Corps of Engineers to decommission the SM–1 nuclear reactor at Fort Belvoir by June 1973. As a result, this item is no longer required in fiscal year 1973.

ITEMS LESS THAN $500,000

Chairman ELLENDER. On line 230 of the P–1 exhibit, there is a request of $18.5 million for "Items less than $500,000." I wish you would provide a statement for the record listing the various items included in this request for $18.5 million.

General BUSH. Yes, sir. I will be glad to.

(The information follows:)

	Quantity
Compressor, 15 c.f.m. 175 p.s.i.	600
Crane, wheeled mounted 7 ton	16
Loader, scoop type M wheeled 1½ cubic yard	30
Spreader, concrete	7
Tractor, wheeled industrial diesel	7
Clothing repair shop, trailer mounted	30
Tractor, full tracked air mobile	39
Drill, pneumatic drifter	21
Mixer, concrete 16 cu. ft	95

Saw, abrasive disk, masonry	30
Compressor, 55 c.f.m. 100 p.s.i	68
Tractor, full tracked, light DED air transportable	20
Maintenance set for float bridge	6
Truck, fork lift, 2,000 pound	100
Power unit, 617/M for generator set 3KW 60HZ	120
Power unit, 631/G for generator set 5KW 60HZ	123
Power unit, 628/G for generator set 3KW 60HZ	120
Power unit, 620/M for generator set 5KW 60HZ	300
Power unit, 625/F for generator set 3KW 60HZ	177
Generator set, 0.5KW 400HZ	400
Power unit, 656/G for generator set 10KW 400HZ	39
Pump, 240 g.p.m	98
Shop equipment, woodworking	60
Welding machine, 200 amp	35
Welding machine, arc	25
Pump assembly, POL 50 g.p.m	160
Pump, centrifugal POL 350 g.p.m	160
Photo mapping section	3
Repair kit, stero	2
Surveying set	3
Surveying set, topographic	1
Surveying set	5
Printing press, offset	14
Roller, airmobile, vibrat	60
Roller, motorized, 5–8 ton	51
Air conditioner, 26,000/400 CH	45
Snow removal unit, 7½T	6
Sprayer, insecticide, 30 gallons per hour	72
Sweeper, rotary, towed	125
Sweeper, magnetic	33
Filter, separator	70
Boat, reconnaissance, 3-man	397
Pontoon boat, aluminum	210
Saw, band, metal cutting	121
Drilling machine, upright, vertical	26
Drilling machine, upright, multiple spindle	14
Grinding machine, internal and external	27
Lathe, turret ram type, universal	60
Lathe, toolroom	80
Lathes, toolroom, metal cutting	16
Milling machine, bed type, horizontal universal	20
Milling machine, universal bed type vertical	8
Shapers, horizontal, metal cutting	22
Honing machine	32
Forges, coal and oil burning	12
Brake machine, hydraulic, power	15
Presses, hydraulic, bench	10
Presses, hydraulic, floor and bench type	15
Shearing machine, metal, hydraulic	67
Welding machine, butt	6
Degreaser, trichlorethylene, vapor type	8
Booth, paint and spray	12
Blast cleaning cabinet, abrasive	7
Furnaces, blast	4
Machining center, tape controlled	1

Spares and Repair Parts

Chairman Ellender. The total requested includes $4.4 million for spares and repair parts. I note that only $2.3 million was provided for this purpose in fiscal year 1972. What is the need for the increase?

General Bush. Because of the high on order position at the end of fiscal year 1971, which could be used to partially support fiscal year

1972 requirements, the fiscal year 1972 request was reduced to $2.4 million. This same situation will not prevail at the end of fiscal year 1972; therefore, the request has been increased to $4.4 million.

FIRST DESTINATION TRANSPORTATION

Chairman ELLENDER. $4.8 million is requested for first destination transportation. How much was provided for this purpose in fiscal years 1971 and 1972?

General BUSH. Sir, $4.4 million was provided in fiscal year 1971 and $3.1 million in fiscal year 1972.

Chairman ELLENDER. These funds provide for the first destination transportation of what equipment?

General BUSH. These funds provide first destination transportation for all types of other support equipment scheduled for delivery in fiscal year 1973.

PRODUCTION BASE SUPPORT

Chairman ELLENDER. The total requested for support equipment and facilities includes $14.2 million for production base support. Tell us exactly what you plan to do with this $14.2 million.

General BUSH. The $14.2 million will be used to fund five provisions of industrial facilities projects, one layaway project, and seventeen production engineering measures projects. The five facilities projects totaling $1.1 million will provide annual support funds for five Army test facilities. The layaway project will provide for plant clearance of industrial production equipment and/or other contractor inventory in privately owned plants at various locations. The 17 production engineering measures projects will provide five manufacturing methods and techniques programs to improve production processes for end items, assemblies, and components planned for future procurement; seven advanced production engineering programs to allow a competitive procurement package, and five military adaptation of commercial item programs for evaluating, testing, and modifying commercial items for military application.

SUPPORT OF FREE WORLD FORCES

Chairman ELLENDER. How much is included in the various Army procurement appropriations for the procurement of equipment that you expect to transfer to the free world forces?

General BUSH. The total cost of "Ammunition and other procurement, Army" appropriations that we expect to transfer to the free world forces is $630,426,000.

Chairman ELLENDER. How does this break down between South Vietnam, Korea, and Laos?

General BUSH. The break down among countries is as follows: South Vietnam, $535,003,000; Korea, $15,565,000; and Laos, $79,858,000; for a total of $630,426,000.

Chairman ELLENDER. How is this total divided between the different appropriations?

General BUSH. Of this total, the "Procurement of Ammunition, Army" is $603,500,000 and "Other procurement, Army" is $26,926,000.

Chairman ELLENDER. Has the committee been furnished with details listing each of the items included in these totals for the various countries?

General BUSH. Yes, sir. The detail by line item for each of the appropriations by country is shown in our budget exhibit SEA–1, dated January 24, 1972.

SUBCOMMITTEE RECESS

Chairman ELLENDER. Is there anything else? If not, dismissed.

The committee will meet at 10 o'clock Monday morning when we will complete the Army.

(Whereupon, at 4:10 p.m., Friday, March 10, 1972, the subcommittee was recessed, to reconvene at 10 a.m., Monday, March 13.)

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1973

MONDAY, MARCH 13, 1972

U.S. SENATE.
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 10 a.m., in room S–126, the Capitol, Hon. Allen J. Ellender (chairman) presiding.

Present: Senators Ellender and Allott.

DEPARTMENT OF DEFENSE

DEPARTMENT OF THE ARMY

RESEARCH, DEVELOPMENT, TEST AND EVALUATION, ARMY

STATEMENTS OF:

HON. ROBERT L. JOHNSON, ASSISTANT SECRETARY OF THE ARMY (RESEARCH AND DEVELOPMENT)

LT. GEN. WILLIAM C. GRIBBLE, JR., CHIEF OF RESEARCH AND DEVELOPMENT, ARMY

ACCOMPANIED BY:

DR. K. C. EMERSON, ASSISTANT FOR RESEARCH (RESEARCH AND DEVELOPMENT)

COL. ALBERT E. JOY, CHIEF, PROGRAMS AND BUDGET DIVISION, OFFICE OF THE CHIEF OF RESEARCH AND DEVELOPMENT, ARMY

LT. COL. LOYAL G. HIGHTOWER, PROGRAMS BRANCH, PROGRAMS AND BUDGET DIVISION, OFFICE OF THE CHIEF OF RESEARCH AND DEVELOPMENT, ARMY

MAJ. GEN. JOHN A. KJELLSTROM, DIRECTOR, ARMY BUDGET, OFFICE, COMPTROLLER OF THE ARMY

BUDGET REQUEST AND 1972 APPROPRIATION

Chairman ELLENDER. Let the subcommittee come to order.

The next appropriation to be considered is "Research, Development, Test and Evaluation, Army" for which the fiscal year 1973 request is $2,068,716,000, as compared with the fiscal year 1972 appropriation of $1,826,791,000, which includes pending supplementals amounting to $39,135,000.

PROGRAM AND FINANCING

At this point in the record there will appear certain program and financing information from the justifications.

(The information follows:)

DEPARTMENT OF DEFENSE, MILITARY

RESEARCH, DEVELOPMENT, TEST, AND EVALUATION, ARMY

PROGRAM AND FINANCING (IN THOUSANDS OF DOLLARS)

	Budget plan (amounts for R.D.T. + E. actions programed)			Obligations		
	1971 actual	1972 estimate	1973 estimate	1971 actual	1972 estimate	1973 estimate
Program by activities:						
Direct:						
1. Military sciences	166,406	186,089	205,480	169,324	194,449	181,080
2. Aircraft and related equipment	178,301	167,962	247,100	73,612	210,362	274,000
3. Missiles and related equipment	848,451	895,868	964,280	832,602	975,268	963,980
4. Military astronautics and related equipment	6,120	10,810	18,860	6,843	10,010	14,060
5. Ships, small craft, and related equipment				100		
6. Ordnance, combat vehicles, and related equipment	142,565	179,031	189,070	157,026	171,031	202,270
7. Other equipment	297,379	348,681	384,980	320,487	372,821	376,880
8. Programwide management and support	57,932	62,250	58,946	57,510	67,779	56,446
Total direct	1,697,154	1,850,691	2,068,716	1,617,504	2,001,720	2,068,716
Reimbursable (total)	128,785	110,400	115,770	124,871	124,400	115,770
Total	1,825,939	1,961,091	2,184,486	1,742,375	2,126,120	2,184,486
Financing:						
Receipts and reimbursements from:						
Federal funds	—126,130	—108,900	—114,770	—123,891	—108,900	—114,770
Non-Federal sources	—2,655	—1,500	—1,000	—2,655	—1,500	—1,000
Unobligated balance available, start of year:						
For completion of prior year budget plans				—389,712	—416,929	—200,000
Available to finance new budget plans	—5,125			—5,125		
Reprogramming from (—) or to prior year budget plans	—54,108	—51,900				
Unobligated balance transferred from other accounts		—51,900			—51,900	
Unobligated balance transferred to other accounts		51,900			51,900	
Unobligated balance available, end of year for completion of prior year budget plans				416,929	200,000	200,000
Budget authority	1,637,921	1,798,791	2,068,716	1,637,921	1,798,791	2,068,716
Budget authority:						
Appropriation	1,607,889	1,787,656	2,051,100	1,607,889	1,787,656	2,051,100
Transferred to other accounts	—42,081			—42,081		
Transferred from other accounts	72,113			72,113		
Appropriation (adjusted)	1,637,921	1,787,656	2,051,100	1,637,921	1,787,656	2,051,100
January 1972 pay increase supplemental/amendment		11,135	17,616		11,135	17,616

NOTES

Reimbursements are derived principally from provision of laboratory services to private organizations (10 U.S.C. 2481).

The amounts shown as January 1972 pay increase supplemental/amendment are not distributed to each individual appropriation in the fiscal year 1973 President's budget, but are reflected as a 1-line defensewide contingency amount. The amounts shown above are estimates, pending final determination of the amounts to be requested when supplemental and amended estimates are formally transmitted

PRESENTATION FORMAT

Chairman ELLENDER. The two principal witnesses will be Assistant Secretary of the Army Robert L. Johnson and Lt. Gen. William C. Gribble, Jr., Chief of Research and Development.

You may proceed, Mr. Secretary.

Mr. JOHNSON. Mr. Chairman, it is a pleasure to appear before the committee again this year to cover the Army's fiscal year 1973 research, development, test and evaluation budget request. In our integrated statements General Gribble and I plan to provide you a broad overview of this request by covering the following areas:

1. A summary of the actions taken, and results achieved, so far with respect to the fiscal year 1972 appropriation. This will include not only important ongoing reviews, but the important new initiatives we discussed last year and the management actions intended to ensure efficient use of appropriated funds.
2. A comparison in major areas of our capability vis-a-vis potential enemies in order to highlight required priorities and new capabilities.
3. An outline of new capabilities being investigated via the initiatives and prototype routes.
4. An overall budget summary by budget actvity.

PROGRESS IN MAJOR PROGRAMS

Significant progress has been made in a number of our major ongoing programs.

CHEYENNE

Several significant actions have been completed in the Cheyenne program in fiscal year 1972. First, was the signing of a restructured development contract in August 1971 which provided for the settlement of the litigation and completion of the development program. Army Preliminary Evaluation I and Research and Development Acceptance Test I were completed in the first half of fiscal year 1972. The combined results of these tests indicate that the basic development of the aircraft equipped with the improved control system (ICS) is complete and has resulted in an acceptable system up to gross weights of 20,500 pounds.

PROGRAM EXPENDITURES AND STATUS

Chairman ELLENDER. How much have you spent to date for development?

General GRIBBLE. We have obligated approximately $257.2 million to date.

Chairman ELLENDER. At what state have you presently arrived?

Mr. JOHNSON. The program has resulted in an excellent machine, both in terms of an aircraft and of its equipment.

Our concern is that the production cost of the device is turning out to be around $4 million apiece, and we now have, as I will discuss shortly, an evaluation underway to answer the question: "How much should we pay for our minimum requirements in an attack helicopter?" If that turns out to be something akin to the Cheyenne, then the program is ready to proceed.

Chairman ELLENDER. In other words, the cost factor must first be determined?

Mr. JOHNSON. The requirements that we are spending the money on need to be reduced to the minimum so that we can determine whether the best way to meet those requirements is with the Cheyenne or with a reduced aircraft.

Selection of Cheyenne or A–X Aircraft

Chairman Ellender. Before Mr. Packard left the Department of Defense I discussed the Cheyenne with him on several occasions. It was my position that we should develop only one close support aircraft, that is either the Air Force's A–X or the Cheyenne—but not both. However, we continued the development of both, and from your statement and that of General Gribble it appears that you have already made up your minds and want to proceed with the production of the Cheyenne in the near future, and the Air Force wants to produce the A–X. I do not think this is in accord with my discussions with Mr. Packard.

Mr. Johnson. Before Mr. Packard left, my understanding of his position was that the Army in fact required in its mission an attack helicopter, and that, correspondingly, an upgrading of the fixed-wing aircraft for the type of missions they performed was also required.

Chairman Ellender. Yes; it is clear that the Army wants an attack helicopter and the Air Force wants the A–X. However, I am very hopeful that we can still have a decision to produce only one, the Cheyenne or the A–X, but not both.

Army Requirement for Attack Helicopter and Support Fixed-Wing Aircraft

Mr. Johnson. The studies which we are embarked upon, and the evaluation which I will shortly describe, are oriented entirely toward firming up the minimum requirements for an Army attack helicopter. It is our firm conviction that there is a need for an attack helicopter in the Army, as well as the fact the Army needs to be supported with fixed-wing aircraft. It is up to the Air Force to decide which fixed-wing aircraft that is.

Chairman Ellender. Proceed.

Cheyenne Flight Test

Mr. Johnson. The gun, fire control, and navigation subsystems have demonstrated in flight testing that they meet or exceed required accuracy specifications.

In phase B (TOW/night vision system and firing accuracy demonstrations), 35 TOW missiles were fired in-flight, resulting in [deleted].

Development work on the Advanced Mechanical Control System (AMCS) is proceeding to include hardware fabrication, wind tunnel and whirl tower tests, and installation on a prototype aircraft. First flight of the AMCS is expected in October 1972.

Hardware Demonstration

Actual hardware demonstration of the redesigned equipment resulting from the producibility/cost reduction program will begin in fourth quarter fiscal year 1972. Preliminary indications are that unit cost of the Cheyenne can be reduced about 10 percent. In short, the Cheyenne is now a development success, and if it were not for concern about its cost in production, we would now be asking to put it in full-scale production.

ATTACK HELICOPTER REQUIREMENT EVALUATION

To resolve the question, "How much should we pay for an attack helicopter?," the Army plans to conduct an evaluation of the advanced attack helicopter requirement during the second half of fiscal year 1972. This evaluation, which constitutes a reevaluation of the requirement document for this system, will take into consideration the experience gained in the Vietnam conflict, along with changes in the midintensity warfare environment, technological advances and other influences. The Army is proceeding with a view toward confirming or revising the stated requirements.

The evaluation plan will include a combination of engineering, cost and schedule analyses; analysis of prior and ongoing studies; analysis of field experiments; selected flight testing of industry-sponsored experimental attack helicopters (Bell Helicopter Co.'s King Cobra and Sikorsky's Blackhawk); and perhaps some special testing of Cheyenne to fill identified data gaps.

Based upon the resulting new requirements, our advanced attack helicopter needs will be met by continuing the Cheyenne program, modifying it as required or; if the requirement changes are too large, embarking on an entirely new course.

Chairman ELLENDER. What do you mean by "new course"?

Mr. JOHNSON. It is quite possible that our evaluation, which is an in-depth analysis and test, will show that a machine the size of the Cheyenne is not required. If a machine as large as the Cheyenne is not necessary, then we should not spend in production the money to get it; and we would embark upon the modification of an existing machine, such as the King Cobra, or, if necessary, a smaller machine completely. Any such machine would always carry the same load of equipment, because by definition we would only put in the minimum equipment required.

ROTOR CONTROL LAWSUIT

Chairman ELLENDER. What has really been the problem with the Cheyenne? Was there a lawsuit of any kind involved?

Mr. JOHNSON. The basic problem that led to the lawsuit was the difficulty in the control of the rotor so it was an acceptably controllable flying machine. That problem has now been overcome and it flies extremely well within the weight ranges we require. Furthermore, the installed equipment is working remarkably well: The gunfire, the accuracy of the missile fire, and the accuracy of navigation is great.

PROCUREMENT OF REQUIRED MINIMUM CAPABILITY

Our concern is that with all of that capability it is costly. We want to be very sure that we only spend money for the minimum capability that we must have. So our evaluation is establishing this year what that capability should be so that we will be prepared for our fiscal year 1974 request to either say we have verified that all of the capability of the Cheyenne is required; or to say that a lesser capability can do the job and we recommend a different approach to achieving our needed attack helicopter.

AIRCRAFT SELECTION

Chairman ELLENDER. I presume that you have had discussions with Mr. Packard.

Mr. JOHNSON. Yes, I have.

Chairman ELLENDER. Didn't you get the impression that he was in favor of producing only one of these aircraft?

Mr. JOHNSON. I have never had the either/or impression that you imply, Mr. Chairman. As he examined the needs for close-support aircraft, he came up with the conclusion that there was to be a different mission performed, and the question was entirely which aircraft should you choose for each mission.

Chairman ELLENDER. Inasmuch as both of these expensive aircraft are basically for the close air support mission I could not understand why we need both, and Mr. Packard had some questions on each of these aircraft. He wanted to continue with the development of both to determine which one could best perform the mission before making a production decision.

Mr. JOHNSON. In this particular case, Mr. Chairman, there is a different mission being performed.

Chairman ELLENDER. Please explain.

AIRCRAFT MISSIONS

Mr. JOHNSON. There is a different mission being accomplished by an attack helicoper: low, close in support of the specific problem the ground forces face, as compared to the broader mission of the mass destruction behind the lines and reasonably close to the battle area.

It is the great difference between the individual attack of the helicopter against the immediate objective that is bothering the forces, as opposed to this more general mass attack of the supporting forces coming up to the battle that the fixed-wing aircraft does so well and which the attack helicoper does not even attempt.

Chairman ELLENDER. Proceed.

Mr. JOHNSON. In order to fund for the full evaluation, which includes taking advantage of the unique opportunity to test other experimental attack helicopters developed by the helicopter industry, the Army requested $5 million in emergency funds from DOD and $5 million in the fiscal year 1972 supplemental R.D.T. & E. budget request. These funding actions were taken by the Army because this evaluation must be performed in the immediate future in order to provide the basis for a decision in time for the fiscal year 1974 budget formulation and submission.

UTILITY TACTICAL TRANSPORT AIRCRAFT SYSTEM (UTTAS)

The Army's helicopter lift fleet must be modernized. The UH–1 Huey has been the utility helicopter in Vietnam, but it does not meet the minimum payload requirement of lifting an infantry squad with their equipment. The Huey fleet will be employing 30-year-old technology and 15- to 20-year-old aircraft by 1980. Development of the UTTAS will reduce fleet costs by nearly one-half over a 10-year span of time. We can accomplish the same mission with fewer units, and our maintenance man-hours per flight will be significantly reduced.

The Department of Defense approved the UTTAS R. & D. program in June 1971. As the initital step, industry was solicited for proposals for the UTTAS engine development. In December 1971 General Electric was selected to develop the 1,500 shaft horsepower engine for the twin engine UTTAS. In January 1972, we released requests for proposals to industry for the airframe R. & D. contracts. We plan to award contracts in September 1972, starting with fiscal year 1973 funds, to two airframe contractors for an airframe prototype flyoff competition. After the evaluation phase in 1976, the Army will select one contractor for final R. & D. and production.

HEAVY LIFT HELICOPTER (HLH)

The Army is developing the Department of Defense Heavy Lift Helicopter (HLH) to meet the shore-based heavy lift helicopter requirement of all services. To fully exploit the airmobile concept of freeing the soldier, his weapons and equipment from terrain restrictions, the Army needs the helicopter lift capability to transport light armor, mechanized infantry vehicles, direct support artillery, heavy engineer equipment and containerized cargo. Our present capability of ten tons with the CH–54 is inadequate. The Army managed program is our only real HLH development. It has been configured for the movement of loads externally with the standard shipping container as its design load.

Its performance capability will permit the movement of virtually all tactical equipment except for tanks. It will about equal in performance, but not in size or overall weight, a capability the Soviets have demonstrated for several years. It will provide a useful service to all of our military operations even if eventually operated only by the Army in support of its own operations and the other Services. It is the minimum design in size and cost which can provide the lift capability we need for a wide range of logistical and tactical missions.

MARINE CORPS AND NAVY HELICOPTER

Chairman ELLENDER. Is such a helicopter being developed by the Marines?

Mr. JOHNSON. No, sir. The Marines and the Navy have under modification the existing CH–53, by which they hope to upgrade its capability. Even when upgraded to that point, it will carry a little more than half of the load that we will be able to carry on the one being developed for the Department of Defense.

Chairman ELLENDER. It has not yet been tested?

Mr. JOHNSON. No. Both of them are under development headed toward prototype demonstration. The machine of the Navy is CH–53–E, which will carry roughly 13 tons. The machine for the DOD, which the Army is working on, will lift 22½ tons.

MISSION VARIANCE

Chairman ELLENDER. They are both in the research and development stage?

Mr. JOHNSON. They are both in development. The Navy machine, being a modification of an existing machine, would probably show up in prototype form prior to the DOD HLH.

Chairman ELLENDER. How would they be utilized?

Mr. JOHNSON. Largely in the case of the Navy-Marine it is for support of their forces directly from ships. In the case of the DOD heavy lift helicopter, the 22½-ton machine, it has two different missions. The most important one is the unloading of containers from ships without the presence of port facilities, and in being able to supply an operation without having to construct a major port. That is its first major requirement.

The second major requirement is the movement up within the battle area of heavy pieces of equipment, armored personnel carriers, artillery, that sort of thing, so that you are not stopped by terrain.

So it has two basic functions: ship to shore for unloading of containers, and then the one in the battle area.

There has been a misunderstanding in the past in the HLH program because of the Navy's program to improve the CH–53 for use with the LPH. The Navy improved CH–53 program is for a helicopter with only 60 percent the payload of the HLH under identical atmospheric conditions. The HLH mission cannot be performed with the improved CH–53.

DOD HLH PROGRAM

The DOD HLH program was approved on May 7, 1971 with the announcement that Boeing-Vertol had won the competition to design, fabricate, and test the critical components for a tandem rotor heavy lift helicopter. The HLH program is currently approved only through prototype development, as is the Navy improved CH–53 program. These prototypes will be tested in about the same time frame and will provide the data on which to make subsequent decisions regarding full engineering development and production for the different missions involved in each of these two systems.

Chairman ELLENDER. Wasn't there an effort made to develop one helicopter to meet the requirements of both services?

Mr. JOHNSON. There was in the definition of the large 22½-ton machine. There was the requirement placed upon the helicopter that it fit aboard their largest ship, which, I believe, is called the LHA. The presently designed heavy lift helicopter will fit aboard that ship in order to perform whatever missions are useful to the Navy. But they only have five of those ships, whereas they have a large number of the LPH that I mentioned earlier. It is from the LPH that the smaller machine, the CH–53, would operate.

Chairman ELLENDER. Proceed.

XM 803 TANK

Mr. JOHNSON. As directed by the Congress, the Army has taken action to terminate the XM803 tank development program. In the termination of this program every effort has been made to insure that maximum benefits are derived from previous program investments.

The Army is planning for the initiation of a tank prototype program as the Congress specified.

PROGRAM TERMINATION AND EXPENDITURES

Chairman ELLENDER. Did you terminate the XM 803 tank program?

Mr. JOHNSON. We terminated the program, with the exception of two vehicles, one which was almost complete and another which was

complete as an automotive device, which will be completed and made available to the Army. But the program, both within the contractor and the Army, has been terminated.

Chairman ELLENDER. How much was actually spent on the XM 803 program?

Mr. JOHNSON. I will have to provide that for the record, Mr. Chairman.

Chairman ELLENDER. I notice many of your programs are terminated. That is the reason I indicated so much is spent with so little hardware to show for it.

Mr. JOHNSON. The number that you wanted is $309 million.

Chairman ELLENDER. That is what you spent——

Mr. JOHNSON. On the development of the XM 803.

Chairman ELLENDER. It was then abandoned.

Mr. JOHNSON. The Army did not wish to abandon the program. At the direction of Congress the program has been abandoned.

TANK WARFARE REEXAMINATION

A special task force, under the direction of the Commanding General, U.S. Army Combat Development, Command (CGUSACDC), is reexamining the whole philosophy and approach to tank warfare in order to insure that the new program will produce the most cost effective solution. The fiscal year 1972 program is directed at the development of components and major subsystems; that is, fire control, power package, suspension, and weapon systems; which will be critical in any tank prototyping program. We need a new tank, despite cancellation of the XM 803, to offset the Warsaw Pact's present quantitative armor advantage. The development and production of a qualitatively superior tank is, we feel, the best solution to correct this situation.

Chairman ELLENDER. What progress has been made on the new tanks?

Mr. JOHNSON. We have two things underway. The major effort is associated with an evaluation of the requirements for the tank. If we simply designed a tank to meet the requirements that we had for the XM 803, it would be as expensive.

The problem with the XM 803 was not performance; it was performing excellently. But, again, it was unit cost. So we must take a good look at the requirements we are attempting to meet. That study will be done in August.

In parallel with that, we have asked each of two contractors, the only two we know of in the country who have tank experience, Chrysler and General Motors, if they will provide to us their thoughts through a study on what would be inexpensive but capable enough to meet our demands. All of these ideas will then be focused in August on the program with which we wish to proceed.

Chairman ELLENDER. Is it true that Chrysler had a tank that would meet your requirements, but that someone insisted you go along with the one you abandoned?

Mr. JOHNSON. No, sir, that is not true. There have been various ideas proposed by a company on what a tank might be that would meet the Army's needs, but they have never really been adequately thought about in combination with the Army to make sure that that was the case. In fact, they were not suitable for our uses.

PROGRAM INITIATION

Chairman ELLENDER. When did the Army initiate the XM 803 program?

Mr. JOHNSON. I believe that was initiated as a development program with Germany in 1963.

Chairman ELLENDER. Proceed.

M–60 TANK

Mr. JOHNSON. The demise of the XM–803 tank means that the M–60 tank will be in service much longer than previously planned before it is replaced by a more modern tank. Therefore, a product improvement program for the tank has been planned and will be expedited. This program calls for application of nine major product improvements to the M–60 series tanks. Of these nine improvements, three are developmental in nature and require R.D.T. & E. funds. These are the solid-state ballistic computer, the laser range finder, and the tube-over-bar suspension system. The introduction of these three improvements will provide the M–60 series tanks substantially increased capabilities in the areas of firepower and mobility. A principal feature of the M–60A1 product improvement program is its provision for the application of the majority of the planned improvements as a system, rather than as individual components. These improvements will enhance our tank capability on an interim basis, but will not provide the capability we need to meet future threats.

ADVANCED BALLISTIC MISSILE DEFENSE

During fiscal year 1972, we have emphasized the expansion of the advanced development from which both upgraded capabilities and followon systems for Safeguard and Hardsite can evolve.

Hardsite has now been renamed to the Site Defense of Minuteman.

This effort has included advanced developments in the fields of radar, data processing, reentry physics, discrimination technology, optics, and interceptor missile technology, as well as the study of advanced system concepts. Significant progress has been made in all of these areas, and promising growth paths for both the terminal and area defense missions have been identified. Some specific accomplishments include:

Successful completion of the [deleted].

Development of a new, [deleted] applicable to Site Defense of Minuteman which is currently undergoing evaluation using flight test data.

Entry into operation of a data processing system analyses program which develops data processing requirements similar to those normally encountered by a BMD computer during an actual engagement. These requirements can be used to exercise a candidate computer or its software to determine its ability to handle a BMD engagement.

The Parallel Element Process Ensemble (PEPE) has been demonstrated. PEPE is a technique for physical augmentation of the capacity of a computer, including commercial versions, so that the combination is capable of handling the future severe BMD data processing requirements.

The ABMD program will continue to pursue these and other efforts designed to increase our technological capability to cope successfully with the evolving ICBM/SLBM threat.

LANCE

Lance is being developed to replace the Honest John rocket and the Sergeant missile systems. The missiles will have a maximum range of [deleted] kilometers with the nuclear payload and [deleted] kilometers with a nonnuclear warhead. Accuracy of the system will be [deleted] circular error probable for the nuclear capability and less than [deleted] for the nonnuclear capability.

Engineer test/expanded service tests began in fiscal year 1972 on the nuclear system and are scheduled for completion in March 1972. The box score to date [deleted]. Type classification Standard A for the nuclear system is scheduled in [deleted].

PROGRAM EXPENDITURES

Chairman ELLENDER. How much has been spent on that?

General GRIBBLE. $444 million in research in prior years.

TOTAL COST

Chairmen ELLENDER. I understand the total acquisition cost, including R. & D. for the Lance missile system is $774.4 million; is that correct.

Mr. JOHNSON. Yes, sir.

Chairman ELLENDER. Would that include production costs?

General GRIBBLE. That would include the cost of production.

Chairman ELLENDER. Of how many?

General KJELLSTROM. It is [deleted] missiles in the total program through 1974 on the basis of the justification book submitted for the procurement appropriation.

Chairman ELLENDER. That is a nuclear weapon?

Mr. JOHNSON. That provides the nuclear capability.

MISSILE CAPABILITIES

Chairman ELLENDER. Describe, if you would, the Lance capabilities and what it will replace.

General GRIBBLE. Lance is programed to replace three major weapons systems; the Little John free rocket system, the Honest John system, and the Sergeant system.

Both the Little John and Honest John were dual capable systems. In other words, both Little John and Honest John had a nonnuclear capability, as well as a nuclear capability.

There were some [deleted] battalions of those three weapons systems in the Army's force structure. We have been working on Lance to give us a capability of replacing those [deleted] battalions with [deleted] battalions, with a savings in cost and manpower that is represented by that reduction in force structure.

RETENTION OF ROCKET BATTALIONS

But if we are confined in the Army to a Lance system, which is nuclear capable only, it will not be able to perform the mission that we were formerly capable of performing with the nonnuclear Honest John and Little John.

Therefore, it might be required of the Army, in order to retain that capability, to maintain in our force structure a large number of rocket battalions so that our corps commanders would have a nonnuclear capability at the ranges that the Lance system is capable of reaching.

Chairman ELLENDER. How would you accomplish that?

General GRIBBLE. We would have to retain in our force structure, sir, some Honest John's that we are now hoping to be able to be replaced with nonnuclear Lance.

1972 STATUTORY INJUNCTION: RECONSIDERATION THROUGH REPROGRAMING

I am aware of the congressional language last year in the appropriation act that asked us to refrain from continuing our nonnuclear Lance warhead development effort. We have en route to the Congress a request of your committee to reconsider that direction to the Army because of the importance which we associate with it. That will be in the form of a reprograming request, which is now before the Office of the Secretary of Defense.

Chairman ELLENDER. How much would it cost to produce the nonnuclear Lance?

General GRIBBLE. To complete development, we are estimating $1.5 million. We have done a substantial amount of work already in developing that capability.

Chairman ELLENDER. Don't you think it might be better to do that and abandon these other two?

General GRIBBLE. Yes, sir; we have reached that conclusion. Our request, which is en route to the Congress, will bring that fact out.

PERSONNEL REDUCTION

Chairman ELLENDER. You will be able to reduce personnel.

General GRIBBLE. In terms of battalions we will be reducing from a total of [deleted] to a total of [deleted] battalions.

Chairman ELLENDER. What will be the difference in manpower?

General GRIBBLE. It will be a requirement for 2,000 soldiers.

Chairman ELLENDER. Fewer?

General GRIBBLE. Yes.

ANTICIPATED DEPLOYMENT DATE

Chairman ELLENDER. How long would it be before this will be in the hands of our troops?

General GRIBBLE. We hope to begin introducing the Lance in our European force structure in [deleted].

Mr. JOHNSON. I think we should make it clear, Mr. Chairman, that this does not represent the initiation of the nonnuclear warhead research and development. That has been going on for some years. It is really the completion of that work. We have already flown warheads

of the type required and demonstrated their capability against typical targets.

This is essentially the culmination of that effort, which will allow us to field the warheads we have been able to demonstrate at the time mentioned by General Gribble. We are scheduled to type classify the nuclear system type A in [deleted].

Chairman ELLENDER. That will be in Europe?

Mr. JOHNSON. It will be given the stamp of approval for production to begin and that will then go to the troops in Europe in [deleted].

Chairman ELLENDER. When you say "troops in Europe," those are our troops?

Mr. JOHNSON. Our troops.

Chairman ELLENDER. Solely our troops?

POSSIBLE SALES TO NATO ALLIES

Mr. JOHNSON. There has been interest expressed by other countries, but there has been no agreement as yet to supply it.

Chairman ELLENDER. Did you attempt to secure the cooperation of our European allies?

General GRIBBLE. Yes, sir. There have been interests expressed by our NATO allies and the procurement by them of [deleted] battalion sets of Lance equipment.

Chairman ELLENDER. How would that be done?

General GRIBBLE. It would be made available, I would presume, through our international security operation and foreign sales purchased by those countries from the United States.

Chairman ELLENDER. No definite decisions have been reached?

General GRIBBLE. Maybe not the total reason, but one of the reasons is that many of these countries are interested in the nonnuclear capability that is associated with Lance. Until they are fully advised that Lance will have that nonnuclear capability, they must refrain from making any firm commitments.

Chairman ELLENDER. In providing these weapons to our allies in Western Europe, will we require that they share the research and development costs?

General GRIBBLE. Yes, sir.

Chairman ELLENDER. Proceed.

PENDING REPROGRAMING REQUEST TO COMPLETE NONNUCLEAR WARHEAD DEVELOPMENT: TEST RELIABILITY

Mr. JOHNSON. The Army has requested congressional approval to complete development of the Lance nonnuclear warhead using the Air Force's BLU–26 grenade as the cargo. The basis for this request is the promising result obtained [deleted] from the live tests targeted against a [deleted] at White Sands Missile Range, N. Mex., during July–September 1971.

A recent study completed by the Army Materiel System Analysis Agency corroborated the live test results and concluded that nonnuclear Lance is effective when targeted against [deleted] using the BLU–26 as the cargo. In addition, this warhead will be effective when targeted against the [deleted] units, command posts, communication complexes, supply depots, bridge construction sites and assembly areas.

Nonnuclear Lance will provide tactical flexibility to the Army Corps Commander, enable the Army to suppress enemy air defense sites, thus reducing the attrition rate of our (Air Force) aircraft; and enhance the foreign sales of this system to NATO.

HAWK

The Hawk Improvement Program (HIP) was initiated in 1964 to correct the deficiencies and increase the capabilities of basic Hawk so that it can counter the 1972–81 medium-to-low altitude aircraft threat, until replaced by SAM–D. The program provides a significant increase in system effectiveness due to a new missile, reduced reaction time by the use of computer techniques, and [deleted]. The system intercept range increases from [deleted]. System reaction time decreases from [deleted], and a [deleted]. Target speed handling capability has increased from [deleted]. The new certified round missile eliminates missile maintenance at the battery and direct support level.

Initial Production Test (IPT) firings continued through September 1971 and satisfied the remaining missile engineering test objectives. The 20 round missile Reliability Demonstration Test (RDT) conducted in first quarter fiscal year 1972 showed that the increased quality control measures had been successful in raising the reliability to a level above the original requirement. As a result of the RDT and IPT, the system was type classified Standard A on December 21, 1971. The Secretary of Defense has approved fiscal year 1972 procurement funds for [deleted] missiles and [deleted] sets of ground support equipment.

SAM–D MISSILE

Chairman Ellender. Is the SAM–D missile to be used abroad?

Mr. Johnson. The major purpose of SAM–D is for defense of the field Army, wherever it may be. The present procurement plan for SAM–D is only to buy enough batteries to support a typical battlefield installation, and we are patterning that after the array in Europe.

There are now no plans to install the SAM–D for the defense of CONUS. It will be capable of doing so if the decision to deploy it were made.

Ally Cooperation

Chairman Ellender. In devising all of these new missile systems, to what extent do you consult with our allies as to their employing the missiles?

Mr. Johnson. In the case of the air defense missiles, the more capable area defense missiles have been for some years the Hawk and the Hercules. It has also been evident for some years that those missile systems required far too many people to operate them. Furthermore, they were getting old and could not be properly supported for some time.

The SAM–D was, therefore, started as a replacement for our requirement of those missiles. The system is a capable one and there is no counterpart in any of the allies' development programs. Instead, they have concentrated their development effort on the smaller systems.

So there is mutual cooperation in the sense that we have not developed these systems and would intend to produce those in this country, if we need them.

Similarly, the SAM–D would be made available to our allies. So there is cooperation in determining requirements, but there has not been participation in the actual program itself.

SALES TO OR PRODUCTION BY ALLIES

Chairman ELLENDER. Well, should a decision be made to use these new missiles in Europe, am I to understand that these missiles would actually be bought by our allies?

Mr. JOHNSON. Either bought or possibly produced by them. How they might participate in SAM–D is not yet clear.

OPERATIONAL DATE AND SYSTEM COST

Chairman ELLENDER. When do you expect this system to be operative?

Mr. JOHNSON. The IOC is, I believe, [deleted], the Initial Operational Capability in the field.

Chairman ELLENDER. Have you an estimate of what the cost of that missile would be?

Mr. JOHNSON. Yes. We, of course, speak of the cost of the system as opposed to just the missile.

General GRIBBLE. About [deleted] per battery for [deleted] batteries.

Chairman ELLENDER. A total cost of $4.2 billion; is that right?

General GRIBBLE. Yes, sir.

Mr. JOHNSON. I should point out, Mr. Chairman, that the system would replace the Hawk and the Hercules, whose operating costs per year are so high that that total cost would be saved in manpower alone in a period of something like 4 years.

ALLY COOPERATION IMPERATIVE

Chairman ELLENDER. I am troubled by the uncertainty of allied cooperation. We develop the systems. We procure the weapons. Meanwhile we just hope that our allies will purchase the system. Did they build either the Hawk or the Hercules?

Mr. JOHNSON. The Hawk was. They never built the Hercules. That was provided them. Whether they purchased it or whether it was given to them, I don't remember.

Chairman ELLENDER. I would guess it was a gift.

Mr. JOHNSON. I should again point out that if our allies were to employ SAM–D, it would be useful to us because they would be better defended.

Chairman ELLENDER. But here is something that bothers me. We have four and a third divisions there. We are doing everything we can to provide them with all of the equipment necessary to defend themselves. How will our troops be affected if the other divisions there don't get the same type of protection?

Mr. JOHNSON. I would hope they use the equipment they have.

Chairman ELLENDER. Hope and insist. If not, get out of there. That

is what I have been saying for 20 years. Our allies will depend on Uncle Sam as long as you permit them to. I would be a little more brutal about it. If our divisions, despite our efforts to equip them properly, are outflanked by enemy action resulting from the collapse of other divisions not as well prepared, what do you think is going to happen to our own divisions? You will endanger them in case of war. Those countries are on the border, yet there is little done by them to improve their own divisions unless we provide the equipment. And our Defense Department permits this to continue. That is what irks me.

General GRIBBLE. The number of Hercules and Hawk batteries manned by our allies in Europe exceed the number manned by the United States.

Chairman ELLENDER. It should, because they are supposed to have more divisions there.

General GRIBBLE. The Hawk-Hercules belt protects all of Western Europe. Because of the fact that SAM–D will not be fielded in Europe until some period subsequent to [deleted], we can only assume at this point in time that they would be as interested in replacing their Hawk and Hercules as are we in the United States.

Chairman ELLENDER. But why can't that decision be made when you decide to produce the SAM–D? Don't you see the point? If they refuse, what then? They will have inferior missiles to ours. It certainly won't mean balanced defenses in the divisions.

General GRIBBLE. It makes nothing but good sense to replace their systems about the same time as we do.

Chairman ELLENDER. Of course it does. We are permitting ourselves to be placed in a situation similar to that which we found ourselves in during World War I and World War II, in which we furnished most of the weapons and equipment. Meanwhile our financial condition becomes yearly more critical.

PROGRESS IN 1972 NEW INITIATIVES

Mr. JOHNSON. The Army has moved out smartly on the exciting ideas represented by our fiscal year 1972 new initiative program.

TERMINAL HOMING

The results to date on terminal homing hardware confirm our belief that terminal homing will have a great impact on our future capabilities. This program is directed toward defeating enemy tanks, armored personnel carriers, field fortifications, air defense sites, and other point targets even at extended ranges. The ranges of weapons fired with terminal homing techniques will provide a capability from directly in front of the forward edge of the battle area to many kilometers in the enemy's rear area.

PROGRAM COSTS

Chairman ELLENDER. How much are you requesting for this purpose?

Mr. JOHNSON. The various terminal homing initiatives in fiscal year 1973 are for $33.3 million.

Chairman ELLENDER. The total cost of this effort is stated at [deleted]. Through fiscal year 1972, $29.0 million has been made available; is that correct?

General GRIBBLE. Yes, sir.

TECHNOLOGY UTILIZATION

Chairman ELLENDER. Is this for use in Europe?

Chairman JOHNSON. Any battle area would profit from the application of terminal homing.

General GRIBBLE. Fundamentally, sir, it is addressed to a major effort to improve the accuracy of almost all of our fire support systems.

Mr. JOHNSON. It is not a single program. It is the application of terminal homing in a number of different areas.

CONCEPT PRINCIPLES

Chairman ELLENDER. Proceed.

Senator ALLOTT. Mr. Chairman, may I ask a question. I think I I understand the principle of this. I refer to your laser illuminator. You say here, "The program is directed toward defeating enemy tanks, armored personnel carriers, field fortifications, air defense sites, and other point target even at extended ranges."

As I understand this—you should correct me if I am wrong—you have to illuminate the target with a laser?

Mr. JOHNSON. Yes, sir.

Senator ALLOTT. How do you have any assurance of illuminating targets behind enemy lines?

Mr. JOHNSON. We have two ways. One is the way we have already demonstrated at our White Sands Missile Range, which is simply to be on higher ground so that from the top of a hill or mountain you can see some distance. These are effective over long ranges.

Senator ALLOTT. They are line of sight?

Mr. JOHNSON. They are line of sight.

The second way is to be in an aircraft, either helicopter or fixed-wing airplane, so that you can be high and illuminate the target. But you must be within line of sight, or it must be, as in the case of artillery at the moment, within line of sight of a forward observer. You do not have to be within line of sight of the weapon launch point, but only from the illuminator point.

Senator ALLOTT. I understand that but I don't understand where you could find a convenient hill when you need it.

Mr. JOHNSON. You can't always.

Senator ALLOTT. And you can't always be sure that you can maintain helicopters in the air.

Mr. JOHNSON. That is why you must not rely completely on such devices. But they are very effective under a wide array of battle conditions.

UTILIZATION IN VIETNAM

Senator ALLOTT. Have these been used in Vietnam?

Mr. JOHNSON. Yes. Not by the Army, but by the Air Force, who have been using these laser designator devices in the dropping of what they call Paveway bombs. In that case, the target is illuminated, again, line of sight, from either the same or an accompanying aircraft.

Senator ALLOTT. Thank you.

REMOTELY PILOTED VEHICLE

Chairman ELLENDER. But in Vietnam you had little or no opposition from the air. Do you think it would work as well in Europe, since you have to see the target before you illuminate it?

General GRIBBLE. With the particular threat to our aircraft in a higher intensity conflict, we have another program we have not undertaken to describe this morning, which is a drone or remotely piloted vehicle which would also have the capability to designate targets, it being directed by a man on the ground in some designated position, who himself does not require line of sight.

But he can direct this drone, something like flying a model airplane, to the point where the model airplane can get within line of sight of this target and illuminate the target. But this is in the very earliest stages of our exploratory program.

Senator ALLOTT. Does this employ the radar concept?

General GRIBBLE. No, sir. It employs the laser concept.

Senator ALLOTT. How do you know what your drone is looking at?

General GRIBBLE. Well, we have many sources of intelligence. From these many sources we can determine the general direction in which we would send out the drone. On board the drone would be a small, lightweight television package, which is the easiest way to describe it.

The television scene which is acquired by that camera would be projected on a display that the operator would have in front of him. Using that display he could then trigger the laser illuminator to focus on the target.

Chairman ELLENDER. The operator could see the object from the television?

General GRIBBLE. Yes, sir.

Chairman ELLENDER. Proceed.

LASER ILLUMINATION/DESIGNATION

Mr. JOHNSON. There are five projects in the program:

The laser illuminator/designators will illuminate targets on which Army, Navy, and Air Force ordnance with laser seekers can then home. All four services are cooperating closely in this project to insure interoperability of systems. The army is working on units capable of being handheld, ground mounted, or heliborne, and which have ranges of a [deleted] meters out to distances of [deleted] kilometers, depending on the type. The feasibility of using such designators for direct and indirect fire weapons launched from the ground or by helicopter has been demonstrated in our exploratory development programs.

The fiscal year 1972 funds were used to initiate development of the handheld and the ground mounted laser illuminator/designators and the definition of the system integration for the airborne designator using common components from the ground designator system. Contractors will be award by April 1972.

Cannon Launched Guided Projectile

The cannon launched guided projectile project has as its objective the development of terminal laser guidance for 155 millimeter projectiles. Such guidance will provide the accuracy [deleted] needed to defeat stationary and moving tanks and armored personnel carriers. Contracts were awarded to provide for an operational demonstration in [deleted] of the laser semiactive 155 millimeter guided projectile. After evaluation of this demonstration, we will pursue a program to field this new projectile in [deleted].

Heliborne Fire and Forget Missile (Hellfire)

The heliborne fire and forget missile (Hellfire) will provide attack helicopters with the capability to attack stationary hard point targets up to ranges of [deleted] kilometers and moving targets out to [deleted] kilometers. To reduce cost, developmental risk, and to demonstrate system feasibility for this type missile, we have conducted a highly successful prototype flight test program using an off-the-shelf missile (Hornet) that has been modified with laser guidance.

To date, at ranges from [deleted] for example, shot number [deleted.] The round hit [deleted.] During fiscal year 1972 and fiscal year 1973, the Army plans to continue concept formulation in this program by completing cost-effectiveness studies and critical component work, and by planning flight and operational tests with the prototype missile for early fiscal year 1974 to determine mission and performance envelops and to develop doctrine and tactics. These efforts will provide a determination of the technical and operational effectiveness of the laser guided missile system. The helicopter launched missile has been nominated for tri-service use and would be applied to current and future attack helicopters.

Terminally Guided Submissiles

This project increases the effectiveness of medium range surface-to-surface missiles such as Lance or division support missiles against armored targets at ranges beyond cannon artillery. The concept is for a large warhead to bring [deleted] and conducting tests to determine technical feasibility.

Work has also been initiated on advanced infrared seekers and millimeter radiometry seekers to improve seeker accuracy. Although the technical risk in this program is moderately high, we feel that the potential of this program is worth the risk. [Deleted] are scheduled beginning in August 1972.

Radar Area Correlation

Radar area correlation increases the Pershing Ia missile system's accuracy from the present Circular Error Probable (CEP) of [deleted.] This improvement will permit the use of [deleted], thus minimizing [deleted.] The technology provides for [deleted.]

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Work is underway to demonstrate the technical feasibility of configuring radar area correlation components for missile use by fabricating such a correlator and flying it on a helicopter during fiscal year [deleted]. If this prototype program is successful, radar area correlation would, at a later date, be demonstrated on actual missile flights.

In the terminal homing program there is close cooperation among the services to insure that test, technical, and operational data are exchanged. For example, the Army's laser equipments are coordinated with the other services in technical aspects; that is, frequency and pulse width, to provide a capability for guiding Air Force weapons, such as the Paveway bomb, and Navy missiles, such as the Bulldog, in addition to Army ordnance.

AERIAL SCOUT

The Aerial Scout program will examine improvement options for the current observation helicopter with the goal of obtaining test data which will provide a basis for further research and development decisions. The fiscal year 1972 effort has resulted in contract award for the development and integration of mission configured prototypes by both light observation helicopter producers, Bell Helicopter and Hughes Tool Co. These prototypes will be used to evaluate their capability to operate around the clock in restrictive weather conditions with installed subsystems which would permit acquiring, locating, and designating targets for subsequent destruction. Prototype tests will provide the necessary data to make an appropriate decision concerning engineering development.

FORWARD AREA AIR DEFENSE

This program was initiated to improve the forward area air defense systems (Chaparral/Vulcan and Redeye) so that they could cope with the projected low-altitude aircraft threat of the late 1970's and the 1980's. The fiscal year 1972 program objective was to initiate development of a successor to Redeye, and the product improve the Chaparral guided-missile system.

A new system, Redeye II, was selected by the Army and the Marine Corps as the most promising candidate to fill the requirement for a new Man Portable Air Defense System (MANPADS). Redeye II incorporates a new seeker which will permit engagement of low-flying aircraft [deleted] a new guidance package which we believe is [deleted] a new motor which will provide the capability to engage aircraft flying at speeds up to [deleted] knots; and a new launcher. Each of the above components except the launcher has been proven in advanced development resulting in an engineering development effort of low to moderate technical risk. The project manager's office has been established and engineering development actions initiated.

In the case of Chaparral, the Army has approved a product improvement program designed to provide the Chaparral air defense system with [deleted]. This improvement, obtained by modifying the current guidance section, will [deleted]. Fiscal year 1972 R. & D. funds are being used to develop [deleted] for the new guidance section.

AIRCRAFT ELECTRONIC WARFARE SELF-PROTECTION

The aircraft EW self-protection program was initiated to provide equipments to increase the survivability of Army aircraft when operating in a sophisticated air defense environment. [Deleted.] To meet this challenge, we are considering an [deleted]. Under this concept, [deleted].

SERVICE COOPERATION

The program has been coordinated with the Air Force and Navy to preclude duplication of effort. [Deleted.]

1972–73 FUNDING

Chairman ELLENDER. How much are you asking for this program?

General GRIBBLE. It is [deleted] in fiscal year 1972 and it is [deleted] in fiscal year 1973.

Chairman ELLENDER. What progress have you made?

General GRIBBLE. Secretary Johnson just ran over some of them. The major portion of this money will be utilized in reverse engineering to develop the capability in our laboratories of building an exact replica of the [deleted].

It is deployed forward in their battle array, and it is probably the [deleted].

From that, essentially [deleted], we do believe under this program we are going to be able to build a replica of that system. That would be the major expenditure.

Mr. JOHNSON. I should point out that the whole object of building that is in order to test our countermeasures against a realistic threat and not to duplicate that for our own use.

Chairman ELLENDER. But you must have that system to know how to fight against it?

Mr. JOHNSON. That is right.

DEVELOPMENT OF OTHER DEVICES

Chairman ELLENDER. Must you have the system in hand before you can devise methods to fight it?

General GRIBBLE. There are other things we have going on. For example, we are developing a radar warning receiver which would be mounted on our own aircraft. This would give the pilot an indication that he is being painted by an enemy radar.

Being warned of that, he can take evasive maneuvers.

[Deleted.]

It is a complex business of countermeasures and counter-countermeasures that we are talking about and have been applying our efforts and resources to.

Chairman ELLENDER. What percentage of our efforts are being devoted to countering what the Russians are doing?

General GRIBBLE. All of the efforts that I have just described are oriented to that objective.

Chairman ELLENDER. Practically all of the work we are doing is directed against Russia?

General GRIBBLE. And the countries who are provided war materiel by them, sir.

Mr. JOHNSON. Our infrared countermeasures program, although not a joint program, is closely coordinated with the Navy [deleted]. We intend to continue this program in fiscal year 1973 to expand our data base and initiate application engineering for system configuration on various types of Army aircraft.

AIRCRAFT EW SELF-PROTECTION PROGRAM

Our aircraft EW self-protection program also includes [deleted] for our evaluation. If it satisfies our requirements, we will enter engineering development in fiscal year 1973. The [deleted] and we plan to award the engineering development contract by May of this year.

PROGRAMS IN SUPPORT OF THE SOLDIER

A number of signficant actions have been taken to give greater focus and attention to the soldier, the Army's No. 1 asset. These actions included establishment of the Office of the Director of Discipline and Drug Policy at Army staff level, creation of an Individual Soldier Division in the R.D. & E. Directorate at Army Materiel Command; and expansion of the Manpower Resources Research and Development Center, all geared to assist in solving soldier related problems. In addition, three boards chaired by general officers have recommended important changes in training, leadership, and soldier subsistence policies, and the Chief of Staff has established a system of special reviews of all soldier oriented programs to insure high level attention and command emphasis.

DRUG ABUSE

In the area of drugs, The Surgeon General dramatically adapted available laboratory equipment and procedures for use in the field for the identification of hard drug users.

Chairman ELLENDER. Have you made any progress in that?

Mr. JOHNSON. In fiscal year 1972, we were primarily utilizing and adapting existing equipment and techniques. We do have, as part of our fiscal year 1973 program, an effort oriented toward getting smaller, lighter and more adaptable equipment for the detection of drug abusers for use in the field to replace the complex laboratory gear we had to use quickly in Vietnam.

Furthermore, improved techniques will provide the capability to detect drugs not detectable by present procedures. It will also permit examination of the problem of multiple drug use.

Chairman ELLENDER. Proceed.

Mr. JOHNSON. The detection of drug abusers was a necessary step in quantifying our problems in order to develop a program for prevention, treatment, and rehabilitation. We have developed a pilot educational course to provide Army commanders with trained personnel to improve drug abuse prevention programs. I do not mean to imply that we have solved the drug problem—only that we have made encouraging progress.

IMPORTANT MANAGEMENT ACTIONS

A number of important management actions have been taken this year, all having as their goal a more efficient use of our total Army dollars, not just our RDTE dollars. By spending our RDTE dollars wisely we hope to effect significant Army savings in the future.

Chairman ELLENDER. Can you be specific as to the changes made that have brought or will bring about better management?

Mr. JOHNSON. Yes, and I would like to address those as the very next items in my statement.

PRODUCTION UNITS COST REQUIREMENTS IN DESIGN

Each of our new products initiated this year has had included as part of the "design to" requirements a production unit cost goal. This goal is intended to provide the scale of values against which to judge program design decisions and as an important measure of program progress. It has been pointed out, both to program managers and to contractors, that exceeding these production unit costs will begin to reflect seriously upon the ability of the Army to produce the system once developed. Such design goals have been established for SAM–D, MICV, ARSV and UTTAS, as well as four other smaller aircraft programs.

RELIABILITY, AVAILABILITY AND MAINTAINABILITY

The important effects of reliability and maintainability on life cycle costs and the availability of systems for combat has come sharply into focus this year. In the same way that unit cost requirements have been established, we have set for each of our new programs reliability, availability and maintainability goals. These are not empty promises but are backed up by recognizing that real progress in predicting, designing, and controlling these parameters has been made in the last several years.

Each program has been priced to include: significant amounts of component and subsystem testing under operating environmental conditions; user participation in maintainability through the use (early in design) of maintainability mockups; demonstration in engineering development via both test and analysis that these goals are capable of being met in the production activities.

PROPER USE OF PROTOTYPING

Much has been written about and many actions taken to apply the principles of advanced prototyping as laid out by Mr. Packard. As part of his program, we sought approval for initiation of five prototyping programs in fiscal 1972. When these funds, requested late in the budget process, were not provided, we requested approval to reprogram funds for two programs: the air defense suppression missile and target acquisition aid for Chaparral. This year we seek funds for eight additional programs as will be covered by General Gribble. We believe, however, that the use of prototype hardware to provide realism in programs is applicable in many different ways and we have structured (and will continue to do so) our new programs accordingly. SAM–D has demonstrated advanced prototypes of the missile and the radar. MICV is scheduled to approach the problem through the use of competitive prototype components through the engineering development phase.

ARSV will utilize an expanded contract definition phase with competitive prototypes of one-wheeled vehicle and one-tracked vehicle. UTTAS will have competitive prototypes of two helicopters meeting

the state of the art requirements in an evaluation based largely upon predicted unit cost and RAM performance.

The management flexibility to employ prototyping in the way that best fits a given program is a good example of dynamic Army management.

Operational Test and Evaluation

Our revised policies and procedures significantly increase the role of the user in the materiel acquisition process by establishing an operational test and evaluation capability separate and distinct from the developer. Operational test and evaluation should not be considered as a specific test but rather a continuing assessment by operational personnel of materiel from inception through production. The model for major systems development programs includes two series of tests conducted by soldiers in the field that provide specific operational test data prior to production decisions. The expanded service test provides operational test data on which a limited production decision can be made. The intensified confirmatory troop test, using production or production-like items, is then conducted in as realistic an operational environment as possible.

The goal of operational test and evaluation is to provide an independent evaluation by the user of a system's acceptability for service use, to include a validation of the related organization, doctrine, basis of issue, training requirements, and logistical support prior to a major production decision. By providing this evaluation in time to affect major production decisions, we will insure that Army dollars are not spent prematurely, and thus inefficiently, for unready systems.

Application to ARSV

Let me illustrate the application of the above management approaches to our new ARSV program.

ARSV is a three-man lightly armored, ground combat vehicle and replaces the M114A1. The ARSV will provide the Army, for the first time, with a true ground scout capability by significantly increasing mobility and through the use of advanced sensing during day and night operations.

The development program emphasizes the achievement of improved reliability and maintainability. First, early and continuous emphasis is placed on reliability, durability and maintainability, and the amount and type of component and subsystem testing required.

Minimum mission reliability and power train durability goals represent an improvement over the M–114 of 88 percent and 40 percent, respectively. Compared to the M–114, design requirements for the ARSV call for a reduction from 2.5 to 1 in maintenance time required for repair and an increase of 2 to 1 in reliability of the parts and components themselves. These improvements in maintainability and reliability combine to reduce ARSV maintenance requirements by approximately 5 to 1 over the M–114. Put another way, the ARSV will have a 90 percent system availability during periods of intense usage as compared with 55 percent for the M–114.

Second, the program requires competitive testing and evaluation of prototype vehicles as a basis for decision to proceed with the advance production engineering/limited production phase of the program. This

is particularly important in the case of ARSV, since at least one of the contender's proposals involves an articulated wheeled vehicle rather than a tracked vehicle. We will obtain experimental demonstrations of improved reliability and maintainability during prototype comparison.

Third, a goal of $116,200 for the production unit cost has been established.

Fourth, the engineering test/expanded service test, will be conducted on 17 vehicles produced on a regular hand-tooled production line. These tests will verify adequacy and quality of the ARSV produced on an assembly line.

TECHNOLOGY BASE

The Army technology base consists of the in-house and contract scientific and engineering capabilities funded by the research and exploratory development categories. We are talking here about a proposed $349 million program for fiscal year 1973, comprising approximately 17 percent of the total fiscal year 1973 Army R. & D. request. This figure compares to funding levels of $289 million in fiscal year 1971 and $324 million in fiscal year 1972.

The technology base is more vital today than ever to the future of our Army. Faced with reduced personnel levels, radically changed recruitment options, and urgent needs for improved weapons systems, we must develop up-to-date technology to insure our future capability to perform our assigned missions. The know-how for meeting these challenges must be produced in the technology base by drawing on the resources of our in-house laboratories, industry, the universities, and other scientific organizations.

In response to your guidance during last year's R. & D. presentations, we are continuing to evaluate management of the technology base. The D.D.R. & E. convened several high-level groups both within and outside of the Defense Department to assist in the evaluation. These reviews were generally favorable to our in-house laboratory system and they confirmed that several areas in which we were taking new approaches were sound.

I would like to now briefly discuss one step that we are taking to further improve the management of our in-house research and development centers and laboratories.

LEAD LABORATORY CONCEPT

As a result of our experience with the lead laboratory concept, the Army Materiel Command (AMC) has formally implemented this concept for those technologies where several laboratories are concurrently engaged in a particular technology area. Under this concept, the lead laboratory is designated as the field manager for a particular technology area.

As such, it is responsible for formulating the technology program and distributing the approved funds in its particular technology area.

The lead laboratory is also responsible for: monitoring the progress on each element in its program; identifying technological gaps and areas of undesirable duplication; insuring that results are available to potential users; and conducting technological reviews.

To date, eight research and development centers and separate laboratories have been formally designated as lead laboratories for some 12

technology areas ranging from countermine warfare to guidance and control and terminal homing.

Program Potential Savings

The potential savings of this concept can be best appreciated when one considers that these eight lead laboratories administratively consolidate the equivalent of 85 laboratory functions affecting some 79 separate projects that account for in excess of $100 million in support of the technology base.

As a specific example, the U.S. Army Materials and Mechanics Research Center (AMMRC) at Watertown, Mass., is responsible for managing some $10.3 million as the lead laboratory for materials technology. In this role, AMMRC is responsible for pulling together the R. & D. support of materials technology being conducted by Frankford Arsenal, Picatinny Arsenal, Rock Island Arsenal, Watervliet Arsenal, Mobility Equipment R. & D. Center, Aberdeen R. & D. Center, and the Missile Command Systems Laboratory.

Laboratory Community Ad Hoc Member of Project Manager Staff

The Army Materiel Command has recently formalized the requirement that a member of the collocated laboratory community serve as an ad hoc member on the project manager's staff representing the total AMC laboratory system. This individual will be in a much better position to sense when a technical problem is arising in weapon systems development. I am certain that this action, when tied to the lead laboratory concept, will significantly improve the involvement of our laboratories in supporting major weapon system programs on a timely basis.

Laboratory Management of Technical Programs Related to Systems Aquisition Process

I would like to take this opportunity to point out also that our Army laboratories do manage a significant number of technical programs that are related to the systems acquisition process. For example, Natick Laboratories manages the DOD food program, the U.S. Weapons Command laboratories manage the lightweight company mortar project, and the Mobility Equipment Research and Development Center manages the petroleum handling equipment effort which cumulatively accounts for some $10.5 million.

In summary, I feel that our accomplishments in fiscal year 1972 have been significant. We are improving the weapons acquisition process through attention to production unit costs in the design process, through increased use of prototypes, and by providing for proper operational test and evaluation.

Reliability and Maintainability of Equipment Improvement

In addition to this effort, we are taking steps to improve the reliability and maintainability of future equipment. This program should result in significant savings in maintenance costs in future years.

To improve the operation of our laboratories we have expanded the lead laboratory concept in fiscal year 1972. Many of the programs that I have reported on today will continue in fiscal year 1973. We have an

excellent research and development program planned for fiscal year 1973, and request your support.

1973 R.D.T. & E. COSTS ASSIGNMENTS OF MILITARY PERSONNEL

Chairman ELLENDER. As the record shows, the total amount for R.D.T. & E. that is requested for fiscal year 1973 by the three services is $8.7 billion. The Army's share is $2.1 billion.

The three services also have 34,300 military men who are paid out of military personnel funds, not R.D.T. & E. Of these, 10,800 are officers.

As I understand it, the Army has 8,295 military personnel assigned to the various Army R. & D. programs, of which 2,328 are officers.

These personnel costs must be added to the cost of research. Last week it was testified that about 22 percent of them actually smell powder. The rest of them are all support personnel. I presume R. & D. personnel are included in the support column?

General GRIBBLE. Yes, sir; and performing a very important function within that support complex.

Chairman ELLENDER. Having military personnel paid from the other appropriation makes it difficult to arrive at the true cost of R. & D.

General GRIBBLE. The accounting principles that have been laid down have always been, to my knowledge, that military personnel are paid out of the Military Personnel Appropriation, regardless of the functions which they perform. There has been no exception, to my knowledge, that those employed in the Research, Development, Test and Evaluation activities of the Army or other services would be paid for out of the R.D.T. & E. funds.

Chairman ELLENDER. I understand that. It has been going on for some time. In addition, there is the research operation in the Office of the Secretary of Defense, under Dr. Foster. Each of the services also has military personnel engaged in those activities.

General GRIBBLE. I believe that Dr. Foster has been required and has been responding by submitting a report to the Congress on the military personnel within the research and development complex. I don't know if that has been reported in recent months, but I believe it was last year. I have seen such a report.

ILL-ADVISED UTILIZATION OF MILITARY PERSONNEL

Chairman ELLENDER. I am told that Dr. Foster has 40 colonels working in his organization. I would hope that the Department of Defense would avoid finding civilian-type jobs for military personnel. It was indicated in testimony recently that only 22 percent of the Army's military personnel are combat forces.

There is something wrong in a system which trains men for combat and then employs them in jobs that can be handled by civilians. The service academies are expensive to operate and maintain. The fringe benefits a military man receives are expensive, too. Civilians should be used wherever possible.

PROGRAM MILITARY PERSONNEL IMPERATIVES

Mr. JOHNSON. Mr. Chairman, I believe it is essential that there be a proper coupling of what the research and development people are doing which so vitally affects the future of the man in uniform, the

fighting man and everyone else in uniform. It is absolutely necessary that that work interface and be effected by people who, in fact, have the very background that you are talking about, the fighting background.

The presence of these men in the R. & D. establishment makes certain that the work is oriented in the right direction and meets the fighting man's needs.

Chairman ELLENDER. But you get your information about that from the field.

Mr. JOHNSON. Only through these people.

TESTING NEW EQUIPMENT IN FIELD

Chairman ELLENDER. Exactly, from those engaged in the field. Why is it that that information could be not be transferred to your R.D.T. & E. activities through the civilians and let the civilians do that instead of using military personnel?

General GRIBBLE. Sir, the information coming from the people in the field you are talking about is correct. The people who are in the field giving us the information are the people counted in these totals. These people are in the field, in our centers. More than 50 percent of the 8,000 military personnel in the Army's R.D.T. & E. establishment are in the field testing new equipment that has been developed by and large by our universities, by our industrial complex, and by the civilians in Government service.

There are approximately 5,000 people in our test and evaluation centers doing that. These are people in the field, military personnel.

RESEARCH IN SURGEON GENERAL'S LABORATORIES

Another 20 percent of our 8,000 people, more than 1,600, are performing research in our Surgeon General's laboratories. These are military doctors and military corpsmen who have had military experience and, therefore, know firsthand what the problems are that have to be corrected.

Chairman ELLENDER. The treatment would be the same as in any other hospital.

General GRIBBLE. Sir, the treatment, the apparatus that is available to them, the conditions under which they operate, the traumatic nature of the wounds and the nature of the diseases are, for the most part, unique to the military environment.

SUGGESTED SUBSTITUTION OF CIVILIANS IN LIEU OF MILITARY PERSONNEL

Chairman ELLENDER. My tentative conclusion is that if there are reductions to be made in the Defense budget, one of these might well be by utilizing civilians in jobs presently held by military personnel, although civilian in nature.

General GRIBBLE. I would maintain in the two major categories that I described that those functions could not be served as well by civilians as the military. If you are developing something for the soldier, I believe the soldier must test it out and report on its suitability.

I think to have it developed by civilians and then tested and accepted by civilians, you run the risk in getting the equipment that would not be suitable for use by the soldier.

Chairman ELLENDER. Must you have as many as 34,300 military personnel of which 10,000 are officers? As was just said, there are 40 colonels working under Dr. Foster.

General GRIBBLE. Yes, sir.

AMBIGUITY RESULTING FROM NONINCLUSION IN R.D.T. & E. APPROPRIATION OF ALL COSTS

Chairman ELLENDER. And paid, not out of these funds, but out of the funds that are provided for your military personnel. That makes your R.D.T. & E., not $8.7 billion, but substantially higher.

General GRIBBLE. Sir. that information is not held covertly by either the services or Dr. Foster; it is reported to the Congress. It is reported separately and they are identified with the R.D.T. & E. function.

Chairman ELLENDER. I personally feel that the costs of all personnel dealing with Research, Development, Test and Evaluation should be included in the appropriate appropriation.

General GRIBBLE. I know, speaking for the Army, in documenting our request for fiscal year 1973 we have included a list of the personnel, where they are and what they are doing, by number.

I know that Dr. Foster reports separately to the Congress in a special report on the number of military personnel and what they do within the R.D.T. & E. establishment. I know in our Military Personnel Appropriation, which comes before your committee, these people, are identified as being engaged in R. & D. activities.

But I say that the bulk of these military personnel are in a field environment performing a function that I consider critical to the viability and health of the R. & D. program.

Senator ALLOTT. Mr. Chairman, if I may respond. I think the Chairman has a valid point in that, if you are going to look at your R.D.T. & E. costs, you also do have to consider the costs of the military personnel who are associated with R.D.T. & E.

Your civilian personnel costs are included in your R.D.T. & E. figures, are they not?

General GRIBBLE. Yes, sir.

PROGRAM OFFICER PERSONNEL

Senator ALLOTT. The chairman has brought up obliquely other questions I would like to explore a little bit. One, I gather, is that he believes that there is a disproportionate number of officers to enlisted people in this area. I would assume—and you can tell me if I am correct—that the reason for this is that, for the most part, you find among officers and not among enlisted people those disciplinary skills which are necessary to carry out an R.D.T. & E. program; is that correct?

General GRIBBLE. That is correct, sir.

Senator ALLOTT. The situation would not differ markedly from a private research organization or a university in which highly skilled technical personnel are supported by a relatively smaller group of less skilled people.

General GRIBBLE. Yes, sir.

Senator ALLOTT. Am I thinking correctly on this? Is this not true?

General GRIBBLE. I think you are thinking correctly on it. Our figures would bear you out.

Civilian Development Costs

Senator Allott. Another matter is also implicit in the discussion. I refer to cost, which is quite apart from the military personnel argument presented. Suppose a particular weapons system, such as Redeye, were developed entirely by a civilian institution of some sort. I am inclined to believe that the cost would be higher than it presently is. I am not certain. What is your opinion?

General Gribble. I would say that if each of the military personnel that would be involved from inception to completion of the Redeye II development program were replaced by civilians, the cost of development would be substantially higher and the quality of the development would be substantially degraded.

Senator Allott. I don't know that the situation prevails today that prevailed until perhaps 2 years ago. But at that time I saw young men with doctorates, but with no experience, receiving $30,000 and above per year. It seems to me that, based upon my little knowledge in this area, the actual cost might be even higher if we went that route.

Program Military Personnel Cost

But I do think the Chairman has brought up a point that is valid, in considering the amount of money for R.D.T. & E. in this budget, we also ought to consider, and at least add to it in our own minds, the cost of the military personnel who support it. It is a legitimate part of the total, even though it is separated in the military accounts. By any principle of accounting, it is a legitimate part of the R.D.T. & E. costs.

General Gribble. I would agree with that. If there are any facts you would require of us, we would be happy to provide them.

Senator Allott. Thank you, Mr. Chairman.

Chairman Ellender. All right.

Mr. Johnson. Mr. Chairman, that completes my statement. I think we are prepared to proceed with the other half.

Statement of General Gribble

Evaluation of Research and Development Requirements

General Gribble. It is a pleasure for me to appear before this committee again this year. I will present the Army's fiscal year 1973 Research, Development, Test and Evaluation budget request. In my presentation, I will highlight a number of more significant programs, providing an overview of the work planned for fiscal year 1973 and summarize the capabilities the program will provide.

There are many ways that we can look at the Army's R. & D. programs. A logical starting point is the threat, from which most R. & D. requirements emanate. An analysis of foreign Army doctrine and materiel reveals insights into what we must accomplish and the equipment that is necessary to maintain tactical superiority on any future battlefield. We monitor continually the technological activity of our potential enemies so that we can predict the areas of emphasis and new capabilities that they are seeking. Thus, the threat of some future battlefield confrontation dictates the maintenance of a responsive technological base and generates R. & D. requirements for our materiel developments.

ENEMY CAPABILITIES

Today I would like to discuss some of our more significant R. & D. objectives by first examining some capabilities the enemy can achieve, and then showing how our R. & D. programs compare. Such a review will accentuate the requirement for weapon systems the Army considers essential to accomplishing its mission. It will also highlight areas where currently approved programs fall short, thus posing a requirement for increased effort.

BALLISTIC MISSILE DEFENSE

The increasing ballistic missile threat from the Soviet Union and the approaching capability of the People's Republic of China (PRC) to deploy such a weapon system require that we maintain a dynamic research and development program for ballistic missile defense (BMD). The PRC is well into the development of system components for an ICBM capable of attacking soft targets in the United States [deleted]. The Soviet threat expansion may include not only an increase in the number of ICBM's and SLBM's in both single and multiple warhead configurations, but qualitative improvements such as increased accuracy, depressed trajectory and penetration aids. As these foreign capabilities appear, our own strategic retaliatory forces, the National Command Authorities, and the urban and industrial areas of the Nation will become increasingly vulnerable.

In order to insure a future U. S. capability to counter ballistic missile threats greater than those for which Safeguard and Site Defense of Minuteman are designed, the Advanced Ballistic Missile Defense Agency (ABMDA) conducts an advanced development program to formulate and analyze new concepts of defensive systems and then to broaden the technology base which would be needed to support the most promising of those systems.

IMPROVED TANK/ANTITANK SYSTEMS

We all share the great concern over the numerical superiority of Soviet and Warsaw pact tanks compared to NATO central region with more than a [deleted] numerical superiority over allied forces. The Soviets have continually improved their tanks, and recently introduced a new medium and light tank. To overcome these shortfalls, we are upgrading the M–60 series tanks, and, in consonance with guidance of the 92d Congress, are restructuring our tank development program.

We are also developing a variety of antitank systems. The TOW, a heavy antitank weapon, has been fielded and the Dragon, a medium antitank weapon, is scheduled for deployment in early [deleted]. These systems [deleted] the effective range and hit probabilities of current infantry antitank systems.

Improved artillery munitions are being developed such as cannon launched guided projectiles and terminally guided submissiles that will improve the accuracy of artillery fire and will acquire, lock on, and guide into hard point targets.

We also attach great importance to developing the advanced attack helicopter, which will give us the capability of defeating tanks

with a system that can be quickly deployed to critical areas of the battle field, free of the normal constraints of terrain.

IMPROVED MOBILITY SYSTEMS

We expect that offensive action by mobile forces will dominate any future conflict in Europe. Soviet doctrine and organization stress high-speed attack and deep penetration. With an M-day force of [deleted] facing us in the NATO central region, we would expect warfare reminiscent of the large World War II battles, but with an even greater tempo because of Soviet emphasis on ground and air mobility.

In addition to their new medium tank the Soviets have developed a [deleted]. To offset the advances in ground mobility, we are developing the XM–800 armored reconnaissance scout vehicle and the mechanized infantry combat vehicle armed with the Bushmaster automatic cannon.

To upgrade our present helicopter lift fleet, we are developing the utility tactical transport aircraft system (UTTAS) and a heavy lift helicopter (HLH). The UTTAS will lift an infantry squad as a tactical unit. The HLH will significantly increase our ability to lift armor, mechanized infantry vehicles, artillery, engineer bridging equipment, and containerized cargo.

We cannot match the Warsaw pact forces in quantities of all types of equipment; therefore, we must maintain a qualititive edge to include improved reliability, availability, and maintainability. The ground and air mobility programs are both geared to reduce support costs and effort.

IMPROVED AIR DEFENSE SYSTEMS

Because of the technological progress of our potential enemies, we are likely to be confronted by a numerically superior fighter/bomber force equipped with electronic countermeasures. Arrayed with this force will be tactical missiles and rockets with both nuclear and conventional warheads. [Deleted.] The SAM–D, systems, employing phased array radar will possess the multiple engagement capability, resistance to electronic countermeasures, lethality, and system realiability to meet the medium and high-altitude threat. The recently deployed Chaparral, Vulcan and Redeye systems provide short-range air defense against aircraft that penetrate at low-altitude below radar coverage. We are also taking measures that will improve our low-altitude air defense capabilities by upgrading the performance of Chaparral and Vulcan and by development of a new man portable missile system to replace Redeye.

[Deleted.]

IMPROVED MUNITIONS AND DELIVERY SYSTEMS

The Soviets have a [deleted] edge in field artillery weapons, both in numbers of weapons and range capability. [Deleted.] These factors dictate a requirement for significant improvements in U.S. ammunition and weapons. Near term improvements to range defi-

ciencies are rocket assisted projectiles and a new tube for the self-propelled 155-millimeter howitzer. These improvements will not completely achieve the ranges of comparable Soviet artillery; therefore, for the longer term a new 105-millimeter howitzer and 155-millimeter howitzer are being developed to satisfy the range and maneuver requirements of the 1980's. The Lance XM–251 conventional warhead which contains a large number of the Air Force BLU–26 antilight material bomblets, has been spectacularly successful in recent tests against a [deleted].

SURVEILLANCE, TARGET ACQUISITION AND NIGHT OBSERVATION

The ability of a large, highly mobile force to assemble and attack under cover of darkness or low visibility could be critical to the outcome of a battle. We should be able to locate and neutralize such a force under adverse conditions of visibility. We know that Soviet doctrine and training places great emphasis on night operations, and they have developed infrared devices for major items of equipment.

Because of these capabilities the surveillance, target acquisition, and night observation (STANO) program is highly important. Our program has continued to advance night vision technology. We have developed an effective family of short- and medium-range surveillance radars, designed to detect personnel and vehicular targets. At this time, however, we do not have an effective capability to locate hostile indirect fire weapons accurately; therefore, we have recently accelerated development of countermortar and counterbattery radars. A wide variety of unattended ground sensors is also being tested. To complement these systems, we are examining the feasibility of unmanned aerial surveillance systems to assist in accurate target location and to provide tactical intelligence under all battlefield conditions.

TACTICAL COMMUNICATIONS

The Soviets have been very active in developing strategic and tactical communications systems. They have developed techniques for [deleted]. Our objective is to develop a multichannel communications system with common equipment and procedures for use by all services and our allies. To this end, we are developing digital transmission, trunking and switching facilities to provide reliable interface with tactical, strategic, and civil systems. Major efforts are being devoted to developing electronic counter countermeasure techniques to reduce the susceptibility of our command, control and communications systems. This is a major factor in the development of the tactical radio communication system, the Army's new tactical radios for the 1980's.

We consider electronic warfare to be an integral part of military operations. In each of the previous R. & D. objectives that I discussed, there are electronic warfare implications and developments associated with particular weapons systems. We also have general support electronic warfare equipments [deleted]. Our enemies depend heavily, as do we, on low-powered tactical FM radios for the control of their tactical units. For example, we estimate that on a typical [deleted]. These nets are extremely vulnerable to electronic warfare operations, and disrupting them would seriously degrade the conduct of opera-

tions by the higher commands. [Deleted]. Our fiscal year 1973 new initiative, which I shall discuss in detail later, is designed to provide the [deleted].

PROTOTYPES

Mr. Johnson has already described our overall prototype program, so I will restrict my comments to the eight projects that we have incorporated in our fiscal year 1973 program.

AIR DEFENSE SUPPRESSION MISSILE

The objective of this prototype effort is to demonstrate a dual sensor mounted on an existing missile as a helicopter launched air defense suppression missile for the air-to-ground attack of antiaircraft systems. The missile will be designed to [deleted] air defense system in the forward enemy area. At the present time, there is no system in the Army inventory designed to accomplish this mission. This effort is important in order to reduce helicopter vulnerability by providing an onboard air defense suppression capability when operating in an environment of enemy radar-controlled antiaircraft guns. The basic missile for this demonstration will be either the present Redeye missile or the 2.75″ folding fin aerial rocket. The new technology is the missile sensor which consists of a [deleted]. It will have the capability of initially guiding the missile with the [deleted]. The technological risk of this effort is considered moderate; however, the increased capability provided is considered to be worth the risk. We are requesting $2.9 million to support this program in fiscal year 1973.

ELECTRONIC WARFARE EQUIPMENT

The objective of this program is the development of a [deleted] tactical communications electronic warfare system. The purpose of the system is to provide the [deleted]. The Army considered this program to be so important that fiscal year 1972 funds were reprogramed to provide for an early initiation. These funds are being used to develop the final detailed system specification to be included in the development contract that we intend to award in fiscal year 1973. We are requesting $12 million in fiscal year 1973 for this effort.

THERMAL SIGHT FOR M60A1

In fiscal year 1973 we plan to initiate the prototyping and feasibility testing of a simplified thermal sight for use in the M60A1 tank. It is anticipated that the sight will be mounted entirely inside the tank turret and will be fully integrated into the tank fire control system. The sight will provide the tank crew with an improved capability of detecting and engaging targets during darkness, where there is no natural light; and during daylight, when the target is obscured by smoke or dust. The early prototyping and feasibility testing of this sight will permit the acquisition of data pertaining to the operational

employment of such a device as an integral part of the tank fire control system. The resulting data will be available for use not only in the M60A1 tank product improvement program, but also in the Army's new tank program. This will be a two-year program, and will require $2 million in fiscal year 1973.

REMOTELY PILOTED AERIAL OBSERVER/DESIGNATOR SYSTEM [deleted] (KM)

The remotely piloted aerial observer/designator system is a small, low-performance drone system for use over enemy forward areas where the loss rate of manned aerial observer aircraft would be unacceptably high. The system consists of a remotely piloted drone carrying television cameras which are monitored at a ground control station. When targets appear on the screen, personnel on the ground activate lasers on the drone which illuminate the target for attack by laser guided weapons. The system operates out to [deleted] kilometers from the ground station, which will permit target acquisition and artillery adjustment for the division tube artillery. This prototype program includes manufacture of the drone and the necessary control and display equipment.

Two competitive prototype contracts will be initiated in fiscal year 1973. This first year's effort is oriented primarily toward the fabrication and flight testing of competitive prototypes of the airborne subsystem, which includes the integrated television sensor and laser designator. The funding required to accomplish the planned fiscal year 1973 work is $7 million.

IMPROVED FIRE CONTROL FOR LOW-ALTITUDE AIR DEFENSE SYSTEMS

The purpose of this program is to improve our current Chaparral and Vulcan low-altitude air defense systems. Since target detection, identification and tracking must all be accomplished visually, these systems are limited to daytime, fair weather operations. Additionally, Vulcan's [deleted] limits its effectiveness against high-performance aircraft.

The first part of the program will involve the development and testing of an experimental prototype gunfire control system. This effort will focus on obtaining smooth tracking, an increased hit probability, and determining by hardware test and evaluation the achievable increase in system effectiveness. The second part of the program is to procure and test several different forward looking infrared type night vision devices which could provide Chaparral, and possibly Vulcan, with the capability to engage targets at night and during periods when weather obscures visibility. We are requesting $7 million for this prototype program in fiscal year 1973.

FORWARD AREA TACTICAL SURVEILLANCE SYSTEM (60 KILOMETERS)

This prototype is a simple, high performance drone system that will provide point or small area surveillance to a distance of 60 kilometers. It will carry either an aerial camera or an infrared line scan imaging system. Preprogramed flight will be used to simplify the drone control and to reduce electronic countermeasure vulnerability.

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The high-speed and short-flight duration provide a good forward tactical surveillance capability with the timely availability of intelligence information. By procuring development models of the Canadair CL–89 surveillance drone system, currently under production for NATO countries, and fabricating an improved version under a cost sharing arrangement with the Canadian Government, the time and cost is expected to be less than one-half that required for a new development.

Our fiscal year 1972 program is to procure the basic CL–89 drone system with ground support equipment, and to train the personnel to operate the equipment. The fiscal year 1973 program will be the flight test of the basic system, development and procurement of the CL–289 improved system, and the development of subsystem prototypes to provide the improved capabilities for forward area use. The funding required to accomplish the planned fiscal year 1973 work is $5.5 million.

Heavy Lift Helicopter

Mr. Johnson has discussed the DOD HLH program in some detail; therefore, I will limit my remarks to the prototype program.

In January 1972, the Department of Defense approved the development, through the prototype stage, of a 22.5 ton heavy lift helicopter to meet the land based heavy lift helicopter requirements of all services. The advanced technology component development program, initiated in June 1971 with the signing of a contract with Boeing-Vertol, will provide the components (rotor, transmission, flight control system) to be used in the prototype.

The purpose of the prototype will be to not only demonstrate that the major technical problems have been solved, but to also demonstrate that the HLH will satisfy the land based mission requirements of all services. The decision to enter engineering development will be based on an analysis of the results of the prototype flight test program. We are requesting $15 million to support the HLH prototype in fiscal year 1973. In addition, we are also requesting $38 million to continue the advanced technology component development program.

Tilt Rotor Research Aircraft Program

This joint Army/NASA program was initiated to develop a prototype aircraft to demonstrate that current technology is adequate for the development of useful commercial or military tilt rotor aircraft. The tilt rotor concept combines the hover efficiency and maneuverability of the helicopter with the performance and productivity of a fixed-wing aircraft to meet DA approved and anticipated future aviation requirements. The prototype aircraft will be used for investigations, throughout the flight envelope, of tilt rotor aerodynamics, structural and environmental characteristics, military mission compatibility, aircraft handling and control qualities and V/STOL avionics applications. Currently there are two parallel preliminary design and program plan studies in progress to develop a request for quotation for the tilt rotor aircraft program. We have requested $3 million in fiscal year 1973 to continue this program. A detailed statement of work and specifications will be written for a request for quotation that will be released to industry in April 1972 for the design and fabrication of two tilt rotor aircraft. Source selection and contract award will be made by the beginning of the third quarter fiscal year 1973. First hover flight is scheduled for April 1975.

NEW INITIATIVES

Our new initiative program consist of five projects designed to exploit new ideas and expedite ongoing projects that will produce significant results within a short period.

R. & D. Support of Dynamic Unit Training

Research and development in support of dynamic unit training can be categorized as research to improve training methods, adopt advances in training techniques, and devise innovations in military unit training management. "Dynamic unit training" means realistic, mission oriented training conducted by an Army unit.

The Army will more thoroughly train the soldier by supplementing school training with more extensive training by the unit of which the soldier is a member. This will lead not only to more proficient individual soldiers but also to confident, smooth functioning units. This approach raises the question of how to assure high-quality training by the military units.This research and development effort will seek answers to these and other questions on how best to manage this new decentralized unit training. Especially important is the development of reliable and valid methods for measurement of unit proficiency. The program will also emphasize the adaptation of new educational technology to unit training and the development of training devices designed to fulfill team and unit training needs. We are requesting $2 million for this program in fiscal year 1973.

Meteorological Satellite Applications

Meteorological satellites are now acquiring horizontal resolution and developing the capability of making vertical sounding of the atmosphere. The combination of these two developments enables us to use satellite meteorological data to support tactical operations. Particularly relevant is the capability to acquire a real-time integrated weather picture of the atmosphere over friendly areas, to survey weather conditions over enemy held areas, and to provide a short-range forecast tool to support tactical operations. The capabilities will lead to vastly improved weather forecasts and measurements of atmospheric parameters for use in meteorological corrections for artillery fire, sound ranging, helicopter operations, surveillance, target acquisition, and night operations. For the artillery there is the potential that upper air measurements of temperature, density, and wind will be continuously available along the entire trajectory rather than, as at present, at a single point every 2 hours.

Work planned for fiscal year 1973 includes an investigation of the application of this new capability for Army tactical operations. A contract will be let for equipment to assemble a ground receiving station capable of receiving real-time information from existing and planned weather satellites. The fiscal year 1973 fund request is $1.7 million.

Battlefield Cover and Deception

[Deleted.]

During World War II good optical camouflage and rubber dummies were effectively used to deceive and deny intelligence to the enemy concerning our tactical operations. Sophisticated sensors cannot be fooled by optical camouflage and rubber dummies. A simulated truck must

look like a truck to infrared and radar sensors, as well as to the eye, to be a tactically effective decoy. The technology is available today to permit the development of effective battlefield electromagnetic cover and deception systems to minimize this highly lucrative source of intelligence. The Army's fiscal year 1973 new initiative for battlefield cover and deception will include the development of the following classes of devices: [deleted].

The funding requested for this program in fiscal year 1973 is $1.5 million.

INNOVATION IN HIGH-ENERGY LASERS

This program will initiate work on an exploratory development high-energy chemical laser device. The laser will have an energy output of [deleted] of power; believed suitable for effectiveness [deleted]. Chemical lasers have the greatest energy per weight potential of any known high-energy laser [deleted], however, the technology of the chemical laser is the least advanced of the high-energy laser sources. This program will initially address the technology of high-energy chemical lasers: fuels, pumps, laser cavities, expansion nozzles, parameters such as temperature, pressure, and fuel characteristics, and ecological considerations. We are requesting $6 million in fiscal year 1973 for this effort.

IMPROVED PERSHING

The current Pershing system in NATO has the mission of a quick reaction, deep strike, nuclear interdiction system. The desirability of defeating [deleted] limits the usefulness of Pershing. Pershing can be improved to meet the stringent requirements with moderate technical risk and at minimal cost, when compared to developing a new deep strike interdiction missile system. The improvements include reducing the time required to launch [deleted] by use of a switching central; an automatic azimuth laying system to achieve an autonomous system independent of manual survey means; and improved accuracy [deleted] by use of radar area correlation terminal guidance. The reduction in reaction time and automatic azimuth laying will improve the system's tactical utility and survivability. The [deleted] Circular Error Probable will allow the use of a [deleted].

Our fiscal year 1973 request of $8.2 million for Pershing will provide $4 million for the start of a 2-year development program on the switching and automatic azimuth laying systems and will provide $4.2 million to complete the development of the improvements started in fiscal year 1970 to increase the prelaunch reliability of the system.

Radar area correlation terminal guidance is currently funded in terminal homing with completion estimated in [deleted]. Upon successful demonstration of feasibility, this part of the Pershing fiscal year 1973 new initiative program is scheduled to enter engineering development in [deleted].

BUDGET REQUEST

Our fiscal year 1973 R.D.T. & E. budget request is for $2,068.7 million. Shown on the chart below is this program compared with that for fiscal year 1972 by the eight budget activities.

R.D.T. & E. BY BUDGET ACTIVITY

[Dollars in millions]

Budget activity and title	Fiscal year 1972	Fiscal year 1973
1—Military sciences	186.1	205.5
2—Aircraft	176.0	247.1
3—Missiles	895.9	964.3
4—Military astronautics	10.8	18.9
5—Ships	0	0
6—Ordnance	187.0	189.1
7—Other equipment	360.7	385.0
8—Management and support	62.3	58.9
Total[1]	1,878.7	2,068.7

[1] Will not add due to rounding.

The fiscal year 1973 increase is attributable to the addition of the new initiative and prototype programs, increased emphasis on our technology base, and peak funding for a number of major weapon system developments. I have already addressed the new initiative and prototype programs. For the remainder of my presentation, I will discuss selected efforts in each of the budget activities.

MILITARY SCIENCES

This program supports research and exploratory development in the physical, engineering, environmental, and medical sciences, as well as work related to Army manpower resources. The objectives are to discover and understand new ideas and concept in Defense-relevant research areas, and then exploit those that will give us improved and needed technology for military use. Among the strong reasons for continued Army research and exploratory development are:

The maintenance of the continuity of effort required to conceive and develop the advanced weapons systems needed by the Army.

The maintenance of competent in-house staffs that can direct, monitor and assess the performance of contractors performing basic and applied research.

The maintenance of a capability in both research and materiel development to improve existing weapon systems.

The fiscal year 1973 request of $205.5 million for budget activity 1 represents approximately 10 percent of the total fiscal year 1973 Army R. & D. request. This represents a $19 million or 10 percent increase over fiscal year 1972 funding.

One principal area of increase is Defense research sciences, up $6 million for increased effort in electronics, materials, biomedical, behavioral and social sciences research. A second is civil engineering techniques, increased by $5 million to exploit antipollution technology. A third is military manpower resources techniques, up $4 million to improve soldier-oriented programs.

The final program with a significant increase in funding is biomedical investigations, up $7 million, primarily in the drug abuse research area. Examples of our work in this activity are:

BIOMEDICAL INVESTIGATIONS

This research program is one of our soldier-oriented programs. Work planned for fiscal year 1973 encompasses studies of the effects of new suppressive drugs for the treatment of diarrheal diseases, and production and testing of vaccines against diseases of military importance such as malaria and hepatitis. Medical aspects of the identification, treatment and rehabilitation of drug users are other important fiscal year 1973 projects. The required funding requested for fiscal year 1973 is $37 million.

MILITARY MANPOWER RESOURCES TECHNOLOGY

The scope of this program includes research on the problems of race relations, youth dissent against the military, motivation and incentives to military service, military training leadership, human performance, psychological measurement, personnel classification and psychological operations.

These are some of the most pressing problems within the Army community. Our program of drug research will concentrate on such problems relating to drug abuse as the causative factor, and methods of combating drug abuse through unit training programs. These investigations are closely linked to the programs of the Surgeon General and do not duplicate research being conducted by the other services.

Our race relations research program attempts to identify problems contributing to conflict or tension in interpersonal relationships within the Army. The objectives are to develop experimental training programs to reduce conflict and tension and a Commander's Handbook or guide to assist in the recognition of conflict situations and racial problems within the unit. We have requested $12 million for this program in fiscal year 1973.

POLLUTION CONTROL

On February 4, 1970, the President issued Executive Order 11507 to further the purposes of the Clean Air Act, the Federal Water Pollution Control Act, and the National Environmental Policy Act. The Executive order directed that the Federal Government provide leadership in the nationwide effort to protect and enhance the quality of our air and water resources. The Executive order stated that actions to correct air and water pollution from Federal sources are to be completed or underway no later than December 31, 1972.

Plans for fiscal year 1973 include the continued development of processes for biological degradation of Army waste products, as well as other processes for treatment of wastes; search for improved methods of reducing noise levels in Army helicopters and VSTOL aircraft; methods of prevention of radiation hazards from laser devices; and adaptation of existing commercial items for Army pollution abatement purposes. We are requesting $11 million in fiscal year 1973. An additional $10 million will be requested in other programs.

AIRCRAFT

This budget activity provides for development of aircraft and related equipment to support the Army's air mobility concept. In order to maintain an effective battlefield air movement capability in the

future, we have given air mobility our highest R. & D. priority. To support this broad program in fiscal year 1973, we have programed $247.1 million; 12 percent of our entire R. & D. budget request. Before highlighting two of the more significant programs, I would like to mention generalized areas of effort which individually do not represent large expenditures of dollars, but which collectively represent a significant portion of the aircraft budget request. In the area of survivability, we are looking at infrared suppression, noise reduction, armor protection improvements and camouflage. Our interest in safety is a continuing effort to protect lives and to reduce the high cost of accidents. Our experience in crashworthy fuel systems has been so successful, we are expanding this effort to include systems for the CH–54 and all future aircraft. We are also aware that we must be able to operate our aircraft at night and in poor weather conditions to improve our combat effectiveness. We have several programs looking at night vision equipment for fire control and low-level navigation.

Avionics programs are directed toward improving communications and navigation which impact on survivability and our ability to function as members of the combined arms team. Research in weapons is directed toward improvements of both area and point target weapons. Reliability and maintainability efforts reduce maintenance costs and manpower requirements. Improvements in ground support and diagnostic equipment will improve the overall availability of our aircraft. Research into new areas of technology includes the tilt prop prototype efforts with NASA, advancing blade concept prototype, and several areas of engine component demonstrations.

Past efforts in research of demonstrator engines have led us to the present development of the engines for the UTTAS. Continued efforts to improve stability, control, maneuver, and performance of our helicopters are included in the research category. Also funded under this budget activity are efforts to improve our airdrop capability from Air Force aircraft. I would now like to highlight two of our specific aircraft development programs.

CHEYENNE

The Cheyenne continues to be of great importance to the Army by adding to our inventory of weapons an advanced aerial fire support system.

Chairman ELLENDER. As I said this morning, there is no doubt that you want the Cheyenne.

General GRIBBLE. Yes, sir. We want an advanced attack helicopter system. The Cheyenne has been working well. What we are taking a look at is to see whether or not——

Chairman ELLENDER. If you would have to choose between Cheyenne and the A–X, you would want the Cheyenne?

General GRIBBLE. Yes, sir.

Chairman ELLENDER. That is all I want to know, because we are trying to eliminate one of them.

General GRIBBLE. The Cheyenne will provide a highly responsive, 24-hour-a-day weapon system to the ground commander to assist him in defeating mechanized and armored forces. No other attack helicopter in the current Army inventory—or in the entire world, for that matter—can achieve the capabilities of the Cheyenne.

Of the $53.6 million requested for fiscal year 1973, $17.1 million are required to complete the development of the Cheyenne to include the advanced mechanical control system. This rotor control system will overcome control problems experienced at high speeds and maneuvers and enable us to utilize the full potential of this aircraft. The remaining $36.5 million are required to obtain three additional, fully equipped, prototype representatives of production aircraft.

Possible Production Upon Satisfactory Evaluation: Cost Reduction Imperative

Chairman Ellender. Is it your considered judgment that, as soon as you evaluate the performance of these prototypes, you would be ready for production?

General Gribble. I think we will be ready to include in our fiscal year 1974 program, depending on the results of the evaluation which Secretary Johnson described to you——

Chairman Ellender. You refer to cost?

General Gribble. Yes, sir.

Chairman Ellender. If the cost is too high, you won't——

General Gribble. Yes, sir; we would not be coming to the Congress requesting procurement funds.

Chairman Ellender. What limit would you put on that cost?

General Gribble. Sir, we are approaching it in a different way. The Cheyenne is estimated, we will say, the cost per unit, at approximately $4 million. The airframe and the dynamic components, just to fly it away, cost a relatively small fraction of that, such as maybe 40 percent, maybe $1.6 million. So the bulk of the cost of the Cheyenne lies in the equipment that it carries in order to perform its mission.

Now, this cost lies in the fire control system, in the gun, in the missiles, in the rockets, in the size of the fuel tank, in the radar warning receivers to help reduce its vulnerability to air enemy defense. We know what those systems will do; we know what those systems will cost, but we don't know quantitatively what their value is in combat.

Cost Evaluation in Simulated Combat Environment

What we are attempting to do through a combination of realistic testing and evaluation in a simulated combat environment, reinforced by a very sophisticated methodology to examine costs, as well as value and effectiveness, is to make a determination whether every single one of those features which are identified with that Cheyenne system are worth to us in the field the cost we have to pay for it on the production line.

That is the very severe program that we are undertaking to resolve between now and the fall of this calendar year.

Possible Alternative Program

Depending on the outcome of that, we will be before your committee next year either seeking production authority of Cheyenne or describing to you what we proposed to do in the advanced helicopter attack program, if it turns out to be something other than Cheyenne.

Chairman ELLENDER. As you stated this morning, you might want to take existing helicopters and improve them.

General GRIBBLE. Yes, sir.

TERMINATION OF PRODUCTION CONTRACT AND RESTRUCTURING R. & D. CONTRACT

Chairman ELLENDER. Why didn't you do that to begin with? Why go into development of a new one, particularly when you are doubtful, as I understand it, that this could be done? As I recall, you had to cancel the Cheyenne production contract.

General GRIBBLE. We terminated a contract; yes, sir.

Chairman ELLENDER. That cost a lot of money. Did you lose substantially?

General GRIBBLE. No; we restructed that contract and are continuing.

Chairman ELLENDER. With the same people?

General GRIBBLE. With the same people, with the Lockheed Corp. and with their subcontractors.

The contract which was terminated was a production contract, not the research and development contract. The research and development contract is continuing. It required, however, as a result of litigation with that corporation, a restructuring of that contract. But, essentially, we have the same development time.

The Cheyenne has proven to be a technical or developmental success, and we have the major problem facing us now within the next few months of making a determination as to whether or not we are going to seek from the Congress the authority to produce that gunship or not.

POSSIBLE UTILIZATION OF OTHER RECENTLY DEVELOPED AIRCRAFT

Mr. JOHNSON. May I clarify something in respect to your question on why didn't we grow on existing aircraft rather than to start Cheyenne. The aircraft that could possibly be built upon to do this mission are in themselves very recent aircraft and they only exist as one of a kind. We could not grow on our present attack helicopter, the Cobra. It is too small and does not have enough capability.

But there has been built recently a single helicopter called the Black Hawk and a single configured airplane called the King Cobra. Both are much bigger than the existing Cobra.

So any machine other than the Cheyenne, which has a chance of performing this mission, would be essentially a new machine built upon either the Cheyenne or these very new aircraft.

CAPABILITY REQUIREMENT

Chairman ELLENDER. Is the chief virtue of the Cheyenne that it can carry the TOW missile?

Mr. JOHNSON. That is one of its virtues. It also carries a 30-millimeter gun which is very effective against armored personnel carriers or other machines which are part of an armored column.

So, in conjunction with the electronic equipment which gets you to the right place, points both the gun and missile correctly, and does it at night as well as in the daytime, that is the equipment that was being

discussed by General Gribble and it is that equipment which can be possibly shrunk or modified could be installed in any of the machines.

So that the only possibility of saving money is in a smaller airframe itself.

Production Contract Cancellation Cost

Chairman Ellender. You talked about canceling out a production contract.

General Gribble. Yes, sir.

Chairman Ellender. What did that cost us? I have a figure of $135 million. I presume this is a case where you initiated a production program before the development was completed. Am I correct?

General Gribble. We initiated production before development was thoroughly completed; yes, sir.

Mr. Johnson. The $135 million is correct.

Chairman Ellender. I am not going to go into that. We don't seem to produce in proportion to what we spend, by any means.

General Gribble. We have not certainly to date on that program.

Chairman Ellender. I refer to all of the services, not the Army in particular.

Senator Allott. When was the original contract made on this?

Mr. Johnson. 1966, I believe.

Absence of Production Contract

Senator Allott. And you have no contract now for the production of these?

General Gribble. No, sir; we do not.

Senator Allott. And you are not committed to production?

General Gribble. No, sir.

Senator Allott. And will not be until a decision is made by the Secretary in September of this year?

General Gribble. In time to be incorporated, if he makes an affirmative decision, in the fiscal year 1974 budget request.

Promised Aircraft Selection

Chairman Ellender. I wish to add for the record, since you raise a question, that while Mr. Packard was here, I pointed out to him that there was a contest between the Air Force and Army.

Senator Allott. I remember that.

Chairman Ellender. And Mr. Packard said in my office that a production decision would be made, I thought, during this fiscal year. Now it turns out that they need more development work on it.

I was under the impression that a decision would be made. But as both General Gribble and the Secretary stated, they have made up their minds that the Cheyenne is what they want, provided it doesn't cost them too much. We will end up with both types of aircraft, I presume.

Proceed.

Cheyenne Prototype Program

General Gribble. The prototype program is especially important and has the following objectives:

To consolidate technology gained during the Cheyenne developmental program into flyable systems.

To provide an opportunity to collect valid operational performance data with an integrated weapon system.

To provide reasonable continuity of effort on the Cheyenne program, while preserving the option to build on the experienced gained.

In consonance with DODI 5000.1 we plan to dedicate these three aircraft to early and complete operational testing. Even though the development of the Cheyenne will have been completed with fiscal year 1973 funding, the prototype test program will require fiscal year 1974 R. & D. funds for continuation of tests.

The fabrication of these aircraft will provide the best means for obtaining early test data of serviceability and operational suitability of the Cheyenne prior to a substantial production commitment. We believe that these prototypes are essential to fully implement the "fly-before-buy" concept.

1972 Cost Effective Reevaluation of Material Requirement Document

It is appropriate to mention that, in the second half of fiscal year 1972 and parallel to the previously mentioned Cheyenne work, we are conducting a reevaluation of the materiel requirement document for an advanced attack helicopter to insure that the most cost-effective hardware is procured and that it is not overdesigned or underdesigned in any way.

Contributing to this total analysis will be the testing and evaluation of two industry sponsored experimental attack helicopter prototypes. This revaluation effort is planned to be complete in July 1972.

Utility Tactical Transport Aircraft System (UTTAS)

The UTTAS is a new twin-engine helicopter that will replace the UH–1 in the helicopter assault lift tactical units. The primary UTTAS mission will be to transport troops and equipment into combat; to resupply these troops while in combat, and to accomplish the associated functions of aeromedical evacuation, repositioning of reserves, command and control, and other combat support.

Chairman Ellender. What helicopter will this replace?

General Gribble. The Huey.

Chairman Ellender. You want a larger helicopter?

General Gribble. Yes, sir; we want to do several things. The UH–1, which we are now using, is based on early 1960 technology. It was a technology which was produced during the peak years of Vietnam. Going into the 1980's, that will be an old bird in terms of the age of the aircraft in our inventory and the age of technology on which it is based.

In addition to that, it has several severe limitations. We would like in combat to preserve the combat integrity of the infantry squad. That is our fundamental fighting unit. We cannot do that with the UH–1. We will be able to with the UTTAS.

UH–1 Vietnam Service: Losses

In addition to that, the UH–1, a very sound and good flying machine that has done yeoman service in Vietnam, has been very, very

costly to keep in our inventory because of the problems related with the high cost of maintainability.

We are hoping in the UTTAS to make major improvements that will reduce the cost of maintaining it in the field, making more accessible the things that have to be maintained by the soldiers and making less costly the components that have to be replaced in the depots.

Chairman ELLENDER. As I recall, there were quite a few of them shot down.

General GRIBBLE. Yes, sir; there were.

Chairman ELLENDER. How many?

Furnish that information for the record.

(The information follows:)

In the period 1 July 1965 to 31 December 1971 the Huey troop carrier, UH-1D or H, performed as follows:

Combat sorties	16,602,085
Aircraft hit by ground fire	12,247
Aircraft downed by ground fire	1,358
Aircraft lost to ground fire (lost to inventory) (Included in above figures)	594

Chairman ELLENDER. Would you improve that feature of it so that it would be less vulnerable? Is there any defensive system on it?

General GRIBBLE. Not anything that would distinguish it from the Huey.

AIRCRAFT COST AND PROGRAM SIZE

Chairman ELLENDER. The cost to produce the UTTAS would be [deleted].

General GRIBBLE. Yes, sir; considering the total acquisition cost. The [deleted] figure pertains to production aircraft and includes development costs, spare parts, etc.

Chairman ELLENDER. How many will be required?

General GRIBBLE. [deleted], sir.

1973 UH-1 PROCUREMENT BY AIR FORCE FOR REPLENISHMENT OF ARMY INVENTORY

Chairman ELLENDER. Are you still producing some of those you now have on hand?

General GRIBBLE. No, sir. I believe the Army production has just about ceased on the UH-1.

General KJELLSTROM. The Air Force has a requirement for replacing Army inventory for the U-1, and they have a number for procurement. Otherwise, the Army would have a requirement in our procurement appropriation this year for the UH-1.

Senator ALLOTT. That is the 120?

General KJELLSTROM. That is the 120 included in the Air Force request.

Chairman ELLENDER. These will not be provided to the Vietnamese, will they?

General KJELLSTROM. Largely the Army provided the aircraft to the Vietnamese Air Force out of our inventory. The 120 that the Air Force are procuring are for replacement of these.

Chairman ELLENDER. Why are you insisting on this?

General KJELLSTROM. There is a requirement within the total aircraft requirement for the Army to replace those aircraft. It is unusual that the Air Force budget request includes an item for Army procurement. But it was the determination of the Office of the Secretary of Defense that this technique would be utilized since the Air Force basically has the responsibility for support of the Vietnamese Air Force.

Senator ALLOTT. Mr. Chairman, if I may respond. In effect, what you are procuring is 120 completely obsolete aircraft. They are new, but they are obsolete?

Chairman ELLENDER. And you are replacing these?

General GRIBBLE. Yes, sir. But this new aircraft I am talking about, the first one of the UTTAS, will not appear in our inventory until [deleted]. The last one of the UTTAS in production, if we are going to build [deleted] before the Army is completely equipped, will be at least a decade beyond that.

So there is still a considerable expected productive lifetime for the new aircraft for which production authority has been requested.

PRODUCTION COMPETITIONS

Senator ALLOTT. I note you have a competition on the airframe: Sikorsky, Bell and Boeing-Vertol.

General GRIBBLE. That is correct.

Senator ALLOTT. But I don't see any competition for the turbine engine.

General GRIBBLE. That competition has already been held. I believe we had three industrial firms, all engine developers, who proposed attractive offers to the Army for the engines to power the UTTAS. In a very difficult selection process, the General Electric's entry in that competition was selected, and we are now in contract with General Electric.

But General Electric was selected competitively from among other companies in the industry.

CONTINUAL NEW DEVELOPMENTS OF TURBINE ENGINES

Senator ALLOTT. One thing that bothers me. Perhaps I don't understand it, but I think I do. Isn't there any turbine manufactured that could be effectively utilized as an off-the-shelf turbine?

Everything we have had here from the Navy, the Air Force, or Army has involved the development of new turbine engines. I am no engineer, but I think I understand enough about these things so that I can reasonably doubt why it is necessary in every instance to spend hundreds of millions of dollars in the development of a new turbine. What will this turbine do that existing turbines already in manufacture will not do?

SIZE, RELIABILITY, MAINTAINABILITY, AND UNIT COST

Mr. JOHNSON. I think I can answer that. I think there are, you might say, three major points. Most of the development in the recent years on turbine engines has been toward the much higher horsepower engine. This is a 1500-horsepower engine, of which two are utilized in each aircraft. It does turn out there are not in that band suitable engines.

Now, suitable is not only a function of the size but of two other phenomena: The first is, again, concerned with unit cost and life cycle cost.

The problems of life cycle cost are associated with two features of an engine. One of them is its basic reliability: How often it fails. But the second one is how easy it is to maintain by our type of personnel; the maintainability.

So the engine that was competed for here is the result of a two-engine program, one with GE and one with Pratt & Whitney, which was carried on by the Army for a period of 3 or 4 years prior to this competition, oriented toward the right size, of which it just happened there weren't any, but specifically toward reliability, maintainability, and unit cost.

As a result of our efforts in supporting that technology earlier, we were able, we feel, to get an engine which will be a real payoff in the long run.

So it is focused on the needs of this particular device and the concerns that now affect our development of all equipment, namely, the cost in use.

HUEY HORSEPOWER

Senator ALLOTT. What was the shaft horsepower on the engines on the Huey? What kind of differential in power are we talking about?

Mr. JOHNSON. I think the total Huey power is somewhere around 700 or 800 for the original Huey and 1,400 horsepower for the current Huey. We will have to supply that. It is insufficient for UTTAS and there are other critical performance factors that must be considered. I will provide the major ones for the record.

(The information follows:)

The latest Army Huey turbine engine is rated at 1,400 shaft horsepower, insufficient for the UTTAS.

	UTTAS engine	T-53 engine
Comparison follows:		
Shaft horsepower	1,500	1,400
Specific fuel consumption (pounds fuel/horsepower/hour)	<0.5	>0.58
Maintenance manhours per flight hour	1.0	2.0
Weight (pounds)	300	550

FUEL CONSUMPTION

Mr. JOHNSON. When I say "suitable performance," I mean not only horsepower rating, but another very important thing is the specific fuel consumption. All of these earlier engines use the fuels at a very high rate. That raises the size of the machine, not only to carry the people, but also the fuel.

So I think you will find, in comparing the performance of whatever engines are in the Huey, which we will have to supply for you, there is not only a great difference in the power rating, but in the specific fuel consumption.

Senator ALLOTT. Thank you.

Chairman ELLENDER. Proceed.

ENGINE AND AIRCRAFT DEVELOPMENT PROPOSALS

General GRIBBLE. The UTTAS R. & D. program was approved by DOD in June 1971 and immediately afterwards the request for proposals for the engine development was released to industry. The aircraft development request for proposal was subsequently released to industry in January 1972.

We anticipate that at least three primary airframe contractors—Sikorsky, Bell Helicopter and Boeing-Vertol—will compete for the contract. We plan to select two proposals that best meet the basic requirement. Airframe contract award is scheduled for September 1972.

In fiscal year 1973 the detailed aircraft designs by each of the two selected companies will be completed and released to the airframe fabricators. Contracts for long-lead-time subcomponents will then be let. These long lead time items are primarily power train subcomponents, that will require extensive endurance and durability bench testing to reduce development risk to a minimum.

In addition, the engine developer (General Electric) will be procuring long lead items to provide prototype engines for the competitive flyoff and the subsequent Expanded Service Test. General Electric will also be developing the engine for engine test flight qualifications. First flight is planned for early fiscal year 1975. We are requesting $64 million for this program in fiscal year 1973.

MISSILES

The development of practically all the Army's missile systems and the support of national ranges are funded in this activity. I will discuss some of the major development efforts, less the Safeguard and Site Defense of Minuteman (SDM) programs which will be addressed by the Safeguard system manager.

In fiscal year 1973 we are requesting $964.3 million to fund the missile requirements. This includes $420 million for Safeguard and SDM.

ADVANCED BALLISTIC MISSILE DEFENSE

The Advanced Ballistic missile defense program seeks to develop qualitative improvements for Safeguard and SDM and to continually broaden the technology base required for the orderly evolution of follow-on systems. These efforts are divided among three major program areas: Light area defense, advanced terminal defense, and advanced technology.

The light area defense program seeks to achieve the capability to handle the type of attack the People's Republic of China (PRC) could launch against the United States in the [deleted]. Critical developments include the technology for a [deleted].

The advanced terminal defense program complements the ongoing SDM prototype development by engaging in advanced BMD system concepts and critical component technology studies. Current major efforts include flight tests and technology studies in very high-performance endoatmospheric interceptors, marked progress toward [deleted] high throughput data processing hardware, and continuation of solid-state radar technology designed to lead to cheaper and more reliable radar equipment for the future.

The advanced technology program supports all aspects of ballistic missile defense development. It is here that new system concepts are identified, defined and evaluated, that critical advanced components and techniques are developed, and that technology research is performed.

The advanced ballistic missile defense program is designed to provide this country with technological options beyond Safeguard, and although the two programs are separate, there is close and continual coordination between the responsible R. & D. agencies. We are requesting $102 million for this program in fiscal year 1973.

SAM–D

SAM–D is an advanced surface-to-air missile weapon system designed to provide air defense of the field army. It will replace both Nike Hercules and Hawk in our current inventory.

Chairman ELLENDER. That is the one you say will be ready in [Deleted].

General GRIBBLE. Yes, sir.

Fiscal year 1972 marked the successful completion of the advanced development program. We will enter engineering development in March 1972. No fundamental technical problems have been encountered and the test results have proven the design concept. Initially our principal efforts will be to modify the advanced development model fire control group and to fabricate airborne guidance equipment, both of which are required to support early missile firings at White Sands Missile Range. Fabrication will continue on all other major subsystems—fire control group, launcher group, battalion control group, communication relay group and maintenance equipment. Government agencies will provide support in the areas of armament, vehicles, generators, communications and testing. We are requesting $171.4 million to continue the engineering development effort.

Chairman ELLENDER. Will any of these be used in this country?

General GRIBBLE. They may be. Our present plans in terms of production and fielding include only protection to the field army, wherever the field Army may be, but we have factored into it the number of missiles and batteries required for any contribution they might make to the continental United States for long-range planning purposes.

MANPORTABLE AIR DEFENSE SYSTEM (MANPADS)

MANPADS is a program to develop and field a successor to the Redeye surface-to-air guided missile system. The current Redeye, while highly accurate and reliable [deleted]. MANPADS will be similar to Redeye in size and weight, 30 pounds, but will have improved components. It will permit the individual soldier to engage [deleted].

The fiscal year 1973 engineering development program provides for component development and test flights necessary to prove subsystems. These activities will lead directly into system flight tests in [deleted]. We are requesting $18 million to support our fiscal year 1973 program.

TERMINAL HOMING

The terminal homing program is directed toward defeating tanks, armored personnel carriers, bunkers, field fortifications, air defense

sites, and other point targets. The program has five distinct developments, which will greatly increase accuracy from directly in front of the forward edge of the battle area to many kilometers in the enemy's rear. The fiscal year 1973 funding for the total program is $33.3 million.

Laser designators illuminate targets on which Army, Navy, and Air Force laser guided ordnance can home. The fiscal year 1972 program provided for initiation of prototype models of a precision tripod mounted laser designator and the establishment of system integration requirements for the airborne designator using common components from the ground system. The fiscal year 1973 funding of $4.3 million provides for continuing the development of the laser designators initiated in fiscal year 1972 and contracting for a prototype of the helicopter designator system. These laser designators will be used with the cannon launched guided projectile and the Hellfire missile.

The cannon launched guided projectile project has the objective of developing a guided 155-millimeter projectile to defeat stationary and moving tanks, armored personnel carriers and other hard point targets. In fiscal year 1972, two contracts were awarded for an operational demonstration of the system in [deleted]. The fiscal year 1973 funding of $7.3 million provides for the second year effort on an incremental basis. Each contractor will provide [deleted] fully functional, prototype projectiles with necessary telemetry systems for testing. We will fire and test these prototypes in [deleted] to verify the feasibility of the cannon launched guided projectile. We are seeking an accuracy of [deleted]. This would provide a dramatic improvement in our field artillery capabilities.

The laser guided Heliborne fire and forget missile (Hellfire) will provide the attack helicopter the capability to attack stationary hard point targets to a range of [deleted] kilometers and moving targets out to [deleted] kilometers. Technical feasibility of such a missile was demonstrated by a highly successful prototype program in fiscal year 1972.

The fiscal year 1973 funding of $11 million provides for completing cost-effectiveness studies and critical component work including design of warhead and fuzing, the helicopter launcher, and fire control integration.

Chairman ELLENDER. Would this be fired from a helicopter?

General GRIBBLE. Yes, sir.

Chairman ELLENDER. Such as the Cheyenne?

General GRIBBLE. Such as the Cheyenne.

Due to the substantial potential investment in laser guided systems, the Army considers an early operational-type test necessary early in the program to determine the true tactical utility of such systems. Test planning will be initiated and the initial phases of the test will be commenced. These tests will be designed to develop laser guided missile tactics and doctrine, target acquisition and identification techniques, and the procedures necessary to coordinate the interface between the designator and missile launch vehicle. During the tests a prototype missile, representative of the capabilities which can be achieved by a laser guided missile system, will be used.

The fiscal year 1972 and 1973 concept formulation efforts are designed to provide a basis for entering contract definition in late 1974. The helicopter launched missile has been nominated for triservice use and would be mounted on the attack helicopter.

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Terminally guided submissiles offer the capability to increase the effectiveness of medium-range surface-to-surface missiles, such as Lance, the division support missile, against armored targets at ranges exceeding those of cannon artillery. The objective of the fiscal year 1972 program was to determine the technical feasibility of bringing [deleted].

Fiscal year 1973 funding of $2.6 million provides for developing improved [deleted] seekers which could be used against tactical targets. These improved seekers will be evaluated in flight test in late [deleted]. Although the technical risk in this program is moderately high, there is potential for a significant improvement in the utility of our missile systems.

I discussed radar area correlation terminal guidance earlier in its application to achieving greater accuracy for the Pershing system. Work is underway in fiscal year 1972 to demonstrate technical feasibility. Fiscal year 1973 funds of $6 million allow flying a test radar correlator and guidance platform on a helicopter. With success demonstrated in fiscal year 1973 on helicopter flights, radar area correlation would then be demonstrated on live missile flights early in [deleted].

Missile Ranges

The Army is responsible for operating two national missile ranges. White Sands Missile Range is used for testing tactical missile systems and Kwajalein for strategic missile systems testing. In fiscal year 1972, 6,600 live firings and tests were conducted at White Sands and 50 major missions at Kwajalein. The workload is expected to remain at this same level in fiscal year 1973.

We are requesting $154 million in fiscal year 1973 to support these highly important test requirements and for modernization of equipment and instrumentation.

Military Astronautics and Related Equipment

The Army is responsible for developing satellite communications ground terminals for all services. Communications satellites provide instant communication to virtually any part of the world; thereby, enhancing the command and control of strategic and tactical forces deployed to areas not served by existing or adequate communications.

Strategic communications systems include the worldwide command and control system, the national communications system, and the defense communications system. In support of these strategic systems, equipment for phase II of the defense satellite communications system is being developed and will be deployed. Ground terminals for this strategic system are characterized by high-capacity [deleted]. For this purpose, heavy and medium terminals (up to 600,000 lbs.) have been developed and in fiscal year 1973 this equipment will be tested. We will also continue development of a light terminal (2½ ton truck mounted) to provide a highly mobile terminal capability and initiate development of subsystems to make maximum use of the satellite capability. We are requesting $9.4 million for this effort.

Tactical communications system benefit from the capabilities of satellite communications; however, the tactical communication requirement

is oriented on mobility rather than large circuit capacity. Development is continuing on a family of manportable and vehicular-mounted terminals which will provide the tactical commander with a flexible and rapid communications capability that does not exist with the present terrestrial communications systems. In fiscal year 1973 the vehicular-mounted terminals will continue in development, and we will initiate development of the manportable terminal and associated communications control facility. We are requesting $9.5 million for this program in fiscal year 1973.

ORDNANCE-COMBAT VEHICLES

This budget activity covers the general areas of firepower, mobility, and mine warfare. We are requesting $189.1 million for the entire program. I will briefly discuss the more important projects in these areas.

FIELD ARTILLERY DIRECT SUPPORT WEAPON SYSTEM XM-204

The Army is developing a new, light-weight towed 105 millimeter howitzer that will be helicopter transportable and have an extended range.

The XM-204 will have a new type recoil mechanism that produces very low recoil forces and, hence, greater stability, in fact, the XM-204 does not require firing trails or ground anchors. The new recoil mechanism is cheaper to produce, simplier and potentially more reliable than the current mechanism. We plan to enter engineering development during the fourth quarter of this fiscal year and to manufacture and test two prototypes in fiscal year 1973. Development of the XM-204 is scheduled for completion in fiscal year [deleted]. We have programed $3.3 million to support this program in fiscal year 1973.

155 MILLIMETER MEDIUM TOWED HOWITZER XM-198

The new 155 millimeter towed howitzer will provide a maximum range of [deleted] meters, when using rocket assisted ammunition, and will be air transportable. The increased range capability is particularly impressive when compared to the 14,600 meter range of our present howitzer. Two engineering design prototypes will be fabricated and tested in fiscal year 1972. In fiscal year 1973 engineering and expanded service tests will begin as prototypes three through 10 become available. Development of the XM-198 is scheduled for completion in [deleted]. We have programed $12 million in fiscal year 1973 for prototypes and testing.

FIELD ARTILLERY AMMUNITION

The program objective is to increase the effectiveness of the Army's field artillery and mortar systems by developing projectiles, propelling charges, and fuzes to improve range, payload, and lethality. In fiscal year 1972 we continued development of a new propelling charge for the improved 8-inch howitzer round; began component testing of an electronic time fuze; fabricated 400 8-inch rocket-assisted projectiles for engineer design tests; and planned the work to complete engineering and expanded service test of the M-60 tank antipersonnel round. In fiscal year 1973 we plan to initiate engineering development of a

high-performance, low-dud-rate, point detonating fuze for all artillery and mortar high-explosive and smoke ammunition. The fiscal year 1973 request for the field artillery ammunition program is $8.7 million of which 50 percent will be used in fabricating and testing over 3,000 8-inch rocket-assisted projectiles.

EIGHT-INCH NUCLEAR PROJECTILE (XM-673)

A joint Army-Atomic Energy Commission (AEC) effort was initiated in late fiscal year 1971 to develop a new greatly improved 8-inch nuclear projectile. This new projectile offers many significant advantages over the current projectile. [Deleted.]

Our fiscal year 1973 efforts will focus primarily on the development and testing of the radar fuze, electronic programer, power supplies, safety circuits, and the projectile case. We are requesting $4 million in fiscal year 1973 for this program.

ARMORED RECONNAISSANCE SCOUT VEHICLE (ARSV)

The ARSV will be a three-man, lightly armored, combat vehicle designed to replace the M–114. It is being designed to provide significant improvements in mobility, maneuverability, armor protection, and reliability. The $15.6 million requested for fiscal year 1973 will be used to fund the contractors selected to develop competitive prototypes in the ARSV program. The question of wheels versus tracks is yet to be determined; both have advantages that will be considered. For example, a wheeled vehicle is more quiet and has a higher road speed while a tracked vehicle could provide better cross-country mobility and maneuverability. This determination will be made based on contractor responses to the request for proposal and on hardware competition, if both wheel and track proposals are successful in winning the initial competition.

To digress from the text, we have actually received proposals and are in the process of evaluating them. We received six from industry and, interestingly enough, three of those proposals would propose wheeled vehicles and three would propose tracks. So it is an interesting competition.

Senator ALLOTT. From the standpoint of maintainability, your wheeled vehicle offers advantages, does it not?

General GRIBBLE. Yes, sir, Iwould think it would offer advantages. It is a smoother ride.

Senator ALLOTT. And you have a small vehicle, only a three-man vehicle. What is the maneuverability of these two vehicles in the present state of the art? That is, track versus balloon tires.

General GRIBBLE. We have never had in the Army's inventory a wheeled vehicle that could compare in mobility to the Army's tracks. However, we are aware of a number of industrially sponsored research and development efforts that look very interesting in terms of the mobility comparison, and we have done a lot of evaluations in our own laboratories.

So I believe the dav is aproaching, Senator, where we can see an equivalence that has been elusive in the past.

Chairman ELLENDER. You will use rubber tires, I presume?

General GRIBBLE. Yes, sir.

Mechanized Infantry Combat Vehicle (MICV)

MICV will be a fully tracked, lightly armored, amphibious infantry squad carrier and will replace the M113. The vehicle will provide infantrymen with a capability for protected mounted combat. Technical design requirements call for increased combat effectiveness in cross-country mobility, ballistic protection, and improved stabilized weaponization.

MICV is scheduled to enter engineering development during fiscal year 1973. A cost-plus-incentive-fee contract will be awarded for engineering development and advanced production engineering. The contractor will be required to fabricate and deliver three prototype vehicles for the Army's early design testing during fiscal year 1973. We are requesting $10.8 milion in fiscal year 1973 for this program.

Vehicle Rapid Fire Weapons Systems (Bushmaster)

Bushmaster is proposed as the primary armament for the mechanized infantry combat vehicle. The Bushmaster will be a single barrel automatic gun in the 20–30 millimeter range weighing approximately 150 pounds. The weapon will have a variable rate of fire up to 550 rounds per minute and will employ a selective dual ammunition feed system for a family of ammunition that includes [deleted]. The Bushmaster request for proposal was released to industry in December 1971. Four weapons manufacturers are expected to participate and two or more selected contractors will be awarded contracts for a competitive shoot-off to be conducted in fiscal year 1973. Following the competition a comprehensive evaluation of these prototype weapons and ammunition will be conducted. We are requesting $5.6 million for this program in fiscal year 1973.

Tank Prototype Program

In accordance with congressional guidance, we are terminating the XM–803 tank program. In the termination actions every effort is being made to insure that we derive maximum benefits from pervious investments in the program. Also, in accordance with congressional guidance, we are initiating a new tank prototype program. As a prelude to the actual start of such a program, the Army has formed a special task force to review tank requirements and formulate an appropriate requirements document. Meanwhile, we are continuing the development of those components which we feel are likely candidates for consideration in the tank prototype program. We are requesting $19.7 million in fiscal year 1973 for continuation of the new tank prototype program.

Scatterable Mines

The scatterable mine program will provide rapid delivery of antitank and antipersonnel mines by vehicle, aircraft, and artillery shells. Each mine, if not activated at a predetermined time will self-destruct. This will facilitate the movement of friendly troops through previously mined areas and lessen the possibilities of civilians encountering live mines after the cessation of hostilities.

In fiscal year 1972, we continued the successful engineering development of the helicopter delivered scatterable [deleted] and the cannon artillery delivered [deleted] mine. Also, we are prepared to begin engineering development of the cannon artillery delivered [deleted]. The fiscal year 1973 program provides for continuation of these projects. We will also continue development of components of other capabilities such as underwater mines and a ground vehicle delivery system for scatterable mines. We are requesting $17.4 million in fiscal year 1973 for this program.

OTHER EQUIPMENT

This program covers a broad range of equipments not accounted for under other budget activities. It includes such items as communications equipment, tactical bridging, materials handling, construction, training medical, meteorological, organization and personal equipment, subsistence, protective clothing and equipment. We are requesting $385 million to support the fiscal year 1973 program.

CHEMICAL-BIOLOGICAL DEFENSE

The chemical-biological defense systems provide a capability for the soldier to perform all combat functions in a toxic environment with minimum loss of efficiency. To accomplish this goal, systems are required for detection, warning, protection, sampling and identification, decontamination, and treatment.

In fiscal year 1972, significant progress was made on a chemical area scanning alarm, a biological alarm, and unit detection kits for chemical attack. In fiscal year 1973, the chemical area scanning alarm will progress into advanced development, the biological alarm will be completing advanced development, the detection kits will enter engineering development, and a modular collective protection system will be field tested. We are requesting $13.9 million for fiscal year 1973.

Chairman ELLENDER. Is that to provide protection against the use of lethal chemicals?

General GRIBBLE. Yes, sir, it is. It is against lethal chemicals.

Chairman ELLENDER. I thought we were seeking agreements not to use chemicals.

General GRIBBLE. These are defensive measures. If you can have implicit or explicit faith in agreements which most countries are a party to and assuming we had an agreement refraining from the use of chemicals, then we could refrain from doing any development to defend against them.

PROGRAM COST

Chairman ELLENDER. How much does this development cost?

General GRIBBLE. We have requested $13.9 million for this in fiscal year 1973, sir.

Chairman ELLENDER. That is just the start?

General GRIBBLE. There are several projects, as I outlined, and they are in various stages of maturity. The earliest one is an alarm which would warn us of an impending attack.

Chairman ELLENDER. By chemicals?

General GRIBBLE. Yes, sir. It would sense the presence in the air of some minute quantity, but prior to it being a lethal concentration, that would warn our soldiers to put on protective masks or to seek protective cover.

Chairman ELLENDER. You have several programs here. My question was directed as to the entire cost.

General GRIBBLE. The entire cost, sir, of this program is $13.9 million in this fiscal year.

Chairman ELLENDER. Can you project the future costs?

General GRIBBLE. No, sir; I don't have those figures. And I don't believe the Army has at this stage because of the relatively immature state of the technology.

Chairman ELLENDER. As I have said many times, unless and until the fear that exists between us and Russia can be dispelled, programs of this kind cannot be discontinued. That is why it is unending.

Proceed.

TACTICAL COMMAND AND CONTROL

General GRIBBLE. A great deal of work has been accomplished on the tactical data systems area since I last appeared before you. We have identified common data requirements in the division, and are insuring that the information can be passed between various tactical data systems. In addition, a tactical command and control master plan has been developed which provides integrated management of our efforts. We will continue the developmental work on TACFIRE, the Air Defense Control Center (AN/TSQ–73), the tactical operations system operable segment and other army tactical data equipment. All of our efforts are aimed at improving command and control through the use of automated techniques by coherent management of the development of individual systems and the development of hardware and software to fill critical gaps. We are requesting $27.8 million in fiscal year 1973 for this program.

NIGHT VISION

The purpose of this program is to develop night vision equipment to satisfy all our tactical needs. The fiscal year 1972 program includes direct and remote view image intensifier tubes, infrared detectors, light sources and associated power supplies, for combat vehicles and the individual soldier. This work will continue in fiscal year 1973, stressing improved night vision devices with a 30- to 50-percent reduction in size and weight. These smaller devices will reduce the cost of night vision items by standardizing component packages. We are requesting $19.3 million in fiscal year 1973 for this program.

HOSTILE WEAPONS LOCATING SYSTEMS

We are developing a countermortar radar and a counterbattery radar. The countermortar radar will replace the aging AN/MPQ–4 countermortar radar, which has been in use since 1959; and the counterbattery radar will replace the AN/MPQ–10, which was first fielded during the Korean war. During fiscal year 1972 the countermortar radar will enter engineering development with a contract scheduled to be awarded in June 1972 for five sets. The counterbattery radar has been expedited in advanced development by the initiation of a two-contractor competitive prototype phase. The contracts for these com-

petitive prototype models are expected to be awarded in late fiscal year 1972 or early fiscal year 1973. During fiscal year 1973 work will begin to manufacture models of both radar systems. We are requesting $11.3 million for the fiscal year 1973 effort.

Chairman ELLENDER. What is the purpose of this?

General GRIBBLE. This enables us to locate precisely enough to engage the enemy artillery or mortars that are firing at our troops.

Chairman ELLENDER. Do you mean to locate them at the place from which they are shot?

General GRIBBLE. Yes, sir; the place they are fired from. What it really does is detect the incoming projectile at two or three places along its trajectory. And by quickly computing that trajectory and then extrapolating it to its source, you know where the tube is it was fired from. It gives us a great advantage in knocking out enemy artillery.

PROGRAMWIDE MANAGEMENT AND SUPPORT

The programwide management and support budget activity provides for those costs that cannot be identified to specific projects in other budget activities. This program provides resources to finance the general and administrative R.D.T. & E. expenses at major command headquarters—except Department of the Army headquarters—operation and maintenance of selected general purpose research and development activities; and procurement of minor construction and special purpose equipment. In fiscal year 1973 we have programed $59 million for these activities.

PRIORITY OPERATIONAL REQUIREMENTS

In summary, our fiscal year 1973 R.D.T. & E. program is the result of careful analysis of the priority operational requirements and the equipment required to give the Army the qualitative superiority in any future conflict. We have made a concerted effort to insure that our fiscal year 1973 program enables us to get the most out of the R. & D. dollars that you provide. We feel that we have a well-balanced forward-looking fiscal year 1973 program and ask your support.

MAINTENANCE AND OPERATION OF COMMAND HEADQUARTERS AND TEST FACILITIES

Chairman ELLENDER. You referred to $59 million for program wide management and support. What will these funds be used for?

General GRIBBLE. These moneys would be required for the maintenance and operation of our command headquarters and special test facilities.

Chairman ELLENDER. When you say "maintenance", would it replace instruments you use?

General GRIBBLE. We have certain installations in the Army where research and development and test is the major or predominant activity in that installation. In those cases where it is, then our program, the program which you have just reviewed and this particular item, would pay for the cost of maintaining the structures, the roads, providing the utilities at that base.

CIVILIAN EMPLOYMENT

Chairman ELLENDER. To what extent do you hire civilians to do that work?

General GRIBBLE. Almost exclusively, sir.

Mr. JOHNSON. May I clarify one thing, Mr. Chairman? With respect to the maintenance of the capability, General Gribble is referring to the maintenance of the headquarters in administrative actions. The maintenance of equipment is contained in our field station accounts and that sort of thing. He is talking about maintaining the capability to run a program.

It is those things that cannot be related to any particular single program, except for the minor construction things that you referred to.

Chairman ELLENDER. I am not clear on it.

General GRIBBLE. I believe Secretary Johnson is trying to make clear to you, sir, that these funds are not used for the purchase of equipment that might end up in our inventory. He thought from my remark I was implying that.

Let me make my statement over in briefer terms and maybe it will be clear.

There are certain installations in the Army where the predominant activity is either research, development, or tests. In those cases, the Army has assigned a responsibility to this appropriation to carry the cost, the burden, the administrative expense, and the overhead of operating that post, camp, or station.

Chairman ELLENDER. Do you have any questions, Senator?

Senator ALLOTT. I have no further questions.

MILITARY SCIENCES

Chairman ELLENDER. The first budget activity to be considered is military sciences for which $205.5 million is requested for fiscal year 1973. How much was provided for fiscal years 1971 and 1972?

Mr. JOHNSON. $166.4 million was provided in fiscal year 1971 and $186.1 million in fiscal year 1972.

IN-HOUSE LABORATORY INDEPENDENT RESEARCH

Chairman ELLENDER. Of the total requested for military sciences, $12.2 million is for the program element entitled "In-House Laboratory Independent Research." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: RESEARCH

Description.—This program provides individual Army scientists and engineers an additional opportunity to maintain and increase professional competence by doing original work in areas suited to their research talents. It is one of several measures utilized to strengthen scientific and engineering competence, to improve morale, to aid scientific and technical personnel recruitment and retention within Army R&D laboratories, and to facilitate communication and interaction with the scientific community. It provides the resources and flexibility to respond to new technical challenges as they occur. This program serves as a wellspring for creative and innovative ideas, many of which progress into the Development programs. There were approximately 500 research tasks pursued in FY 1971; these were representative of efforts in prior years.

Work performed by.—42 Army R&D laboratories and installations throughout the United States and the Canal Zone.

Fiscal year 1972 program.—This program element consists of approximately 500 indivdual efforts with an average annual cost of approximately $20,000 each. Most efforts are completed within one or two years; therefore about one-half of each year's program represents new efforts initiated and conversely about-one-half of the on-going program terminates each year. Many items move into the regular program as exploratory development tasks, or have their output utilized to advance existing programs.

Based on the merits of the annual report submitted by each participating installation at the close of each fiscal year, new funding is allotted for the upcoming fiscal year. Directors of individual laboratories or comparable installations assign funds to both new and continuing promising work efforts. This freedom from a rigidly structured program and the resulting autonomy at installation level permit the directors to most effectively utilize their in-house laboratory independent research funds.

Fiscal war 1973 planned program.—This highly successful program will continue with no change in the basic objective previously outlined.

Program to completion.—This is a continuing program.

Resources (In Millions of dollars:)

R.D.T. & E. funds for fiscal year 1971, $10.7; fiscal year 1972, $11.3; fiscal year 1973, $12.2; additional funds to completion are continuing; and the total estimated cost is not available.

R.D.T. & E. man years for fiscal year 1971, 384; fiscal year 1972, 421; fiscal year 1973, 416; additional man years to completion are not available; and the total estimated man years are not available.

Chairman ELLENDER. I note in the descriptive summary that some 42 Army facilities are involved in this program. Would you please provide for the record a listing showing these facilities, and indicate how much each of them received for fiscal years 1971 and 1972, along with the estimate for fiscal year 1973.

Mr. JOHNSON. I will be happy to. However, the detailed funding for fiscal year 1973 will not be available until August 1972. At that time 1973 funding will be allotted based on the merits of the 1972 annual reports submitted by each participating facility.

(The information follows:)

IN-HOUSE LABORATORY INDEPENDENT RESEARCH FUNDING

[In thousands of dollars]

Developing Agency	Fiscal year— 1971	1972
Chief of research and development: Manpower Resources R. & D. Center	100	110
Chief of engineers:		
Cold regions R. & D. Laboratory, Hanover, N.H	100	100
Construction Engineering Research Laboratory, Urbana, Ill	70	75
Topographic Laboratory, Fort Belvoir, Va	90	105
Waterways experiment station, Vicksburg, Miss	275	300
Total	535	580
Medical research and development command:		
Aeromedical research laboratory, Fort. Rucker, Ala	40	65
Biomechanical Research Laboratory, Walter Reed, Washington, D.C	50	55
Equipment and development Laboratory, Fort Totten, N.Y	15	10
Institute for Dental Research, Walter Reed, Washington, D.C	10	15
Institute for Infectious Diseases, Fort Detrick, Md	100	100
Institute of Surgical Research, Fort Sam Houston, Tex	50	50
Letterman Institute of Research, San Francisco, Calif	25	35
Research Institute of Environmental Medicine, Natick, Mass	150	140
Medical Research Laboratory, Fort Knox, Ky	25	20
Research and Nutrition Laboratory, Denver, Colo	100	120
Walter Reed Institute of Research, Washington, D.C. (includes overseas units)	1,100	1,195
Total	1,665	1,850

IN-HOUSE LABORATORY INDEPENDENT RESEARCH FUNDING—Continued

[In thousands of dollars]

Developing Agency	Fiscal year— 1971	1972
U.S. Army Materiel Command:		
Aviation Materiel Laboratories, Fort Eustis, Va.	100	75
Ballistics Research Laboratories, Aberdeen, Md.	910	750
Biological Laboratories, Fort Detrick, Md.	400	250
Coating and Chemical Laboratory, Aberdeen, Md.	50	15
Harry Diamond Laboratories, Washington, D.C.	825	915
Human Engineering Laboratory, Aberdeen, Md.	175	175
Materials and Mechanical Research Center, Watertown, Mass.	400	500
Natick Laboratories, Natick, Mass.	385	400
Atmospheric Sciences Laboratory, White Sands, N. Mex.	180	190
Avionic Laboratory, Fort Monmouth, N.J.	50	70
Combat Surveillance and Target Acquisition, Fort Monmouth, N.J.	55	65
Communications and ADPS Laboratory, Fort Monmouth, N.J.	200	300
Electronics T. & D. Laboratory, Fort Monmouth, N.J.	270	650
Institute for Exploratory Research, Fort Monmouth, N.J.	350	(1)
Night Vision Laboratory, Fort Belvoir, Va.	60	70
Missile Command Laboratories, Redstone Arsenal, Ala.	860	830
Mobility Equipment R. & D. Center, Fort Belvoir, Va.	180	300
Picatinny Arsenal R. & D. Laboratories, Dover, N.J.	750	775
Frankford Arsenal R. & D. Laboratories, Philadelphia, Pa.	260	300
Edgewood Arsenal R. & D. Laboratories, Edgewood, Md.	525	525
Tank and Automotive R. & D. Laboratories, Warren, Mich.	260	400
Deseret Test Center, Dugway, Utah	75	90
Tropic Test Center, Fort Clayton, C.Z.	40	50
Benet R. & D. Laboratories, Watervliet, N.Y.	700	700
White Sands Missile Range, White Sands, N. Mex.	85	60
Rock Island Arsenal Laboratories, Rock Island, Ill.	255	170
Totals	8,400	8,625

[1] Combined with above.

INCREASE OVER 1972

Senator YOUNG. The $12.2 million you are requesting for fiscal year 1973 is an increase of $950,000 over the $11.3 million provided for fiscal year 1972. Comment on your need for this increase.

Mr. JOHNSON. Yes, sir. The requested increase is intended to offset the effects of inflation on salary costs for scientists and engineers. The increase is also a response to requests from the Secretary of Defense and the Director, Defense Research and Engineering, to revitalize DOD efforts in science and technology.

DEFENSE RESEARCH SCIENCES

Chairman ELLENDER. $77.2 million is requested for the program entitled "Defense Research Sciences." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: RESEARCH

Description.—The objectives of this program are to increase knowledge and understanding in those fields of the physical, engineering, environmental, biological-medical, and behavioral-social sciences directly related to explicitly stated long-term national security needs. It provides fundamental knowledge for the solution of identified military problems. It also provides part of the base for subsequent exploratory and advanced developments in Defense-related technologies and of new or improved military functional capabilities in areas such as communications, detection, tracking, surveillance, propulsion, mobility, guidance and control, navigation, energy conversion, materials and structures, and personnel support.

The following thirteen sub-elements comprise the Army Defense Research Sciences program element: General Physics, Chemistry, Mathematical Sciences, Missile, Electronics, Materials, Mechanics, Energy Conversion, Aeronautical Sciences, Terrestrial Sciences, Atmospheric Sciences, Biological-Medical Sciences, and Behavioral-Social Sciences.

In the physical sciences investigations are supported in the subdisciplines of general physics, chemistry and mathematics. They are directed toward acquiring a broad base of expanded knowledge on which to found new processes, techniques, materials, systems, and devices in such representative areas as design and synthesis of new materials, lubricants, power sources, propellants, and explosives. Coupled to these is a vigorous program of fundamental and applied mathematics in support of the Army's total scientific program.

Engineering sciences research comprises electronics, materials, mechanical sciences (including aeronautics and ballistics), and energy conversion. The engineering sciences provide the foundation of basic knowledge supporting the development of the advanced communications, surveillance, weapons, and mobility systems required by the Army of the future.

Environmental sciences research investigations are supported in atmospheric sciences which contribute to the knowledge of the earth's atmospheric envelope, and in the terrestrial sciences which contribute to our knowledge of geography, seismology, and cartography as they relate to the earth. The knowledge, methodology, and techniques derived from the aforementioned areas contribute to solutions of problems of concern to the Army in mapping and navigation, trafficability and mobility, and living and operating in the severe desert, polar, and tropical regions of the world.

Biological-medical sciences research supports investigations in biochemistry, biophysics, pathology, physiology, immunology, microbiology, entomology, pharmacology, radio-biology, and zoology. Primarily basic in nature, it provides the input to applied research directed toward the maintenance of the health and well-being of the soldier, his ability to survive and fight under adverse environmental conditions, and the development of an adequate chemical and biological weapons defense capability.

Behavioral and social sciences research comprises psychophysiological investigations of sensation, perception, and psychomotor activities, theoretical and methodological analyses of learning, intelligence, personality charatceristics and the measurement of performance; and the collection and analysis of social science data as they relate to knowledge of foreign people and their cultures. The objective of this research is acquisition of new knowledge in the area of human resources that will prepare the U.S. Army soldier to adapt, and perform within the broad range of physical environment, cultural environment and types of warfare to which he may be subjected. The underlying purpose of the research is to understand, measure, predict, and improve the performance of U.S. Army soldiers operating individually and in units.

This broad grouping of research into scientific areas characterizes the nature of the research effort. It derives from the strong need of the Army to participate in and sponsor work where appropriate in the scientific community for the development of new knowledge in areas of Army interest.

Work performed by.—Approximately 67% of work under this program is performed by in-house laboratories and activities. Contract performers include academic institutions, not-for-profit organizations, and industrial laboratories.

Fiscal year 1972 program.—New programs are being initiated and work is continuing on promising research in all sub-areas of the Defense Research Sciences as shown in individual Descriptive Summaries for each sub-element. A sampling of typical efforts follows:

In connection with investigations of crystals for microwave and millimeter wave applications, experimental and theoretical work is seeking out the properties of rare-earth garnets with the expectation of achieving vastly improved properties. A variety of elements are being investigated in the layered structure of thin heavy layers in a lighter matrix to achieve improved shield against x-rays or gamma rays. Investigations are proceeding on induced luminescence in dyed materials (clothing) by laser irradiation at a variety of wavelengths, and on quenching substances that will reduce this effect without changing the ordinary camouflage properties of the materials; solid state chemistry of pseudostable materials continue to exploit their unique and useful properties for explosives and pyrotechnics. Research will continue to provide fundamental data and theory for lasers for target designators, for laser isolator materials, for improved

knowledge of the internal behavior of materials needed for missiles under various conditions and environments, and for interaction of laser beams with laser-created plasmas.

Night vision research is being conducted in (1) image intensification, (2) optical and infrared radiation, (3) far infrared detection, (4) light sources, and (5) visionics, the interaction of night vision schemes and man. Work is continuing to determine what targets of military significance can be effectively damaged or degraded in performance by lasers and what beam power, energy wavelenghts, pulse duration, and repetition frequency are required to produce these effects. Work is underway to identify the microstructure and the composition of the several phases in alloyed metals and relating these to the mechanical properties of the materials. Continuing efforts include construction and laboratory tests of a fluidic fuel-air ratio control system to minimize fuel consumption and air pollution; completion of sensitivity analyses for both low and high perforance characteristics for all caliber weapons; development of improved kinetic energy penetrators through exploitation of high density materials; and programs in the general area of basic mechanics research in the mechanics of materials and structures, fluid and solid mechanics, high speed aerodynamics, and shock, vibration, and wave propagation. Power sources are under investigation to produce batteries with power densities two to three times higher that would allow soldiers in combat to carry less weight or remain on patrols longer.

Research will continue to define a more nearly optimum rotorcraft blade airfoil through two-dimensional airfoil wind tunnel tests, and investigations of the effect of airfoil characteristics, such as chord, radius and sweep angle; to improve the design of high temperature gas turbine components through studies of high strength and lighter weight materials with long-life properties; to determine the response of ice to acoustics, mechanical and electrical signals; in the development of techniques for modifying or dispersing ice fog; on techniques to detect military activities in forested areas by remote sensing. The chemical composition of atmospheric aerosols and gases and the changes of atmospheric composition in polluted and unpolluted environments will be investigated with the knowledge gained being applied in the development of chemical fog/cloud modification techniques directed toward Army aviation and field Army localized operations.

Basic research data is contributing to an understanding of the processes involved in infections, surgical shock, ionizing radiation damage, vascular response to cold, and in utilization of specific food nutritive elements. New methods are being explored for insect control without pesticides such as use of sex attractants and killing with low level ultraviolet light. Basic and supporting food research is being increased to accelerate improvements in the total military feeding system to optimize the acceptability and nutritional aspects. Research will continue on: human reaction under stressful situations, development of useful physiological measures of alertness, visual identification of rapidly moving targets, human aspects of organizational effectiveness, determination of the significant psychological and social factors involved in effective intercultural communications, military noise control and abatement, and protection of the soldier, and keeping track of events in fast-moving situations.

Fiscal year 1973 planned program.—Research will be supported in new and continuing efforts to advance the most relevant and promising areas of science. Examples include investigations of electronic and optical properties of laser and optical system materials, with emphasis on optical windows for transmission of high power laser energy; materials for optical isolation to be used between stages of laser amplifiers; experimental spectroscopic studies of various missile propellant materials; and the theoretical model of crack propagation under pulsed stress. New magnetic materials for the design of control devices for phase shifting, isolating, attenuating and filtering functions will be researched. Increased attention will be given to solid state electronics research particularly in the field of material related effects adverse to the efficient operation of night vision devices. The study of new lasers, particularly semiconductor lasers, will generate new insights into increasing the laser frequency coverage available to the Army, laser frequency conversion, and laser propagation through the atmosphere with reasonable energy losses under tactical circumstances. Investigations will be made on fracture toughness and tensile strength for several selected materials of ordnance interest under varying conditions of temperature and

strain, and the information will be used to help define the safety margin for gun launching environments. Work will be conducted to develop and apply analytical methods to problems in nonuniform elasticity of homogeneous materials, and results will be used to develop materials for critical military applications such as: helicopter rotors, booms, and power transmission systems; antiballistic missile casings and nose cones; and lightweight armor. Mechanics research will support continued effort in mechanics of materials and structures, high speed aerodynamics, fluid and solid mechanics, and shock and vibration. Research will provide rotorcraft and Vertical/Short Take-Off and Landing (V/STOL) aircraft technology as related to advanced Army aircraft systems requirements in support of Army air mobility. Aircraft structural research programs will provide the Army with: higher performing aircraft, improved reliability, maintainability, and survivability characteristics, and reduced aircraft vulnerability. Continue research of phenomena related to ice adherence, ice fog, and arctic ecological subsystems. Continue efforts in the areas of sensing arrays and holography for military mapping and in the area of atmospheric effects on distance and angle measurements. Continue basic research activities to establish new vertical wind, temperature and density profiles for use in missile design and projectile trajectory analyses. Military medical emphasis will include immuno-chemistry, investigations of enzyme and mineral function in cellular metabolism, pharmacology of new drugs, and the ecology of animals and arthropods which are reservoirs and transmitters of human infectious agents. Research will continue on: new methods for measuring learning and training achievement; more precise quantification and assessment of skills, abilities and personality traits; development of techniques and methodology for measuring motivation. attitudes. and values of the soldier.

Program to completion.—This is a continuing program.

Resources, (In millions of dollars.)

R.D.T. & E. funds for fiscal year 1971, $66.9; fiscal year 1972. $70.9; fiscal year 1973, $77.2; additional funds to completion are continuing; and the total estimated costs are not available.

R.D.T. & E. man years for fiscal year 1971. 2265; fiscal year 1972. 2455; fiscal year 1973, 2435; additional man years to completion are not available; and the total estimated man years are not available.

1971–1973 Project Funding

Chairman Ellender. Please provide a tabulation for the record listing the projects to be funded, the amounts for fiscal years 1971 and 1972, and the estimate for fiscal year 1973.

Mr. Johnson. I will be glad to do so.

(The information follows:)

[In millions of dollars]

	Fiscal years—		
	1971	1972	1973
Element 6.11.02.A—Defense research sciences	66.851	70.918	77.220
General physics	5.631	6.120	5.790
Chemistry	3.882	3.440	3.660
Mathematical sciences	4.180	4.151	4.580
Missile	.475	.520	.510
Electronics	7.797	8.169	8.840
Materials	6.700	7.108	7.820
Mechanics	6.242	6.420	7.010
Energy conversion	1.641	1.580	1.730
Aeronautical sciences	5.145	5.620	6.200
Terrestrial sciences	2.545	2.450	2.940
Atmospheric sciences	3.196	3.980	3.960
Biological medical scieqces	17.587	19.430	21.230
Behavioral social sciences	1.830	1.930	2.950

PROGRAM INCREASED EMPHASIS

Senator YOUNG. Why do you need the increase of $6.3 million you are requesting for this program in fiscal year 1973?

Mr. JOHNSON. Increased emphasis in fiscal year 1973 will be placed on research in mathematical sciences, electronics, materials, aeronautical sciences, terrestrial sciences, biological-medical sciences, and the behavioral and social sciences. In the mathematics field, additional skilled university mathematicians will be made available and will furnish assistance to in-house investigators in order to satisfy Army requirements. For electronics, in addition to continuing the ongoing fiscal year 1972 program, emphasis will be oriented toward finding new materials and applying new physical effects for the development of novel devices that will operate at higher frequencies. Those higher frequencies offer significant advantages for radar and range-finding because of their superior and directivity characteristics. Further, within the electronics research area, consideration of new lasers and particularly semiconductor lasers will generate new insights into increasing the laser frequency coverage available to the Army. In the area of materials, investigations will be made on fracture toughness, tensile strengths, effects of temperature and strain, and for developing new processes for the manufacture of basic Army explosives. Also, experiments on the gas permeability of pyrotechnic flare compositions of aluminum and magnesium mixed with sodium will be continued. For aeronautical sciences research, increased effort will be applied in the areas of aircraft technology as related to advanced Army aircraft systems such as vertical/short take-off and landing and rotorcrafts.

Other examples of efforts in this field are research and investigations in the aerodynamics of combustors, compressors, and turbines. This research program will provide the Army with higher performing aircraft and improved reliability, maintainability, and survivability of aircraft. For terrestrial sciences, investigations will be made in tropical soils for engineering and construction applications. Further, research will be effected on phenomena related to ice adherence, ice fog, and arctic ecological subsystems. For the biological-medical sciences, particular emphasis will be given to research on enzyme and mineral function in cellular, metabolism, pharmacology of new drugs, and the ecology of animals and arthropods which are reservoirs and transmitters of human infectious agents. In addition, increased efforts will be placed on parasitic diseases, including the development of new vaccines and improved environmental control measures. For the fields of behavioral and social sciences new importance is given to establishing the Modern Volunteer Army. As a result, new methods are to be investigated for measuring, learning, and training achievement in order to gain more valid criteria for assessing (1) improvements in training methods, (2) skills and abilities, (3) personality traits, and (4) development of techniques and methodology for measuring motivation, attitudes, and values of the soldier.

GENERAL PHYSICS

Chairman ELLENDER. $5.8 million is for the project entitled "General Physics." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

DEFENSE RESEARCH SCIENCES

CATEGORY: RESEARCH

Description.—Research in this sub-element provides fundamental knowledge applicable to future Army material to include military vehicles, munitions, weapon systems, communication systems, guidance and surveillance systems, intelligence systems, and logististics and survival systems. This research provides knowledge and data highly relevant to such technologies as detection and location, electronics and energy conversion, nuclear weapons effects, personnel protection, and materials, structures and dynamics; and strongly supporting to other technologies such as air mobility, surface mobility, navigation and position location, automatic data processing, communications, electronic warfare, missiles, munitions and weapons, combat support, chemical systems, biological defense, biological and medical sciences, environmental, and construction methods. Emphasis is given to the following: (1) electro-optics, providing information for future new and novel optical surveillance and communication systems, very high speed optical computers, high density and readily accessible information storage, optical displays, and personnel detection and camouflage; (2) lasers, to provide versatility and improved performance for laser rangefinders, radars, illuminators, designators, communications, weapons, and night vision devices; (3) properties of solids and crystals to provide greater reliability and longer lifetime for Army material, to achieve novel and more effective electronic devices and systems, and to produce material with greater strength and structural integrity with less weight; (4) electromagnetic phenomena, gaseous interactions and plasma physics to provide data and knowledge related to the missile atmospheric re-entry problem; (5) cryogenics, with applications to efficient and high-speed computers, novel energy conversion devices, a variety of electronic and radiation sensors, and efficient electromagnetic sources; and (6) novel conduction phenomena, pertinent to a wide variety of electronic devices to operate under extreme environments. Subareas of physics include acoustics, crystallography, electricity and magnetism, optics, plasma physics, nuclear physics, quantum theory, solid state physics, thermo-dynamics, wave propagation, cryophysics, atomic and molecular physics and surface physics. A highly competitive system of evaluation is used to select work of greatest competence, originality, and relevance.

Work performed by.—Approximately 60 percent of this research is accomplished internally at the Electronics Technology and Devices Laboratory, Electronics Command, Fort Monmouth, New Jersey; Materials and Mechanics Research Center, Watertown, Massachusetts; Pitman-Dunn Laboratories, Frankford Arsenal, Philadelphia, Pennsylvania; Feltman Research Laboratory, Picatinny Arsenal, Dover, New Jersey; Harry Diamond Laboratories, Washington, D.C.; Ballistic Research Laboratories, Aberdeen Research and Development Center, Aberdeen Proving Ground, Maryland; Natick Laboratories, Natick Massachusetts; Benet Research and Engineering Laboratories, Watervliet Arsenal, New York; and Mobility Research and Development Center, Fort Belvoir, Virginia. Contracts or grants are supported with 88 industrial and university laboratories, including the following of $36,000 or more: University of Illinois, Urbana, Illinois; International Business Machines Corporation, Yorktown Heights, New York; New York University, New York, New York; University of California at Berkeley, Berkeley, California; Massachusetts Institute of Technology, Cambridge, Massachusetts; Johns Hopkins University, Baltimore, Maryland; Duke University, Durham, North Carolina; Stanford University, Stanford, California; and the University of Washington, Seattle, Washington. The remaining laboratories have contracts or grants worth a total of $1,770,000.

Fiscal year 1972 program.—In connection with studies of crystals for microwave and millimeter wave applications, experimental and theoretical work is

seeking out the properties of rare-earth garnets with the expectation of achieving vastly improved properties. Thin film junctions are being fabricated in operational geometries and subjected to initial feasibility tests as millimeter and infrared detectors and converters. Computer-controlled design techniques are being applied to optimize performance of unique flash lamp-pumped dye lasers. Materials for insulation of quartz fiber radiation dosimeters are being analyzed to achieve forms relatively immune to gamma ray radiation and presence of electric fields to lead to improved performance of the dosimeters. A variety of elements are being investigated in the layered structure of thin heavy layers in a lighter matrix to achieve yet improved shielding against x-rays or gamma rays. Nuclear cross-sections are being examined for reactions involving bombardments of carbon and iron isotopes with the light isotope of helium to achieve additional data applicable to nuclear weapons effects. Research is being pursued on metallic surface instabilities caused by rapid heating from electromagnetic pulses, and on thermo-luminescence from ferroelectrics of various types, as related to laser effects and sources. Additional efforts are underway to examine shock-induced effects in ferrous alloys, spallation effects due to shocks to include wave interaction with fracture zones, and related work, leading to a better knowledge of the overall effect of shock waves and detonations on Army materiel. Investigations are proceeding on induced luminescence in dyed materials (clothing) by laser irradiation at a variety of and multiple wavelengths, and on quenching substances that will reduce this effect without changing the ordinary camouflage properties of the materials. In heat pipe research, new operating fluids are being investigated to perform at temperatures encountered in extracting waste heat from engine exhausts for useful purposes such as shelter heating. Analysis is being made of the redistribution of carbon in mild steels arising from diffusion, to further the improvement of various alloys for guns and gun systems. Emphasis is continuing on a broad spectrum of work in the various subfields of physics. In atomic, molecular and plasma physics, consideration is being given to far infrared molecular spectroscopy, metastable autoionization of atoms, theory of charge distribution and internal fields of complex atoms, radiative lifetimes, energy exchange collisions, and molecular beam scattering. This work is in support of obtaining improved materials for Army materiel, of understanding the nature of the upper atmosphere for effects of nuclear events and re-entry, and of a thorough knowledge of the motion of hypervelocity objects through the atmosphere. Research in electromagnetic radiation, lasers, and optics is leading to new knowledge in optical parametric upconversion (for example, converting from infrared to visible light), ultrashort light pulses, and the non-linear effects associated with high energy pulses, all to contribute to better fundamental understanding of lasers and their applications. Research in structure of solids is providing detailed fundamental information on critical transition phenomena, crystal structure, equilibrium energetics, surface energy states, and atomic motions on surfaces, for application to improved materials for Army materiel. The program in transport phenomena in solids is particularly concerned with electronic and optical properties of amorphous semiconductors, passage of particles through solids, and atomic motions in general, again to find future application in improved materials and in new and novel electronic devices. Cryophysics and liquid phenomena are also receiving attention with emphasis on high pressure data, thermal boundary effects, and superconductivity, to provide for future applications in materials, in high speed computers, and in other electronic systems and equipments.

Fiscal year 1973 planned program.—This broad program in various subareas of physics will continue, being planned to give support to a balanced effort to allow prompt and thorough exploitation of new results, theoretical concepts and experimental data. Support will be given to the most highly qualified investigators in Army laboratories and on contract and grant. The program will include effort to produce and exploit break-throughs pertinent to Army requirements and missions and to support work addressed to identified Army problem areas, where fundamental research is indicated to secure information needed for future applied work. The program will be so directed as to allow rapid incorporation of results into relevant Army applications.

Program to completion.—This is a continuing program.

Resources. (In millions of dollars:) R.D.T. & E. funds for fiscal year 1971, $5.6; fiscal year 1972, $6.1; fiscal year 1973, $5.8; addditional funds to completion are continuing; and the total estimated cost is not available.

PROGRAM DECREASE

Chairman ELLENDER. Your request for fiscal year 1973 is somewhat less than the funds provided for fiscal year 1972. Please comment on this.

Mr. JOHNSON. The slight decrease by about 5 percent in general physics was made to provide greater increases in the engineering sciences areas of electronics, materials, mechanics, energy conversion, and aeronautics.

CHEMISTRY

Chairman ELLENDER. $3.7 million is requested for the project entitled "Chemistry." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

DEFENSE RESEARCH SCIENCES

CATEGORY: RESEARCH

Description.—The objective of research in chemistry is to acquire new knowledge of the composition, structure and properties of matter and its chemical transformation in order to support future exploratory development of materials necessary for the Army to fulfill its mission. Research in the specific fields of solid state chemistry, surface chemistry, photochemistry, radiation chemistry, reaction kinetics, organometallics, metal chemistry, electrochemistry, spectroscopy, structural determinations and thermodynamic properties, nitrogen, cyclic and unsaturated compounds is related to this goal. The program also has major application to developmental programs in missile propulsion, identification of friend or foe, ground surveillance and target acquisition, and chemical-biological defense. There are substantial applications in nuclear investigations, missiles and combat support.

Work performed by.—Army's chemistry sub-element is made up of two projects. The work in one of these is performed totally in-house at ten stations. These are: Electronic Technology and Devices Laboratory, Fort Monmouth, New Jersey; Frankford Arsenal, Philadelphia, Pennsylvania; Edgewood Arsenal, Edgewood, Maryland; Picatinny Arsenal, Dover, New Jersey; Mobility Equipment Research and Development Center, Fort Belvoir, Virginia; Rock Island Arsenal, Rock Island, Illinois; Army Materials and Mechanics Research Center, Watertown, Massachusetts; Ballistic Research Laboratories, Aberdeen Proving Ground, Maryland; Harry Diamond Laboratories, Washington, D.C.; and Natick Laboratories, Natick, Massachusetts. The work in the other project is executed through contracts and grants. The following major contractors and grantees with unit cost exceeding $25,000 are supported under this project: Brooklyn Polytechnic Institute, Brooklyn, New York; Rice University, Houston, Texas; Stanford Research Institute, Menlo Park, California; Brigham Young University, Provo, Utah; Research Institute of Advance Studies, Baltimore, Maryland; Johns Hopkins University, Baltimore, Maryland; National Bureau of Standards, Gaitherburg, Maryland; California Institute of Technology, Pasadena, California; Cornell University, Ithaca, New York; and Purdue Research Foundation, Lafayette, Indiana. Work is performed by an additional one hundred and three contractors at a total cost of $1.4 million.

Fiscal year 1972 program.—Research is being conducted in such areas as: electrolyte phenomena and mechanisms of electrochemical processing to improve fuel cells for more efficient energy conversion devices; surface chemistry of metal oxides to assist in the preparation of materials which resist breakdown through catalytic processes; charge-transport phenomena at interfaces to provide a basis for the optimization of certain semiconductor devices such as energy and photo sensors; synthesis of polymers of enhanced strength and thermal stability properties for use in such items as lightweight gun tubes; solid state chemistry of pseudostable materials to exploit their unique and useful properties for explosives and pyrotechnics; analysis and photochemistry of chemical reactants to provide aid to the exploratory and development efforts directed toward defense against

specific toxic agents; thin boundary films which control corrosion and lubrication of metals to increase efficiency and reliability, and reduced maintenance requirements of present weapons; properties of materials with low concentrations of impurities for guiding efforts in developing improved lightweight armor and lightweight structural materals; and degradation kinetics of organic materials essential to the development of ordnance devices.

Fiscal year 1973 planned program.—Continuation of research in areas described above.

Program to completion.—This is a continuing program.

Resources (in millions of dollars)—R.D.T. & E. funds for fiscal year 1971, $3.9; fiscal year 1972, $3.4; fiscal year 1973, $3.7; additional funds to completion are continuing; and total estimated cost is not available.

In-House and Contract Basic Chemistry Research

Senator Young. I note in the descriptive summary that two projects are involved in this effort. Please describe them briefly.

Mr. Johnson. One of these projects, project No. 1T061102B13A, entitled "Research in Chemistry," supports basic chemistry research performed totally in-house at 10 Army laboratories. The other project, project No. 20061102B13B, entitled "Fundamental Research in Chemistry," supports contracts and grants for basic chemistry research at universities, not-for-profit institutions, industrial laboratories and other Government agencies such as the National Bureau of Standards. Under both of these projects, research is conducted in the specific fields of solid state chemistry, photochemistry, radiation chemistry, reaction kinetics, organometallics, metal chemistry, electrochemistry, spetroscopy, structural determinations and thermodynamics.

Program Increase

Chairman Ellender. Why do you need the increase of $220,000 you are requesting?

Mr. Johnson. The increased funding will be used to intensify our efforts in: synthesizing polymers with improved thermal stability, examining the intermedate species involved in photochromic reactions essential to the development of flash blindness protection systems, and obtaining a better insight into the mechanisms of tunable dye laser reactions for the purpose of increasing their lasing power output.

Mathematical Sciences

Chairman Ellender. $4.6 million is for the project entitled "Mathematical Sciences". Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

Defense Research Sciences

RESEARCH

Description.—The effort in the Mathematical Sciences has two objectives. One is to provide for a systematic advance in the acquisition of basic knowledge in such mathematical areas as numerical analysis, statistics, probability, and the methodology of operations research, paralleling advances in the other scientific, engineering, and management sciences, so that Army personnel are provided with the most efficient analytical procedures for solving problems and making advances in such areas as weaponry, operations, and logistics. The second objective is to provide the most skilled mathematicians in a consultative and research capacity for Army installations and, from the contacts made by these mathematicians, to

determine those mathematical areas of Army interest that require further perusal. This sub-element supports investigations conducted in Army laboratories and by contract with industry and the academic community.

Work performed by.—Approximately 25% of the work is performed internally at the Aberdeen Research and Development Center, Maryland; U.S. Army Electronics Command Laboratories, Fort Monmouth, N.J.; Picatinny Arsenal, N.J.; Rock Island Arsenal, Ill.; and Harry Diamond Laboratory, Washington, D. C. The balance of the work is performed by universities. Those receiving $25,000 or more are: (1) University of Pennsylvania, Philadelphia, Pennsylvania; (2) University of Wisconsin, Madison, Wisconsin; (3) University of California at Los Angeles, California; (4) Texas A&M University, College Station, Texas; (5) Brown University, Providence, RI.; (6) University of Maryland, College Park, Md.; (7) City University of New York, New York; (8) Washington University, St. Louis, Mo.; (9) Northwestern University, Evanston, Ill.; and (10) Princeton University, Princeton, N.J. In addition, there are 25 other universities participating at a total funding level of $1,150,000.

PROGRAM ACCOMPLISHMENTS AND FUTURE PLANS

Fiscal year 1972 program.—Emphasis is being given to the computing and information sciences. As an example, research is being pursued on artificial intelligence and non-numeric programming because of the potential application to Army problems in pattern recognition and the design of large and complex computer programs for scheduling and logistics control. A sustained and continuing effort is being made to obtain useful research results so that they can be applied to solve Army problems. In addition, the high caliber of mathematical consultation provided to Army facilities is being continued.

Fiscal year 1973 planned program.—Research will be pursued in the areas of mathematics of interest to the Army: applied mathematics, numerical analysis, statistics, probability, information science, and the mathematics of operations research (optimization techniques) in order to be responsive to Army requirements. In addition, highly skilled mathematicians will be made available and will furnish assistance to Army in-house investigators.

Program to completion.—This is a continuing program.

Resources (in millions of dollars:)

R.D.T. & E. funds for fiscal year 1971, $4.2; fiscal year 1972, $4.2; fiscal year 1973, $4.6; additional funds to completion, are continuing; and the total estimated cost is not available.

Chairman ELLENDER. How is the work on this project divided between Army in-house facilities and academic institutions?

Mr. JOHNSON. Work on this project is conducted primarily at academic institutions under contract to the Army. Army in-house facilities are funded $1.3 million and academic institutions are funded $3.3 million.

Senator YOUNG. Why do you need the increase of $429,000 you are requesting for fiscal year 1973?

Mr. JOHNSON. The increased funding of $429,000 for fiscal year 1973 is used mostly to maintain and improve consultation and assistance capabilities for solving mathematical problems with military relevance. Army in-house facilities received an increase of $200,000 to up-grade mathematical capabilities, explore new mathematical areas with military relevancy, and to up-grade computational capabilities. Academic institutions received an increase of $229,000 to maintain and improve consultation and assistance capabilities for solving mathematical problems with military relevancy.

MISSILES

Charman ELLENDER. $510,000 is requested for the project entitled "Missiles." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

DEFENSE RESEARCH SCIENCES

RESEARCH

Description.—This research is intended to develop information on physical processes and material properties associated with Army missile system components and technology. Theoretical and experimental work will be performed in various areas of solid state physics and electronics, radiation physics, atmospheric physics, mathematics and physical chemistry. Specific objectives include providing detailed information concerning energy transfer processes in laser and optical system materials, propellant ignition processes, crack propagation under pulsed radiation, nuclear cross sections, and atmospheric characteristics for missile design and behavior. Work is selected on the basis of the merit of the work, originality, and relevance.

Work performed by.—This entire effort is performed at the Physical Sciences Division, Research, Development, Engineering and Missile System Laboratory, Missile Command, Redstone Arsenal, Alabama.

Fiscal year 1972 program.—Research work in the several subareas of effort will continue to provide fundamental data and theory for lasers for target designators, for laser isolator materials, for improved knowledge of the internal behavior of materials needed for missiles under various conditions and environments, and for interaction of laser beams with laser-created plasmas. Also, considerations will continue on the spectra and molecular structure analyses of missile propellants, on mathematical investigations of stability and of crack propagation, and on the climatology of the upper atmosphere.

Fiscal year 1973 planned program.—Research will continue on electronic and optical properties of laser and optical system materials, with emphasis on optical windows for transmission of high power laser energy. Further consideration will be given to materials for optical isolation to be used between stages of laser amplifiers. Experimental spectroscopic studies will be made of various missile propellant materials to include the diazanaphthalenes and polyacetylenes because of their energetic decomposition upon ignition and unstable intermediate species. Additional data will be obtained and analyzed with regard to the upper atmosphere, to include work on wind shear profiles, and relationships to gusts and turbulence. New work will be undertaken on visibility and transmission parameters as related to temperature, wind density and humidity. The theoretical model of crack propagation under pulsed stress will be extended to more than one crack, a random distribution of cracks, and to account for energy losses involved.

Program to completion.—This is a continuing program.

Resources (in millions of dollars:)

RDTE funds for fiscal year 1971, $0.5; fiscal year 1972, $0.5; fiscal year 1973, $0.5; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. It would seem that this program is continuing at roughly the same level as in fiscal year 1972. Am I correct?

Mr. JOHNSON. Yes; it is planned to support this work at essentially the same level of effort.

ELECTRONICS

Chairman ELLENDER. $8.8 million is requested for the project entitled "Electronics." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

DEFENSE RESEARCH SCIENCES

RESEARCH

Description.—The objective of this sub-element is to discover new electronic phenomena or generate new understanding of basic concepts, particularly to solve critical Army electronics problems related to exploratory development where progress has been inhibited by a lack of understanding of fundamentals or a scarcity of basic data. Electronics research is performed in such militarily relevant scientific and technological areas as solid state electronic devices and materials including radiation effects; signal generation, processing, propaga-

tion and reception between the spectral limits of very low frequency and ultraviolet; control theory; computer sciences; network and systems design; biomedical electronics; laser materials, techniques and safety; and phenomena, materials and techniques for night vision detectors, imaging devices, image intensifiers and image processors. The intent of the sub-element is also to provide for coupling within the scientific community of academic, industrial, and military electronics researchers and to maintain a competent, expert group of in-house scientists to give depth to the Army electronics research and development program. The work performed by the distinguished industrial and university researchers, supported by grant or contract from the program, is designed to complement the efforts of the Army scientists. The results of this research program are continuously monitored, evaluated and applied by development laboratories, especially those engaged in the following application areas: electronic warfare, night vision, communications to include avionics, electronic data processing, identification friend or foe, combat surveillance and target acquisition, guidance and fire control, navigation/location, and missile technology.

Work performed by.—Approximately 66 percent of the work is accomplished internally at the Electronics Command, Fort Monmouth, New Jersey; Harry Diamond Laboratory, Washington, D.C.; Frankford Arsenal, Philadelphia, Pennsylvania; Ballistics Research Laboratory, Aberdeen Proving Ground, Maryland; Picatinny Arsenal, Dover, New Jersey; and Night Vision Laboratory, Fort Belvoir, Virginia. The balance is performed by contractors. Ten contractors having contracts worth $48,000 or more include: Massachusetts Institute of Technology, Cambridge, Massachusetts; Columbia University, New York, New York; University of Illinois, Urbana, Illinois; Varian Associates, Palo Alto, California; Hughes Research, Malibu, California; Raytheon Company, Waltham, Massachusetts; Westinghouse, Washington, D.C.; Stanford University, Palo Alto, California; University of California, Berkeley, California; University of Southern California, Los Angeles, California. 21 additional contractors have contracts worth $410,000.

Fiscal year 1972 program.—Antenna research is continuing relative to low silhouette designs for ground and airborne use and methods to utilize the helicopter air frame as an antenna. Field effect transistor devices are being considered in terms of new geometries and insulator and gate materials in order to establish the feasibility of microminiaturizing proximity fuse analog circuits. The scatter dispersion and absorption of electromagnetic waves (radio frequency through laser light) are being investigated in various media. Night vision research is being conducted in (1) image intensification, (2) optical and infrared radiation, (3) far infrared detection, (4) light sources, and (5) visionics, the interaction of night vision schemes and man. Particular emphasis is being placed on negative affinity and field assisted photocathodes, 1 to 2 micron photocathode materials, 8 to 14 micron detectors and detector arrays, thin film optical coatings, infrared direct view tubes, improved solid laser sources for pulse-gated operation, and digital image processing and analysis. Work is continuing to determine what targets of military significance can be effectively damaged or degraded in performance by lasers and what beam power, energy, wavelength, pulse duration, and repetition frequency are required to produce these effects. Medical and physical research continues to obtain information to minimize the health risks of employing tactical lasers under test, training, maintenance and combat conditions. Research on the interaction of laser light with matter and the formation of intense, ultrashort laser pulses show promise for precision ranging and velocity determination and mapping technology. The fundamental performance limits of a host of new microwave and millimeter wave power generating diodes are being examined. Analyses of speech bandwidth compression, speech recognition, and speaker identification will contribute to the development of future secure voice communications systems. Practical techniques are being developed for fault diagnosis in integrated digital circuitry, for improving the reliability of data transmission with coding, for the filtering and extraction of signals, and for improving network flow reliability with adaptive, self organizing circuitry.

Fiscal year 1973 planned program.—Much of the ongoing fiscal year 1972 program will be continued. Additional research emphasis will be oriented toward finding new materials and applying new physical effects for the development of novel devices that will operate at K-band (20–40 GigaHertz) or higher frequencies. These high frequencies offer significant advantages for radar and rangefinding because of their superior atmospheric and directivity characteristics. Better detection devices in the millimeter and submillimeter wavelength range will be investigated to complement the new ultrafast semiconductor oscillator diodes. New magnetic materials for the design of control devices for

phase shifting, isolating, attenuating and filtering functions will be researched. Increased attention will be given to solid state electronics research particularly in the field of material related effects adverse to the efficient operation of night vision devices. The consideration of new lasers, particularly semiconductor lasers, will generate new insights into increasing the laser frequency coverage available to the Army, laser frequency conversion, and laser propagation through the atmosphere with reasonable energy losses under tactical circumstances.

Program to completion.—This is a continuing program.

Resources (in millions of dollars) :

R.D.T. & E. funds for fiscal year 1971, $7.8; fiscal year 1972, $8.2; fiscal year 1973, $8.8; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. I note in the descriptive summary that much of the 1972 program will be continued in 1973. Are you contemplating initiating any new projects?

Mr. JOHNSON. Although the type of work described in this program is continuing in nature, it is a dynamic program in that each year investigations are completed and new investigations are initiated. For example, recent discoveries in alloy semiconductor materials combined with our earlier research successes in image intensifier techniques are permitting us to initiate research on highly efficient infrared detectors to extend the effective range of night vision devices.

Senator YOUNG. Comment on the need for the increase of $671,000 you are requesting.

Mr. JOHNSON. These additional funds are needed to capitalize fully on recent scientific advances in such areas as laser techniques. We are making our electronics research program more responsive to the scientific and technological threat posed by the Soviet Union that Dr. Foster has outlined in earlier presentations. Specifically, we will develop the technology for intermediate power, tunable, long wavelength infrared laser sources and laser components to provide us with frequency agility in this important part of the spectrum. We will also address the fundamental problems associated with laser applications wherein it is highly desirable that the entire device be exceptionally small and/or be required to perform unattended for long periods of time. This is a very difficult problem because it implies that the conventional laser power supply must be eliminated.

MATERIALS

Chairman ELLENDER. $7.8 million is requested for the project entitled "Materials." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

DEFENSE RESEARCH SCIENCES

RESEARCH

Description.—New knowledge of the structure and properties of all types of materials is a major Army requirement. Concepts and designs for developing advanced munitions, missiles, guns, aircraft, armor, land vehicles and electronic equipment depend in large measure on new materials information. This subelement contains four individual projects. Two are concerned with materials for structural, electrical, magnetic and optical functions—materials possessing strength, ductility, brittleness, wear resistance, tolerance of extreme temperature, resistance to corrosion, resistance to fatigue, or other specific property appropriate to the service required of the materials. The objectives of the other

two projects, one on explosives and pyrotechnics, the other on gun propellants, are to refine fundamental theories and develop a better understanding of these materials to obtain more effective Army munitions. Improvements in all current and future non-nuclear explosive warheads, pyrotechnic weapons and gun systems depend upon research performed under these latter two projects.

Work performed by.—The in-house effort is being conducted at the following eight Army installations: Army Materials & Mechanics Research Center, Watertown, Massachusetts; Frankfort Arsenal, Philadelphia, Pennsylvania; Picatinny Arsenal, Dover, New Jersey; Rock Island Arsenal, Rock Island, Illinois; Watervliet Arsenal, Watervliet, New York: Natick Laboratories, Natick, Massachusetts; Ballistic Research Laboratories, Aberdeen Proving Grounds, Maryland; and Redstone Arsenal, Huntsville, Alabama. Grants and contracts also support work at various universities, not-for-profit organizations, and industrial laboratories. Typical contractors and grantees with unit cost exceeding $25,000, are: Illinois Institute of Technology, Chicago, Illinois; Lehigh University, Bethlehem, Pennsylvania; Massachusetts Institute of Technology, Cambridge, Massachusetts; Princeton University, Princeton, New Jersey; New York University, New York, New York; University of Delaware, Newark, Delaware; University of Massachusetts, Amherst, Massachusetts; University of Illinois, Urbana, Illinois; University of Chicago, Chicago, Illinois; University of California, Los Angeles, California; and National Bureau of Standards, Gaithersburg, Maryland. Work is performed by an additional forty-five contractors at a total cost of $900,000.

Fiscal year 1972 program:

(*a*) New Program Initiated: A new program on the combustion of gun propellants was initiated in FY 1972 to develop needed new concepts for modeling gun propellant systems. This effort concerning steady state combustion reactions complements the transient state phenomena investigations being conducted under the ignition program begun in FY 1971.

(*b*) Continuing Efforts: Work is continuing on: identification and examination of the microstructure and the composition of the several phases in alloyed metals and relating these to the mechanical properties of the materials; measurement of physical and mechanical properties and correlating these with the observed behavior of materials under stress; establishment of atomic and subatomic structure and relating them to physical and chemical properties; investigation of the influence of temperature, pressure and environment on structural properties of materials; development of a cheaper, new chemical process for making the explosives, HMX (cyclotetramethylene tetranitramine); investigation of the practical significance of the electronic mechanism for the initiation of lead azide; and, defining the physical parameters which govern pyrotechnic reactions.

(*c*) Major Items Planned for Completion: None.

Fiscal year 1973 planned program.—Investigations will be made on fracture toughness and tensile strength for several selected materials of ordnance interest under varying conditions of temperature and strain, and the information will be used to help define the safety margin for gun launching environments. Work will be conducted to develop and apply analytic methods to problems in non-uniform elasticity of homogeneous materials, and results will be used to develop materials for critical military applications such as: helicopters rotors, booms, and power transmission systems; anti-ballistic missiles casings and nose cones; and lightweight armor. New processes for the manufacture of basic Army explosives will continue to be investigated. A number of fundamental characteristics of explosives which influence initiation and growth to detonation will be examined with the ultimate objectivity of reducing the complexity of current warhead systems. Efforts on the gun propellant combustion and ignition programs will continue with emphasis on generating selected physical and chemical data to test specific new models. Experiments on the gas permeability of pyrotechnic flare compositions of aluminum and magnesium mixed with sodium nitrate will be continued.

Program to completion.—This is a continuing program.

Resources (in millions of dollars):

R.D.T. & E. funds for fiscal year 1971, $6.7; fiscal year 1972, $7.1; fiscal year 1973, $7.8; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. I note in the descriptive summary that four projects are included under this effort. Please describe them for us briefly.

Mr. JOHNSON. Two of these projects are concerned with materials for structural, electrical, magnetic and optical functions—one supporting in-house efforts at eight Army laboratories, the other providing contract and grant support of research in universities, not-for-profit institutions, industrial laboratories and other Government agencies such as the National Bureau of Standards. The two remaining projects, one on explosives and pyrotechnic materials, the other on gun propellants, support in-house Army research on these topics at three laboratories—Picatinny Arsenal, Frankford Arsenal and the Ballistics Research Laboratory.

Senator YOUNG. Are you contemplating the initiation of any new efforts in fiscal year 1973?

Mr. JOHNSON. No new efforts will be initiated, although increased efforts are contemplated in certain essential areas.

Chairman ELLENDER. Why do you need the increase of $712,000 you are requesting?

Mr. JOHNSON. This increase is needed to provide augmented research support in the structural materials, explosives, and gun propellant areas. In the structural materials area: A series of emerging new lightweight but strong materials, including borides, silicides, and nitrides, require evaluation for potential use in body armor, penetrators and high temperature propulsion systems application; and, the effect of high temperature, high energy pulses on refractory materials being considered for antiballistic missile application needs to be established. In the area of explosives, fundamental studies are required in the evaluation of more economical methods proposed for making explosives for use in munitions. For improved gun propellants, additional work is required in determining the microstructure of candidate propellant ingredients, and microscopic differential thermal analysis investigations are needed on proposed propellant combustion catalysts.

MECHANICS

Chairman ELLENDER. Of the total requested for Defense Research Sciences, $7 million is for the subelement entitled "Mechanics." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

DEFENSE RESEARCH SCIENCES

RESEARCH

Description.—This sub-element supports research in the areas of fluidics, ballistics, and mechanics. Research in fluidics investigates and applies fluid phenomena to fluidic devices and systems to obtain Army materiel of high reliability and operability in extreme environments. Areas of effort include circuit analysis and synthesis, experimental and simulation techniques, fluid dynamics, materials and fabrication, and amplification and sensing. Research in ballistics provides basic support to the Army's weapons development programs and includes efforts in ignition; combustion; projectile-launcher interactions; weapon kinematics; subsonic, transonic, and hypersonic aerodynamics; trajectory behavior; terminal effects of projectiles and warheads; target structural response

and armor; and concept development, modeling, simulation, and analysis of terminal damage mechanisms. Research in mechanics contributes to the development of improved Army materiel through a better understanding of solid mechanics, theoretical and experimental mechanics, fluid mechanics, thermodynamics, and aerodynamics. Areas of effort include structural and material behavior, stress and strain, shock and vibration, wave propagation, elastic and plastic deformation, rupture, fluid dynamics, fatigue, and heat transfer; resulting in military use of new materials, reduced structural loading, a reduction of fatigue problems, increased performance through improved aerodynamic shapes, new propulsion concepts, increased stability, improved reliability, and better maintainability of equipment such as tanks, guns, helicopters, missiles, and munitions.

Work performed by.—Approximately 87 percent of this program is accomplished internally at the following Army laboratories: Watervliet Arsenal, Watervliet, New York; Harry Diamond Laboratories, Washington, D.C.; Ballistic Research Laboratories, Aberdeen Proving Ground, Maryland; Frankford Arsenal, Philadelphia, Pennsylvania; Picatinny Arsenal, Dover, New Jersey; Tank-Automotive Command Laboratory, Warren, Michigan; Mobility Equipment Research and Development Center, Fort Belvoir, Virginia; and Army Materials and Mechanics Research Center, Watertown, Massachusetts. The remainder of the program is a contractual effort with universities and industry. The major contracted program of the sub-element is managed by the Army Research Office-Durham. Contractors having contracts or grants of $25,000 or more are: California Institute of Technology, Pasadena, California; Southwest Research Institute, San Antonio, Texas; University of Minnesota, Minneapolis, Minnesota; Brown University, Providence, Rhode Island; Systems Sciences Software, La Jolla, California; Research Institute for Advanced Studies, Baltimore, Maryland; Massachusetts Institute of Technology, Cambridge, Massachusetts; Purdue University, Lafayette, Indiana; Duke University, Durham, North Carolina; and Lehigh University, Bethlehem, Pennsylvania. There are 23 additional contracts and grants totaling $530,000.

PROGRAM ACCOMPLISHMENTS AND FUTURE PLANS

Fiscal year 1972 program.—New starts include the determination of transient burning and ignition characteristics of high-temperature propellants, research in subsonic and transonic magnus effects on projectiles, and the investigation of blast outputs from cased charges. Continuing efforts include: construction and laboratory tests of a fluidic fuel-air ratio control system to minimize fuel consumption and air pollution; improvement of jet dynamic characteristics in fluid amplifiers and fluidic-electric generation efficiency; the modification and testing of inside-diameter sensors for application to hot forging measurements; construction of various fluidic strain gage configurations; tests of selected plastic materials for projectile rotating band application; effects of tube and breech perforations on interior ballistic performance; completion of sensitivity analyses for both low and high performance characteristics for all caliber weapons; comparison of gas flow and flame spreading rates with analytical models; studies to establish the empirical relations between interior ballistic parameters and gun heating; measurement of shell spin and yawing motions for binary projectiles; development of a semi-empirical method for predicting base pressures on projectiles with turbulent boundary layers and mass addition at the base; approximations of the amplifying effect of the propellant gas jet on the tip-off angular momentum of a projectile uncorking the muzzle; determination of the influence of mild grooving of bullet models, cylinder length, and spin rate on magnus forces and moments; development of improved kinetic energy penetrators through exploitation of high density materials; armor improvements to defeat shaped charges and kinetic energy penetrators; behind-armor effects with emphasis on fracture analysis and spallation mechanisms; optimization of fragmenting munitions characteristics for controlled beam warheads; ignition sources produced by projectile impact for fuel-fire modeling; structural response modeling; crack initiation and propagation studies; and programs in the general area of basic mechanisms research in the mechanics of materials and structures, fluid and solid mechanics, high speed aerodynamics, and shock, vibration, and wave propagation.

Fiscal year 1973 planned program.—The sub-element effort will include: improvement of the analytical design models for fluidic amplifiers and circuits,

and application of the techniques in the dynamic characteristics of jets as they effect amplifier gain and the design of fluidic analog computational elements; extension of fluidic fabrication processes to multiple element devices; the thorough testing of improved rate sensors both alone and in closed loop systems; development of computerized analytical technique for fluidic circuits; interior ballistic emphasis on flame spreading rates in solid propellants in-bore interactions of projectiles and launchers to include heat transfer, friction losses, engraving forces, and pressure gradients; burning rate enhancement of fuel-air propellents; characterization and control of acoustic instability during solid rocket propellant burning; research in missile dynamics to include in-flight behavior of aerodynamic shapes, binary shell stability and high length-to-diameter missile flight characteristics; high speed flow investigations in base bleed; turbulent boundary layers, reacting flow measurement, muzzle jet-projectile interaction, and flow visualization; magnus studies in spin mismatch, boundary layer and normal flow theory for spinning cylinders, and subsonic and transonic effects; structural response modeling for nuclear blast loading and blast loading of aircraft structures; realization of accomplishments in behind-armor behavior of tank-gun size high length-to-diameter penetrators; determination of performance effects of wave shaping explosive variation, and geometry changes; investigations of warheads with multiple fragment layers; and completion of a prototype study of 66 millimeter fragmentation warheads. Mechanics research efforts will support these efforts through continued effort in mechanics of materials and structures, high speed aerodynamics, fluid and solid mechanics, and shock and vibration.

Program to completion.—This is a continuing program.

Resources (in millions of dollars:)

R.D.T. & E. funds for fiscal year 1971, $6.2; fiscal year 1972, $6.4; fiscal year 1973, $7.0; additional funds to completion are continuing; and the total estimated cost is not available.

Senator YOUNG. How are the efforts in this subelement coordinated with similar efforts conducted by other Government agencies?

Mr. JOHNSON. Coordination of efforts in this subelement with similar efforts conducted by other Government agencies is accomplished by program reviews, exchange of program data sheets, research and technology resumes, and technical reports; and liaison and attendance at scientific meetings and conferences at the Department of Defense level, coordination is achieved through meetings of the Defense Committee on Research, and particularly at a meeting sponsored annually by the Office of the Director of Defense Research and Engineering to coordinate the programs of the services in the area of mechanics. Broader coordination is accomplished by participation in the National Aeronautics and Space Administration Research and Technology Committee. In addition, the mechanics programs is included in the triservice structures, aeronautical vehicles, and aircraft propulsion technology coordinating papers.

Chairman ELLENDER. Please describe your major efforts in this subelement for fiscal year 1973.

Mr. JOHNSON. Major efforts in the mechanics subelement for fiscal year 1973 are: the improvement of analytical design models for fluidic amplifiers and circuits with application to the determination of the dynamic characteristics of jets as they effect gain and the design of fluidic analog computational elements; interior ballistic studies of flame spreading rates in solid propellants; in-bore interactions of projectiles and launchers to include heat transfer, friction losses, engraving forces, and pressure gradients; burning rate enhancement of fuel-air propellants; research in the in-flight behavior of aerodynamic shapes, binary shell stability, and high length-to-diameter missile flight characteristics; high speed flow investigations in base bleed,

turbulent boundary layers, and muzzle jet-projectile interaction; magnus studies in spin mismatch, boundary layer, and subsonic and transonic effects; structural response modeling for blast loading of aircraft structures; determination of performance characteristics in the behind-armor behavior of high length-to-diameter penetrators; determination of the effect on performance of wave shaping, explosive variation, and geometry changes; and supporting research tasks in the mechanics of materials, high speed aerodynamics, fluid and solid mechanics, and shock and vibration.

Senator YOUNG. The $7 million you are requesting for fiscal year 1973 is $590,000 more than was provided in fiscal year 1972. Comment on the need for this increase.

Mr. JOHNSON. The $590,000 increase in the mechanics subelement budget for fiscal year 1973 over fiscal year 1972 represents added emphasis and attention to an area which is essential to the development of advanced Army materiel, particulary weapons systems. The research carried out under this subelement will provide the technology required to develop systems of greater accuracy, reliability, maintainability, and ruggedness. Specifically, emphasis is being placed on research in fluidics and interior, exterior, and terminal ballistics. Emphasis on fluidics research offers the potential of Army materiel possessing the capability of operation in extremely adverse environments and possessing increased reliability when compared with equivalent electromechanical systems. The increased emphasis on ballistics research offers the potential of Army weapons systems possessing greater accuracy, lethality, and overall operational effectiveness than those weapons in the inventory today.

ENERGY CONVERSION

Chairman ELLENDER. $1.7 million is for the project entitled "Energy Conversion." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

DEFENSE RESEARCH SCIENCES

RESEARCH

Description.—This program provides relevant fundamental knowledge for the development of energy conversion devices for communication, surveillance, fuzing and propulsion applications. The Army share of the information exchange on energy conversion programs is funded from this program at the Power Information Center. The program element includes basic research in the fields of chemical-to-electrical energy conversion, magneto-hydrodynamics, thermoelectric energy, thermionic energy, photoelectric energy, heat transfer and thermodynamics. Information from this research assists other Army projects that involve the development of devices such as batteries, fuel cells, high speed turbines for production of electricity and thermoelectric generators which supply improved power for radios, radar sets, fuzes for shells and bombs and electric vehicular propulsion.

Work performed by.—Approximately 75% of the work is accomplished internally at the US Army Electronics Command, Fort Monmouth, New Jersey; US Army Mobility Equipment Research and Development Center, Fort Belvoir, Virginia and Harry Diamond Laboratories, Washington, D.C. Approximately 25% of the funds support contracts. Five organizations have contracts of $25,000 or more: (1) TYCO, Waltham, Massachusetts; (2) Brookhaven National Laboratory, Upton, New York; (3) Power Information Center, University City Science

Institute, Philadelphia, Pennsylvania; (4) Northwestern University, Evanston, Illinois; and, (5) Minnesota University, Minneapolis, Minnesota. In addition there are nine contracts which total $220,000.

Fiscal year 1972 program.—Power sources are under investigation in the following four areas: (1) batteries with power densities two to three times higher to allow soldiers in combat to carry less weight or remain on patrols longer; (2) silent power sources with less maintenance to replace the standard motor-generator combination; (3) power generation equipment that is more efficient in the use of hydrocarbon fuels to provide an improvement in logistics; and, (4) long range cost saving situations to be applied to power sources through further research. The present program provides information for making improved power sources and includes efforts aimed at: reducing the cost per kilowatt in fuel cells and metal-air batteries by developing less expensive, more durable and more active electrode materials; doubling the output of batteries through investigations which will allow the application of organic electrolytes; development of graphite and boron fluorine compounds as new high energy, insoluble cathodes for organic cells in use with metal anodes; extending the stability of lead dioxide in fuze batteries to 160° F; increasing oxidation rates of hydrocarbons by exploring new electrolytes in which hydrocarbons are soluble; new approaches in synthesis of superconducting materials with higher critical properties; determination of active sites of catalysts by electron diffraction.

Fiscal year 1973 planned program.—(1) If the structure of active sites is determined, then attempts to artificially create active sites in catalysts will be carried out; (2) The preparation and characterization of hard superconducting thin films will be continued; (3) Preparation and properties of graphite and boron fluorine compounds will be investigated for new cathode materials; (4) Zinc electrodes in alkaline electrolytes and oxygen electrodes will be investigated for low temperature operation; (5) Optimization of spectral match of silicon cells to new radiator compounds with ytterbium oxide will be carried out for the thermophotovoltaic device; (6) Fuze program will be continued for lower operating temperature of thermal batteries and reduction of vapor pressure and corrosiveness of ammonia battery systems; and, (7) Support of research proposals pertinent to energy conversion will be continued.

Program to completion.—This is a continuing program.

Resources (in millions of dollars):

R.D.T. & E. funds for fiscal year 1971, $1.6; fiscal year 1972, $1.6; fiscal year 1973, $1.7; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Are you initiating any new projects in fiscal year 1973?

Mr. JOHNSON. No new projects will be initiated in fiscal year 1973.

Senator YOUNG. It would appear that this project is continuing at roughly the same level as in fiscal year 1972. Is this correct?

Mr. JOHNSON. Yes. The funds changed from $1.58 million in fiscal year 1972 to a proposed $1.73 milion in fiscal year 1973. With the cost of living increase the effort remains at the same level.

AERONAUTICAL SCIENCES

Chairman ELLENDER. $6.2 million is for the subelement entitled "Aeronautical Sciences." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

DEFENSE RESEARCH SCIENCES

RESEARCH

Description.—This program supports research in the following areas: (1) Rotary wing aerodynamics; (2) Fundamental fluid mechanics; (3) Aerodynamic noise; (4) Airofoil development; (5) Rotorcraft vehicle dynamics; (6) Rotorcraft stability and control, handling qualities and control systems; (7) Aero-

dynamics of rotor wakes; (8) Small engine technology; (9) Engine analysis; (10) Turbine and compression technology; (11) Shafting, bearings, and seals; (12) Engine materials; (13) Fatigue characteristics; (14) Structural mechanics and dynamics of aircraft components; (15) Application of new materials and new structural concepts; and (16) Structural design loads. This aeronautical research provides fundamental low-speed and subsonic aeronautics technology necessary to achieve significant improvements in performance and effectiveness of Army air mobility vehicles. In particular, technology is developed to improve stability, control, payload, performance, propulsion efficiency, structural efficiency, vulnerability, survivability, maintainability, and reliability characteristics of Army aircraft.

Work performed by.—The major portion of this program is accomplished internally at the Army Air Mobility Research and Development Laboratory, Moffett Field, California, and at the four directorates of the Laboratory. These directorates are the Eustis Directorate, Fort Eustis, Virginia; Ames Directorate, Moffett Field, California; Langley Directorate, Hampton, Virginia; and Lewis Directorate, Cleveland, Ohio. The remainder of the program is contractual effort with universities and industry and is managed by the Army Research Office-Durham, Durham, North Carolina. The following contractors have contracts or grants of $25,000 or more; (1) Southwest Research Institute, San Antonio, Texas; (2) Illinois Institute of Technology, Chicago, Illinois; (3) Princeton University, Princeton, New Jersey; (4) University of Washington, Seattle, Washington; (5) Pennsylvania State University, University Park, Pennsylvania; (6) Ohio State University, Columbus, Ohio; (7) Johns Hopkins University, Baltimore, Maryland; (8) North Carolina State University, Raleigh, North Carolina; (9) Wyle Laboratories, Huntsville, Alabama; and (10) Massachusetts Institute of Technology, Cambridge, Massachusetts. The remaining contracts program involves 19 contractors for a total of $425,000.

PROGRAM ACCOMPLISHMENTS AND FUTURE PLANS

Fiscal year 1972 program.—Program areas where progress is anticipated in improving the performance, reliability and maintainability of Army aircraft in fiscal year 1972 include the following. Progress is expected in understanding the unsteady flow field environment and compressibility effects on the advancing rotor blade tip regions. Advancement is expected in defining a more nearly optimum rotorcraft blade airfoil through two-dimensional airfoil wind tunnel tests, and investigations of the effect of airfoil characteristics, such as chord, radius and sweep angle. Progress is expected in establishing rotorcraft aeroelastic models that will include a sensitivity analysis of the basic program and wind tunnel tests for verification. Improvements are anticipated in understanding rotorcraft blade tip vortex generation and propagation. The aerodynamic characteristics of conventional and nonconventional anti-torque devices (tail rotors) will be experimentally investigated. Progress is expected in establishing the fundamental aerodynamics of small advanced gas turbine engine components, such as combustors, compressors, and turbines. Advancement is expected in improving the design of high temperature gas turbine components through studies of high strength and lighter weight materials with long-life properties. Improvements are expected in advancing the technology of bearings, seals and engine lubrication of small gas turbine engines. Advancements in rotorcraft structural research include the development and evaluation of failsafe concepts for rotor blades using composite materials, evaluation of mixed modulus materials, determination of the fatigue characteristics of advanced composites and determination of the vibration and damping characteristics of advanced composites.

Fiscal year 1973 planned program.—The planned fiscal year 1973 program is to continue the fiscal year 1972 research program to provide rotorcraft and Vertical/Short Take-Off and Landing (V/STOL) aircraft technology as related to advanced Army aircraft systems requirements in support of Army air mobility. Continuing aerodynamics research programs will include: optimization of rotorcraft airfoil development; analysis of the complex unsteady flow field environment of rotorcrafts, as well as the influence of compressibility effects on the advancing blade tip region; developing improved methods of predicting aerodynamically generated noise; developing rotorcraft blade aeroelastic models that include more realistic aerodynamic data and the response of advanced structures and materials; investigations of rotorcraft blade tip vortex generation and propagation and wake characteristics; and developing methods for im-

proving Vertical Short Take-Off and Landing Aircraft model test techniques. Continuing small gas turbine engine propulsion research will include: investigation of the aerodynamics of combustors, compressors and turbines; studies of high strength-low weight materials for high temperature components to improve the design as well as the thermal fatigue; investigations of bearings, seals, and engine lubrication problems for small size engines; and to conduct combustor research that will include more efficient combustion, reduced emissions and higher performance. This research will assure adequate fundamental knowledge for future propulsion exploratory and advanced development efforts for specific advanced Army aircraft applications. Continuing aircraft structures research will concentrate on use of advanced composite materials that include: analysis of composite rotorcraft fuselage structures; evaluation of failsafe concepts for rotor blades using composite materials; evaluation of mixed modulus materials; determination of rotorcraft design structural loads; determination of the fatigue characteristics of advanced composite and metallic structures; determination of the vibration and damping characteristics of advanced composites and the effects of these characteristics on structural stability; investigation of fracture and buckling behavior of composites and laminate filamentary composite materials; and modification of the energy release rate criteria for predicting crack growth characteristics. Progress in this aircraft structural research program will provide the Army with: higher performing aircraft, improved reliability, maintainability, and survivability characteristics, and reduced aircraft vulnerability.

Program to completion.—This is a continuing program.

Resources (in millions of dollars):

R.D.T. & E. funds for fiscal year 1971, $5.1; fiscal year 1972, $5.6; fiscal year 1973, $6.2; additional funds to completion are continuing; and the total estimated cost is not available.

Senator YOUNG. Are you planning any new initiatives in aeronautical sciences in fiscal year 1973?

Mr. JOHNSON. There are no new initiatives in the research subelement entitled "Aeronautical Sciences" in fiscal year 1973.

Chairman ELLENDER. Comment on the need for the increase of almost $600,000 you are requesting for fiscal year 1973.

Mr. JOHNSON. The increase requested for fiscal year 1973 represents increased emphasis on basic research in support of the Army's advanced aircraft systems program. Specifically, the increase supports research in advanced combustor configurations, investigation of applications of composite materials in Army aircraft, investigations in the unsteady aerodynamics of rotary-wing transonic flow, and an increased level of effort in the aeronautical program in general. This program, conducted in joint cooperation with the National Aeronautics and Space Administration, is essential to the development of technology in support of Army air mobility.

TERRESTRIAL SCIENCES

Chairman ELLENDER. $2.9 million is requested for the project entitled "Terrestrial Sciences." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

DEFENSE RESEARCH SCIENCES

RESEARCH

Description.—Objective of this research is to provide basic information in the terrestrial sciences for the development of (1) Army materiel that will function properly and have longer service life in all natural environments of the world, (2) Army vehicles capable of moving more efficiently off-road over a wide range of soil and relief conditions, (3) military construction and engineering capabili-

ties better adapted to the great variety of soil, geologic, climatic and other natural conditions found in various parts of the world, and conforming with environmental protection objectives, (4) improved methods, techniques, and equipment for collection, analysis, storage, retrieval, and presentation of military geographic intelligence; (5) better maps that can be produced more economically and more rapidly. Areas of research involved respectively in these developments are: (1) terrain and climatic factors to derive data for use in guidance for design, storage, testing, and issue of Army materiel; (2) environmental factors involved in vehicle design; (3) physical properties of soils, rocks, ice snow, vegetation, and other terrestrial factors involved in construction and engineering activities; (4) theoretical geography and geographical methodology to develop new or improved theories, concepts, methods, and techniques for use in area analysis and military geographic intelligence; (5) development of new principles, criteria, and concepts in celestial geodesy, photogrammetry, cartography, and the physical sciences in order to develop improved methods and techniques required for advanced Army topographic and geodetic systems.

Work performed by.—Approximately 70% of the research is accomplished internally by Army agencies, including U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi; U.S. Army Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire; U.S. Army Engineer Topographic Laboratories, Fort Belvoir, Virginia; U.S. Army Tank-Automotive Command, Warren, Michigan. Ten contractors have contracts or grants of $25,000 or more: (1) University of Washington, (2) California Institute of Technology, (3) Purdue University, (4) University of Iowa, (5) University of Denver, (6) University of Illinois, (7) Development and Resources Transportation Company, Silver Spring, Maryland, (8) Colorado State University, (9) University of Oklahoma, (10) Iowa State University. In addition fifteen other universities and nonprofit organizations had contracts or grants worth a total of $150,000.

Fiscal year 1972 program.—Research is continuing on the following: determination of the mechanics of vehicle running gear interactions with soil; determination of the response of ice to acoustic, mechanical, and electrical signals; determination of the attenuation characteristics of ice fog in the visible and infrared ranges; development of techniques for modifying or dispersing ice fog; determination of significant ecological subsystems in the Arctic ecosystem for purpose of analyzing those that can be adversely affected by man's activities; factors affecting ice adherence to surfaces; classification of tropical soils for engineering and construction purposes; changes in soil properties under loading; loading conditions on structures from such external forces as wind, explosions, water, snow, and foundation displacements; detection of military activities in forested areas by remote sensing; investigations of sensing arrays and holography for topographic mapping applications; and atmospheric effects on distance and angle measurements.

Fiscal year 1973 planned program.—Continue research on the phenomena related to ice adherence, ice fog, and arctic ecological subsystems. Test methods for minimizing the adverse effects of man-induced changes in arctic ecosystems and terrain. Continue research on vehicle running gear interactions with soils. Investigate tropical soils for engineering and construction applications. Continue efforts in the areas of sensing arrays and holography for military mapping and in the area of atmospheric effects on distance and angle measurements. Continue research on soil changes under loading and study of loading and failure phenomena in structures.

Resources (In millions of dollars):

R.D.T. & E. funds for fiscal year 1971, $2.5; fiscal year 1972, $2.5; fiscal year 1973, $2.9; additional funds to completion are continuing; and the total estimated cost is not available.

BUDGET REQUEST

Chairman ELLENDER. Are you contemplating the initiation of any new efforts under this subelement in fiscal year 1973?

Mr. JOHNSON. No. Work will continue on the fiscal year 1972 efforts.

Senator YOUNG. Why do you need the increase of almost $500,000 you are requesting for fiscal year 1973?

Mr. JOHNSON. The additional money will be used to increase efforts leading to greater efficiency and economy in military mapping and improved geographic analysis capabilities. Specific areas receiving

increased emphasis will be studies of coherent optical systems, rapid derivation of elevation data from photographic sources, and studies to establish linkages between environmental factors and their effects upon military activities.

ATMOSPHERIC SCIENCES

Chairman ELLENDER. $4 million is requested for the project entitled "Atmospheric Sciences." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

DEFENSE RESEARCH SCIENCES

RESEARCH

Description.—The purpose of this program is to acquire a basic understanding of the structure and dynamics of the atmosphere and to develop numerical models that describe atmospheric phenomena which have a significant, and often critical, effect on practically all types of Army operations. Basic research efforts are directed toward: (1) obtaining significant new knowledge concerning the localized (battle area) effects of small-scale atmospheric processes below a height of 30 kilometers (km) that are associated with many Army tactical operations such as artillery fire power, chemical and radiological contaminant trajectories and air/ground mobility activities; (2) investigation of the physical and chemical properties and dynamic processes of the atmosphere between 30 and 250 km which is needed for the prediction of radioactive fallout, the prediction and correction for atmospheric effects on electromagnetic and acoustic radiation and propagation; and to understand upper atmospheric interactions with Army weapons and long-range communications systems applicable to the basic design of Ballistic Missile Defense Systems and in detection, surveillance and guidance problems pertaining to missiles operating through that portion of the atmosphere; (3) development of improved sensors and probing devices that will meet the Army's need for more detailed, accurate, representative and timely observations and predictions of atmospheric structure; (4) understanding the interaction between atmospheric processes and dynamics which affect the formation, growth and dissipation of clouds, fog, precipitation and haze, thus providing a basis for the development of atmospheric modification techniques applicable to many Army operational, transportation and supply problems; (5) studies of important meteorological phenomena occurring in arctic, tropic and desert regions that affect military operations and troop efficiency in those geographic areas.

Work performed by.—Approximately 85 percent of the work is accomplished internally by the Atmospheric Sciences Laboratory (ASL) with facilities at White Sands Missile Range, New Mexico; Fort Monmouth, New Jersey; and the Ballistic Research Laboratories, Aberdeen Proving Ground, Maryland. The following contractors have contracts of $25,000 or more: (1) Massachusetts Institute of Technology; (2) University of Nevada; (3) Stanford Research Institute; (4) Colorado State University. Additionally eleven other universities and non-profit organizations hold contracts with a total of $209,000.

Fiscal year 1973 planned program.—Continue basic research activities to: (1) establish new vertical wind, temperature and density profiles for use in missile design and projectile trajectory analyses; (2) acquire fundamental knowledge of small-scale atmospheric processes in the lower atmosphere that can be used to develop numerical models that describe atmospheric motion (particularly in mountain, desert and tropical areas). This information is needed to provide predictions of meteorological parameters for many Army air/ground tactical operations; (3) investigate the chemical constituent characteristics as well as thermal and electrical structure, of the upper atmosphere between 30 and 250 km to provide knowledge essential to Army operation and involving ballistic defense systems and long-range communications systems; (4) study the effects of atmospheric turbulence, as well as the absorption and refractive effects of atmospheric constituents, on the propagation of laser energy to gain information needed for the use of lasers in detection and tracking systems and communications, and the design of remote sensing systems for collection of meteorological data; (5) construct numerical models to describe the dynamics of fog/cloud modification,

including the effects of electrical charge upon the coalescence of cloud droplets, and develop chemical fog/cloud modification techniques applicable for field army and army aviation operations; (6) study atmospheric conditions in desert and tropical areas to provide information concerning the effects of those environments on Army operations and equipment.

Chairman ELLENDER. A number of Government agencies—both military and nonmilitary—seem to have projects complementary to this one. Please comment on the ways in which their various efforts are coordinated, and comment on how well you believe their efforts are coordinated.

Mr. JOHNSON. This effort is coordinated with other Government agencies through the Interdepartmental Committee on Atmospheric Sciences (ICAS), and the Interdepartmental Committee on Applied Meteorological Research (ICAMR). Meetings are held once a month by ICAS and once a quarter by ICAMR. The Department of Defense member and representatives from each of the services attend these meetings. Federal plans in various areas in the atmospheric sciences are prepared by these committees. The Federal plan for meteorological services and supporting research and the national atmospheric sciences program, prepared annually, providing a comprehensive view of the total federally supported research in the atmospheric sciences now underway and planned for the coming budget year. Within the Department of Defense this work is coordinated through the Office of the Director Defense Research and Engineering. In addition, direct coordination is maintained at all echelons with the other services and Federal agencies, and cooperative programs also are conducted. Through these means the efforts of this project are well coordinated.

Senator YOUNG. Am I correct in assuming that this project is to be continued in fiscal year 1973 at roughly the same level as in fiscal year 1972?

Mr. JOHNSON. That is correct.

BIOLOGICAL-MEDICAL SCIENCES

Chairman ELLENDER. Of the total requested for defense research sciences, $21.2 million is for the program element entitled "Biological-Medical Sciences." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

DEFENSE RESEARCH SCIENCES

RESEARCH

Description.—Research in biological-medical sciences seeks to obtain a fundamental understanding of basic principles underlying a range of scientific disciplines which are of military significance. Research is conducted in biochemistry, microbiology, medicine, nutrition, physiology, pharmacology, and related disciplines. Sub-element supports a broad and continuing program in the life sciences essential to acquisition or development of fundamental knowledge to: evolve novel materiel in the chemical and biological defense programs; conduct research in the etiology, epidemiology, diagnosis, prevention, care and treatment of casualties; control infectious diseases of military importance; and explore the biological protective aspects of materiel and food sciences. This long range research effort undergrids the exploratory development program to diminish the impact on the efficiency of military operations resulting from the

individual soldier's reduced effectiveness because of disease or other impairing factors.

Work recommended by.—Approximately 67% of work is conducted in-house at US Army Natick Laboratories, Natick, MA; US Army Research Institute of Environmental Medicine, Natick, MA; US Army Edgewood Arsenal Research Laboratories, Edgewood Arsenal, Md.; U.S. Army Medical Research Institute of Infecitous Diseases, Ft. Detrick, Md.; Walter Reed Army Institute of Research, Washington, D.C.; Armed Forces Institute of Pathology, Washington, D.C.; US Army Biochemical Research Laboratory, Washington, D.C.; US Army Institute of Dental Research, Washington, D.C.; US Army Medical Research and Nutrition Laboratory, Denver, Colo.; U.S. Army Medical Research Laboratory, Ft. Knox, Ky.; Joint Laser Safety Team, Frankford Arsenal, Pa.; U.S. Army Institute of Surgical Research, Ft. Sam Houston, Tex.; Letterman Army Institute of Research, San Francisco, Calif.; U.S. Army Medical Research Unit, Balboa Heights, Canal Zone; and by contracts with universities, nonprofit organizations and industry. Typical research contractors of $25,000 or more are University of Virginia, Charlottesville, Va.; University of California, Los Angeles, Calif.; Children's Memorial Hospital, Chicago, Ill.; Baylor University, Houston, Tex.; Emory University, Atlanta, Ga.; Harvard University, Boston, Mass.; University of Colorado, Denver, Colo.; University of North Carolina, Chapel Hill, N.C.; University of Maryland, College Park, Md.; and Georgetown University, Washington, D.C. In addition, 88 other universities and nonprofit organizations have contracts worth approximately 5.5 million dollars.

Fiscal year 1972 program.—Basic research data is contributing to an understanding of the processes involved in infections, surgical shock, ionizing radiation damage, vascular response to cold, and in utilization of specific food nutritive elements. Studies will focus on further investigation of hemorrhagic and endotoxic shock; replacement therapy with blood, plasma, fluid, and electrolytes; mechanisms underlying respiratory insufficiency and infection in wounded personnel; and abnormal endocrine responses to stress. Epidemiological investigations of acute respiratory diseases, pneumonia, and meningitis in training centers will continue. New methods are being explored for insect control without pesticides such as use of aggregation factors combined with low level ultraviolet light. Research on blood will continue emphasizing identification of the natural component of blood that has the property of stimulating white cell population as a basis for the chemical treatment of blood debilitating disease. Investigations continue on drug reaction at the cellular level, respiratory physiology under the influence of chemical agents, and related problems in the defense against biological and chemical agents. Basic and supporting food research is being increased to accelerate improvements in the total military feeding system to optimize the acceptability and nutritional aspects.

Fiscal year 1973 planned program.—Solutions to problems of military medical importance will continue to be emphasized. Immuno-chemistry will retain a high level of effort. Particular emphasis will be given to research on enzyme and mineral function in cellular metabolism, pharmacology of new drugs, and the ecology of animals and arthropods which are reservoirs and transmitters of human infectious agents. Increased efforts will be placed on parasitic diseases, including the development of new vaccines and improved environmental control measures. Basic investigations will continue in microbial and viral genetics and the action of toxic compounds on life processes as related to the chemical and biological defense program. Extension of food research will include investigation of food processing effects on nutritional value, and evaluation of food microbiology related to safety and acceptance of foods.

Program to completion.—This is a continuing program.

Resources (In millions of dollars):

R.D.T. & E. funds for fiscal year 1971, $17.6; fiscal year 1972, $19.4; fiscal year 1973, $21.2; addition funds to completion are continuing; and the total estimated cost is not available.

Senator YOUNG. Comment on the major accomplishments you hope to achieve in this program element in fiscal year 1972.

Mr. JOHNSON. This is a basic research program area concerned with the biological and medical sciences. Studies are oriented towards new knowledge of the structure, function, and interactions of all types of living systems or their components. It is anticipated that greater

insights will be forthcoming in the broad spectrum of biological-medical sciences. Examples include control of hemorrhagic and endotoxic shock, new compounds for protection of the soldier against bloodsucking insects, mechanisms of resistance of organisms to various drugs, adaptation of man to climatic extremes and immune mechanisms stimulated by various antigens. The single most important accomplishment expected is the incremental knowledge obtained in all areas within this program element which will become the foundation of the 6.2 biological-medical effort. It is essential that this supportive research continue, progressively advancing the technology upon which the more advanced developments are built.

Chairman ELLENDER. Comment on your planned program for fiscal year 1973 and tell us why you need the increase of $1.8 million you are requesting.

Mr. JOHNSON. In fiscal year 1973, this program will continue to emphasize solutions to problems of military medical importance. Increased efforts will be placed on parasitic diseases. This will include continued work on development of new vaccines and investigations of the ecology of animals and anthropods which are reservoirs and transmitters of infectious diseases. Considerable effort will be expended to enhance the recovery and rehabilitation of the sick and wounded. The requested funding for fiscal year 1973 includes an increase over fiscal year 1972 by approximately 10 percent. Much of this is required to offset the increased costs of operating our research facilities and the escalating equipment and materials costs. In addition, there are modest increases in two areas: biological effects of lasers and care of the wounded. The development of laser systems has begun to outstrip the understanding and control of the laser's biological effects and this increase is required to insure that adequate safety guidance will be available on a timely basis. Two areas in care of the wounded receiving additional attention are mechanisms for speeding wound healing and methods of stabilizing spinal cord injuries to prevent paralysis.

BEHAVIORAL SOCIAL SCIENCES

Chairman ELLENDER. $3 million is requested for the project entitled "Behavioral Social Sciences." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

DEFENSE RESEARCH SCIENCES

RESEARCH

Description.—The objective of this research is acquisition of new knowledge in the area of human resources that will prepare the US Army solider to adapt and perform within the broad range of physical environments, cultural environments, and types of warfare to which he may be subjected. The underlying purpose of the research is to understand, measure, predict, and improve the performance of US Army soldiers operating individually and in units. This program includes research in both psychological and psychophysiological factors influencing military performance and supports applied programs to achieve: (1) maximization of military manpower resources and minimization of requirements; (2) improved Army training; (3) improved motivation and leadership; (4) assured man-machine compatibility of weapons and military equipment; (5) advanced capabilities in civil affairs and psychological operations; and (6) improved discipline, increased morale, and a military climate which will promote a modern volunteer force.

Work performed by.—In-house research is performed by: The US Army Manpower Resources Research and Development Center, consisting of the Behavior and Systems Research Laboratory and the Motivation and Training Laboratory Arlington, Virginia; the US Army Human Engineering Laboratories, Aberdeen Proving Ground, Maryland; and the US Army Natick Laboratories, Natick, Massachusetts. Contract organizations which perform research under this element and whose contracts exceed $25,000 are: Human Resources Research Organization, Alexandria, Virginia; the American Institutes for Research, Pittsburgh, Pennsylvania; Texas Technological College, Lubbock, Texas; Texas Christian University, Fort Worth, Texas; the University of Louisville, Louisville, Kentucky; and HRB-Singer, State College, Pennsylvania. There are no contracts for less than $25,000.

PROGRAM ACCOMPLISHMENTS AND FUTURE PLANS

Fiscal year 1972 program.—New Programs Initiated: Research to develop new and more effective techniques for improving racial attitudes among military personnel, thereby promoting racial harmony.

Continuing Effort: Research will continue on: human reaction under stressful situations, development of useful physiological measures of alertness, visual identification of rapidly moving targets, human aspects of organizational effectiveness, determination of the significant psychological and social factors involved in effective intercultural communications, military noise control and abatement and protection of the soldier, and keeping track of events in fast-moving situations.

Major Items Planned for Completion: The development of an instructional method, using videotape presentation of typical interaction between American and host-country nationals, designed for use in military advisory training.

Fiscal year 1973 planned program.—A broad program of research will continue to furnish the technological base for the Army's diverse applied research and development in human resources. These programs assume new importance and significance as efforts are expanded to establish the Modern Volunteer Army. Research will continue on new methods for measuring learning and training achievement, thereby gaining more valid criteria for assessing improvements in training methods; more precise quantification and assessment of skills, abilities, and personality traits; effects of impulse noise on hearing abatement and hearing protection; development of techniques and methodology for measuring motivation, attitudes, and values of the soldier.

Program to completion.—This is a continuing program.

Resources (in millions of dollars):

R.D.T. & E. funds for fiscal year 1971, $1.8; fiscal year 1972, $1.9; fiscal year 1973, $3; additional funds to completion are continuing; and the total estimated cost is not available.

Senator YOUNG. Has the research conducted under this subelement been used in any way in the drug abuse program?

Mr. JOHNSON. A basic research effort to increase the accuracy of responses to anonymous questionnaires about use of drugs has been funded from "Behavioral Social Sciences."

Chairman ELLENDER. Comment on the use of techniques developed under this project in connection with the Modern Volunteer Army.

Mr. JOHNSON. A large and significant effort provided 17 man-years in direct support of the Office of the Special Assistant for the Modern Volunteer Army. The worldwide program of innovations is aimed at promoting a modern volunteer Army (Project VOLAR). The research and development effort provided: (1) Techniques for and technical assistance to local commanders for evaluating VOLAR programs at 21 separate worldwide locations to train Army personnel to administer questionnaires, collect data, and use data to modify installation plans; (2) indepth interviews of selected individuals who reenlisted and those who do not; (3) plans and procedures for collecting and analyzing attitude assessment data worldwide, and convert data for use with general purpose retrieval and statistical analysis programs.

Chairman ELLENDER. Comment on the need for the increase of $1 million you are requesting.

Mr. JOHNSON. A major portion of the increase is to support the building of a technological base for badly needed research on social problems facing the Army. The present civilian community research base to address these problems is inadequate. Funds will be used through contractual efforts to assist in developing this civilian community research base. Problem areas to be covered are motivation, morale, incentives, drug abuse and race relations. The balance of the increase is for both laboratory and field experimentation in basic research in human capabilities to establish parameters in a wide variety of stressful conditions such as noise, extreme conditions, stress, et cetera. The research is essential in order to determine basic performance under these conditions.

CIVIL ENGINEERING TECHNOLOGY

Chairman ELLENDER. $9.4 million is requested for the program element entitled "Civil Engineering Technology." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

EXPLORATORY DEVELOPMENT

Description.—This element is made up of projects concerned with the design, construction, operation, and maintenance of Army facilities and the influencing of the natural and man-made physical environment via engineering field operations. This work falls into the groupings of (1) improving combat operations and field capability, (2) developing economy-producing and quality-enhancing permanent construction materials and techniques, and (3) developing the capability to construct and accomplish engineering work in the cold regions, while (4) maximizing, to the extent possible, environmental quality, and minimizing environmental pollution.

Work performed by.—Approximately 80% of the work is to be inhouse research. Participating laboratories include the US Army Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire; US Army Construction Engineering Research Laboratory, Champaign, Illinois; and the US Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. Currently, contracts for $25,000 or more are with the Southeast Research Institute of San Antonio, Texas; Arthur D. Little, Incorporated of Cambridge, Massachusetts; and Black and Veatch of Kansas City, Missouri. Other smaller contracts have a total dollar value of $75,000.

Fiscal year 1972 program.—New Programs Initiated: Development was initiated to capitalize on the membrane encapsulated soil layer concept by testing a variety of surfacing materials, determining capabilities for cold regions, and testing for suitability under current, expedient airfield mattings. Effort was also initiated to maintain environmental quality and minimize pollution during construction and operation of Army facilities.

Continuing Efforts: Continued effort is being devoted to development of engineering design and expedient construction criteria. Work accelerated in applying the systems approach to the development of construction techniques, in critically evaluating construction materials, and in capitalizing on the near breakthrough accomplishments of the FY 1971 program. The funding increase of the FY 1972 program had been planned from its inception as the proper progression of funding in this program element to allow capitalizing on prior years' results.

Major Items Planned for Completion: Publishing of a design manual for theater of operations highway and storage area construction, a handbook for using explosives for clearing vegetation, a manual for adopting soil stabilization equivalent thickness to pavement design, and revised criteria for frost design of pavements will be accomplished. Conduit cover criteria for multiple-wheel landing gear loading, analysis and prediction methods of earth motion due to surface stimulation, an operating computer program for a new method of pavement

design using lifetime dynamic loading, and a standard procedure for acceptance testing of large diesel generators will be completed. For cold regions, a model of drifting snow for planning and layout of buildings and facilities will be completed and provide a major step forward in predicting this important phenomena. This model will have specific application at SAFEGUARD facilities.

Fiscal year 1973 planned program.—The planned increase in funding is required to make an all-out assault on insuring environmental quality during construction and operation of Army facilities and to keep within both the letter and spirit of congressional and executive environmental requirements. Development will be initiated and accelerated in the areas of environmental quality management, environmental protection during construction, facilities pollution control and abatement, and insuring environmental quality during operations in both temperate and cold regions. Concurrently, other civil engineering technology research will continue to find and adapt constructional, operational, and systems techniques toward maximizing values obtained for construction dollars spent. Key research in important design criteria and technology and facilities engineering methods will be accelerated. Research in labor and money-saving nondestructive testing methods should be producing initial results, while methodology for and acceleration of Corps of Engineers design and feedback through construction engineer progress reporting should be completed. In the combat engineering area, effort will concentrate on the airmobile operation—land-air interface—in preparing for reception of expected helicopters and fixed wing aircraft and in developing stabilization and construction methods to optimally use new airfield matting and materials coming into the Army inventory. With regard to cold regions, research will continue to understand and adapt engineering methods to permafrost and cold environments. Accelerated effort continues in an attempt to catch up in developing design and construction criteria for excavating, building roads and airfields, crossing water and ice barriers and constructing and operating facilities in cold regions, particularly Alaska. Finally, during this fiscal year, work will be initiated to further continued concern in the volunteer Army concept by taking human requirements, desires, and ideas of the individual soldier into design construction.

Program to completion.—This is a continuing program.

Resources (In millions of dollars):

R.D.T. & E. funds for fiscal year 1971, $3.2; fiscal year 1972, $4.3; fiscal year 1973, $9.4; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded under this program element, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

Mr. JOHNSON. I will be glad to.

(The information follows:)

[In millions of dollars

Project	Fiscal years		
	1971	1972	1973
4A062103A859—Military engineering design and expedient construction criteria	0.890	1.150	1.380
4A062102A890—Extraterrestrial research	.150	.101	.100
4A062103A891—Permanent construction materials and techniques	.615	.970	5.800
4A062103A894—Engineering in cold environments	1.585	2.090	2.160
Total	3.240	4.311	9.440

Senator YOUNG. Would you comment generally on the objectives of this program?

Mr. JOHNSON. Yes. The objectives of this program are (1) providing the Army with the essential capability to rapidly and effectively construct theater of operations facilities, (2) developing new information, methods, and techniques that will permit the design, construction, and operation of permanent military facilities characterized by enhanced

performance at lower overall costs, and (3) making a significant assault on insuring environmental quality during construction and operation of Army facilities and to keep within both the letter and spirit of congressional and executive environmental requirements.

Chairman ELLENDER. I note you are requesting an increase of approximately $5 million for this program, the greatest part of which seems to be for a project entitled "Permanent Construction Materials and Techniques." Please comment on the objectives of this program and your need for this rather large increase.

Mr. JOHNSON. I will be glad to. The increase is requested for research and development in the fields of environmental quality and pollution abatement and control at all permanent facilities. It will be used to make a significant assault on insuring environmental quality during construction and operation of Army facilities and to comply with both the letter and spirit of congressional and executive requirements for environmental protection. Development will be initiated and accelerated in areas of environmental protection during construction, facilities pollution control and abatement, and insuring environmental quality during operation of Army facilities in both temperate and cold regions. Concurrently, research efforts will be continued to find and adapt other construction, operation, and systems techniques that will yield maximum values for construction dollars spent.

Senator YOUNG. Comment on the project entitled "Engineer in Cold Environment."

Mr. JOHNSON. I will be glad to do so. The purpose of this project is to advance the engineering knowledge and procedures needed to design, construct, operate, and maintain permanent, semipermanent, and expedient military facilities in arctic, subarctic, and other areas characterized by extensive seasonal snow, ice, and frozen ground. Research and development will be accomplished by the Cold Regions Research and Engineering Laboratory, Hanover, N.H., through field and laboratory experiments and investigations concerning systems, methods, and materials that will yield timely, effective combat engineering capability and provide the most practicable permanent facilities with maximum efficiency, economy, and improved performance.

MATERIALS

Chairman ELLENDER. [Deleted] is requested for the exploratory development program entitled "Materials". Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

EXPLORATORY DEVELOPMENT

Description.—Applied research and exploratory development are conducted in the following areas: (1) Liquid Hydrocarbon Fuels; (2) Lubrication, Friction and Wear; (3) Power Transmission Fluids and Corrosion Prevention and other Specialty Compounds; (4) Metallurgical Techniques and Alloy Improvements; (5) Organic Materials; (6) Ceramic Materials; (7) Composite Materials; (8) Electronic Materials; (9) Mechanics of Materials; and (10) Test and Evaluation Methods. All these efforts are aimed at producing improved materials for use in the design, construction or operation of Army materials to satisfy superior performance requirements. A special portion of this program deals with developing hardened Advanced Ballistic Missile (ABM) materials.

Three projects make up the ABM program. In the first, emphasis is on defining necessary materials properties in direct relationship to nuclear effects. The second project is concerned with materials failure mechanisms. The third and largest project has as its objective the development of new materials that satisfy the hardening requirements as determined in the other two projects.

Work performed by.—Approximately 80% of the work is accomplished internally at the: Coating and Chemical Laboratory, Aberdeen, Maryland; Frankford Arsenal, Philadelphia, Pennsylvania; Electronic Technology and Devices Laboratory, Fort Monmouth, New Jersey; Materials and Mechanics Research Center, Watertown, Massachusetts; Redstone Arsenal, Huntsville, Alabama; Mobility Equipment Research and Development Center, Fort Belvoir, Virginia; Watervliet Arsenal, Watervliet, New York; Rock Island Arsenal, Rock Island, Illinois; Natick Laboratories, Natick, Massachusetts; Picatinny Arsenal, Dover, New Jersey; and Edgewood Arsenal, Edgewood, Maryland. Major contractors, with contracts exceeding $25,000, are: Southwest Research Institute, San Antonio, Texas; AVCO, Lowell, Massachusetts; Rutgers the State University, New Brunswick, New Jersey; Corning Glass, Corning, New York; Boeing-Vertol, South Philadelphia, Pennsylvania; Sikorsky, Hartford, Connecticut; Massachusetts Institute of Technology, Cambridge, Massachusetts; General Motors Corporation, Detroit, Michigan; TRW Systems Group, Redondo Beach, California; Lockheed Missiles and Space Corporation, Palo Alto, California; McDonnell Douglas Corporation, Santa Monica, California; General Electric Company, Philadelphia, Pennsylvania; and Martin-Marietta Corporation, Orlando, Florida. Work is performed by thirteen additional contractors at a total cost of $290,000.

Fiscal year 1972 program.—New Programs Initiated: Development of: methods to determine and locate adhesive-bond failure; weapons components from castible polymers; mixed and compound composites for aircraft; dynamic constitutive relations in advanced composites; fracture energy absorption criteria in composite materials; and erosion-resistant heat shield materials, such as [deleted] and heat sink materials such as [deleted] for ABM interceptor application.

Continuing Efforts (FY 1972): Development of: high temperature organometallic compounds; transparent polymers for armor applications; polyfluorophosphazene rubbers for extreme temperature applications; boron compounds for lightweight armor; materials for lightweight composite gun tubes for Army aircraft; textile fibers and fabrics for ballistic, environmental, chemical, thermal and flame protection; and colorants for fibers and fabrics will continue. Investigation of optical sensor materials usable in the long wave length infrared region, evaluation of fiber-reinforced metal and resin-matrix materials using simulation techniques, development of varied composite materials of high modulus such as [deleted] and establishment of dynamic response of advanced substructure materials, all for ABM applications, are also continuing.

Major Items Planned for Completion: Work on: fluorescent colorants and substrates for wide band camouflage applications; armor materials for hardening of air defense missile systems; ultra-fine grain high strength metal materials for armament application; controlled fragmentation in wrought steel and cast iron munitions; dynamic constitutive relations in advanced composites; energy absorption of composite materials at high loading rates; and ultra-fine imaging techniques for non-destructive testing evaluation of new textiles will be completed.

Fiscal year 1973 planned program.—In the composite materials area, materials and configuration development, design and analysis, mechanics and evaluation programs will be conducted. Ceramic materials research will be in four principal areas; reactive hot pressing of alkaline earth compounds to reduce the high temperatures required to produce ceramic armor of high ballistic efficiency; radome and ferrite technology for missiles; improving the thermal and mechanical shock and mechanical fatigue behavior of hot-pressed silicon nitride for aircraft turbines; and detailed characterization of the optical properties of sapphire transparent armor windows as well as the role of impurities in potential laser window materials. Through the use of explosive bonding, lightweight materials for abrasion resistant mine layer cutter blades will be developed. Work will be continued on candidate materials for: advanced structural adhesives with improved high-temperature properties; advanced electronics; optical infrared sensors; antenna windows; and shielding and ground site hardening for ABM systems. Evaluation of full or large-scale models of all materials will be emphasized where the technical level of developments warrants.

Program to completion.—This is a continuing program.

Resources (In millions of dollars):

R.D.T. & E. funds for fiscal year 1971, $16.4; fiscal year 1972, [deleted]; fiscal year 1973, [deleted]; additional funds to completion are continuing; total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded and the amounts for each for fiscal years 1971 and 1972 and the request for fiscal year 1973.

Mr. JOHNSON. Yes, sir.

(The information follows:)

[In thousands of dollars]

Project	Fiscal year 1971 actual	Fiscal year 1972 estimate	Fiscal year 1973 estimate
1T062105A039—Materials engineering for munitions materiel	200	340	200
1T062105A106—Liquid hydrocarbon fuels and combustion	860	1,100	850
1T026105A107—Lubricants, friction and wear	650	650	650
1T062105A108—Power transmission fluids	260	250	250
1T062105A109—Corrosion preventive and specialty compounds	220	240	250
1T062105A328—Metals research for Army materiel	4,225	4,130	4,010
1T062105A329—Organic materials research for Army materiel	2,650	2,800	2,790
1T062105A330—Ceramic materials research for Army materiel	905	970	1,000
1T062105A331—Composite materials research for Army material	1,550	1,970	2,000
1T062105A333—Controlled degradation of materials	250	210	100
1T062105A348—Electronic materials research for Army materiel	1,005	940	850
1T062105A349—Materials research for specific Army requirements	950	890	800
1W062105A659—Antiballistic missile analysis synthesis research	200	[Deleted]	[Deleted]
1W062105A660—Damage mechanism phenomenology antiballistic missile systems	700	[Deleted]	[Deleted]
1W062105A661—Reduction vulnerability antiballistic missile systems	1,550	[Deleted]	[Deleted]
1F062105A668—Emulsified fuel for Army aircraft	247	0	0
Total	16,422	[Deleted]	Deleted

Chairman ELLENDER. How does this exploratory development effort differ from the project also entitled "Materials" for which $7.8 million is requested under "Defense Research Sciences"?

Mr. JOHNSON. In the exploratory development effort for "materials," both applied research and exploratory development are conducted in the following areas: Liquid hydrocarbon fuels; lubrication, friction and wear; power transmission fluids; corrosion prevention and other specialty compounds; metallurgical techniques and alloy improvements; organic materials; ceramic materials; composite materials; electronic materials; mechanics of materials; and test and evaluation methods. All these efforts are aimed at producing improved materials for use in the design, construction or operation of Army materials to satisfy superior performance requirements. A special portion of this program deals with developing hardened advanced ballistic missile (ABM) materials. Three projects make up the ABM program. In the first, emphasis is on defining necessary materials properties in direct relationship to nuclear effects. The second project is concerned with materials failure mechanisms. The third and largest project has as its objective the development of new materials that satisfy the hardening requirements as determined in the other two projects.

The objective of the "materials" project funded under "Defense Research Sciences" is to develop new knowledge of the structure and properties of all types of materials.

Concepts and designs for developing advanced munitions, missiles, guns, aircraft, armor, land vehicles and electronic equipment depend in large measure on new materials information. This subelement contains four individual projects. Two are concerned with materials for

structural, electrical, magnetic and optical functions—materials possessing strength, ductility, brittleness, wear resistance, tolerance of extreme temperatures, resistance to corrosion, resistance to fatigue, or other specific property appropriate to the service required of the materials. The objectives of the other two projects, one on explosives and pyrotechnics, the other on gun propellants, are to refine fundamental theories and develop a better understanding of these materials to obtain more effective Army munitions. Improvements in all current and future nonnuclear explosive warheads, pyrotechnic weapons and gun systems depend upon research performed under these latter two projects.

Senator YOUNG. Of the total requested for materials, $4 million is for the project entitled "Metals Research for Army Materiel". How much of the work performed under this project is done in Army in-house facilities?

Mr. JOHNSON. Approximately 95 percent of the work in this project is conducted in-house at eight Army laboratories.

Senator YOUNG. Please comment on the major efforts you will pursue under this project in fiscal year 1973.

Mr. JOHNSON. In the composite materials area, materials and configuration development, design and analysis, mechanics and evaluation programs will be conducted. Ceramic materials research will be in four principal areas; reactive hot pressing of alkaline earth compounds to reduce the high temperatures required to produce ceramic armor of high ballistic efficiency; radome and ferrite technology for missiles; improving the thermal and mechanical shock and mechanical fatigue behavior of hot-pressed silicon nitride for aircraft turbines; and detailed characterization of the optical properties of sapphire transparent armor windows as well as the role of impurities in potential laser window materials. Through the use of explosive bonding, lightweight materials for abrasion-resistant mine-layer cutter blades will be developed. Work will be continued on candidate materials for: advanced structural adhesives with improved high-temperature properties; advanced electronics; optical infrared sensors; antenna windows; and shielding and ground site hardening for antiballistic missile systems. Evaluation of full or large-scale models of all materials will be emphasized where the technical level of developments warrants.

Chairman ELLENDER. Comment on the objectives of the project entitled "Anti-Ballistic Missile Analysis Synthesis Research" for which you are requesting [deleted].

Mr. JOHNSON. This is one of three projects dealing with the development of hardened antiballistic missile materials. These materials are those that will be used in future advanced ballistic missile interceptors and they must be capable of withstanding and performing effectively in a nuclear environment characterized by extreme thermal, radiation, dust and blast effects. In this particular project, emphasis is on defining the effects of a nuclear burst environment in direct relation to changes in materials properties. The objectives of the work are to establish quantitatively the hardened materials requirements for survival of interceptor missiles in the environment of an enemy nuclear burst while still maintaining the capability to "kill" enemy offensive missiles.

Senator YOUNG. Comment on the project entitled "Damage Mechanism Phenomenology Anti-Ballistic Missile Systems" for which you are requesting [deleted].

Mr. JOHNSON. This project is to support investigations of damage or the failure mechanisms of candidate materials for antiballistic missiles that may be subject to a nuclear burst environment. The understanding of how such materials fail will provide the basis for the development of improved materials. The damage or failure studies are to be carried out in conjunction with underground nuclear tests as well as by various methods for simulating the thermal, blast, radiation and dust effects characteristic of a nuclear burst environment.

Chairman ELLENDER. Comment on the project entitled "Reduction Vulnerability Anti-Ballistic Missile Systems" for which you are requesting [deleted].

Mr. JOHNSON. This is the third and the largest of the Army's hardened antiballistic missile materials projects. Its objective is to develop and characterize new and improved hardened materials in the light of the information obtained from the other two antiballistic missile materials projects. Major efforts are to be directed toward erosion-resistant materials for use as nose tips and leading edges, heat shields for terminal interceptors and hardened optical sensor systems. Substantial work will also be directed toward new materials for protection against X-rays, advanced electronic materials, advanced propellant hardening problems, internal shielding, hardened ground support system materials and scale-up of proven structural materials for testing and verification of materials properties and characteristics.

MILITARY MANPOWER RESOURCES TECHNOLOGY

Chairman ELLENDER. $12.1 million is requested for the program entitled "Military Manpower Resources Technology." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

EXPLORATORY DEVELOPMENT

Description.—The objectives of this research are to assist in the solution of operational problems and to increase the skills, knowledge, and understanding of the U.S. soldier so he can execute his assigned job in the most effective and efficient manner. The program is divided into functional areas as follows: (1) Selection and Behavioral Evaluation—research on selection and classification and on

evaluation of behavior involving unusual demands upon individuals or groups; (2) Human Performance in Military Systems—research to enhance human performance by improving operating procedures, work methods, design of teams, and interactions of men with equipment; (3) Army Leadership Research—research in the area of motivation, morale, and leadership with emphasis on the emerging needs of a Modern Volunteer Army; (4) Army Training Research—research in training methodology, materials, and techniques to improve military training programs; (5) Research on Race Harmony and Drug Abuse—research will place emphasis on youth dissent, race relations, and drug abuse. Also included in this program is research on improvement of civil affairs and psychological operations and on knowledges and attitudes most likely to contribute to success in cross-cultural interactions. This program element has been restructured to combine major portions of three previous program elements.

Work performed by.—Approximately 27% of work is performed by Army laboratories: U.S. Army Manpower Resources Research and Development Center, Arlington, Virginia; U.S. Army Human Engineering Laboratories, Aberdeen Proving Ground, Maryland; U.S. Army Natick Laboratories, Natick, Massachusetts. The following are performing work on contracts of $25,000 or more: American Institutes for Research, Pittsburgh, Pennsylvania; Human Resources Research Organization, Alexandria, Virginia; Human Science Research Incorporated, McLean, Virginia; University of Louisville, Louisville, Kentucky; Utah State University; University of South Carolina; American University, Washington, D.C.; HRB-Singer, Incorporated, State College, Pennsylvania; Manned Systems Sciences, Northridge, California; Bunker-Ramo Corporation, Silver Spring, Maryland. Eight additional contracts total $180,000.

Fiscal year 1972 Program.—New Programs Initiated: Extensive efforts are underway to assist with some of the Army's most pressing problems of drug abuse, racial discord, and dissent. An Army in-house laboratory is being staffed to strengthen Army capability to meet these problems. These and other new programs are oriented to support efforts toward a Modern Volunteer Army. Some specific examples include new efforts to: identify and apply improved measures of interests, aptitudes, and motivation that are relevant to such personnel actions as promotion, school selection, and duty selection; develop a system for selective recruitment, career motivation, and retention of officers under conditions ranging from zero draft to limited mobilization; describe and quantify significant factors affecting the ability of individuals of small infantry units to detect human targets; develop an efficient literacy training program to bring functionally illiterate recruits to at least the seventh grade level of reading ability; and develop a race relations handbook for military unit leaders. An experimental alcohol and drug abuse education course was conducted for selected teams of soldiers from commands throughout the Army.

Continuing Efforts: Research and development support to the Office of the Special Assistant for the Modern Volunteer Army will continue. This includes technical assistance to local commanders, in-depth interviews of selected individuals and development of plans and procedures for data collection and analysis. Efforts to develop effective and reliable methods for determining drug abuse incidence and demographic data will proceed. Development of methods to

better select, train, and utilize military personnel worldwide will continue, as will work to improve Army training Management techniques and psychological operations techniques.

Major Items Planned for Completion: Leaders Race Relations Handbook and improved drug abuse education and prevention programs.

Fiscal Year 1973 Planned Program.—Efforts will continue to develop new and improved forms of the Armed Forces Qualification Test and to improve the performance predictability of the Armed Services Vocational Aptitude Battery in a volunteer force environment. Other work includes: research on personal and experimental factors related to retention and career orientation; identification of human factors problems in air mobility systems during continuous low level operations over extended periods; improvement of operating procedures and crew organization associated with command information systems and night operations; further refinement of training technology, media, methods, and organization. Research will be directed to the societal problems facing Army leadership and will support Army efforts to achieve a modern volunteer force. Examples are: analysis of attitudes, values, and behavior of the American soldier as these impact on race relations, drug abuse, dissent, career decisions and community relations; assessment of the nature and intensity of race relations tensions in the Army; and research on organizational and environmental factors significantly associated with drug abuse and the abuser's perception of the disinvolvement process.

Program to completion.—This is a continuing program.

Resources (In millions of dollars:)

R.D.T. & E. funds for fiscal year 1971, $6.0; fiscal year 1972, $8.3; fiscal year 1973, $12.1; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972 and the request for fiscal year 1973.

Mr. JOHNSON. I will be happy to.

(The information follows:)

6.21.06.A—MILITARY MANPOWER RESOURCES TECHNOLOGY

[In thousands of dollars]

	Fiscal year 1971 actual	Fiscal year 1972 estimate	Fiscal year 1973 estimate
Army leadership research, 2Q062106A712	2,105	1,000	1,000
Surveillance systems, 2Q062106A721	788	750	730
Selection and behavioral evaluation, 2Q062106A722	550	840	700
Human performance in military systems, 2Q062106A723	690	900	800
Image characteristics and interpreter performance, 2Q062106A732	185	250	240
Applied research on dissent in the Army, 2Q062106A740	0	100	900
Applied research on race harmony in the Army, 2Q062106A743	200	600	700
Language and area training, 2Q062106A744	400	200	300
Army training research, 2Q062106A745	195	2,090	4,140
Applied research on troop community relations, 2Q062106A751	412	100	630
Applied research on drug abuse in the Army, 2Q062106A752	236	700	1,000
Improvement of psychological operations of civil affairs operations, 2Q062106A753	252	765	1,000
Element total	6,013	8,295	12,140

Senator YOUNG. You are requesting an increase of $800,000 over the amount provided for fiscal year 1972 for the project entitled "Applied Research on Dissent in the Army". Please comment on this project and the need for this increase.

Mr. JOHNSON. This research will seek to acquire information about Army specific factors involved in the current movement of youth disaffection toward the military. Emphasis will be given to a determination of what social changes the Army should make without jeopardizing its capability to perform its mission.

Chairman ELLENDER. Of the total requested for military manpower resources technology, $4.1 million is for the project entitled "Army Training Research." What are the basic objectives of this program?

Mr. JOHNSON. The basic objective of this program is to identify and develop more effective, efficient and economical means of increasing the skills of the U.S. soldier and improving the performance capabilities of individuals and military units through training. The underlying purpose is to improve training methods, adapt advances in training techniques, and devise innovations in training management in the changing operational and technological environment and in the Modern Volunteer Army (MVA). This project includes research and development on rapid means of instruction in combat, technical and maintenance skills including basic combat training, advanced individual training, logistics training, and ordnance, vehicle, aviation, and electronic maintenance. It includes development of advanced measures for bringing soldiers of widely varying abilities to maximum proficiency in the least amount of time. This effort seeks to devise training management techniques that capitalize on the advantages of individually paced instruction. There is special interest in techniques such as simulation, peer instruction, and programed instruction that may contribute to savings in both training time and money. There is strong new emphasis on obtaining improvements in military unit training and on dynamic, decentralized training, including advanced means of training the individual soldier within his unit.

Senator YOUNG. Please comment on the work done by the Human Resources Research Organization of Alexandria, Va., on this project.

Mr. JOHNSON. The following are selected examples of the work that the Human Resources Research Organization has performed in this project: In development of training management procedures for different ability groups, a task analysis procedure was developed, revised, and applied to the duties of the stock control and accounting specialist (MOS 76P20), the first course selected by the quartermaster school for individualization. Assistance is being provided in developing the required individualized instructional materials. In addition, a course-relevant diagnostic/predictive test battery has been prepared, pretested, and administered to ongoing 76P20 classes. Also, a survey of ongoing individualized military training programs in the three services was conducted. Information has been collected and documented regarding DA personnel assignment system constraints upon individualized, self-paced advanced individual training. Sufficient information has been obtained to show a militarywide need for adequate prediction of course completion time in self-paced training. Alternative approaches have also been formulated. Such techniques as general purpose system simulations of personnel flow through hypothetical self-paced 76P20 courses will be evaluated. Research results have also been provided to the USA Adjutant General School.

In training techniques for new night vision devices, attention has been directed toward broadly assessing the impact of image intensifiers from a human factors standpoint, specifically measuring some behavioral effects associated with the loss of dark adaptation, and developing prototype training materials for specific devices. Information has been obtained on the dark adaptation recovery time needed for effective cross-country movement after use of an intensifier, and on the abilitv

to return fire on a silhouette target after use of an intensifier. The effects of factors that influence the course of dark adaptation were studied in a further attempt to identify factors that affect performance under conditions of dark adaptation in the operational situation.

Research has been conducted under the long-range research area of Project 100,000, which is concerned with the induction of men of lower aptitude into the Army. An entire high-density course, Field Wireman, was selected for field testing of experimental or prototype training strategies. A task analysis for this course was conducted and training objectives were defined in behavioral terms. Instructional media and material designed for multiaptitude levels were developed and organized in a way to optimize learning for all aptitude levels. The initial run was conducted for the purpose of gaining learning time data and data on the feasibility of conducting training within an operational system context. An outgrowth of the initial run was the decision to place a more focused emphasis on peer instruction, which when used was determined to be the most economical and efficient approach. Consequently, peer instruction, coupled with appropriate quality control measures, became the foundation for the training system model developed for the second phase experimental run.

The third and final experimental run was a full test of the instructional model under normal operational conditions. Another HumRRO project is designed to provide research and development effort in support of field experimental activities being conducted by the special assistant for the Modern Volunteer Army (MVA). The work consists of two major efforts: (1) The development and evaluation of an experimental Basic Combat Training-Advanced Individual Training (BCT–AIT) program at Fort Ord, Calif.; and (2) an evaluation of MVA life style and context innovations. The first effort will result in a telescoped BCT–AIT program of instruction for infantry providing for qualifications in two MOS's in 16 weeks. The second effort will provide information on the effects of MVA innovations including an analysis of current satisfiers and irritants in Army life; analyses of soldiers' experiences in areas where MVA innovations are being introduced, and estimates of the impact of different types of MVA innovations on attitudes toward the Army and reenlistment. The experimental BCT–AIT program has been developed and evaluated. Implementation, as per CONARC directive, was effected CONUS-wide. HumRRO teams provided technical assistance to all Army training centers and their associated proponent schools in implementing the program and in revising instructional doctrine. In the way of documentation, a published technical report, seven draft technical reports from a series of nine, and several conference papers have been produced. As segments of reports are completed, they are furnished to OSAMVA for review and comment. After approval, complete reports are processed through the Army Research Office for open release clearance, published, and disseminated.

Chairman ELLENDER. For fiscal year 1972, $2.1 million was provided for this subelement, and for fiscal year 1973, you are requesting $4.1 million. Would you comment on this very large increase?

Mr. JOHNSON. The $2.0 million increase requested in this subelement is for R. & D. to support the training concept envisioned by the Chief

of Staff of the Army. The training concept is characterized by realistic, mission-oriented training conducted by the Army unit. It is also characterized by increased on-the-job training of individuals within the unit. This effort will emphasize the development of methods for the reliable and valid measurement of unit proficiency and unit training quality control. Especially important is the preparation of training management techniques to assure effective individual and unit training. The advances in educational technology and programed instruction, adapted to unit training, will contribute significantly to improved training.

Chairman ELLENDER. Comment on the project entitled "Applied Research on Drug Abuse in the Army" for which you are requesting $1 million.

Mr. JOHNSON. This research will address Army related social problems that arise from the larger national problem of drug abuse. The research will have two major emphases. One is to acquire more knowledge about Army related factors in the practice of drug abuse by soldiers. The other is on the experimentation with training programs aimed at reducing the incidence of drug abuse in the Army. In order to accomplish the first objective, information will be acquired about (1) the incidence of drug abuse, (2) the social dimensions of drug abuse, (3) Army specific organizational and environmental factors involved in drug abuse, and (4) the factors involved when a man voluntarily stops abusing drugs. Research to accomplish the second objective will concentrate on experimentally trying out various drug prevention programs and determining which ones are most effective in reducing the incidence of drug abuse in the Army. This research which addresses social factors and prevention is closely coordinated with the biomedical research program of the Army's Surgeon General. The Surgeon General's drug research program will deal with the larger areas of detection, diagnosis, treatment and rehabilitation.

Senator YOUNG. You are requesting $1 million for the program entitled "Improvement of Psychological Operations of the Civil Affairs Operations." Tell us exactly what the objectives of this project are and why you need the increase of $235,000 you are requesting.

Mr. JOHNSON. The objectives of this program are to provide support to the Army's operational programs in psychological operations and civil-military affairs operations. The increase of $235,000 is needed to provide new operational research requirements specified by the Office of the Deputy Chief of Staff for Military Operations. These new requirements involve the need to analyze enemy psychological operations systems and strategies and the need to increase the effectiveness of civil-military operations overseas under conditions of reduced U.S. military presence.

Chairman ELLENDER. Please comment generally on your need for the increase of $3.9 million you are requesting for military manpower resources technology for fiscal year 1973.

Mr. JOHNSON. A part of the increase is needed to provide research support for urgent social problems facing the Army that could not be funded at the previous funding levels. The specific research requirements on these problems such as motivation, morale, drug abuse and

race relations, have been specified by the Office of the Deputy Chief of Staff for Personnel. Army training research accounts for $2 million of this increase. This is a major new effort that includes development of test and evaluation tasks, methods, techniques, and procedures needed to attain the goals of the Army's policy of dynamic, decentralized training. The new research and development effort will be directed toward: (1) Measures of unit performance; (2) prototype unit training programs; (3) simulation techniques for close-in training; (4) experimental unit testing programs; and (5) systems for management of decentralized training. A broad program of research will continue to develop the technology required in Army training of officers and enlisted men. This project assumes new importance and significance as efforts are expanded to establish a modern volunteer Army. The Army in-house training research capability will be strengthened under this project.

Biological and Medical Investigations

Chairman Ellender. $37 million is requested for the program entitled "biological and medical investigations." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

EXPLORATORY DEVELOPMENT

Description.—The objective of this program is to conduct a comprehensive research and exploratory development program in the life sciences to conserve military manpower, maintain and improve the effectiveness of the individual soldier in any type of environment, provide improved field medical support for all types of military operations, and to reduce mortality, hospitalization, and illness. This program contains 15 individual areas of effort aimed at different fields of biological and medical investigation: (1) Aerobiological Investigations; (2) Biological Defense Investigations; (3) Military Prevention Medicine; (4) Military Medical Materiel; (5) Army Aviation Medicine; (6) Combat Surgery; (7) Internal Medicine; (8) Miltary Psychiatry; (9) Radiation Injury and Protection; (10) Oral and Maxillofacial Sciences; (11) Military Environmental Medicine; (12) Biosensor Systems; (13) Tropical Medicine; (14) Biomedical Factors of Drug Abuse; (15) Medical Defense Against Biological Agents.

Work performed by.—This work is conducted in the laboratories of the U.S. Army Medical Research and Development Command, and through contracts or grants with industry, non-profit, and educational institutions. Approximately 64.5 percent of the funds support in-house effort with the balance grants or contracts. Eleven contractors having contracts over $70,000 are: (1) The National Drug Company, Philadelphia, Pennsylvania; (2) The University of Maryland, College Park, Maryland; (3) Johns Hopkins University, Baltimore, Maryland; (4) Massachusetts Institute of Technology, Cambridge, Massachusetts; (5) North Dakota State University, Fargo, North Dakota; (6) Cornell University, New York; (7) Little, Arthur D. Inc., Cambridge, Massachusetts; (8) Esso Research and Engineering Company, Linden, New Jersey; (9) Stanford Research Institute, Menlo Park, California; (10) Harvard University, Cambridge, Massachusetts; (11) National Academy of Sciences, Washington, D.C. There are an additional 142 contractors aggregating $4.06 million.

Fiscal year 1972 program.—Intramural research in environmental pollution control will be initiated as well as an expansion of the extramural efforts; the evaluation of a noise-cancelling microphone will begin, and research in development of fire-retardant clothing will continue; experimental studies are in progress on the biological effects of lasers; production and testing of *Shigella* vaccine

strains continue, and significant progress is being made in the study of electrolyte loss in non-specific diarrheas; considerable emphasis is being placed on study of individual and group variables which promote combat effectiveness in small operational groups; approximately 3400 aminothiol compounds and related chemicals have been synthesized, the majority of these have undergone preliminary testing for toxicity and radio-protective efficacy; the first clinical tests are planned for polylactic acid bone pins and resorbable suture materials; local electroanesthesia development and techniques will enter clinical phases of study; results demonstrated that during abrupt altitude exposure, the severity of mountain sickness can be greatly reduced without drug therapy; selective breeding of German shepherds continues, an increasing number will be made available to the Infantry Scout Dog and Tracker Programs for evaluation; a new test of antimalarial immunity in human serum has been devised; results of the test for drug sensitivity of human malaria parasites have been compared with clinical response to drug treatment of infected patients with a 97 percent response prediction. Funding requirements increased by approximately $4.0 million between FY 1971 and FY 1972. This can be accounted for by the transfer of $3.0 million in funds from the U.S. Army Materiel Command to the Office of the Surgeon General for initiation of Biological Defense Investigations and the remainder for Drug Abuse research.

Fiscal year 1973 planned program.—Increased funding for FY 1973 reflects the addition of Aerobiological Investigations, Biological Defense Investigations, and Medical Defense Against Biological Agents from other Program Elements (see Related Activities) and the establishment of Biomedical Factors of Drug Abuse (3A062110A833) as a newly funded project. Many new and related studies were initiated in response to progress in on-going programs or identification of new field problems. Included in these are: Increased effort in pollution control and abatement in coordination with Corps of Engineers and Civil Authorities with a concerted effort expended in terminal disinfection of sewage plants and membrane ultrafiltration studies; effects of trauma, and pulmonary insufficiency is anticipated in a controlled research capacity; studies of suppressive drugs in diarrheal diseases; further testing of promising radioprotective drugs for chemoprophylaxis of radiation injury; expansion of programs investigating biological effects of microwave radiation; anticipation that local electroanesthesia will be ready for general clinical use; electric stimulation of bone formation will begin clinical phase of study; study continues on use of dextran in treatment of frostbite and new methods of treatment will be investigated; increased emphasis will be given to biological investigations of malaria and studies with relation to immunization against malaria.

Program to completion.—This is a continuing program.

RESOURCES

[In millions of dollars]

	Fiscal year 1971	Fiscal year 1972	Fiscal year 1973	Additional to completion	Total estimated cost
R.D.T. & E. funds	24.8	30.5	37.0	(1)	(2)
R.D.T. & E. man-years	1,155	1,243	1,226	(2)	(2)

1 Continuing.
2 Not available.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded under this program, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

Mr. JOHNSON. Yes, sir.

(The information follows:)

[Dollars in millions]

Project	Fiscal year— 1971	1972	1973
1W062110AD01—Biological agent production potential	1.308	0	0
1W062110AD03—Aerobiological investigations	1.524	2.530	1.500
1W062110AD05—Biological systems potential	.902	0	0
1W062110AD23—Biological assessment investigations	.469	0	0
1W062110AD35—Biological defense investigations	0	4.400	2.130
1W062110A096—Military defense against biological agents	3.810	4.000	0
3A062110A806—Military preventive medicine	1.087	.940	2.700
3A062110A811—Military medical research program—Southeast Asia	.933	.600	0
3A062110A816—Military medical materiel	.613	.820	1.000
3A062110A819—Army aviation medicine	1.030	1.165	1.600
3A062110A821—Combat surgery	3.843	3.660	3.700
3A062110A822—Internal medicine	2.696	2.730	3.370
3A062110A823—Military psychiatry	.406	2.080	.500
3A062110A824—Radiation injury and protection	.876	.830	2.000
3A062110A825—Oral and maxillofacial sciences	.554	.630	.700
3A062110A826—Clinical research	.646	.550	0
3A062110A827—Military environmental medicine	1.749	1.650	2.000
3A062110A830—Bio sensor systems	.323	.420	.530
3A062110A831—Tropical medicine	1.985	3.460	3.800
3A062110A833—Biomedical factors in drug abuse	0	0	7.300
3B062110A834—Medical defense against biological agents	0	0	4.200
Total	24.754	30.465	37.030

Senator YOUNG. The $37 million you're requesting for fiscal year 1973 is approximately $6.5 million more than was provided in fiscal year 1972. Please comment generally on your need for this rather large increase.

Mr. JOHNSON. The funding increase requested for fiscal year 1973 is needed to support expanded research on drug abuse and pollution. The proposed expansion of research on drug abuse reflects the Army's concern for its portion of this serious national problem. It seeks new techniques for identification and assessment of drug abusers and refinements of treatment and rehabilitation of abusers.

The increased funding for pollution research will support studies on health aspects of pollution by Army unique systems or environments. Knowledge of pollutants will be developed permitting establishment of standards, monitoring of effluents, definition of hazards and requirements for new instrumentation. Military activities involve pollutant problems which civilian procedures are inadequate to handle or which involve unacceptable logistic burdens.

Chairman ELLENDER. Are you requesting funds for any projects which have not been funded in prior fiscal years?

Mr. JOHNSON. Yes. Two projects are new to this program element in fiscal year 1973: Biomedical factors in drug abuse; medical defense against biological agents. The drug abuse work was supported in fiscal year 1972 as part of the military psychiatry project. The Army established a new project in fiscal year 1973 to accommodate the greatly expanded drug abuse research program proposed for fiscal year 1973.

With Fort Detrick becoming an open post to be utilized in part by Health, Education, and Welfare Department agencies (National Cancer Institute) and the Department of Agriculture, responsibility for the remaining nonphysical elements of the biological defense program were shifted to the Army Surgeon General. A new project, medical defense against biological agents, was established to support the technical program of the U.S. Army Medical Research Insitute for Infectious Diseases.

Senator YOUNG. Please comment on the project entitled "Aero Biological Investigations" for which you are requesting $1.5 million.

Mr. JOHNSON. The project is concerned with investigations on the characteristics of airborne microorganisms, their survivability when floated in air as in a biological warfare attack, and their infectivity through the respiratory route. Only a few diseases normally attack man through his lungs, but in a deliberately contrived attack many microorganisms are infective by this route. The signs and symptoms associated with diseases contacted in this manner, as well as the course of these diseases, must be studied. In addition, aerobiological techniques are applied to testing the effectiveness of protective devices such as masks and alarms.

Senator YOUNG. $2.1 million is requested for the project entitled "Biological Defense Investigations". Please comment on the objectives of this project and tell us what you hope to accomplish with the $2.1 million you are requesting.

Mr. JOHNSON. The objectives of this project are to investigate a wide range of viruses, bacteria, rickettsia, fungi, or their toxic products to determine their pathogenicity when used in a deliberate contrived attack against man. These are agents not normally encountered as public health problems, but are agents not normal to areas where our military personnel are stationed and hence they pose a potential biological warfare threat. Studies of these potential agents are essential to the development of protective measures against them. Other studies investigate processes for producing cells, tissue, and their products for aerobiology studies, and tests of alarms and protective devices.

Chairman ELLENDER. For "Military Preventive Medicine", you are requesting $2.7 million. What is the objective of this program, and why do you need the rather large increase of $1.8 million you are requesting?

Mr. JOHNSON. The objectives of this program are to develop global epidemiological information which is necessary for the protection of health of Army personnel, to develop improved arthropod repellents and other methods of prevention of disease in troops, and to establish standards of environmental quality for Army unique contaminants to provide protection of human health and welfare from the effects of environmental pollution. Increased funding requests reflect additional intra- and extra-mural efforts in pollution control and abatement. The activiation of a new in-house research unit fully dedicated to environmental engineering will permit the program to address critical needs related to environmental pollution while continuing the program related to protecting the soldier in the field. In addition to providing in-house support to contracts where it is advantageous, the in-house unit will conduct studies on the following: (1) an environmental health engineering services mobile pollution study to evaluate capabilities for a mobile facility to be used by Army Environmental Health Engineering Services; (2) air and water standards for unique Army polutants; (3) health aspects of pesticide disposal for standard Army pesticides to insure environmental protection; (4) health aspects of solid waste handling and disposal for Army solid wastes; and (5) development of direct wastewater reuse standards to enable the direct recycle and reuse of military waste waters and simple rapid tests to validate potability.

Senator YOUNG. You are requesting $1 million for a project entitled "Military Medical Materiel". Describe this project and tell us what you will do with the $1 million you are requesting.

Mr. JOHNSON. Yes, sir. The objectives of this project are to conduct exploratory development through investigations, studies, and applied research directed toward solving specific problems related to medical care and treatment of military patients. This effort varies from fundamental applied research to development of sophisticated breadboard hardware. These efforts provide basis for determining the technical feasibility and cost of required engineering development tasks. Fiscal year 1973 funding will support studies on means for field sterilization of surgical supplies and equipment; a rapid response pyrogen identification system for field preparation of water for injection; automated field eye refraction, spectacle fabrication equipment; and modernized field pharmacy systems.

Chairman ELLENDER. You are requesting $1.6 million for a project entitled "Army Aviation Medicine". What are the objectives of this project, and why do you need the increase of $435,000 you are requesting for fiscal year 1973?

Mr. JOHNSON. Objectives of the Army aviation medicine project are to: Study all biomedical aspects of Army aviation and airborne operations; determine causes of and means of preventing disability, injury and performance decrement; and determine means to enhance performance in aviation and airborne operations.

The backlog of problems needing study and solution has grown faster than the Army aeromedical laboratory has been able to attack under past funding levels. In addition, the rising costs of equipment and laboratory operations coupled with increases in sophistication of studies require an increase in support if these critical problems are to receive adequate attention. The planned increase of $435,000 will permit an expanded effort to reduce this gap between numbers of new problems and solutions achieved. A specially instrumented helicopter will be used to study causes of pilot disorientation and effects of low level flight on other aircrew performance.

Chairman ELLENDER. How are your efforts in aviation medicine coordinated with similar efforts of the Air Force?

Mr. JOHNSON. Work on this project is focused on problems unique to the Army aviation environment. There is continuous formal and informal information exchange with the other military departments, the Federal Aviation Administration, and the National Aeronautics and Space Administration. Coordination mechanisms utilized include: literature searches, consultation with other agency laboratory staff members in experimental study design, cooperative studies including joint use of special facilities and equipment, utilization of data reduction services of other laboratory when a special capability exists, frequent seminars and technical discussions with personnel from other aviation medicine laboratories. The Surgeons General of the Army and Navy have formally established a joint Army-Navy coordinating panel for flight medical research. The panel meets twice a year and is attended by Air Force representatives as well.

COMBAT SURGERY

Chairman ELLENDER. Of the total requested for biomedical and medical investigations, $3.7 million is for a project entitled "Combat Surgery". Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

EXPLORATORY DEVELOPMENT

Description.—The Combat Surgery project supports research and development to improve surgical procedures and supporting medical techniques for the care of soldiers wounded on the battlefield. Improved surgical techniques will save more of the severely wounded, return more men with minor injuries to duty, and enable more rapid evacuation of those who cannot return to duty. The program consists of research efforts to enhance military surgical care within clinical and field settings through the study of shock due to hemorrhage or severe trauma, burns, wounds and wound infection, blood replacement and preservation, blood substitutes, various types of prostheses and anesthesia. Clinical studies continue on additives to whole blood and on various plasma expanders for use in shock caused by reduced blood volume. The bacteriology, disordered function and changes in tissue chemistry resulting from thermal burns are studied to reduce illness and mortality rates. Efforts continue in areas of prostheses and tissue adhesives. Biochemical and biophysical investigations continue in wound healing, effects of radiation from laser devices, and the complications of shock. Organ transplantation techniques are studied with respect to preservation. Studies on nervous system injury and applications of automatic data processing equipment to problems of patient evaluation and routine control are emphasized.

Work performed by.—The laboratories of the US Army Medical Research and Develpment Command, e.g., US Army Institute of Surgical Research, Fort Sam Houston, Texas; Walter Reed Army Institute of Research, Washington, D.C.; and contract or grant effort of industrial, non-profit and academic institutions. Approximately 40 percent of the funds support in-house effort with the balance grants or contracts. Ten contractors having contracts over $50,000 are: University of Florida; Gainesville, Florida; Medical University of South Carolina; Charleston, South Carolina; Harvard University, Cambridge, Massachusetts; Cincinnati University, Cincinnati, Ohio; Pasadena Foundation for Medical Research, Pasadent, California; Boston University, Boston, Massachusetts; Louisville University, Louisville, Kentucky; Louisiana State University, New Orleans, Louisiana; Latter Day Saints Hospital, Salt Lake City, Utah; Mount Sinai School of Medicine, New York, New York. There are an additional 46 contractors aggregating $1.6 million.

Fiscal year 1972 program.—Laboratory studies indicated possibility for further extension of whole blood storage life to 70 days or more. Problem of cellular debris and microclots solved by special treatment. Studies continue on problems of air evacuation of wounded. The pulsed pressure washing technique was adapted to a device to clean hands and arms of surgical room personnel. Less than one minute of cleansing is equivalent or superior to standard 10 minute brush method with less damage to skin of the hands. Biodegradeable ceramics were developed for temporary bone replacement and internal splinting. These are gradually absorbed and replaced by living bone without further surgery. Biodegradeable plastics were developed (polylactic acid and polyglycolic acid) for internal splinting, sutures, tissue replacement. These also are absorbed by the body. Cadaver skin was shown to be cheaper and more effective for temporary burn wound closure than pig skin. A new chemical shows color changes indicating viability of tissues in a wound. This may lead to better wound preparation, saving of tissue from removal and earlier total closure of wounds. A large scale survey of problems in care of spinal cord and head injuries will be undertaken to provide baseline studies to permit evaluation of new treatment methods. A new device shows promise of determining rapidly the status

of peripheral nerves and spinal cord pathways. This device would be in field use quickly if early success is repeatable. Safety factors for many laser devices have been established and are under analysis. Research on difficult, long term problems of mechanisms and treatment for shock, wound closure, post operative support, wound infection, surgical case nutritional needs will continue. Research continues on problems in development of electroanesthesia procedures.

Fiscal year 1973 planned program.—A broad program on basic surgical problems will continue. Areas of emphasis will be: head and spinal cord injury; improved prosthetic materials and their application to wound repair; improved methods for wound cleansing, removal of dead or dying tissue, identification of viable tissue, and primary closure of serious wounds when first treated; continued study of factors involved in serious burns, broad spectrum vaccines to prevent infection in burns, identification of all possible burn infecting agents, simplification and standardization of care of seriously burned; improved wound healing by nutritional advances; prevention or control of shock reactions due to hemorrhage, bacterial toxins, trauma; improve blood supply and storage; develop rapid, automated means to assay blood to eliminate that from dangerous donors carrying parasitic diseases and hepatitis.

Resources. (In millions of dollars:) R.D.T. & E. funds for fiscal year 1971, $3.8; fiscal year 1972, $3.7; fiscal year 1973, $3.7; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Give us some examples of what you hope to accomplish in this project in fiscal year 1972.

Mr. JOHNSON. Research in the care and treatment of the wounded is a slow, difficult effort. Because of the complexities of human systems and its many interacting components, quick, simple solutions to problems are seldom possible. Conversely, new incremental knowledge is applied to clinical practice as soon as its usefulness is demonstrated thus providing interim improvements to practice. Specific examples of study areas in fiscal year 1972 follow. The studies on posttraumatic injury and post-surgical pulmonary reactions known as shock-lung will be continued. Previous work has provided interim control measures, but more information on its causes and means to prevent its development are needed. Vaccines will be sought to prevent the common infections of wounds, surgical incisions, and badly burned patients. Feasibility of vaccines against some infectious agents has been demonstrated in the laboratory. Studies will be made on the special nutritional needs for surgical patients. Some data show that wound healing rates can be accelerated by dietary augmentation. Proper ratios of nutritional factors will be defined. Continued studies on whole blood preservation will be pursued. It is hoped to extend refrigerated shelf life to 70 days thus essentially eliminating logistic losses due to discarding of outdated blood supplies. Clinical studies will begin on new biodegradable plastics and ceramics for internal support or braces for bone fractures. Animal studies have been most successful on the utility and compatibility of these materials which eliminate the need for future surgical removal after healing of the fracture.

Senator YOUNG. Describe the major efforts to be undertaken in fiscal year 1973 with the $3.7 million you are requesting.

Mr. JOHNSON. The work will continue on high priority problems previously identified. The work on shock-lung therapy, wound cleansing with pulsed-pressure lavage equipment, and prevention of wound infection with vaccines should complete clinical trials. Major effort will be placed on head and spinal cord injuries; continued study of means to identify dead or dying tissues to speed final wound closure; continued studies on temporary covering materials for seriously burned

tissues; automation of assays of blood supplies to eliminate blood from dangerous donors—carriers of parasite infections or hepatitis; and a continuation of studies on nutritional needs of the surgical patient.

MILITARY INTERNAL MEDICINE

Chairman ELLENDER. $3.4 million is requested for the project entitled "Military Internal Medicine." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: EXPLORATORY DEVELOPMENT

Description.—The objective of this project is to improve existing methods of prevention, diagnosis, and treatment of selected diseases of military medical concern such as dermatitis, hepatitis, diarrheal diseases (both specific and non-specific), kidney failure, anemia (particularly secondary to hemmorrhage), nutritional deficiencies, metabolic diseases, and application of computers to clinical medicine. Hepatitis research is directed toward development of an effective vaccine through volunteer studies. Nutrition research is directed to the soldiers' nutritional state and requirement under normal and military environmental conditions and dietarily induced alterations of intestinal metabolism. Enteric research is directed toward the cause of diarrheas and the development of effective vaccines and improved treatments. Since hepatitis and diarrheal diseases are major causes of troop ineffectiveness and man-hours lost, additional funds have been recently programmed for a concerted effort in these areas.

Work performed by.—Approximately 70 percent of this work is performed in-house in the laboratories of Walter Reed Institute of Research, Letterman Army Institute of Research, and The Armed Forces Institute of Pathology. Two contracts in excess of $100,000: The University of Miami, Coral Gables, Florida, and The University of Maryland, Baltimore, Maryland. The University of Pennsylvania has the only other contract. It is for $21,000.

Fiscal year 1972 Program.—Development includes plans for production and testing of promising *Shigella* vaccine strains. A determined effort is being made in investigations concerning mechanisms of intestinal immunity. Another research area receiving emphasis is the effect of electrolyte loss upon intestinal immunity in non-specific diarrheas. Field tests to determine the efficiency of gamma globulin as a prevention against hepatitis have been concluded. Much progress has been realized in hepatitis research. Laboratory animals and volunteers have been infected with sera from known cases of infectious hepatitis (I.H.) and the virus has been grown in tissue culture. Considerable research has also been done on serums hepatitis (S.H.). Many of its physical properties have been determined by electron microscopy, and a specific antisera has been produced. Many tests for its identification are being perfected. The above are giant steps in hepatitis research and are bringing closer the development of an effective anti-hepatitis vaccine.

Fiscal year 1973 Program.—A significant increase in funds has been programmed for the project. Twenty-five additional contracts are anticipated totaling approximately $800,000. These funds are directed to a large extent toward a concentrated effort in hepatitis and diarrheal research. The goals are to: (1) define and identify the hepatitis causing agent; (2) establish the relationship between I.H. and S.H.; (3) develop animal and cell culture models for study as a means to develop vaccine; and to (4) produce vaccines that are effective against diarrhea caused by known organisms or non-specific" diarrhea whose cause is not yet known.

Resources.—(Dollars in millions):

R.D.T. & E. funds:	
Fiscal year 1971	2.7
Fiscal year 1972	2.7
Fiscal year 1973	3.4

Additional to Completion: Continuing.
Total Estimated Cost: NA

Chairman ELLENDER. From time to time there are reports in the press of outbreaks of hepatitis at military bases. What progress have you made in the treatment of hepatitis under this project?

Mr. JOHNSON. Viral hepatitis is an important military medical problem, ranking close to battle injuries as a major cause of troop ineffectiveness. The aim of the Army research program is in the development of a vaccine against this disease. Before this can be accomplished, the agents of both infectious and serum hepatitis have to be identified, characterized, and isolated in tissue culture and inactivated. Progress has been good in the area of serum hepatitis in that isolation, characterization, and purification of an antigen associated with this problem have been carried out. The reactive component of the antigen has been identified, and serum containing this antigen has been treated by heat inactivation and shown to offer protection from hepatitis. It has been demonstrated that this disease is infectious not only by the transfusion but also by the oral route. The Marmoset has been shown to be promising as a suitable animal model in the study of infectious hepatitis. These accomplishments are major steps in establishing necessary technical data for studies in the development of a protective vaccine against hepatitis.

Senator YOUNG. What will be the major efforts you will undertake in fiscal year 1973?

Mr. JOHNSON. The hepatitis research program in fiscal year 1973 will be directed toward further characterization of the antigen associated with serum hepatitis, attempts to find methods by which to identify the infectious hepatitis agent, and further attempts to propagate both of these agents of serum hepatitis and infectious hepatitis in tissue culture. To accomplish these goals, 12 extramural contracts are planned totaling approximately $500,000. This effort will be coordinated with in-house hepatitis research efforts through the Army's coordinated hepatitis program.

Chairman ELLENDER. Why do you need the increase of $640,000 you are requesting in fiscal year 1973?

Mr. JOHNSON. Increased funding in fiscal year 1973 reflects expanded efforts in the hepatitis research program and investigations into the cause of diarrhea so far unrelated to specific infectious agents. This condition has been called nonspecific diarrhea. Diarrhea from all causes is a worldwide problem affecting troops in both developed and underdeveloped countries. Along with malaria and hepatitis, diarrheal diseases are major causes of troop ineffectiveness.

IONIZING RADIATION INJURY AND PROTECTION

Chairman ELLENDER. $2 million is requested for the project entitled "Ionizing Radiation Injury and Protection." Please describe the objectives of this project.

Mr. JOHNSON. The objectives of the radiation injury and protection project are to provide prophylactic and/or therapeutic measures which will prevent or reduce the incapacitating effects of ionizing radiation on U.S. Army troops in the event nuclear weapons are used on the battlefield. Principal effort is directed to a search for antiradiation drugs which will reduce initial effects as well as provide a margin of safety for maneuvering in a fallout area. This project also supports studies on the biological effects of nonionizing electromagnetic radiation—microwave, principally—to provide a reliable data base for

safety criteria for personnel operating in radiation fields generated by military devices. Emphasis is on the effects of chronic exposure to low power fields.

Chairman ELLENDER. Why do you need the rather large increase of almost $1.2 million you are requesting in fiscal year 1973?

Mr. JOHNSON. In fiscal year 1972 the Army medical research program took over responsibility for the microwave biological effects effort formerly funded by the Advanced Research Projects Agency. Since this occurred late in the budget cycle, only a minimal holding level was available. The microwave studies are now included in the radiation injury and protection project for fiscal year 1973 with a proposed funding level of $900,000. This represents an increase in funding of $700,000 over the fiscal year 1972 level and is in consonance with increasing national concern for potential hazards from microwave devices. The balance of the increase is designed to improve the depressed state of funding in the antiradiation drug program. This very difficult problem requires an input of chemical compound analogs to partially effective drugs already tested. This chemical synthesis program is increasingly expensive. Coupled with generally rising costs of operations and equipment, this results in a decreasing purchasing power for the research dollar in terms of numbers of compounds acquired and evaluated.

MILITARY ENVIRONMENTAL MEDICINE

Chairman ELLENDER. Of the total requested for biomedical and medical investigations, $2 million is for the project entitled "Military Environmental Medicine." What are the objectives of this project?

Mr. JOHNSON. The objectives of the military environmental medicine project are to develop improved methods for prevention, diagnosis, and treatment of diseases produced by extremes of climate to which soldiers may be exposed. Field and laboratory studies are conducted to investigate the following problem areas: (1) Medical problems and decrements in military performance during military operations at high terrestrial elevation; (2) techniques, equipment, and procedures best calculated to make the soldier operationally effective in hot and cold weather.

Chairman ELLENDER. What do you hope to accomplish in fiscal year 1973, and why do you need the increase of $350,000 you are requesting?

Mr. JOHNSON. Studies in fiscal year 1973 will involve evaluation and testing of various animal models for use in high altitude, heat, and cold research. Utilization of various pharmacological agents on improving performance and survival to various environmental stresses will also be investigated. Further studies in adjustment to high altitudes will involve enzyme correlations as they apply to the ability of red blood cells to carry oxygen. Evaluation of new methods of frostbite therapy will continue with emphasis on the ability to identify viable tissue which has not been irreversibly damaged by the cold conditions.

RESEARCH IN TROPICAL MEDICINE

Chairman ELLENDER. Of the total requested for biomedical and medical investigations, $3.8 million is for the project entitled "Research in Tropical Medicine." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY EXPLORATORY DEVELOPMENT

Description.—This project includes related efforts previously funded as portions of several projects such as Military Preventive Medicine, Military Research Program Southeast Asia, and Malaria Prophylaxis. The program will be expanded from this base and will be a continuing study of those aspects of diseases that are problems in military operations in tropical and sub-tropical regions, especially the Middle East where a number of parasitic diseases are rampant. Work will include studies of location and spread of diseases; identification and classification of insects and other disease carriers; the interaction of disease organisms with carriers, animal reservoirs, and man; further screening of chemical compounds and evaluation of candidate drugs that appear to be effective in the treatment of malaria and schistosomiasis. Examples of diseases to be studied are: malaria, schistosomiasis, American and African trypanosomiasis (Chagas Disease, African Sleeping Sickness), filariasis, amoebic infections—these are all animal parasites causing serious human illnesses for which there are no good methods of prevention or treatment. Additionally, many new virus diseases of potential military significance are being discovered as new areas of the world are developed.

Work performed by.—This work is conducted in the laboratories of the U.S. Army Medical Research and Development Command including its overseas units in Kuala Lumpur, Malaysia; Bangkok, Thailand; Tokyo, Japan; Panama; and by field teams of experts from the Army's Continental United States laboratories for study of special problems. Approximately 65% of the effort will be performed by in-house activities with the balance through contracts and grants with industry, non-profit and educational institutions. Major contractors having contracts over $25,000 are: Smithsonian Institution, Washington, D.C.; Health and Social Services Department, Sante Fe, New Mexico; Institute for Medical Research, Kuala Lumpur, Malaysia; University of Pittsburgh, Pittsburgh, Pennsylvania. Three other contractors have contracts totaling $50,000.

Fiscal year 1972 program.—A broad program of research on diseases of military importance will be conducted on diseases such as malaria, schistosomiasis, amebiasis, filariasis, scrub typhus, arbovirus infections, and diarrheal diseases. On-going field work will be supported in Thailand, Hawaii, Panama, Jamaica, Haiti, Guatemala. New field studies will be initiated in areas when opportunities for profitable investigations are present.

Fiscal year 1973 program.—The program outlined above will continue to be developed. Increased emphasis will be given to biological investigations of malaria and studies with relation to immunization against malaria. The drug screening program will be expanded in efforts to find additional compounds with anti-malarial or anti-schistosomal activity and additional testing of compounds showing this activity will be conducted.

Program to completion.—This is a continuing program.

Resources (in millions of dollars):

R.D.T. & E. funds:	
Fiscal year 1971	2.0
Fiscal year 1972	3.5
Fiscal year 1973	3.8

Additional to completion: Continuing.
Total estimated cost: Not available.

Senator YOUNG. I note in the descriptive summary that parts of this project were previously funded as portions of other projects. When were these portions brought together under this subelement and why were they?

Mr. JOHNSON. Related efforts were gathered into this project in fiscal year 1971. The objective of consolidating these efforts was to provide visibility and emphasis on diseases of the tropics with which the U.S. soldier has had little contact and thus lacks even the partial immunity often found in people native to the tropics. Many of these diseases are caused by infectious agents which are studied by similar, recently devised techniques. Consolidation under one project at this time is a logical development.

Chairman ELLENDER. As the title of the project indicates, you seem to be solely concerned with research into diseases peculiar to the tropics. Is this as a result of our presence in Vietnam?

Mr. JOHNSON. Although several of the tropical diseases under active study have been problems in Southeast Asia, such as malaria and dengue fever, they are problems elsewhere. In addition, a number of tropical diseases are studied in this project which do not occur in Southeast Asia. These diseases present a future potential hazard to our troops in other tropical areas of the world. As a group they are less well known, less well studied and control methods for the diseases or the vectors are not well established.

Senator YOUNG. What have been the most significant developments under this project to date?

Mr. JOHNSON. A number of new drugs have been screened for activity against schistosomiasis and several promising new candidates discovered with reduced side effects than older drugs. Laboratory results show potential feasibility for future vaccine development against parasitic disease. An experimental vaccine against African trypanosomiasis (sleeping sickness) has shown good activity in cattle. Species of new world monkeys have been discovered which can be infected with human malaria parasites. Taxonomic studies on tropical mosquitos and ticks have been completed leading to more rational preventive medical approaches to control of disease spread by these vectors. Immunologic studies have identified a number of strains of the scrub typhus organism. Four of these have been selected for development of a vaccine which should be effective against the eight known human disease strains. The efficacy of the Army-developed Venezuelan equine encephalitis vaccine was amply proven by its use to contain the Texas outbreak of that disease in horses in 1971. A live virus vaccine against one strain of dengue fever has been developed. Work continues to overcome difficulties in production of large quantities of this vaccine. Animal studies indicate feasibility of preparing one multivalent vaccine which will protect against the four main types of denuge.

Chairman ELLENDER. Why do you need the increase of $340,000 you are requesting for fiscal year 1973?

Mr. JOHNSON. The planned funding increase will aid in offsetting the rising costs of research. In addition, the increase represents an acceleration of the program from its inception in fiscal year 1971. Potential antiparasitic drugs accumulated in the malaria drug program will be tested on an expanded scale against other infectious parasites such as those causing schistosomiasis and African trypanosomaisis. Feasibility studies on antimalaria vaccine development will be started.

BIOMEDICAL FACTORS IN DRUG ABUSE

Chairman ELLENDER. Of the total requested for biomedical and medical investigations, $7.3 million is for the project entitled "Biomedical Factors in Drug Abuse." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY EXPLORATORY DEVELOPMENT

Description.—The objective of the project is to define and investigate the causes of drug abuse within the Army community and to develop effective

medical prevention and treatment programs. The program will develop a system to identify users, including addicts. Epidemiologic methods will be used to establish an identification (detection) system to permit the definition of the incidence and prevalence of drug use in the Army. The information obtained will be incorporated into the design of treatment and rehabilitation methods.

Work performed by.—This year the work is being performed in-house at the Walter Reed Army Institute of Research, Washington, D.C. with the following contracts planned or let: Public Health Research Institute, New York, NY, University of Louisville, Louisville, Kentucky, Optical Sciences Group, Inc., San Rafael, California, Scientific Research Instruments, Baltimore, Maryland, and Human Sciences Research, Inc., McLean, Virginia, with one additional contract planned for less than $25,000.

Program accomplishments and future plans

Fiscal year 1972 program.—A survey has been conducted in the available biochemical detection systems for the identification and diagnosis of drug abuse. Laboratory and field screening and confirmatory procedures have been established, as well as data analysis and reporting systems. Studies are being conducted on a comparison of biochemical and immunologic methods for the detection of drug abusers. Sociometric techniques, interviews, questionnaires, examination of drug abusers, and military populations are being applied to determine the incidence, prevalence and medical complications of drug abuse. Studies are being conducted to determine the essential data required for all identified drug users and drug dependent individuals.

Fiscal year 1973 planned program.—Studies will be continued to develop and evaluate rapid, accurate, low-cost laboratory and field screening techniques for the identification and diagnosis of drug abusers, with emphasis upon drugs not presently detectable in biological fluids. The medical significance of drug abuse will be compared with statistical analyses of other requirements for medical attention. Data will be collected to develop effective countermeasures for the prevention and control of drug abuse in the Army. A reliable, accurate methodology for assessing the effectiveness of the Army medical drug abuse programs will be developed.

Program to completion.—This is a continuing program.

Resources: (in millions of dollars):

R.D.T. & E. funds:	
Fiscal year 1971	0.0
Fiscal year 1972	0.0
Fiscal year 1973	7.3

Additional to Completion: Continuing.
Total Estimated Cost: NA.

Senator YOUNG. I note that this project was begun in fiscal year 1972 under the project entitled "Military Psychiatry." Comment on this and tell us why it is now funded as a separate project.

Mr. JOHNSON. A small effort was being conducted in research on drug abuse, with emphasis on psychiatric aspects, by military psychiatrists prior to fiscal year 1972. A major Army effort in the control of drug abuse was initiated as a result of the Presidential directive of June 17, 1971. As an administrative convenience, the expanded program was funded through the existing project, military psychiatry. In order to provide administrative visibility for this important area of military concern, the new project was established to be funded in fiscal year 1973.

Chairman ELLENDER. What is the relationship between this project and the one we discussed earlier entitled "Applied Research on Drug Abuse in the Army."

Mr. JOHNSON. The work under this project is concerned with the biomedical aspects of drug abuse while "Applied Research on Drug Abuse in the Army" involves research on the behavioral and social aspects of the problem. Work under the two projects in closely coordi-

nated between the developing agencies concerned, as well as by Army staff agencies.

Chairman ELLENDER. Apparently, though research was begun on this project under military psychiatry in fiscal year 1972, fiscal year 1973 is the first year in which you are actually requesting funds. Am I correct?

Mr. JOHNSON. Yes; as regards funding for the new project, biomedical factors in drug abuse. Funds for drug abuse research, $1.5 million, were provided as a part of the military psychiatry project in fiscal year 1972.

MEDICAL DEFENSE AGAINST BIOLOGICAL AGENTS

Chairman ELLENDER. $4.2 million is requested for the project entitled "Medical Defense Against Biological Agents." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: EXPLORATORY DEVELOPMENT

Description.—The objective of the project is to develop an effective medical defense against biological agents. Improved techniques are sought for mass production of vaccines against known and potential biological weapons. A continuing evaluation of the vulnerability of man to potential biological agents is conducted. Improved methods are sought for rapid, early laboratory identification of infectious diseases, as well as better methods for prevention or treatment for those diseases that pose a biological agent threat.

Work Performed By.—Approximately 75 percent of the work is performed internally by the U.S. Army Medical Research Institute of Infectious Diseases, Fort Detrick, Maryland. Two contractors have contracts of $100,000 or more: National Drug Company, Philadelphia, Pennsylvania, and the University of Maryland, College Park, Maryland. In addition, three other univerities have contracts totaling $102,000. These contracts are with Ohio State University, Columbia, Ohio; Rutgers University, New Brunswick, New Jersey; and Johns Hopkins University, Baltimore, Maryland. An additional small contract with the University of Virginia, Charlottesville, Virginia, is under active consideration and several others with universities will be let in FY 1973 as the program develops.

Program Accomplishments and Future Plans

Fiscal Year 1972 Program.—Continue the development of vaccines against diseases that pose threats as biological warfare agents. Continue the development of large scale production methods for vaccines and techniques for rapid identification of organisms causing diseases. Study the feasibility of combining various vaccines to decrease logistical requirements. Search for toxoids which will counteract the effects of biological toxins that pose threats as warfare agents. Study immunization programs for insect-borne diseases. Study the factors influencing susceptibility to plague and improvement of methods of preventing and treating plague. Develop a polyvalent staphylococcal toxoid to protect against four or more types of toxin poisoning. Electron microscopy and electron spin resonance spectroscopy to detect early signs of infection will be investigated. Develop effective vaccines against Rocky Mountain Spotted Fever and African tick virus. Develop large scale production methods for vaccine against CHIK virus. Production of emergency supplies of live, attenuated vaccine against Venezuelan equine encephalitis (VEE), a disease of equine and man that poses threat as biological warfare agent, but has also appeared as extensive, naturally occuring outbreaks in Central America and Mexico, and recently in Texas and Louisiana. The project was funded at $4.0 million in FY 1972.

Fiscal Year 1973 Program.—FY 1973 investigative work will be guided by the results obtained from previous studies. It will include research on the pathogenesis of infections of military importance, the medical diagnosis, prevention, and treatment of potential biological warfare agents, the laboratory identification

of potential biological warfare agents, and the immunological and aerobiological research necessary to establish a sound technological base for medical defense.

Program to Completion.—This is a continuing program to advance the state-of-the-art to a point when medical protection can be perfected. No predictable completion date for this technology.

Resources.—(Dollars in millions):

R.D.T.E. funds;	
Fiscal year 1971	0.0
Fiscal year 1972	0.0
Fiscal year 1973	4.2

Additional to Completion: Continuing.

Total Estimated Cost: NA.

Chairman ELLENDER. I note that you have done and are continuing to do research in the field of equine encephalitis. What direct interest has the Army in this disease, and why doesn't research of this nature fall more naturally under some other Government agency such as the Department of Agriculture?

Mr. JOHNSON. The Army has always had the responsibility for protection of its active duty military personnel from either naturally occurring diseases in areas where they may be stationed or against biological weapons that may be used against them. The virus of equine encephalitis can attack humans. A vaccine developed for protection of Army personnel was used by the Department of Agriculture, which has the responsibility for protection of equines, to contain a recent epidemic in equines in Mexico and the Southern United States.

Senator YOUNG. Describe what your major efforts will be in fiscal year 1973, and tell us what you will do with the funds you have requested.

Mr. JOHNSON. Major efforts will continue on: (1) the causes and effects of infectious diseases, (2) the development of vaccines to prevent these diseases, (3) better ways to detect, diagnose, and treat these diseases. The program emphasizes exotic diseases that are not normal public health problems but which may be potential biological warfare agents that could be used against us. Termination of the offensive biological warfare program increases the need for greater emphasis on this defensive program.

ATMOSPHERIC INVESTIGATIONS

Chairman ELLENDER. Of the total requested for military sciences, $4.7 million is for a program entitled "Atmospheric Investigations." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: EXPLORATORY DEVELOPMENT

Description.—The purpose of this program is to determine how atmospheric conditions (fog, wind, turbulence, density, precipitation, pollution, icing, visibility, electrical potential trace gases and particulates) affect Army operations; and develop techniques and equipment to apply this knowledge to enhance Army operational capabilities. The bulk of the current meteorological equipment exploratory development program is directed toward meeting published Materiel Needs pertaining to development of: (1) atmospheric sensing equipment for use by artillery units for wind and density corrections to attain a first round target hit capability—the fast rising balloon, the forward area Portable Radar for Wind Measurement, and the rocket component for the new Artillery Meteorological

Data Sounding System; (2) the Portable Automatic Weather Observing Station to obtain meteorological measurements from forward, remote, and enemy held areas; and (3) Cloud Height/Visual Range Set for use at forward area non-instrumented air fields and helicopter landing sites. New techniques under development to enhance the application of meteorological data to Army operations include: (1) improved meteorological corrections for artillery gunnery and sound ranging operations; (2) application of weather radar data cloudiness and precipitation for Army tactical operations; (3) support of air mobility operations (including air traffic control and air navigation); (4) improved prediction of transport, diffusion, trajectory and fallout pattern of atmospheric aerosols and particulates for chemical, biological and nuclear defense activities, field test design, personnel safety applications, demilitarization and detoxification of munitions, protection against toxic rocket fuels, and atmospheric pollution problems on and near Army installations; (5) modification of localized adverse weather conditions resulting from fog and/or low clouds; (6) Army applications of meteorological satellites which provide meteorological information over large and inaccessible areas in a near real-time mode; (7) a field army Automatic Meteorological Systems which will automatically observe, analyze, predict, disseminate and display atmospheric information with the accuracy and timeliness, and in the detail and format required by each supported Army operational element on a scheduled and/or demand basis; and (8) sensors and methods to measure upper atmospheric parameters to reduce ionospheric effects on weapons systems and to determine the effects of natural (e.g., solar flares) and man-made (nuclear) disturbances (blackouts) of the ionosphere on these weapons systems.

Work Performed By.—Approximately 85 percent of the work is accomplished internally at the US Army Atmospheric Sciences Laboratory (ASL) with facilities at White Sands Missile Range (WSMR) and Fort Monmouth, New Jersey; BRL, Aberdeen, Maryland; and Redstone Arsenal, Huntsville, Alabama. The balance is performed by the following contractors: The Canadian Commercial Corporation, Ottawa, Ontario, Canada ($150,000), GCA (Salt Lake City office), Bedford, Massachusetts ($150,000), an unknown bidder ($120,000) for exploratory development models of the Portable Automatic Weather Observing Station (PAWOS), the Institute of Storm Research, University of St. Thomas, Houston, Texas ($25,000).

Fiscal year 1973 planned program.—Proceed with development of the components of the Meteorological Data Sounding System Rocket under the US-Canada Development Sharing Agreement. Continue studies to revise temperature and density departure tables for artillery fire for operationally strategic world areas. Complete the assembly of a meteorological satellite earth terminal display system, including antenna, radome, and new generation facsimile. Initiate a study on the users and applications of meteorological satellite data received from various national satellites to Army operational problems and begin development of techniques for providing pertinent meteorological satellite data to users in the field army on a real-time basis. Conduct further studies and tests on the helicopters downwash seeding technique for dissipating warm fog and clouds and apply the results toward developing "software" required for making this technique available for general field use as an operational capability. Prepare a manual for incorporating the new sound ranging corrections which result in a 25 percent increase in target location accuracy. Conduct *in-situ* and laboratory studies on the atmospheric (CO_2, H_2O, and dust) attenuation of laser beams in the eye-safe and high-energy frequency range, and in particular, determine if dust strongly attenuates the laser beam in the eye-safe frequency range, thus posing a serious problem to the use of the eye-safe frequency. Investigations will continue on the effects of nuclear and man-made ionospheric region blackouts on communications, surveillance and target acquisition especially for major weapon systems and for anti-ballistic missile defense. Efforts will concentrate on development of ionospheric reaction-rate codes for various weapons. The development of models for the transport, trajectory and diffusion of aerosols and particulates will continue with emphasis on special terrain conditions.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

Mr. JOHNSON. Yes, sir.

(The information follows:)

[Dollars in millions]

Project	Fiscal year— 1971	1972	1973
1M062111A125—Meteorological rocket program	0.500	0.375	0.200
1T062111A126—Meteorological equipment and techniques development	1.357	2.120	3.480
1T062111A128—Meteorological of transport and diffusion	1.250	.933	.900
1T062111A616—Ionospheric environmental sensing techniques	.150	.200	.150
Total	3.257	3.628	4.730

Senator YOUNG. Describe your major efforts for fiscal year 1972.

Mr. JOHNSON. Our major efforts for fiscal year 1972 were: (1) atmospheric effects on laser propagation: Measurement of the attenuation of the laser beam in the "eye-safe" frequency range by atmospheric gases and particulates, and investigation of the atmospheric distortion of laser beam propagated over an 80-kilometer path through the atmosphere. (2) Meteorological ballistic corrections for artillery fire: development of techniques for correction of artillery fire in mountainous terrain for the effect of vertical currents, as well as the standard effects for wind and air density. (3) Fog and cloud dissipation: Investigate helicopter downwash mixing to increase visibility over small helicopter landing areas enveloped in a shallow layer of warm fog, and develop a mobile propane seeding dispenser for use at small helicopter landing areas and fire bases. (4) Chemical and biological defense: Assess the combined effects of terrain, vegetation, surface materials and structures on atmospheric diffusion and transport of vapor and aerosols, and determine how to use atmospheric pressure, wind, dew, temperature and humidity measurements and predictions to forecast concentrations and viability of CB on chosen areas for defense against attack by CB. (5) Atmospheric soundings: Complete exploratory development of an atmospheric sounding rocket to measure in a 30-minute period temperature, humidity, wind direction and speed in the upper atmosphere above 30 kilometers and telemeter the data to the ground station.

Chairman ELLENDER. Please comment on the joint United States-Canada development agreement on the meteorological data sounding system rocket.

Mr. JOHNSON. This rocket is being developed under a United States-Canada Development Sharing Agreement. Under the terms of the agreement, Canada provided 75 percent of the cost of the initial phase of development and 50 percent of the cost of the current phase. The objective of this project is to develop a meteorological sounding rocket for tactical use. The rocket will be capable of obtaining atmospheric data up to 30 kilometers for use in artillery corrections and nuclear fallout prediction.

Senator YOUNG. What will you do with the $4.7 million you are requesting for fiscal year 1973, and why do you need the increase of $1.1 million you are requesting?

Mr. JOHNSON. In fiscal year 1973 we will continue the development of the rocket components for meteorological sound rocket; the development of automated techniques for the prediction of the movement of atmospheric aerosols and particulates with emphasis on special terrain conditions. Temperature and density departure tables for artillery

correction for operationally strategic areas will be revised. Further studies of the helicopter downwash technique for dissipating warm fog will be conducted. The software and prediction techniques for the automatic meteorological system will continue to be developed. Investigations will continue on the effects of nuclear and man-made ionospheric blackouts on Army weapons and communications systems. New remote sensing techniques and equipment will be investigated and developed.

The additional $1.1 million is part of $1.7 million in this project to be used to initiate a new effort in meteorological satellite applications. Under this effort we plan to analyze data from existing and planned satellites of other agencies to determine what information is most useful to the Army; develop techniques and equipment for Army use of these data for tactical operations and other applications; and influence instrumentation and sensors used in future satellites to obtain data that are useful to the Army.

METEOROLOGICAL EQUIPMENT AND TECHNIQUES DEVELOPMENT

Chairman ELLENDER. Of the total requested for atmospheric investigation, $3.5 million is for the project entitled "Meteorological Equipment and Techniques Development." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: EXPLORATORY DEVELOPMENT

Description.—Current requirements for meteorological systems to support Army combat operations and RDTE activities are expressed in Qualitative Materiel Requirements (currently being revalidated as Military Needs) for Artillery Meteorological Sounding Systems, Fast Rise Balloon Systems, Portable Automatic Weather Observing Stations, Mobile Weather Radars and Portable Weather Observing Packs. For the longer range, the Qualitative Materiel Development Objective for the Automatic Meteorological System expresses the need to support all meteorologically-sensitive Army operations with more timely, accurate and representative atmospheric information. Thus, new techniques and equipment will be developed to observe, analyze, predict and modify atmospheric conditions, utilizing existing and newly developed technologies. Additionally, a base is provided for the development of techniques for use in applying atmospheric data in combat operations which go directly from applied research to the user. Included are improved meteorological corrections for artillery operations, interpretation of weather radar data for Army applications and improved meteorological methods to support air mobility operations (to include air traffic control and air navigation). Techniques for the application of data obtained from sensors carried by meteorological satellites constitute a new and large part of this program. As a highly useful means of remotely sensing the atmosphere, meteorological satellites can provide meteorological information over otherwise inaccessible areas, locate and monitor the development of severe weather and provide near real-time information on weather conditions that have many battle area implications involving personnel and material. Substantial progress in this R&D area will have extremely high pay-off value for the Army in terms of improved air/ground mobility operations, improved accuracy of artillery fire, improved target acquisition and surveillance capability and improved capability to account for atmospheric effects in communications and nuclear operations.

Work Performed By.—Approximately 70 percent of the work is accomplished internally by the U.S. Army Atmospheric Sciences Laboratory, with facilities at White Sands Missile Range, New Mexico, and Fort Monmouth, New Jersey. Contracted work will include the following: successful bidder, to complete development of a radio frequency system and build prototype validation models of a Portable Automatic Weather Observing Station ($200,000); successful bidder,

for the study of weather radar techniques for the Army ($40,000); successful bidder, for multi-level meteorological models for artillery meteorological messages ($25,000). Additionally, a project order was submitted to the Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire, for the investigation of Arctic "whiteout" and ice and supercooled water droplet fog dissipation.

Fiscal Year 1973 Planned Program.—Conduct further investigations and tests of the helicopter downwash seeding technique for dissipating warm fog and clouds, and apply the results toward the development of both software and hardware required to make this technique available for field army operational use. Prepare a manual that incorporates newly determined sound ranging corrections which have resulted in a 25 percent increase in target location accuracy. Continue the development of meteorological equipment and techniques needed in support of all meteorologically-sensitive Army operations. A new effort will be initiated to develop techniques for applying newly developed advanced meteorological satellite sensor data to Army operational requirements, particularly improved vertical soundings of temperature, density, moisture and winds, and greater cloud resolution. Specifically, in fiscal year 1973 contracts will be awarded to purchase a digital facsimile system, a digital video converter and a very high resolution radiometer direct read-out station to support this effort. Grants also will be awarded for infra-red radiation research and ground truth efforts having meteorological satellite data applications.

Chairman ELLENDER. I note a reference to Arctic "whiteout." What is Arctic "whiteout"?

Mr. JOHNSON. Whiteout is an atmospheric optical phenomenon of the polar regions in which the observer appears to be engulfed in a uniformly white glow. Neither shadows, horizon, nor clouds are discernible; sense of depth and orientation is lost; only very dark, nearby objects can be seen. Whiteout occurs over an unbroken snow cover and beneath a uniformly overcast sky when the light from the sky is about equal to that from the snow surface. Blowing snow may be an additional cause. This phenomenon is experienced by pilots in the air as well as by persons on the ground. It is sometimes said to resemble "being in a bowl of milk." It is an extremely dangerous situation.

Senator YOUNG. Why do you need an increase of $1.4 million?

Mr. JOHNSON. The additional $1.4 million is part of a total of $1.7 million included in this project to initiate a new effort in meteorological applications. Under this effort we plan to analyze data from existing or planned satellites to determine what information is most useful to the Army; develop techniques and equipment for Army use of this data for tactical operations and other applications; and influence instrumentation and sensors used in future satellites to obtain data that is useful to the Army. Meteorological satellites have acquired the horizontal resolutions and capability of making vertical soundings of the atmosphere which make possible unique applications to support tactical Army operations. Particularly relevant is the capability to (1) acquire an integrated weather picture and vertical sounding of the atmosphere over local areas and in real-time; (2) to survey weather conditions over enemy held areas; and (3) to provide a "short-range" forecast tool to support small unit tactical operations. This new development will lead to vastly improved weather information and measurements of atmospheric conditions for use in meteorological corrections for artillery fire, sound ranging, helicopter operations, surveillance and target acquisitions and others. For the artillery, for example, there is the potential that upper air measurements of temperature, density, and wind will be available along the entire trajectory in real-time rather than, as at present, at a single point every 2 hours.

Improved forecasts at both the division and lower echelons will reduce storm damage and curtailment of operations due to adverse weather, and increase safety and health of personnel.

TERRESTRIAL AND MOBILITY INVESTIGATIONS

Chairman ELLENDER. Of the total requested for "Military Sciences," $3.1 million is for the program entitled "Terrestrial and Mobility Investigations." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY EXPLORATORY DEVELOPMENT

Description.—This program defines and quantifies natural and man-made elements of the environment that impact on personnel, on the design and use of military equipment and on off-road vehicle mobility. Research in surface mobility is concerned with improving the cross-country performance of vehicles, including surface effects vehicles, improving techniques for predicting vehicle mobility, developing improved methods of classifying and portraying terrain, and developing means of waterproofing, dust-proofing and preparing expedient surfacings. Environmental research analyzes and applies environmental data for establishing criteria for design, testing and use of Army materiel. Cold regions research investigates properties of snow, ice and frozen ground and analyzes environmental effects on materiel performance. Analytical models are developed to identify and quantify the effects of the environment on the performance of materiel, including line-of-sight sensors and seismic detectors.

Work performed by.—Approximately 95% of the work is accomplished in-house by the U.S. Army Tank-Automotive Command, Warren, Michigan; U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi; U.S. Army Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire; and the Combat Developments Division, U.S. Army, Alaska. Major contracts (over $25,000) include: Michigan Technological University, Houghton, Michigan ($35,000); Robotics Incorporated, Schenectady, New York ($30,000); National Water Lift Company, Kalamazoo, Michigan ($40,000); Stevens Institute of Technology, Hoboken, New Jersey ($56,000); General Electric Company, Schenectady, New York ($43,000); and Wilson, Nuttall-Raimond Incorporated, Chestertown, Maryland ($35,000). This program element contains one additional contract for $13,000.

Fiscal Year 1972 Program.—

(*a*) New Programs Initiated: Work was begun on the application of cybernetics to mobility problems and development of cybernetic mobility aids. Research includes experiments to apply force-feedback steering control to improve tractive efficiency in soft soil, development of a cybernetic control mechanism for a variable characteristic suspension system, design of a multi-degree of freedom articulated joint between two vehicles such as the M113. Pitch-controlled and longitudinal-controlled articulated vehicles will be examined. Field experiments will be initiated in Alaska to test the feasibility of using the surface effects vehicles as a logistical carrier in cold regions to support operations at considerable distances from main bases. These experiments will utilize the Bell SK–5 to develop knowledge concerning the interaction between surface effects

vehicles and arctic and subarctic terrain and will determine the operational requirement for such vehicles in cold regions.

(*b*) Continuing Efforts: Field tests will be conducted to validate and refine the first generation analytical mobility prediction models and to evaluate the current method of analyzing the riverine performance of military vehicles, particularly river exiting performance. New designs of aluminum, steel, and plastic landing mats will be investigated. New dust palliatives, waterproofers, and blast resistant materials will be tested. Research will be continued to better understand the effects of the environment on the soldier and on the design, test and use of Army materiel. Experiments will be continued on methods to anchor equipment (guns, radar) in frozen soils and the interaction between cold regions terrain and various surface vehicles, including surface effects vehicles. Constraints imposed by the environment on the design and performance of Army materiel will be identified and quantified. Emphasis will be on line-of-sight sensing devices and seismic sensors for detection and surveillance.

(*c*) Major Items Planned for Completion: Field experiments in Alaska using the Bell SK–5 surface effects vehicle to determine the usefulness of such vehicles as logistical carrier in cold regions will be completed by June 1972.

Fiscal Year 1973 Planned Program.—Work will be continued on force-feedback control devices associated with vehicle mobility. New designs of landing mats, membranes and anchorages will be tested, particularly those used for supporting heavy aircraft. Dust palliatives, soil stabilizers and blast resistant materials will be evaluated as they become available from industry. Work will continue on environmental design criteria and the environmental effects on Army materiel, particularly sensors. Critical Army requirements in cold regions will be investigated with emphasis on snow and ice control, behavior of organic and thawing soils under loads, and effect of snow-covered terrain on surface mobility.

Program to Completions.—This is a continuing program.

RESOURCES

[Dollars in millions]

	Fiscal year—			Additional to completion	Total estimated cost
	1971	1972	1973		
R.D.T.&E.	2.6	3.4	3.1	(1)	(2)
R.D.T.&E. man-years	21.0	12.0	8.0	(2)	(2)

[1] Continuing.
[2] Not available.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

Mr. JOHNSON. I will be glad to.

(The information follows:)

[In millions of dollars]

Project	Fiscal year 1971	Fiscal year 1972	Fiscal year 1973
1T062112A045—Vehicle mobility under adverse conditions	0.200	0.595	0.500
1T062112A046—Trafficability and mobility research	1.300	1.100	1.100
1T062112A129—Geographic research	.560	.580	.500
1T062112A130—Cold regions research	.150	.200	.240
1T062112A131—Environmental constraints on materiel	.420	.880	.760
Totals	2.630	3.355	3.100

Senator YOUNG. Please describe the work you are doing on the surface effects vehicle and tell us how your work is coordinated with that of the Navy.

Mr. JOHNSON. The Army is conducting field experiments in Alaska using a Bell Aerosystems SK–5 to test the feasibility of utilizing surface effects vehicles as logistical carriers. This work is coordinated with related activities at the Naval Ship Research and Development Center, Carderock, Md.

Chairman ELLENDER. What cooperative efforts are we involved in with Australia, Great Britain, and Canada?

Mr. JOHNSON. The technical cooperation program, which is a triservice, quadripartite program oriented toward basic and applied research, accomplishes information exchange and program coordination.

Chairman ELLENDER. What are your major efforts in fiscal year 1972?

Mr. JOHNSON. In fiscal year 1972 we have initiated work on the application of cybernetics to mobility problems and development of cybernetic mobility aids. Research in fiscal year 1972 will include experiments to apply force-feedback steering control to improve tractive efficiency in soft soil, development of a cybernetic control mechanism for a variable characteristic suspension system, design of a multidegree of freedom articulated joint between two vehicles.

We will also be examining pitch-controlled and longitudinal-controlled articulated vehicles. Field experiments will be initiated in Alaska to test the feasibility of using the surface effects vehicles as a logistical carrier in cold regions to support operations at considerable distances from main bases. These experiments will utilize the Bell SK–5 to develop knowledge concerning the interaction between surface effects vehicles and arctic and subarctic terrain and will determine the operational requirement for such vehicles in cold regions. Field tests will be conducted to validate and refine the first generation analytical mobility prediction models and to evaluate the current method of analyzing the riverine performance of military vehicles, particularly river exiting performance. We will also investigate new designs of aluminum, steel, and plastic landing mats. New dust palliatives, waterproofers and blast resistant materials will also be tested. Research will be continued to better understand the effects of the environment on the soldier and on the design, test, and use of Army materiel. Experiments will be continued on methods to anchor equipment (guns, radar) in frozen soils and the interaction between cold regions terrain and various surface vehicles, including surface effects vehicles. Constraints imposed by the environment on the design and performance of Army materiel will be identified and quantified. Emphasis will be on line-of-sight sensing devices and seismic sensors for detection and surveillance.

Senator YOUNG. What do you hope to accomplish in fiscal year 1973 with the funds you are requesting?

Mr. JOHNSON. In fiscal year 1973 work will continue on force-feedback control devices associated with vehicle mobility. New designs of landing mats, membranes and anchorages, particularly those used for supporting heavy aircraft will be tested. We will evaluate dust palliatives, soil stabilizers and blast resistant materials as they become available from industry and continue work on environmental design criteria and the environmental effects on Army materiel, particularly sensors. We will also investigate critical Army requirements in cold regions with emphasis on snow and ice control, behavior of organic and thawing soils under loads, and effect of snow-covered terrain on surface mobility.

GENERAL CHEMICAL INVESTIGATIONS

Chairman ELLENDER. $5.8 million is requested for the program entitled "General Chemical Investigations." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: EXPLORATORY DEVELOPMENT

Description.—The objective of this program element is to provide a technological base for offensive and defensive efforts for the chemical programs. This element supports and paces all efforts in the civil disturbance, incapacitating and binary lethal chemical weapons programs and defensive chemical programs. It includes information related to optimizing chemical agent dissemination and aerodynamic dispersion characteristics of various potential submunition shapes. Parameters involved in process chemistry and biosynthesis of related classes of binary lethal, incapacitating and riot control chemical agents are studied. New and improved means of evaluating chemical agents, munitions, agent munition combinations and defensive systems are to be developed. Systems analyses of chemical weapons and defense systems are conducted. Search for potential chemical agents is conducted. The investigation of the medical effects of chemical and riot control agents is carried out. Information on which to base defensive equipment and other materiel development is provided. This program contains eight projects devoted to search for potential chemical agents, evaluation of chemical agent effects, medical effects of chemical agents, medical effects of riot control agents, dissemination and dispersion technology, agent process technology, testing and assessment technology and systems analyses of chemical defense and weapons.

Work performed by.—Edgewood Arsenal, Md. performs all lethal and incapacitating chemical agent work for the DOD. Basic weapon system technology and general chemical warfare investigations are conducted for the Army at Edgewood Arsenal with participation by Picatinny Arsenal, Dover, N.J.

Fiscal year 1972 program.—Agent screening efforts on binary lethal agents and incapacitating agents continued. [Deleted.]

Fiscal year 1973 planned programs.—Agent screening efforts for new binary lethal agents that are percutaneously active will continue. [Deleted.] The search for improved riot control agents will be continued. [Deleted.]

Program to completion.—This is a continuing program designed to provide basic technological data for further research and development on chemical lethal and incapacitating agents and weapons to provide the Army and other Services with an effective chemical warfare capability.

Resources (In millions of dollars:)

R.D.T. & E. funds for fiscal year 1971, $7.1; fiscal year 1972, $6.6; fiscal year 1973, $5.8; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for fiscal years 1971 and 1972, and the request for fiscal year 1973.

Mr. JOHNSON. Yes, sir; I will be glad to.

(The information follows:)

[In millions of dollars]

Projects	Fiscal year 1971	Fiscal year 1972	Fiscal year 1973
1W062116AD10—Search for potential chemical agents	1.000	0.800	0.950
1W062116AD19—Technical evaluation of chemical effects	.630	.700	.580
1W062116AD21—Medical effects of chemical agents	2.030	2.070	1.700
1W062116AD22—Medical effects of riot control agents	1.040	.959	.730
1W062116A081—Chemical dissemination and dispersion technology	1.200	.900	.750
1W062116A083—Chemical agent process technology	.535	.410	.300
1W062116A084—Chemical testing and assessment technology	.500	.510	.570
1W062116A092—Systems analysis of chemical defense and weapons	.200	.242	.200
Total	7.135	6.591	5.780

Chairman ELLENDER. Can you give us a brief, unclassified description of your planned program for fiscal year 1973 and tell us what you will do with the $5.8 million you are requesting?

Mr. JOHNSON. This is a continuing program that provides the technological base for the entire chemical weapons and chemical defense program. This element supports and paces all efforts in the civil disturbance, incapacitating and lethal binary chemical weapons program and the chemical defense program. In fiscal year 1973, exploratory development will continue on technology to improve the Army's chemical defense posture; studies will continue to improve chemical agent dissemination; process chemistry of new lethal and incapacitating chemical agents will be studied; new and improved means of evaluating chemical agents, munitions, agent-munition combinations and defensive systems will be developed; systems analyses of chemical weapons and defense systems will be conducted and the search for potential chemical agents will continue.

NUCLEAR MUNITIONS AND EFFECTS

Chairman ELLENDER. [Deleted] is requested for the program entitled "Nuclear Munitions and Effects." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: EXPLORATORY DEVELOPMENT

Description.—This program element has three main objectives: nuclear munitions, nuclear weapons effects research and test (NWER&T), and radiological detection and measurement techniques. a. In nuclear munitions it has five projects that support exploratory development in nuclear artillery projectiles, missile warhead sections, atomic demolition munitions (ADM) and ADM firing systems, munition protection systems, and multi-use componentry. These projects emphasize simplicity, reliability, increased accuracy, and reduced size, weight, cost and reaction time. Developments in these areas are promising and permit orderly, low risk transition into advanced or engineering development. b. In NWER&T there are two main areas. The first area is supported by three projects: Nuclear Effects Simulators, which permits study of nuclear effects from sources less costly and more easily controlled than underground nuclear bursts; Nuclear Weapons Effects on Materiel, which is aimed at determination of design criteria with respect to hardening materiel against nuclear effects; Defense Against Nuclear Effects, which is aimed at gaining fundamental knowledge into the physical properties of nuclear particles and rays. The second area is supported by one project: Nuclear Construction and Engineering. This project seeks knowledge in developing protective structures and techniques (strategic and tactical) which will insure survival of personnel and equipment in a nuclear burst environment. This project is also aimed at developing methods and techniques of effectively using atomic demolition munitions. c. The Radiological Detection and Measurement Project is to investigate the latest radiation sensitive devices and miniaturization techniques for hand-held and low-altitude airborne systems and to use indirect measurement of radiation by-products for the high-altitude, high-speed airborne systems.

Work performed by.—U.S. Army Materiel Command, Washington, D.C.; U.S. Army Research and Development Center, Aberdeen Proving Ground, Md.; Harry Diamond Laboratories, Washington, D.C.; U.S. Army Electronics Command, Fort Monmouth, N.J.; Office, Chief of Engineers, Washington, D.C.; U.S. Army Engineer Waterways Experiment Station, Vicksburg, Miss.; U.S. Army Engineer Explosives Excavation Research Office, Livermore, Calif.; Picatinny Arsenal, Dover, N.J.; Oak Ridge National Laboratories, Oak Ridge, Tenn.

Fiscal year 1972 program.—a. In the munitions area earlier efforts continue on [deleted]. Warhead effectiveness analyses are being conducted as required to

support joint Army/Atomic Energy Commission (AEC) feasibility studies. Work continues on a joint Army/AEC feasibility demonstration of [deleted]. Maintain cognizance of [deleted]. b. In the nuclear weapons effects research and test area work has continued on the determination of [deleted] vulnerability to nuclear bursts. Much of this work is being accomplished through the use of nuclear effects simulators and underground nuclear tests. [Deleted.] c. Prepare contract agreement with Oak Ridge National Laboratories for feasibility determination studies for development of miniature multipurpose radiac device components, and conduct initial studies on radiac digital reader devices.

Fiscal year 1973 planned program.—a. In the nuclear munitions area: Projectiles: Studies and tests on [deleted]. b. In the nuclear weapons effects research and test area: Continue nuclear effects research [deleted]. Army materiel systems. Provide guidance and assistance to contractors involved in development [deleted]. c. Radiacs: Work will be conducted on light emitting diode type displays for digital readout, feasibility studies on solid state integrating devices and feasibility studies on fluorescence and NO_2 absorption. It is intended that Oak Ridge National Laboratories will conduct work on the advanced aerial radiac system and miniature multipurpose radiac device components. Work on a feasibility study for a nuclear munitions detector is planned.

Program to completion.—This is a continuing program.

Resources (In millions of dollars):

R.D.T. & E. funds for fiscal year 1971 $6.6; fiscal year 1972, [deleted]; fiscal year 1973 [deleted]; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

General GRIBBLE. Yes, sir.

(The information follows:)

[In millions of dollars]

Project	Fiscal year 1971	Fiscal year 1972	Fiscal year 1973
AD40—Projectiles	0.280	0.185	0.250
AD41—Missile warheads	.765	.490	.690
AD42—Atomic demolition munitions	.235	.560	.210
AD43—Munitions protection systems	.050	.050	.050
AD44—Multi-usage componentry and RF	.220	.200	.300
AD50—Nuclear effects simulators	.915	[Deleted]	
AD51—Nuclear weapons effects, Army applications	2.535		
AD52—Defense against nuclear effects	.230		
A481—Radiation detection and measuring technique	.250	.254	.300
A880—Nuclear construction and engineering	1.135	1.100	.900
Total	6.615	[Deleted]	

Chairman ELLENDER. I note that the Defense Nuclear Agency coordinates the Army's efforts in this area with those of other services and also shares in the cost. Of the total provided for this program to date, how much has the Defense Nuclear Agency provided?

General GRIBBLE. The Defense Nuclear Agency (DNA) does coordinate Army efforts in the area of nuclear effects research, development, and testing. DNA provides funds to the Army for work in nuclear weapons effects which has application to other services, as well as the Army, and for which Army capabilities or expertise are particularly adept. During the period fiscal year 1963–fiscal year 1971 the Army has spent about $30 million under this program element, and its predecessors, for nuclear weapons effects work to meet Army's requirements. During this same period the DNA transferred about $128 million to the Army for all programs ecompassing nuclear weapons effects research, development, and tests. In fiscal year 1971, for ex-

ample, the Army funded $4.8 million for nuclear weapons effects work under this program while DNA supported the Army with $8.3 million.

Senator YOUNG. Has the committee been provided with full details on your planned program for fiscal year 1973 for nuclear munitions and effects?

General GRIBBLE. Yes, it has.

ELECTRICAL POWER APPLICATIONS

Chairman ELLENDER. Of the total requested for "Military sciences," $3.6 million is for the program entitled "Electrical Power Applications." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: EXPLORATORY DEVELOPMENT

Description.—A broad and continuing applied research program on chemical, electrical, mechanical and nuclear problems in energy conversion is supported to develop more efficient and reliable power devices for communication and surveillance, electric vehicle propulsion, utility electric power, reserve fuze power for rocket and cannon projectiles and information on cost effectiveness of nuclear power. Research concentrates on fuel cells, batteries, ultra high speed turbines, power conditioning and analysis of the cost effectiveness of Army applications of nuclear energy.

Work performed by.—Approximately 80% of the work is performed internally at (1) Harry Diamond Laboratories, Washington, D.C.; (2) US Army Electronics Command, Fort Monmouth, New Jersey; (3) US Army Mobility Equipment Research and Development Center, Fort Belvoir, Virginia. Approximately 20% of the funds support contracts. Seven contracts of $25,000 or more are supported with: (1) Lockheed Missiles and Space Company, Sunnyvale, California; (2) Texas Instruments, Dallas, Texas; (3) Argonne National Laboratory, Argonne, Illinois; (4) General Electric Company, Schenectady, New York; (5) Energy Research, Bethel, Connecticut; (6) Florida Institute of Technology, Melbourne, Florida; (7) Engelhard Industries, Newark, New Jersey or Energy Research, Bethel, Connecticut. In addition there will be twelve other contracts with multiple bidders totalling $330,000 not yet negotiated.

Fiscal year 1972 program.—The program includes: (1) Tests on 500 watt and 250 watt thermoelectric units in field environment with user equipment and fabrication of germanium photovoltaic cell to achieve a current density of 3 amperes/cm^2 to evaluate rare earth oxide materials as radiators; (2) Evaluation of highly fluorinated graphites for high energy density primary electrolyte batteries design and fabrication of sealed nickel-zinc battery, investigations on molten electrolyte systems to achieve high shelf life and reduced self-discharge of high temperature batteries, development of organic electrolyte batteries with output of 80 watt hr/lb and performance below 0° F, and the purchase and testing of high energy density batteries for vehicle propulsion; (3) Evaluation of models reflecting the new power conversion techniques to assess their capability and reliability under the worst operating conditions; (4) The design and performance parameters of power conversion equipment and high speed electric motors for ultra high speed electric power generators directly driven by gas turbine; (5) Critical factors affecting fuel cell catalyst life by varying such parameters as air composition in the field, and reactor temperature. The high voltage fuel cell concept combining the technology of fuel cell electrodes with thin films and microcircuitry is also being pursued. Advance in this silent power source development and elimination of transformer stage in power conditioner will result if the concept proves workable; (6) Development of self-opening copper ampul, thermal battery for high spin rates and miniature reserve power source for 20 and 30mm fuzes; (7) Analysis on nuclear power dredges, underground plants, mobile nuclear power and cost effective parameters, and radiation sewage treatment at military installations; and, (8) Initiation of a

300 watt model of Sterling engine piezoelectric generator as a lightweight low noise power source and new techniques of preparation of small radial turbine components from silicon carbide.

Fiscal year 1973 planned program.—The program includes: (1) Evaluation of thermoelectric system performance and reliability of standard family units to meet field requirements and component design criteria for thermophotovoltaic systems. Development of experimental models of low power thermoelectric and solar cell power supplies for Army's new electronic sensor systems; (2) Emphasis on development of primary nonreserve and reserve organic electrolyte batteries for radios, radar, night vision and sensor uses. Program includes magnesium, zinc-air, methanol-air, aluminum-air batteries and hybrid battery systems of primary batteries with sealed secondary batteries; (3) Exploratory development of two models of a manpack charger capable of charging 12 and 24 volt sealed/vented secondary batteries at rates up to 3 amperes from 22 to 40 volt sources such as fuel cells, thermoelectric generators, and DC engine generators; (4) Tests and evaluation of 30KW and 100KW permanent magnet generators. Effort on 100KW samarium cobalt permanent magnet generator will be continued to provide an alternate generator source; (5) A contract will be let to search for a high temperature electrolyte suitable for hydrocarbon/air fuel cells to raise the temperature to a point that hydrocarbon oxidation readily occurs; (6) Development of high voltage fuel concept will continue. Properties of magnetic materials and construction of 4.6°K miniature cryogenic refrigerator will be investigated; (7) Continue development of fuzes for reliability, stability and fast activation; and, (8) Review applications of nuclear energy, power dredges, underground applications and mobile nuclear power plants for advanced anti-ballistic missile defense systems.

Program to completion.—This is a continuing program.

Resources: (In millions of dollars)

R.D.T. & E. funds for fiscal years 1971, $3.7; fiscal year 1972, $3.8; fiscal year 1973, $3.6; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

Mr. JOHNSON. Yes, sir.

(The information follows:)

[In millions of dollars]

Project	Fiscal year 1971	Fiscal year 1972	Fiscal year 1973
1T062119A002—Advanced energy transformations	0.200	0.205	0.200
1T062119A012—Electrical power research	1.600	1.780	1.670
1T062119A053—Power sources applied research and engineering	1.360	1.550	1.470
4A062119A886—Nuclear power applications	.500	.300	.300
Total	3.660	3.835	3.640

Senator YOUNG. What do you hope to accomplish with the $3.6 million you are requesting for fiscal year 1973?

Mr. JOHNSON. For fiscal year 1973 the following program will be accomplished:

Fabricate second generation man pack thermoelectric generators for 24 hour/day forward area missions.

Complete component design criteria of a thermophotovoltaic system for construction of a generator prototype.

Develop design data for a thermionic power module including a multi-fuel burner.

Fabricate experimental lithium-organic batteries to meet high power requirements to operate at temperatures down to –20° F.

Design and fabricate maintenance free lead-acid batteries in standard line configuration to improve energy density and cycle life.

Fabricate and test 30 and 100 kilowatt permanent magnet generators for turbo alternators.

Investigate new high temperature catalysts for thermal cracking of fuels for fuel cells.

Evaluate the 300 watt Sterling engine piezoelectric generator as a silent power source.

Continue evaluation of new fuze systems for stability and fast activation.

Continue evaluation studies of nuclear energy for underground applications and power plants for advanced anti-ballistic missile defense systems.

COMBAT DEVELOPMENT INVESTIGATION

Chairman ELLENDER. $3 million is requested for the program entitled "Combat Development Investigation". Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: EXPLORATORY DEVELOPMENT

Description.—The objective of this program is to conduct developmental studies and investigations for the determination of doctrine and qualitative and quantitative requirements for all types of equipment for the Army in the field. Projects funded under this effort are investigation of support fire control, tactical ADPS, future communication systems, surface-to-air missiles, air mobility, and combat support doctrine.

Work performed by.—US Army Combat Developments Comand, Ft. Belvoir, Virginia, Computer Sciences Corporation, Falls Church, Virginia, Stanford Research Institute, Stanford, California.

Fiscal year 1972 program.—Contract was awarded for a study on system control for Army communication systems. Contract was awarded for investigation of the proper force mixture of scout helicopters and attack helicopters. Efforts on tactical bridging studies and on containerization were continued.

Fiscal year 1973 planned programs.—Studies on communications requirements of users and on integrated communications will be initiated. Investigation of interoperability requirements for tactical ADPS will also be initiated. Supporting studies and analysis will be performed on air defense missile weapons and control systems. Basic studies on logistic support areas will continue.

Program to completion.—Efforts begun in earlier years will continue. As new questions on doctrine or requirements are identified, new studies will be initiated.

Resources (In millions of dollars:)

R.D.T. & E. funds for fiscal year 1971, $2.4; fiscal year 1972, $2.7; fiscal year 1973, $3.0; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

Mr. JOHNSON. Yes, sir.

(The information follows:)

[In millions of dollars]

Project	Fiscal year 1970	Fiscal year 1971	Fiscal year 1972
6A062120A953—Supporting fire control analysis	0.120	0	0
6A062120A960—ADPS future armies	.325	.500	.500
6A062120A965—Investigation of future communication systems	.750	1.150	1.520
6A062120A966—Surface-to-air missile development	0	.490	.530
6A062120A967—Air mobility investigation	.690	.400	.140
6A062120A976—Weapon requirement investigation	.330	0	0
6A062120A985—Combat support doctrine development	.211	.150	.330
Total	2.426	2.690	3.020

Senator YOUNG. Describe briefly your work in the field of surface-to-air missile technology for which you are requesting $530,000 under this program element.

Mr. JOHNSON. Chairman Ellender, there are three major efforts in studies and analysis to be developed under this project. The first effort is to analyze and document operational capabilities of the improved Hawk system in the present configuration and evaluate this operational capability. Secondly, SAM–D system firing doctrine software and logic will be developed in accordance with the needs of the air defense user. Finally, the Army capability for dynamic analysis of automated/semi-automated air defense command will be increased by a quantitative measurement of cost, capabilities, and limitations of the command, control and communications doctrine and organizations. It is anticipated that the existing analytical capability will be improved by these efforts and new analytical models and techniques can be developed.

Chairman ELLENDER. Tell us what you will do with the $3 million you are requesting for the fiscal year 1973.

Mr. JOHNSON. In fiscal year 1973 we will initiate studies on communications requirements of users, on integrated communications, and initiate investigation of interoperability requirements for tactical ADPS. Supporting studies and analysis will be performed on air defense missile weapons and control systems. Basic studies on logistic support areas will continue.

MANPOWER RESOURCE DEVELOPMENT

Chairman ELLENDER. Of the total requested for "Military Sciences," $3.6 million is for the program element entitled "Manpower Resources Development." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The informaton follows:)

CATEGORY: ADVANCED DEVELOPMENT

Description.—This element provides for advanced development of innovative Army training programs and for evaluating and adapting to Army use training advances made in education. Development of nonsystem training devices to provide more effective training, reduce costs, and eliminate wear on tactical materiel is funded by this element. The goal is to reduce to practice the most effective, efficient, and economical techniques, procedures, materiels and programs for training individuals and units in both technical and military skills. This element has been restructured and includes the following: (1) Language instruction development for the Defense Language Institute and techniques for language proficiency testing; (2) Evaluation and modification of computer-administered instruction (CAI) for Army training; (3) Investigation of troop-community

interaction; (4) New efforts to develop more effective manpower management systems; (5) Development of training materials and programs to optimize military unit training; (6) Provides a pro rata share of the maintenance and operating cost at the US Naval Training Device Center; (7) Development of a Synthetic Flight Training System for rotary wing instrument training; (8) Development of training devices not related to specific Army weapons systems. The underlying need of these developments is to improve the performance of the modern US Army soldier operating individually and in units. This program supports efforts to successfully achieve a Modern Volunteer Army.

Work performed by.—Approximately 19% of the effort is performed internally by US Army Manpower Resources Research and Development Center, Arlington, Virginia and Naval Training Device Center, Orlando, Florida. Contract efforts of $25,000 or more include: Singer-General Precision, Link Division, Silver Spring, Maryland; Fairchild Camera and Instrument Corporation, Syosset, New York; Technical Associates, Incorporated, Metairie, Louisiana; Joanell Laboratories, Livingston, New York; ABA Industries, Pinellas Park, Florida; Del Mar Engineering Labs, Los Angeles, California; Kollsman Instrument Corporation, Elmhurst, New York; and Human Resources Research Organization, Alexandria, Virginia. There are no other current contracts. Anticipated bidders are: International Training Consultants, Burbank, California; Educational Training Services, Princeton, New Jersey; American University, Washington, D.C.; and Georgetown University, Washington, D.C.

Fiscal year 1972 program.—New Programs Initiated: Development of unit training techniques including better criteria for evaluation of unit training, better use of information systems in reporting and supervising training, and training programs directed by unit missions and personnel turnover rather than standard general training programs; development of new systems for personalized military career development counseling and management information serving the needs of a Modern Volunteer Army; development of small unit leadership practices and leadership training programs in furtherance of the Modern Volunteer Army concept. Devise means of using simulations and other small area training techniques or substitutes for military unit training ordinarily requiring large areas, supplies and materiel.

Continuing Efforts.—Evaluation of the Computer-Administered Instruction will be continued to determine an optimum system for the Army training environment. Advanced techniques for language training and language proficiency measurements to be performed by the Defense Language Institute will continue. Nonsystem Training Devices covering a variety of equipment and support of the Army's pro rata share of the maintenance and operating costs of the U.S. Naval Training Device Center will continue. Technical assistance will continue in Korea, Thailand, and Okinawa to train discussion group leaders and interviewers, collect and analyze survey data to assess program effectiveness in troop-community relations. Technical advisory service for project managers for training device requirements will be continued.

Major Items Planned for Completion. Type classification Standard A for the Synthetic Flight Training System scheduled for 4th Quarter Fiscal Year 1972.

Fiscal year 1973 planned program.—Continue major aspects of the program encompassing: (1) Program development in language instruction methods, course modernization, language proficiency measures, and aptitude and measurement tools for the Defense Language Institute; (2) Expansion of research and development to improve a wide variety of manpower related topics with particular reference to the needs of a Modern Volunteer Army including (a) reassessment of issues influencing attractiveness of the Service (incentives, rewards, and job satisfaction), (b) achieving improvements in manpower management efficiency (job definition, skill assessment, training, promotion, and career management), (c) topics germane to the quality of military life as part of our national society; (3) Development and evaluation of experimental training programs for improvement of troop-community interaction both within the United States and overseas theaters in which work has not been accomplished; (4) Research and development in support of decentralized Army training, including (a) application of training technology to unit training techniques, and training of the individual by the military unit, (b) military proficiency unit measurement, and (c) unit training management; (5) Development of the CH–47 Chinook Helicopter operational field trainer model for the Synthetic Flight Training System; (6) Engineering development of training devices in response to specific Army requirements.

Program to completion.—This is a continuing program.

Resources (In millions of dollars).

R.D.T. & E. funds for fiscal year 1963 through fiscal year 1971, $17.5; fiscal year 1972, $7.6; fiscal year 1973, $3.6; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each fiscal years 1971 and 1972, and the request for fiscal year 1973.

Mr. JOHNSON. I will be happy to.

(The information follows:)

6.31.01.A MANPOWER RESOURCES DEVELOPMENT

[In thousands of dollars]

	Fiscal year 1971 actual	Fiscal year 1972 estimate	Fiscal year 1973 estimate
Synthetic flight training system, 1F063101A275	400	0	0
Nonsystems training devices, 1P063101A572	450	950	700
Army support for Naval Training Devices Center, 1P063101A573	550	550	550
Advanced techniques in training and education, 2Q063101A733	816	1,510	710
Computer administered instruction, 2Q063101A734	694	800	500
Manpower training systems development, 2Q063101A755	0	1,700	250
Development of troop community relations programs, 2Q063101A756	0	700	500
Training systems development, 2Q063101A757	0	1,400	400
Element total	2,910	7,610	3,610

Chairman ELLENDER. $710,000 is requested for a project entitled "Advanced Techniques in Training and Education." I note that $1.5 million was provided for this project in fiscal year 1972. What has caused this very substantial decrease in your request for fiscal year 1973?

Mr. JOHNSON. The fiscal year 1972 funding level in this project reflects the new initiative funds devoted to this project. There were no new initiative funds requested for fiscal year 1973 in "Advanced Techniques in Training and Education." A modest increase has been requested for fiscal year 1973 in Military Manpower Resources Technology (Project 2Q062106A745, Army Training Research) to partially offset the substantial decrease in the project. The $710,000 represents the required base program.

Senator YOUNG. $250,000 is requested for a project entitled "Manpower Training Systems Development." $1.7 million was provided for this project in fiscal year 1972. What has caused this very substantial decrease?

Mr. JOHNSON. This project was a new initiative project in fiscal year 1972, funded at $1.7 million. No new initiative funds are requested for fiscal year 1973 and the $250,000 represents the base program in this area of research. The substantial decrease is partially offset by a modest increase requested in Military Manpower Resources Technology (Project 2Q062106A745, Army Training Research) for fiscal year 1973.

Senator YOUNG. $400,000 is requested for the project entitled "Training Systems Development." $1.4 million was provided for this project in fiscal year 1972. What caused this large decrease?

Mr. JOHNSON. This project was a new initiative project in fiscal year 1972, funded at $1.4 million. No new initiative funds are requested

for fiscal year 1973 and the $400,000 represents the base program in the area of research. The substantial decrease is partially offset by a modest increase requested for fiscal year 1973 in Military Manpower Resources Technology (Project 2Q062106A745, Army Training Research).

Chairman ELLENDER. How much of the funds requested are for work to be performed by the Human Resources Research Organization, Alexandria, Va.?

Mr. JOHNSON. The sum of $1 million is for work to be performed by the Human Resources Research Organization.

Senator YOUNG. Comment on the very large decrease in your fiscal year 1973 request of $3.6 million compared to the amount provided for fiscal year 1972 of $7.6 million.

Mr. JOHNSON. The fiscal year 1972 funding level in this program element represents $5.1 million of new initiative funds devoted to this program element. There are no new initiative funds requested for fiscal year 1973 in Manpower Resources Development. The requested funds are required to maintain the base program.

STUDIES AND ANALYSES

Chairman ELLENDER. Of the total requested for Military Sciences, $9.2 million is for the program entitled "Studies and Analyses." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: MANAGEMENT AND SUPPORT

Description.—This program element provides for the conduct of studies that guide investment decisions; i.e., cost effectiveness of competitive hardware systems, operational analyses of plans and techniques to identify alternatives having greatest utility, and technological investigations that allow scientific analysis of risk involved in weapon system development. It also supports studies that identify the best allocation to be made of available resources; i.e., logistics doctrine development, manpower policy development, combat force development, and deployment concepts both strategic and tactical. Tests of concepts and equipment through simulation and computer-assisted analyses to reach conclusions with minimum expenditure of manpower and without destruction of equipment are also provided for by this program element. All the above studies and analyses are conducted within the categories of manpower and personnel, concepts and plans, operations and force structure, logistics, and science and technology. Each study is individually approved and addresses a specifically defined problem facing the Army. Studies directly support the requirements of the Department of the Army staff and the U.S. Army Combat Developments Command (USACDC), and serve to provide a scientific basis for decision-making.

Work performed by.—The majority of the work in this program is accomplished by the Army's Federal Contract Research Center for operations research, the Research Analysis Corporation at McLean, Virginia. There are four other contractors, all supported at or above $25,000: Stanford Research Institute, Menlo Park, California; Applied Physics Laboratory, Johns Hopkins University, Silver Spring, Maryland; Braddock, Dunn, and McDonald, Colorado Springs, Colorado; and Computer Sciences Corporation, Falls Church, Virginia.

Fiscal year 1972 program.—a. Studies Initiated in Prior Years: The comparison of equal cost forces described above is scheduled for completion this fiscal year. The examination of alternative force designs will continue at least into FY 1973. The REREQ study will move into its second phase and will add expandable items of supply to the data base. Problems associated with a volunteer Army continue to be addressed. There are several modern volunteer Army programs designed

to attract new personnel and to retain qualified personnel. One study is evaluating how well these programs are achieving their objectives. Similarly, another effort is attempting to identify alternative programs that will contribute to the procurement and retention of personnel for the Army Reserve Components in a volunteer Army environment.

b. New Studies Initiated (FY 1972): The success of the Computation of Manpower Programs by Linear Programming model system led to the initiation of several new studies in the area of manpower and personnel. One of these efforts will investigate the problem associated with projecting gains and losses and remaining within man-year ceilings, and will develop the necessary programming tools to insure that these ceiling constraints are observed. Another study will develop an automated, least-cost method for scheduling Army training at service schools, for examining alternative schedules, and for projecting costs. One new study in the area of concepts and plans will investigate selected characteristics of theater forces to determine how these characteristics effect combat capabilities. Among the items to be studied are qualitative differences in major weapons, and force effectiveness differences arising from dissimilar combat service support organizations and logistical capabilities.

Fiscal year 1973 planned program.—Those problems requiring the application of sophisticated investigative techniques are identified annually by the Army staff and major commands, and specific study requirements are prepared to aid in determining solutions. These study requirements are reviewed by the Army Study Advisory Committee chaired by the Assistant Vice Chief of Staff of the Army. The problems of highest priority to the Army Chief of Staff and the Secretary of the Army will be addressed by studies identified in The Army Study Plan for Fiscal Year 1973 published approximately 1 June 1972. General areas of attention will be manpower and personnel, combat operational techniques, force structure, and logistics. Certain of the studies identified by the above process and requiring contractor assistance will be supported by this program element. The scientific analysis techniques of operations research insure that all feasible decision alternatives are evaluated and that the best alternatives are identified for consideration by the Army decision-maker.

Program to completion.—This is a continuing program.

R.D.T. & E. funds for fiscal year 1971, $9.8; fiscal year 1972, $8.4; fiscal year 1973, $9.2; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal years 1973.

Mr. JOHNSON. I will be glad to do so.

(The information follows:)

Project title	Fiscal year— 1971	1972	1973
2J065101M710—Science and technology	$279,000	$305,000	$270,000
SJ065101M746—Manpower and personnel	411,000	1,190,000	1,350,000
2J065101M747—Concepts and plans	3,286,000	2,175,000	1,880,000
2J065101M748—Operations and force structure	2,614,000	1,420,000	2,300,000
2J065101M749—Logistics	400,000	900,000	1,000,000
2J065101M981—Concepts and plans	497,000	70,000	100,000
2J065101M982—Operations and force structure	2,065,000	1,945,000	2,100,000
2J065101M983—Logistics	224,000	355,000	200,000
Total	9,776,000	8,360,000	9,200,000

Senator YOUNG. Please identify those efforts in fiscal year 1972 which are concerned with the Modern Volunteer Army.

Mr. JOHNSON. We have one contract operations research study concerned with Modern Volunteer Army. It is called "Modern Volunteer Army Program Evaluation II," conducted at Research Analysis Corp.

Chairman ELLENDER. How much of the funds requested for fiscal year 1973 is for work to be performed by the Research Analysis Corp., one of the Federal contract research centers?

Mr. JOHNSON. Research Analysis Corp. is to perform about $5,660,000 worth of studies to be funded from Studies and Analyses Program Element for fiscal year 1973.

Senator YOUNG. What projects is the Research Analysis Corp. engaged in?

Mr. JOHNSON. Mr. Chairman, I would be glad to provide a list of the projects for the record.

(The information follows:)

STUDIES AND ANALYSIS CONDUCTED AT RESEARCH ANALYSIS CORP. FUNDED FROM FISCAL YEAR 1972 STUDIES AND ANALYSES PROGRAM ELEMENT

Manpower Program Analyses Using Chance-Constrained Techniques.
Modern Volunteer Army Program Evaluation.
NATO Combat Capabilities Analysis (COMCAP).
Analysis for General Purpose Force Objectives and Resource Determination (AFFORD 74–81).
Integrated Analysis of Strategic and General Purpose Forces, 1974–1984 (IFORA–II).
Strategic Weapons Exchange Models (SWEM).
Models for Manpower and Personnel Distribution.
Student Instructor Load Model (SIL–II).
Models of the U.S. Army Worldwide Logistic System (MAWLOGS).
Simulation and Gaming Methods for Analysis of Logistics (SIGMALOG).
Logistics Performance Standards.
Analysis of the Impact of Inventory Management Policies on the Operational Readiness of the Army Vehicle Fleet.
Equal Cost Firepower II (ECF II).
SAM–D [deleted] Capability.
Integrated Manpower Programing, Phase II (IMP–II).
Comparisons of Alternatives for Attack Against Targets Beyond the Forward Edge of the Battle Area.
Support Force Analysis and Planning.
Analysis of Collection Systems Tasking and Product Integration (COSINT.)
Maintenance of Reserve Components in a Volunteer Environment.
Economic Analysis of Proposed Army Investments.
Query Response System.
Advanced Technology and Army R&D Planning.
Communication Optimization Methodolgy for Military Information Exchange II (COMMIX II).
Nonnuclear Ammunition Economically Constrained Combat Rates Methodology Study, Phase II (AMMIXII).
Evaluation of CONAF Alternative Force Designs II (CONAF/RACAFE II).
Army Systems Phasing Model.

Chairman ELLENDER. How much of the $9.2 million requested for fiscal year 1973 is for work to be performed by the applied physics laboratory at John Hopkins University?

Mr. JOHNSON. In the fiscal year 1973 the applied physics laboratory at Johns Hopkins University is not scheduled to perform any work to be funded by the studies and analyses program element.

Chairman ELLENDER. What projects is the applied physics laboratory engaged in now?

Mr. JOHNSON. The Army has engaged the applied physics laboratory in fiscal year 1972 to perform certain research projects in missile technology and mapping and geodesy. These investigations, however, are research and not classified as studies.

Senator YOUNG. Please comment on your need for the increase of $840,000 you are requesting.

Mr. JOHNSON. $390,000 is required to offset cost-of-living increases and the remainder is for studies and analyses in recognition of additional emphasis on continued evaluation of optimum mix of force size, weapons capabilities, operational techniques, support structure, relative costs and overall force effectiveness.

AIRCRAFT AND RELATED EQUIPMENT

Chairman ELLENDER. The next budget activity to be considered is aircraft and related equipment for which you are requesting $247.1 million. How much was made available for this budget activity in fiscal years 1971 and 1972?

Mr. JOHNSON. In fiscal year 1971, $178.3 million and in fiscal 1972 $176 million.

CHEYENNE ATTACK HELICOPTER

Chairman ELLENDER. The first program in the aircraft and related equipment activity is the Cheyenne attack helicopter, for which $53,610,000 is requested. Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

ADVANCED AERIAL FIRE SUPPORT SYSTEM (AAFSS)

CATEGORY: OPERATIONAL SYSTEMS DEVELOPMENT

Background.—The AAFSS program was initiated as a result of a March 1963 decision by the Secretary of the Army that the Army should develop an optimum aerial fire support system. Conceived as a follow-on replacement for current gunships, the AAFSS is potentially the most effective anti-armor and suppressive fire weapons system that will be available in the next decade. Its capability to defeat tanks during day, night and adverse weather conditions makes the AAFSS an essential weapons system for the European theater if the threat posed by the armored forces of the Warsaw Pact is to be countered without using nuclear weapons. While the primary mission of the system is anti-armor, other missions include the delivery of direct aerial fires for land combat and airmobile forces, reconnaissance and security, and aerial escort. The AAFSS will be integrated into the maneuver elements of land combat forces and will be controlled by ground commanders. It will provide the ground commander with a discrete fire support means capable of movement through the forward battle area in daylight, at night, or under adverse weather conditions to defeat a variety of targets. The AAFSS, with night vision and computerized fire control, will also be particularly effective in future limited conflicts because of its ability to severely limit the movement of guerrillas at night and under conditions of poor visibility. Following an industry-wide competition, a fixed price incentive development contract with production options was awarded in March 1966 to the Lockheed-California Company for the AH–56A (Cheyenne). Development proceeded satisfactorily initially and an option to procure 375 aircraft was exercised by the Army in January 1968. Delays due to technical problems, primarily in the rotor control system, resulted in a decision by the Army to terminate the production contract for default in May 1969. Litigation over the termination and Lockheed losses on the fixed price development contract have adversely impacted the development schedule since the termination. In March 1970, Lockheed informed the Department of Defense that it was experiencing serious financial difficulty because of heavy losses that had been sustained in several major defense contracts including the Cheyenne. The Deputy Secretary of Defense outlined his proposed plan for resolving the overall Lockheed financial problem to the Congress on 30 December 1970. In August 1971, a restructured development contract settling the litigation and providing for completing the Cheyenne development effort was signed.

Description.—The Cheyenne is an advanced attack helicopter that will be significantly more combat effective than current attack helicopters in all types of conflict. It is a helicopter weapons platform with fully integrated armament, avionics, fire control, and self-contained navigation subsystems. It is armed with a belly-mounted 30mm automatic gun with a 360° field of fire and 3000 meter range; either a 40mm grenade launcher or high rate of fire 7.62mm minigun in a nose turret; and TOW missiles or 152 2.75'' rocket, or a combination of both. The AH–56A will incorporate a thermal imaging night vision system that requires no incident light and which can look through smoke and light fog; protection against [deleted] bullets; self-sealing fuel tanks, redundant controls; and an infrared suppression system to limit vulnerability to heat seeking missiles. It will be capable of carrying podded electronic countermeasure devices to counter enemy radar directed weapons. A neodymium laser provides precise range data to the fire control system and can be used as a target designator for a variety of weapons now being developed. The laser rangefinder, used in conjunction with the self-contained navigation system, will enable the AH–56A to determine the precise location of enemy targets at standoff ranges of over 5000 meters. This gives the pilot the option of employing artillery or other weapons to destroy targets when these other fires are more appropriate. The AH–56A, through application of available technology, will offer significant improvements over present attack helicopters in performance, fire control, and weapon effectiveness. The thermal imaging night vision integrated into the computerized fire control system gives the system the capability of defeating targets out to the maximum effective range of installed weapons at night and under conditions of poor visibility. Performance charactreistics include a maximum speed of over 210 knots, an unrefueled ferry range of 1500 nautical miles, and the capability to hover out of ground effect at 3500 feet, 90°F at design gross weight.

Work performed by.—U.S. Army Materiel Command, Washington, D.C.; U.S. Army Aviation Systems Command, St. Louis, Missouri; U.S. Army Electronics Command, Fort Monmouth, New Jersey; U.S. Army Missile Command, Huntsville, Alabama; U.S. Army Aviation Systems Test Agency, Edwards, AFB, California; U.S. Army Test and Evaluation Command, Aberdeen, Maryland and Yuma, Arizona; and U.S. Army Weapons Command, Rock Island, Illinois. Participating contractors are: Lockheed-California Company, Van Nuys, California (Prime Contractor); General Electric Company, Lynn, Massachusetts; General Electric Company, Binghamton, New York; Hughes Aircraft Corporation, Culver City, California; Chromcraft, St. Louis, Missouri; Teledyne Systems Corporation, Hawthorne, California; Sylvania Electric Products, Inc., Williamsville, New York; Emerson Electric, St. Louis, Missouri; Bendix Corporation, Navigation & Control Division, Teteboro, New York; Chicago Aerial Industries, Barrington, Illinois; EPSCO, Inc., Westwood, Massachusetts; Honeywell, Inc., Minneapolis, Minnesota; Norton Company, Worcester, Massachusetts; Radio Corporation of America, Van Nuys, California; Simonds Precision Products, Inc., Long Island City, New York; Singer-General Precision, Inc., Pleasantville, New York; Sperry-Rand, Phoenix, Arizona; SPECO, Springfield, Ohio; Air Research Manufacturing Company, Phoenix, Arizona; United Aircraft Corporation, Windsor Locks, Connecticut; Fairchild-Hiller Aircraft Corporation, Bayshore, New York; Royal Industries, Inc., Santa Ana, California; Bertea Corporation, Irvine, California; Aeronutronic Division, Philco-Ford Corporation, Newport Beach, California.

Fiscal year 1972 program.—The basic development of the Cheyenne was completed in December 1971, with the completion of the Research and Development Acceptance Test of a prototype aircraft equipped with the improved rotor control system. Also tested during this acceptance test were the weapons (excluding the TOW missile and night vision system), navigation and avionics systems. All systems either met or bettered requirements. Weapon and navigation system accuracies were well above expectations. The TOW/Night Vision pre-production equipment were integrated into the swivelling gunner's station and installed in a flying prototype. On 28 Sep. 71 the first TOW missile was fired at night using the night sight. To date 35 TOW missiles have been fired with the pre-production equipment during both day and night of which [deleted]. Firing conditions have ranged from minimum to maximum range, 0 to 150 knots, and at varying altitudes. The Army Preliminary Evaluation of the TOW missile and night vision sight will be conducted during January and February 1972. This portion of the development program is proceeding so successfully that it may be possible to revise the Army Preliminary Evaluation and the Research and Development Ac-

ceptance Test of the TOW and night vision system to achieve some compression of schedule. In March 1972, it is planned for the Cheyenne to undergo a limited operational test at Hunter-Liggett Military Reservation in California. In addition to the development testing in FY 1972, work continues in fabricating, testing, checkout, and installing on a flying prototype the advanced mechanical rotor control system. This control system will allow further exploitations of the airframe capabilities of the Cheyenne in speed, payload, and maneuverability. Also planned is an Advanced Attack Helicopter Requirements Evaluation. The purpose of this evaluation is to validate or revise as appropriate the Materiel Needs Document for the Advanced Attack Helicopter. The evaluation will consist of engineering, cost and schedule analyses, the analysis of experimental field testing results, and will include flight testing of industry developed experimental attack helicopters. The evaluation funds will be placed under a new project number (D242) of the AAFSS program element and will not be used for the Cheyenne development program. Phase I of the Producibility/Cost Reduction program was completed. Phase II has been initiated and consists of hardware evaluation of Phase I results to include some flight testing. Preliminary results indicate an approximate 10% reduction in unit cost.

Fiscal year 1973 planned program.—The planned development program of the Cheyenne will be completed utilizing $17.1 million of the total $53.6 million request. The advanced mechanical control system development will be completed with the final Army flight evaluation tests of the Cheyenne equipped with this system in the 1st Quarter of FY 74. First flight of the advanced mechanical control system is planned for late August or early September 1972. Also included in the development program is the completion of the Producibility/Cost Reduction program. The remaining $36.5 million in the program will be used to fabricate three fully equipped, flyable Cheyenne prototypes. These aircraft will be used to obtain test results which will be available three years sooner than if production aircraft were used for the same purpose. Full implementation of the FY 73 Cheyenne program is dependent upon the results of the Advanced Attack Helicopter Requirements Evaluation described above.

Program to completion.—The Cheyenne development program will be completed in 1st Quarter FY 74 with Army completion of the Research and Development Acceptance Test of the aircraft equipped with the advanced mechanical rotor control system.

RESOURCES

[Dollars in millions]

	Fiscal year—				
	1971 and prior	1972	1973	Additional to completion	Total estimated cost
R.D.T. & E funds	[1] 268.2	[2] 14.4	53.6	0	[3] 336.2
Procurement:					
Funds	[4] 0	0	0	NA	NA
Quantities					
R.D.T. & E man-years	153.0	161.0	147.0	NA	NA

[1] Does not reflect $135,000,000 associated with the cancelled production contract.
[2] Includes supplemental of $5,000,000 but does not include $5,000,000 emergency funds for the attack helicopter evaluation, project D242.
[4] Includes weaponization and night vision costs incurred under other program elements.
[3] Includes supplemental of $5,000,000 and $200,000 for civilian pay raise not shown in the Dec. 31, 1971, selected acquisition report. The $200,000 is reflected as a $100,000 increase in the fiscal year 1972 and fiscal year 1973 funds.

Chairman ELLENDER. We discussed this program at length earlier. However, I do want to be sure that I understand exactly what you plan to do with the $53.6 million you are requesting. How much of this total is required to complete the Cheyenne development program and how much is requested for work on the three additional prototype helicopters?

Mr. JOHNSON. Of the $53.6 million requested, $17.1 million is required to complete the development of the Cheyenne. The remaining $36.5 million is required for fully equipping and renovating two of

the research and development prototypes currently in storage and for the completion of the first aircraft started under the canceled production contract.

Senator YOUNG. Now, with respect to the $17 million that is required to complete the development, exactly how will this money be spent?

Mr. JOHNSON. The work to be accomplished in fiscal year 1973 to complete the development of the Cheyenne is completing the installations of, checkouts, flight tests and Army evaluation of the advanced mechanical control system, and to test and evaluate appropriate changes identified in phase I of the producibility/cost reduction program during phase II. This chart which I will provide for the record gives a breakout of the planned utilization of the $17.1 million in support of the work described.

[In millions]

	Amount
Prime contractor	$10.0
Basic development	3.5
Advanced mechanical control system (AMSC)	4.5
Government furnished materiel repair and overhaul	.8
Engineering change proposals and aircraft repair	1.2
In-house	7.1
Testing	2.9
Support	4.2
Total	17.1

Chairman ELLENDER. Just what is the need for these three additional prototypes for which you are requesting $36.5 million?

Mr. JOHNSON. The three prototypes will be used for early operational testing. Operational testing employing Army operational pilots to fly the aircraft in a tactical field environment will provide early test data to identify any changes necessary to be made to the aircraft to enable it to be a more efficient combat system or to more easily live in the field with the combat units prior to the completion of the first production aircraft. Thus, modifications identified as desirable in the early operational testing will be incorporated during production and negate or greatly reduce costlier retrofit programs that would otherwise be required. In addition, the operational testing will greatly assist in preparing for the fielding of the aircraft to operational combat units by providing realistic data with which to refine tactics and techniques of employment, to refine logistic support requirements, and to refine crew training requirements. These three preproduction prototypes are considered the minimum number required to obtain realistic operational test data. Because of the age of the airframes and installed equipment on the current flying prototypes as well as the continued need for them in the completion of the development program on schedule, it is not feasible to do the desired operational testing with the current prototypes.

In addition to providing the early operational test data, these three prototypes will assist in bridging in gap between development and procurement efforts.

Chairman ELLENDER. I note on page 116 of the descriptive summary that, through fiscal year 1972, $282.6 million has been made available

for the R. & D. work on the Cheyenne. Please provide a tabulation for the record, breaking this total down by fiscal years.

Secretary JOHNSON. I will be happy to do so.

(The information follows:)

[In millions]

Fiscal year	Appropriated	Reprogramed (+ or −1)	Available
1964	$1.0	0	$1.0
1965	1.0	+$4.6	5.6
1966	17.3	+8.9	26.2
1967	24.9	+13.0	37.9
1968	48.0	+13.2	61.2
1969	36.7	+13.0	49.7
1970	16.0	+1.0	17.0
1971	34.6	+35.0	69.6
1972	9.3	[1] +.1	9.4
Total R.D.T. & E.	188.8	+88.8	277.6

[1] Funds to provide for civilian pay raise.

Mr. JOHNSON. The $277.6 million shown on the table represents all of the R.D.T. & E. funds through fiscal year 1972 that have been made available for the development of the Cheyenne. Included in the $282.6 million shown on page 116 of the descriptive summary is the $5 million included in the fiscal year 1972 supplemental request, for completing the funding of the currently on-going advanced attack helicopter requirements evaluation. Because the fiscal year 1972 supplemental request was converted to a fiscal year 1973 budget amendment and the Army required the funds to complete the evaluation by July 31, 1972, $4.2 million of fiscal year 1972 R.D.T. & E. funds were reprogramed to complete the funding of the advanced attack helicopter requirements evaluation. In addition to the $4.2 million that was reprogramed, $5 million of fiscal year 1972 emergency funds were obtained to provide total funds of $9.2 million for the evaluation. The funds for this evaluation are carried in the advanced aerial fire support system program element but are in a separate project from the Cheyenne and will not be used in funding the development of the Cheyenne.

Senator YOUNG. I note in a footnote that this total of $282.6 million does not include $135 million associated with the canceled production contract. Just what is involved in this $135 million?

Mr. JOHNSON. These are sunk procurement funds and include funds used to settle the terminated production program. They were paid to either the prime contractor, subcontractors or to suppliers of Government-furnished materiel required for the production program.

Chairman ELLENDER. Please provide a statement for the record setting out the total amount provided for the production of the Cheyenne and the disposition of this total amount.

Mr. JOHNSON. Yes, sir.

(The informtaion follows:)

A total of $203.5 million was available for the terminated Cheyenne production program. Under the terms of the settlement, $54.0 million was paid to Lockheed as progress payments and $36.0 million was provided for Lockheed subcontractor claims. $52.2 million was paid to suppliers of government furnished materiel and the balance of $61.3 million was reprogrammed to the RDT&E account. Of

the latter amount, $35.0 million was used for retroactive payments associated with the restructured Cheyenne development contract and the balance of $26.3 million was applied to directed recoupments in support of other fiscal year 1972 RDT&E programs.

AIRCRAFT WEAPONS TECHNOLOGY

Chairman ELLENDER. Of the total requested for Aircraft and Related Equipment, $2.1 million is for the program element entitled "Aircraft Weapons Technology." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

EXPLORATORY DEVELOPMENT

Description.—The objective of this program element is to obtain data and determine the feasibility of applying advanced armament techniques and weapons to appropriate Army aircraft. Through investigations, analytical studies and laboratory tests, data are acquired to determine the feasibility of improved fire control equipment, advanced gun-type weapons and associated equipment, and advanced missile guidance techniques. Concepts for improved warheads and fuzes for aerial weapons are investigated. Cost effectiveness studies of aerial weapon subsystems are performed. Special studies, analyses and evaluations of service aircraft armament requirements and industry proposals are conducted. The program element has five projects that are designed to achieve the foregoing objectives. The projects are: Aircraft Weapons Fire Control, Gun-Type Aerial Weapons, Aircraft Missiles and Rockets, Aircraft Weapon System Effectiveness, and Aerial Weapons Warheads. The work performed in these exploratory development projects is needed in order to establish and maintain a sound technological base for progressing to advanced and engineering development of weapon subsystems for Army aircraft.

Work performed by.—US Army Frankford Arsenal, Philadelphia, Pa.; US Army Human Engineering Lab, Aberdeen, Md.; US Army Weapons Command, Rock Island, Ill.; U.S. Army Missile Command, Huntsville, Ala.; US Army Test and Evaluation Command, Aberdeen, Md.; US Army Munitions Command, Dover, N.J.; US Army Materiel Systems Analysis Agency, Aberdeen, Md. Falcon Research and Development Co., Cockeysville, Md., was awarded a two year contract (FY 72, 73) for a portion of the aircraft weapon system effectiveness project.

Fiscal year 1972 program.—Programs have been initiated that are investigating aerial fire control concepts that will minimize operator manipulation of control and improved stabilization, sighting, target acquisition and tracking techniques at extended ranges. Programs are being initiated and tests are being conducted addressing advanced aerial night viewing devices that can increase the Army's night and adverse weather fighting capability. Contracts have been negotiated and efforts are underway addressing hybrid computer simulations of aircraft dynamatics, target cueing devices, automatic target tracking, infrared mathematical models, and cathode ray tube/infrared conversion. A program was initiated to develop and verify a computer model simulating aircraft weapon mounts and support structures. Simulation models will be developed to evaluate gun-type weapons with respect to weight, rate of fire, cost, accuracy and reliability. The production/cost reduction effort on CHEYENNE was supported under this program element. Also supported were the Packard Committee and GAO evaluations on close air support. Additionally, concepts for a helicopter launched anti-radiation missile were evaluated.

Fiscal year 1973 planned program.—Continue simulation studies, generate concepts and conduct studies to derive fire control problem formulation for advanced systems. Continue investigations into target cueing techniques as applied to display systems. Continue on-going efforts on automatic target trackers and air data measurement systems. Conduct studies to determine feasibility of combining different sensor system displays and formulate systems analysis models addressing trade-offs as a function of input. Continue improvement of mounting techniques through simulation and model refinement and further gun system error source isolation and elimination techniques. Continue improvements to reliability through model simulation. Continue the investigation of advanced warheads concepts with emphasis on the Selective Effects Armament Subsystem (SEAS) requirement and fuel air explosives. Continue to develop, improve and

utilize mathematical models to evaluate the effectiveness of various attack helicopter armament systems with emphasis on the helicopter fire and forget anti-tank weapon and air defense suppression. Evaluate prototype hardware developed to meet the SEAS requirement. Assess nighttime and limited visibility capabilities of anti-tank weapons. Evaluate improvements to existing projectiles, fuzes and weapon performance. Evaluate proposals from private industry. Continue support to attack helicopter field experiments.

Program to completion.—This is a continuing program.

Resources (in millions of dollars):

R.D.T. & E. funds for fiscal year 1971, $1.4; fiscal year 1972, $1.8; fiscal year 1973, $2.1; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

Mr. JOHNSON. Yes, sir.

(The information follows:)

[In millions of dollars]

Project	Fiscal year—		
	1971	1972	1973
1F162201D023—Aircraft weapons fire control	0.500	0.500	0.600
1F162201D025—Gun-type aerial weapons	.010	.212	.500
1F162201D035—Aircraft weapons systems effects	.900	.830	.685
1F162201D036—Aerial weapons warheads	.000	.265	.265
Total	1.410	1.807	2.050

Senator YOUNG. Comment briefly on the objectives of the project entitled "Aircraft Weapons Fire Control" for which you are requesting $600,000.

Mr. JOHNSON. The objectives of this program are to generate concepts and develop the technology necessary for improvement in performance, life, and operation of heliborne fire control systems. Efforts will include analytical and simulation studies in the areas of long-range target detection/recognition and night/all-weather fire control systems.

Chairman ELLENDER. Please comment on the project entitled "Gun Type Aerial Weapons" for which you are requesting $500,000, and tell us why you need the increase of $288,000 you are requesting.

Mr. JOHNSON. It is in this project that we do exploratory development work for aircraft guns. Included are weapon effectiveness studies which identify the areas of effectiveness improvements with the most potential; analyses to identify the error sources of our helicopter guns, and what corrections are of most benefit; and how we can reduce the recoil as felt by the helicopter, a very important consideration. All of this work is very necessary, and we have found that $500,000 is the minimum funding level to do this work at the scope and rate required.

Senator YOUNG. What are the objectives of the project entitled "Aircraft Weapons Systems Effectiveness" for which you are requesting $685,000?

Mr. JOHNSON. The overall objective of this project is to assist in the development of Army aircraft weapons systems by performing effectiveness and cost effectiveness studies on helicopter armaments and related equipment on a comparative basis. It is a continuing project which has been funded at this level or higher for over 10 years. This

year's effort will be directed primarily at evaluating new developments in antitank, antipersonnel, and air defense suppression weapons and to provide analytical support for ongoing field experiments.

Chairman ELLENDER. Comment on your request for $265,000 for the project entitled "Investigation of Aerial Weapons Warheads."

Mr. JOHNSON. The objective of this project is to develop preliminary designs of advanced warheads for use on weapons for Army aircraft that will provide greater area coverage and significantly improved lethality against personnel and materiel targets as well as a high probability of first round kill against hard point targets. This year's effort will be focused primarily on the warhead and fuzing requirements for the selective effects armament subsystem.

Chairman ELLENDER. Why do you need the increase of $243,000 you are requesting for this program element for fiscal year 1973?

Mr. JOHNSON. This increase will simply allow us to apply the required level of effort in advanced development type supporting technology in the area of helicopter weaponry. Most of the increase will go toward the gun system technology, but, in general it is needed to support the work I have just addressed.

AIRCRAFT AVIONICS TECHNOLOGY

Chairman ELLENDER. Of the total requested for aircraft and related equipment, $3.3 million is for the program entitled "Aircraft Avionics Technology." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

EXPLORATORY DEVELOPMENT

Description.—This exploratory development program provides the technological base for investigation of new ideas, concepts and techniques in aviation electronics. The objective of the program element is to obtain data and determine the feasibility of applying new aviation electronics technology to Army aircraft and ground based avionics equipment. Particular emphasis is placed on helicopter operations at night and during periods of reduced visibility. These efforts are aimed at achieving a capability to provide airmobility support during weather conditions under which the ground forces operate. The program element is composed of four projects: Navigation, Positioning, and Landing; Air Traffic Management; Aviation Communications; and Airborne Avionics Techniques. Airborne Avionics Techniques includes investigation of environmental sensing, instrumentation/displays, and flight control systems. The work performed in these projects is needed in order to establish and maintain a sound technological base for progressing to advanced and engineering development.

Work Performed By.—Avionics Laboratory, U.S. Army Electronics Command, Ft. Monmouth, N.J. and Electronics Components Laboratory, Ft. Monmouth, N.J. Previous contractors include: Airborne Instruments Laboratory, Melville, N.Y.; Radio Corporation of America, Maplewood, N.J.; Bell Helicopter Co., Ft. Worth, Texas; Hughes Aircraft Co., Fullerton, Calif.; Lockheed Electronics Co., Plainfield, N.J.; Northrop Corp., Palos Verdes Pen, Calif.; Norden Division of United Aircraft Corp., Norwalk, Conn.; Honeywell, Boston, Mass.; Sperry Rand, Phoenix, Ariz.; and Cornell Aeronautical Laboratory, Buffalo, N.Y. These are also representative of future contractors for this type of activity.

Fiscal year 1972 program.—Examination of techniques and concepts for avoiding obstacles and objects at day and night and during reduced visibility will continue. Specific areas in which studies and analysis will be conducted are: Lasers, radar, field of view measurements, and display techniques. Flight control studies

and simulation of load stabilization and the effects of oscillating loads on the handling qualities of large cargo helicopters will be conducted. In the area of navigation, investigations of navigation computer techniques and hybrid techniques will be conducted. An in-house study addressing the problems of interfacing air traffic management with the tactical environment will be conducted. Emphasis will be placed on providing an understanding of data exchange requirements with Air Defense systems and other services during tactical operations. A detailed study will be initiated to define the man/machine interface requirements for the operation of Army aircraft low level at night and during periods of poor weather. The study consists of simulation, limited flight testing, and investigation of available techniques and technology to accomplish a low level operations capability. Antenna designs to achieve electrically efficient integrated airborne antennas will be formulated using computer techniques.

Fiscal year 1973 planned program.—Investigation of the application of low cost dopplers and reduced complexity inertial systems for augmentation of the LORAN navigation system will be continued. Navigation computation techniques will be investigated with the aim of reducing the complexity of the navigation problem mathematical solution. Tactical Landing System effort will be continued with emphasis on the landing portion of the approach problem. Air Traffic Management studies will be continued and experiments will be conducted to establish technical feasibility and perform technological tradeoffs. Antenna effort will be directed at improving homing and communications antennas for Army aircraft. The application of integrated circuit technology to provide a reliable and efficient matching device for electrically small antennas will be pursued. Environmental sensing effort will continue with emphasis on laser technology for the detection of terrain and obstacles. Instrumentation activities will be devoted to the investigations of multi-sensor tactical displays and the integration of information from multiple sensors. The night operations study effort initiated in FY 72 will be continued with emphasis on flight demonstration of the concept.

Program to completion.—This is a continuing program.

Resources (in millions of dollars):

R.D.T. & E. funds for fiscal year 1971, $3.7; fiscal year 1972, $4.1; fiscal year 1973, $3.3; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record setting out the projects funded under this program, the amounts made available for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

Mr. JOHNSON. Yes, sir.

(The information follows:)

[In millions of dollars]

Project	Fiscal year—		
	1971	1972	1973
1F162202AA91—Navigation and positioning	0.940	0.900	0.800
1F162202AA92—Air traffic management	.396	.400	.400
1F162202AA93—Aviation communications	.373	.200	.200
1F162202A219—Airborne avionics technology	2.023	2.614	1.940
Total	3.732	4.114	3.340

Senator YOUNG. For fiscal year 1972, $4.1 million was provided, and you are requesting only $3.3 million for fiscal year 1973. What has caused this decrease?

Mr. JOHNSON. During 1972 we did the major portion of a one time study effort directed at determining what we need to see in order to fly our helicopters low level at night and during periods of reduced visibility. The funding hump was primarily due to this one study effort. Also, our exploratory development effort in navigation and positioning is beginning to phase down as the Loran airborne system enters the advanced development phase.

AIR MOBILITY TECHNOLOGY

Chairman ELLENDER. Of the total requested for aircraft and related equipment, $8.2 million is for the program entitled "Air Mobility Technology". Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

EXPLORATORY DEVELOPMENT

Description.—The objective of this program element is to perform studies and investigations that will lead to development of items of aviation related equipment, excluding aircraft, that support the Air Mobility concept of the Army. The purpose of the work done under this program element is to provide a firm basis for future advanced and engineering development. The program element consists of the following projects:

Aerial Delivery and Cargo Handling Equipment. The objective of this project is to advance the state-of-the-art for airdropping personnel, supplies and equipment and to advance delivery and cargo handling technology, both external and internal for Army helicopters.

Ground Support Equipment. The objective of this project is to establish design criteria and advanced concepts to improve servicing and maintenance of Army aircraft.

Operational Effects on Aircraft. The objective of this project is to identify the helicopter icing problem, investigate methods to overcome identifiable deficiencies, and then pursue experimental hardware of components showing the most promise to eliminate these deficiencies. In FY 72 this project was reported under P.E. 6.22.05.A, Air Mobility Readiness Technology.

Aircraft Survivability. The objective is to enhance the combat effectiveness of aircraft in terms of increased survivability through the use of new materials, design criteria, concepts, and techniques. Combat damage data is analyzed to determine the exact need for vulnerability reduction. Lightweight armor is developed, aircraft signature (infrared, radar, noise, optical) reduction techniques are investigated, components (engines, transmissions, etc.) are tested to determine improvements in designs capable of withstanding combat damage. In FY 72 this project was reported under P.E. 6.22.05.A.

Air Mobility Human Factors. The objective is to investigate ways and methods to design and fabricate aircraft which the human can effectively and efficiently operate. Emphasis will be to insure the Utility Tactical Transport Aircraft System (UTTAS), the Heavy Lift Helicopter (HLH), and other future helicopters are designed with appropriate consideration for human factors. In FY 72 this project was reported under P.E. 6.22.05.A.

Aircraft Reliability and Maintainability. The objective of this project is to advance Reliability and Maintainability technology so that future aircraft systems will operate at greatly reduced cost and increased effectiveness. In FY 72 this project was reported under P.E. 6.22.05.A.

Flight Safety. The objective is to improve overall operational safety and crash survivability of Army aircraft and personnel by incorporating crash safety design criteria in aircraft. In FY 72 this project was reported under P.E. 6.22.05.A.

Work Performed by.—Aero Structures, Menlo Park, Calif.; Pioneer Recovery Systems, Manchester, Conn.; Dunlop and Associates, Darien, Conn.; U.S. Army Air Mobility R&D Laboratory, US Army Aviation Systems Command, St. Louis, Mo.; Ballistic Research Laboratory, Aberdeen Proving Grounds, Md.; Human Engineering Laboratories, Aberdeen Proving Grounds, Md.; and Natick Laboratories, Natick, Mass.

Fiscal year 1972 program.—Continued efforts to improve helicopter cargo handling equipment including load acquisition devices, containers, and pallets. Provided design input for the heavy lift helicopter hoist. Studied system for rapid preparation of airdrop loads, reduction of drop zone dispersion, airdrop in high ground winds. Completed engineering support of the C–5A aircraft service tests. The blade replaceable pocket concept tests in Reliability & Maintainability will be completed during FY 72. The results of problems identified, analyzed, and explored during FY 71–72 have been used to support the development of the

UTTAS engine specifications and the UTTAS system specification and airframe qualification plan. Helicopter reliability testing requirements have been quantified and formed the foundation of the reliability considerations for UTTAS. Reliability & Maintainability analytical methods in the form of math models have been developed and are being verified. Conducted flight tests on second generation infrared suppression kits for UH–1H and OH–6A. Tests being conducted to obtain unsuppressed infrared signature data on all Army aircraft. Development of lightweight armor to defeat 12.7 mm and higher sized projectiles initiated.

Fiscal year 1973 planned program.—Continue helicopter cargo handling studies and studies of rapid preparation of airdrop loads, reduction of drop zone dispersion and airdrop in high ground winds. Initiate studies of high level (10,000 ft) airdrop systems and high gliding deceleration. Results of FY 72 efforts will be used to develop design criteria for elastomeric bearings. Engineering investigations of problems identified in FY 72 will be initiated on engine erosion/protection reduction, engine fasteners and connectors; gear box housing design, helicopter maintenance design requirements, and lubrication/cooling techniques. Reliability & Maintainability investigations will be initiated in the area of flight controls, hydraulics, electrical and fuel systems and transparent structures. Work will continue on high speed shaft and seal analysis, in-flight survey of vibration and temperature environmental effects, and the development and application of math analytical techniques to evaluate helicopter Reliability & Maintainability effectiveness. Conduct infrared suppression kit flight testing on a third generation kit for the UH–1H. Investigate the behavior of dual hardness steel armor material when subjected to flight loads to determine if it will be possible to construct an aircraft fuselage from armor material. Conduct dynamic tests of a crashworthy troop seat. Study mission requirements of the UTTAS and HLH to determine human factor problem areas, and propose suitable solutions to problems identified. Begin design of mockups to prove concepts.

Program to completion.—This is a continuing program.

Resources (in millions of dollars):

R.D.T. & E. funds for fiscal year 1971, $8.2; fiscal year 1972, $9.1; fiscal year 1973, $8.2; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record setting out the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

Mr. JOHNSON. Yes, sir.

(The information follows:)

[In millions of dollars]

Project	Fiscal year—		
	1971	1972	1973
1F162203AA31—Aircraft subsystem components	0.033		
1F162203AA33—Aerial delivery and cargo-handling equipment	1.697	1.935	1.870
1F162203AA52—Aircraft survivability	3.650	2.970	2.100
1F162203AA54—Operational effects on aircraft		0.220	0.350
1F162203AA55—Airmobility human factors		0.134	0.300
1F162203A119—Aircraft reliability and maintainability	1.623	2.864	2.600
1F162203A434—Aircraft ground support equipment	0.692	0.600	0.600
1F162203A529—Flight safety	0.458	0.350	0.350
Total	8.153	9.073	8.170

Senator YOUNG. Please comment briefly on each of the individual projects funded under this program and indicate if any of them are new projects.

Mr. JOHNSON. The objective of the aerial delivery and cargo handling equipment project is to advance the state-of-the-art for airdropping personnel, supplies and equipment, and to advance delivery and cargo handling technology, both external and internal for Army

helicopters. In the ground support equipment project, design criteria and advanced concepts to improve servicing and maintenance of Army aircraft will be established. The objective of the operational effects on aircraft project is to identify the helicopter icing problem, investigate methods to overcome identifiable deficiencies, and then pursue experimental hardware of components showing the most promise to eliminate these deficiencies. The objective of the aircraft survivability project is to enhance the combat effectiveness of aircraft in terms of increased survivability through the use of new materials, design criteria, concepts, and techniques. Combat damage data is analyzed to determine the exact need for vulnerability reduction. Lightweight armor is developed, aircraft signature (infrared, radar, noise, optical) reduction techniques are investigated, components (engines, transmissions, etc.) are tested to determine improvements in designs capable of withstanding combat damage. The objective of the air mobility human factors project is to investigate ways and methods to design and fabricate aircraft which the human can effectively and efficiently operate. Emphasis will be to insure the Utility Tactical Transport Aircraft System (UTTAS), the Heavy Lift Helicopter (HLH) and other future helicopters are designed with appropriate consideration for human factors. In the Aircraft Reliability and Maintainability project, Reliability and Maintainability technology will be advanced so that future aircraft systems will operate at greatly reduced cost and increased effectiveness. None of these projects are new projects for fiscal year 1973.

Chairman ELLENDER. What are the major aircraft systems with which you have been concerned under this program element?

Mr. JOHNSON. The major aircraft systems that we are concerned with in this program element are the C–5A, UTTAS, HLH, UH–1, OH–6A, CH–47, and CH–54.

Chairman ELLENDER. Tell us briefly what you will do with the funds you are requesting for fiscal year 1973.

Mr. JOHNSON. In the fiscal year 1973 planned program helicopter cargo handling studies and studies of rapid preparation of airdrop loads, reduction of drop zone dispersion and airdrop in high ground winds will be continued. Studies of high level (10,000 feet) airdrop systems and high gliding deceleration will be initiated. Results of fiscal year 1972 efforts will be used to develop design criteria for elastrometric bearings. Engineering investigations of problems identified in fiscal year 1972 will be initiated on engine erosion/protection reduction, engine fasteners and connectors; gear box housing design, helicopter maintenance design requirements, and lubrication/cooling techniques. Reliability and maintainability investigations will be initated in the area of flight controls, hydraulics, electrical and fuel systems and transparent structures. We will continue work on high speed shaft and seal analysis, in-flight survey of vibration and temperature environmental effects, and the development and application of math analytical techniques to evaluate helicopter reliability and maintainability effectiveness. Infrared suppression kit flight testing on a third generation kit for the UH–1H will be conducted. We also plan to investigate the behavior of dual hardness steel armor material when subjected to flight loads to determine if it will be possible to construct an aircraft fuselage from armor material. Dynamic tests of a crashworthy troop seat

will be conducted. Mission requirements of the UTTAS and HLH to determine human factor problem areas will be studied and suitable solutions to problems identified will be proposed. In addition, we will begin design of mockups to prove concepts.

AERONAUTICAL TECHNOLOGY

Chairman ELLENDER. Of the total requested for Aircraft and Related Equipment, $7.9 million is for the program entitled "Aeronautical Technology." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

EXPLORATORY DEVELOPMENT

Description.—This element supports exploratory development programs to provide and develop aerodynamic technology, propulsion technology, structural design loads and structures technology and advanced aircraft systems research that will contribute to fulfilling the operational objectives of improved performing, all-purpose, all-weather rotorcraft and Vertical/Short Take-Off and Landing (V/STOL) aircraft systems that meet future Army aircraft mission requirements. Aerodynamic technology includes: (1) Aerodynamics of wings, bodies, propellers, rotors, jets and their interactions; (2) Boundary layer flow, in particular on rotary wings; (3) Mechanics of aerodynamic noise generation; (4) Flight loads; and (5) Advanced control systems, stability and control and handling qualities. Propulsion technology for small size gas turbine engines includes: (1) Advanced power devices; (2) Engine components; (3) Engine accessory systems; (4) Engine operational problems; (5) Basic internal aerodynamic investigations; (6) Advanced power transmissions; (7) Speed reducers including bearings, gears, seals and shafting; and (8) Thrust producers technology. Structural design loads and structures technology include: (1) Establishment of Army aircraft structural design criteria; (2) Measurement and prediction of dynamic rotorcraft design loads; (3) Experimental evaluation of structural components; (4) Stress analysis, design methods and test techniques; (5) Advanced structural design concepts to permit failsafe design and incorporation of advanced materials that will improve maintainability and reliability with lower initial and life cycle costs; and (6) Improved aircraft structural fatigue resistance. Advanced aircraft systems studies include: (1) Studies of the inter-related facets of aeronautical systems technology; (2) Evaluation of potential of advanced aeronoutical technology; and (3) Assessment of technological voids and risks that include guiding supporting aeronautical research and technology programs. The aeronautical technology developed under this program provides improvements in: Aircraft performance; Handling qualities; Stability and control characteristics; Engine specific fuel consumption power-to-weight ratios and size; Aircraft maintainability; Reliability; Structural integrity; Crew performance requirements and training; and Survivability and has application to future Army aircraft systems such as the Armed Aerial Weapons Systems, Utility Tactical Transport System, Heavy Lift Helicopter System, Light Tactical Transport Aircraft System and the Manned Aerial Vehicle for Surveillance Systems.

Work performed by.—Approximately 30 percent of this program is accomplished internally at the Army Air Mobility Research and Development Laboratory, Moffett Field, California, and the four directorates of the laboratory. These four directorates are: Eustis Directorate, Fort Eustis, Virginia; Ames Directorate, Moffett Field, California; Langley Directorate, Hampton, Virginia; and Lewis Directorate, Cleveland, Ohio. Ten contractors having contracts of $25,000 or more are: (1) Mechanical Technology, Incorporated, Latham, New York; (2) International Harvester Company, San Diego, California; (3) United Aircraft Corporation, East Hartford, Connecticut; (4) Honeywell Incorporated, Minneapolis, Minnesota; (5) Bell Helicopter Corporation, Fort Worth, Texas; (6) Sikorsky Aircraft, Stafford, Connecticut; (7) Boeing-Vertol, Morton, Pennsylvania; (8) Pratt-Whitney Aircraft, West Palm Beach, Florida; (9) Technology Incorporated, Dayton, Ohio; and (10) Mississippi State University, State College, Mississippi. There are 36 other contracts for an approximate total of $4,300,000.

Fiscal year 1972 program.—Program areas where progress is anticipated in fiscal year 1972 include the following: The flight tests of advanced airfoil rotors, whirl tower tests of new rotors, development of theories to improve performance prediction techniques, wind tunnel and ground tests of advanced anti-torque devices, investigation of rotor performance characteristics operating into stall, experimental determination of turbulent boundary layer profiles, correlation of noise measurements versus rotor blade loading, investigation of noise reduction due to air injection at the rotor tip and whirl tower tests to establish "blade slap" criteria. Progress is expected in the development of techniques for analyzing, reducing or eliminating the dynamic response and aeroelastic problems associated with rotorcraft. Investigations are expected to produce the underlying cause of the rapid buildup in control loads of high performance rotorcraft during maneuvering flight. Progress is expected from continuing small size gas turbine propulsion research and technology program in axial/centrifugal compressors, loss prediction techniques for small airflow axial turbines, advanced engine accessories, improved engine particle separators to minimize erosion, low noise level transmissions, advanced vertical/short takeoff and landing aircraft propeller systems and engine emissions. Advances are expected in the design application of composite structures to gearbox housing, advanced composite tubular main rotor blades and advanced composite fuselage concepts. Progress will be made in standardization of analysis techniques for loads prediction and dynamic structural stability. Improved computerized simulation models for analysis of advanced systems that include mission and technology parameters are expected.

Fiscal year 1973 planned program.—The fiscal year 1973 planned program is a continuing program and will reflect fiscal year 1972 program progress. Included in the fiscal year 1973 planned program are the following investigations: Research and technology efforts to develop: improved viscous flow analytical methods, acoustic directional control devices, stability and control, improved characteristics, automatic and advanced control systems, improved rotorcraft hovering capabilities, and performance prediction techniques; improved aeroelastic effects, dynamic response, and vibrations and flutter characteristics; and improved handling qualities, rotor control dynamics, and mechanical/fluid stability devices. Research and technology programs will continue to advance small gas turbine engine technology that offer significant improvements in horsepower-to-weight ratio, specific fuel consumption, maintainability, reliability, installation flexibility and survivability, and is available for incorporation into advanced demonstrator engines or gas generators. Included will be analytical, experimental and design investigation of small compressor, combustor and turbine componentry, advanced accessory systems, operational problems, small scale internal aerodynamics, power transmissions, speed reduction gearboxes, and thrust producers. Structural design loads and structures technology program plans for fiscal year 1973 include analytical and experimental investigations of dynamic load criteria; dynamic rotorcraft loads; operational flight loads; aircraft structures and composites; structural design concepts using composite structures and stress analysis of advanced structures. Advanced aircraft systems research effort will continue to develop, refine and expand computerized simulation models for analysis of advanced systems encompassing consideration of mission and all air mobility technologies with emphasis to incorporate effects of sub-system technology on over-all performance, continue in-depth analysis of optimum resource allocation and coordinate analysis with Army aeronautics R.D.T. & E. long-range plan, and develop management displays for project performance, cost tracking and laboratory profile. This fiscal year 1973 planned program is directed to provide Army aircraft designers with the necessary research and technology base to meet current and projected Army air mobility aircraft systems operational objectives.

Program to completion.—This is a continuing program.

Resources (In millions of dollars):

R.D.T. & E. funds for fiscal year 1971, $6.5; fiscal year 1972, $8.1; fiscal year 1973, $7.9; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record setting out the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

Mr. JOHNSON. Yes, sir.

(The information follows:)

[In millions of dollars]

Project	Fiscal year— 1971	1972	1973
1F162204AA41—Aerodynamics-fluid mechanics	0.504	0.625	0.420
1F162204AA42—Aerodynamics mechanics	.506	.725	.570
1F162204AA43—Design criteria and loads	.924	1.320	1.730
1F162204AA44—Handling qualities	.909	1.500	.800
1F162204AA61—Aircraft systems analysis	.800	.580	.780
1F162204AA63—Special vehicle studies	0	.020	.020
1G162204AA71—Power devices	1.185	1.422	1.620
1G162204AA72—Propulsion components	.979	1.050	1.050
1F162204A170—Aircraft structures and composites	.650	.900	.930
Total	6.457	8.142	7.920

Chairman ELLENDER. There were only four projects in this program element last year according to the tabulation appearing on page 1348 of part 2 of the fiscal year 1972 hearings, and this year you are requesting funds for nine. Where were these other five new projects funded last year?

Mr. JOHNSON. The fiscal year 1973 program element 6.22.04.A, Aeronautical Technology, represents the amalgamation of four fiscal year 1972 program elements: 6.22.04.A, Aeronautical Technology; 6.22.06.A, System Synthesis Analysis; 6.22.07.A, aircraft propulsion technology; and 6.22.08.A, Aircraft Structures Technology. This tabulation which I will provide for the record shows where the 1973 projects were funded in fiscal year 1972.

Projects	*Fiscal year 1973*
Fiscal year 1972:	
Same as 1973	1F162204AA41, aero-fluid mechanics.
Same as 1973	1F162204AA42, aero mechanics.
1F162204AA43, flight loads; and 1F162208AA82, aircraft load criteria.[1]	1F162204AA43, Design criteria/loads.
Same as 1973	1F162204AA44, aircraft handling qualities.
1F162206AA61, aircraft system analysis.[2]	1F162204AA61, aircraft system analysis.
1F162206AA63, special vehicle studies.[2]	1F162204AA63, special vehicle studies.
1G162207AA71, power devices[3]	1G162204AA71, power devices.
1G162207AA72, propulsion components.[3]	1G162204AA72, propulsion components.
1F162208A170, aircraft structures and composites.[1]	1F162204A170, aircraft structures and composites.

[1] A part of program element 6.22.08.A, aircraft structures technology.
[2] A part of program element 6.22.06.A, system synthesis analysis.
[3] A part of program element 6.22.07.A, aircraft propulsion technology.

Senator YOUNG. Comment briefly on your planned program for fiscal year 1973 and tell us what you will do with the $7.9 million you are requesting.

Mr. JOHNSON. The 1973 program will support: The development of improved understanding of rotorcraft aerodynamics and advanced stability and control systems leading to improved handling qualities and aircraft performance; advanced small gas turbine engine and components technology for improved specific fuel consumption, maintainability, reliability, and survivability; and structural design loads and structures technology development to include analytical and experimental investigations of dynamic loads, operational flight loads, use of

composites, and stress analysis of advanced structures. In addition, aircraft systems research will develop, refine, and expand simulation models for advanced systems analysis and management.

Heavy Lift Helicopter

Chairman Ellender. The next item is the request of $53 million for the continuation of the development of the Heavy Lift Helicopter. Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

ADVANCED DEVELOPMENT

Description.—The Department of Defense (DOD) HLH will be a helicopter having characteristics that represent a compromise between the original service requests. The DOD HLH will completely satisfy the land based HLH missions of all services, will have a gross weight of 118,000 pounds and is designed to lift 22.5 tons while hovering out of ground effect at sea level, 95°F. The DOD HLH will be capable of transporting the 22.5 ton MILVAN container. The MILVAN container has been accepted by the International Standards Organization (ISO) as the standard container for use throughout the world. It will provide the US the capability of off-loading container ships during those periods when adequate ports are not available. Although the DOD HLH has a physical size that will allow it to be based on an LHA Navy ship, the Navy determined its size was too large to be routinely operated from a LHA. The objective of the Advanced Development phase of the HLH program is to demonstrate with a prototype that the technology to develop an HLH is in hand prior to approving engineering development and that the HLH is suitable to perform its stated mission of transporting heavy bulk loads in both a logistical and tactical environment. The DOD HLH must also be capable of being based aboard LHA class of shipping. In order to reduce the costs of the program, only one tandem rotor prototype will be built. This prototype will be austere in that the fuselage will be constructed of aluminum instead of the extensive use of composite materials envisioned for the production HLH, all navigation and precision hover equipment will be eliminated, and mission equipment such as the range extension fuel cells will be eliminated. An engine development program is being pursued in which an existing gas turbine engine is being modified to meet the requirements of the HLH.

Work performed by.—US Army Aviation Systems Command, St. Louis, Mo.; US Naval Air Systems Command, Washington, D.C.; Vertol Division, The Boeing Co., Morton, Pa.; General Electric Company, W. Lynn, Mass.; Detroit Diesel Allison Division, Indianapolis, Ind.

Fiscal year 1972 programs.—The FY 72 funds are being used to support the last six months of the Boeing-Vertol efforts during FY 72 and to initiate the engine program Boeing-Vertol will continue design efforts, material testing, fabrication method testing, and wind tunnel testing to arrive at the design criteria for the critical components. The Army plans for the engine program that will power the Dynamic Test Stand Rig (DTSR) to be Contractor Furnished Equipment. Boeing-Vertol conducted a competition between three engine manufacturers. The Army plans to sign a contract with Boeing-Vertol for the engine development in March 1972.

Fiscal year 1973 planned program.—A significant increase in funding will occur in 1973 in order to provide funds to initiate a flying prototype program with Boeing-Vertol. Boeing-Vertol will continue their efforts on component development and the engine development. The design criteria will be incorporated into the final component designs, the components will be fabricated, and fullscale subcomponent testing will be initiated. The DTSR will be fabricated. The engines will be fabricated and initial testing conducted. The Army will sign a contract in the 1st Quarter to conduct a prototype program. The Army plans one austere prototype that will use the components currently being developed. The purpose of the prototype is to demonstate that the technology to develop an HLH is in hand prior to entering Engineering Development, and to demonstrate the degree to

which the DOD HLH meets the mission requirements of the services. The Army will also initiate an Engine Development program to provide the engine to power the prototype with the same engine manufacturer that is developing the engine for the DSTR. Extensive studies will be conducted to determine the cost for the Engineering Development and cost of producing an HLH.

Program to completion.—The development of the critical components will be completed by the end of FY 74. The prototype is scheduled to fly prior to the end of FY 75. The data on which to base a decision to enter Engineering Development will be available by the end of FY 75. Valid cost estimates for engineering development and production cost estimates should be available by the end of FY 74.

Resources (in millions of dollars):

R.D.T. & E. funds for fiscal year 1963 through fiscal year 1971, $42.0; fiscal year 1972, $30.0; fiscal year 1973, $53.0; additional funds to completion are $87.9[2]; and the total estimated cost is $212.9.[1 2]

Chairman ELLENDER. On page 130 of the descriptive summary, I note the following statement: "The Department of Defense (DOD) HLH will be a helicopter having characteristics that represent a compromise between the original service requests." Would you please elaborate on this statement?

Mr. JOHNSON. Yes, sir. I will be glad to do so. The Navy originally requested an HLH that could lift 18 tons while hovering in ground effect at sea level, 90° F. This helicopter had a gross weight of 70,200 pounds. The Army originally requested an HLH that could lift 23 tons while hovering out of ground effect at 4,000 feet, 95° F., with a vertical rate of climb of 500 feet per minute. This HLH had a gross weight of 154,000 pounds, over twice that of the Navy HLH. A compromise was reached for an HLH that could lift 22.5 tons while hovering out of ground effect at sea level, 95° F., with zero rate of climb. This DOD HLH had a gross weight of 118,000 pounds. It represented an HLH that met essential Army missions and was capable of being based on the largest Navy ship, the LHA.

Senator YOUNG. With respect to capability, how does the helicopter you are now proposing to develop differ from the improved CH–53 program of the Navy?

Mr. JOHNSON. The Department of Defense HLH is essentially a helicopter twice the size and capability of the improved CH–53. For example, at sea level, 95° F., while hovering out of ground effect, the HLH will lift 22.5 tons, while the improved CH–53 will lift 13.4 tons. Also, the HLH has a gross weight of 118,000 pounds, while the improved CH–53 has a gross weight of 67,000 pounds.

Chairman ELLENDER. It looks as though this helicopter is being designed to be compatible with the 22.5-ton Milvan container. Would you comment on this Milvan container?

Mr. JOHNSON. Yes, sir. The Milvan container is the container purchased by the Department of Defense to move cargo. The Milvan is an 8 foot by 8 foot by 20 foot container with a rated maximum loaded weight of 22.4 tons. The Milvan container has been accepted by the International Standards Organization as the standard container for use throughout the world. Commercial users currently employ various sized containers, but the common sizes are 8 feet by 8 feet by 20 feet, 8 feet by 8 feet by 35 feet, and 8 feet by 8 feet by 40 feet. The two larger containers have a maximum weight of 25 tons. The HLH can carry up to the 40-foot container loaded to 22.5 tons.

[1] Includes $23,200,000 for development of CH–54 Flying Crane.
[2] Includes only the cost through prototype.

Senator YOUNG. Does the HLH program include the development of a new engine as well as a new airframe?

Mr. JOHNSON. Yes, sir, it does; however, rather than develop a completely new engine, we are taking an existing engine and converting it to a free shaft engine for use in a helicopter.

Chairman ELLENDER. I note that the total estimated cost of this effort is stated at $212.9 million for the cost "through prototype." How many prototypes are involved in this program?

Mr. JOHNSON. There will be one prototype in the program.

Senator YOUNG. On page 132 of the descriptive summary, I note the following statement: "A significant increase in funding will occur in 1973 in order to provide funds to initiate a flying prototype program with Boeing-Vertol." Is the Boeing-Vertol the only company that will build a prototype?

Mr. JOHNSON. Yes, sir; that is correct.

Chairman ELLENDER. Why aren't you proceeding with this program with the construction of competitive prototypes?

Mr. JOHNSON. We considered proceeding with a competitive prototype program, but discarded such a program because of the cost. It is estimated that it would have cost more than $100 million to have a second competitor build a single austere prototype. It is difficult to justify the additional funds considering that a rather small number of aircraft will be procured. In essence, it is extremely doubtful if the additional funds expended to obtain competitive leverage would be recouped during procurement.

Chairman ELLENDER. $11.5 million is requested for the program element entitled "Advanced Helicopter Development." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

ADVANCED HELICOPTER DEVELOPMENT

ADVANCED DEVELOPMENT

Description.—The Advanced Helicopter Development Program has the objective of investigating and demonstrating new rotary wing technology to provide improvements in the combat effectiveness of Army rotorcraft. The program contains four projects: Rotary Wing Aircraft; Reaction Drive Technology; Propulsion Components; and Demonstrator Engines. The efforts herein will provide a broad technology base on which to design and fabricate improved rotary wing aircraft and aircraft engines in the future. Some technology will be applicable to current operational aircraft. The program emphasis will be to demonstrate that component technology is in hand by ground testing demonstrator engines and ground and flight testing flight vehicles. Included within the Rotary Wing Project are investigations of basic rotor characteristics through the conduct of whirl testing, wind tunnel testing, flight testing of advanced rotors and flight testing of advanced aircraft concepts. Within the Demonstrator Engine project, efforts are directed toward the demonstration of new technology in the shaft horsepower ranges that the Army has exhibited the greatest need.

Work performed by.—U.S. Army Air Mobility Research and Development Laboratory, Ames Research Center, Moffet Naval Air Station, Calif.; NASA Ames (Moffett NAS, Calif.), Lewis (Cleveland, Ohio), and Langley (Langley, Va.) Research Centers. US Army Aviation Systems Command, St. Louis, Mo.; Bell Helicopter, Ft. Worth, Texas; Vertol Division, The Boeing Company, Morton, Pa.; Sikorsky Aircraft Division of United Aircraft Corp., Stratford, Conn.; Garrett-

AiResearch Corp., Phoenix, Ariz.; Williams Research Corp., Walled Lake, Mich.; Lycoming Division-AVCO, Stratford, Conn.; Pratt & Whitney, W. Palm Beach, Florida.

Fiscal year 1972 program.—Efforts within FY 72 have continued from those initiated in FY 71. These include the ABC Demonstrator Vehicle, the Tilt Rotor Prop Aircraft, the Advanced Rotor Test Vehicle, the Fan-in-Fin Tail Rotor, the Armored Fuselage Concept, the Plastic Tail Rotor, Fluidics and Computer Math Models. Configuration definition for component arrangement and gas generator arrangement by the four contractors (Small Turbine Advanced Gas Generator) will continue in the engine program. Detail design for compressor, combustor, turbine, rigs, and seals and power turbine nozzle will be completed.

Fiscal year 1973 planned program.—Continue efforts initiated in the previous years (FY 71 and 72) in the areas of ABC Technology Demonstrator Vehicle, Tilt Rotor Prop Aircraft, Advanced Rotor Test Vehicle, and the Fan-in-Fin Tail Rotor. Contractual efforts will continue in the engine program that are devoted toward the fabrication and test of the Small Turbine Advanced Gas Generator components and the initiation of first test series for the assembled gas generator.

Program to completion.—This is a continuing program.

Resources: (In millions of dollars:) R.D.T. & E. funds for fiscal year 1963 thru fiscal year 1971, $40.2; fiscal year 1972*, $14.8; fiscal year 1973, $11.5. Additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. I note that the $11.5 million requested is for the support of two projects. The first of these is entitled "Advanced Development Rotary Wing Aircraft" for which you are requesting $8 million. What are the objectives of this project, and what will you do with the $8 million you are requesting?

Mr. JOHNSON. The advanced development rotary wing project is designed with two objectives; first, to advance the state-of-the-art of conventional rotorcraft design to a point comparable to fixed-wing aircraft design; and secondly, to advance the knowledge of new and more efficient rotor concepts for employment on future military air systems.

The $8 million requested for this project will fund: the in-flight demonstration of a coaxially mounted, contrarotating rotor system known as the advancing blade concept for investigating the system's high speed, low vulnerability characteristics and flight maneuverability without the use of a tail rotor; two continuing efforts pursued jointly with NASA, the tilt rotor research aircraft and advanced rotor test; the development and testing of a fan-in-fin tail rotor; and the application of new structures and composite materials to improve rotary wing aircraft design criteria.

Senator YOUNG. I note in the descriptive summary that there is apparently a subproject entitled "Tilt Rotor Prop Aircraft" which is funded under "Advanced Development Rotary Wing Aircraft." If I am reading the summary correctly, $3 million of the $8 million requested is for this subproject. Am I correct about this?

Mr. JOHNSON. Yes, sir; that is correct.

Senator YOUNG. Please describe the objectives of this project.

Mr. JOHNSON. The primary objective of this project is to experimentally demonstrate, through "proof of concept" flight testing, that current technology is adequate for the development of useful military or commercial V/STOL tilt rotor aircraft. This effort is an essential step in the evaluation of a prototype tilt rotor aircraft, making possible research well beyond the level of "demonstration of feasibility."

*Includes supplemental of $3 million.

Chairman ELLENDER. The remaining $3.5 million is for the project entitled "Demonstrator Engines and Propulsion Systems." Describe this project and your planned program for fiscal year 1973.

Mr. JOHNSON. Yes, sir; the program objective is to demonstrate the feasibility of advanced technology engine components from exploratory development such as high pressure ratio compressors, turbines with high inlet temperatures and other efficient components. The overall plan is to demonstrate the new technology in those shaft horsepower ranges that the Army has exhibited the greatest need. These shaft horsepower categories are 1,200–3,000 shp and 200–1,000 shp. Exploratory development components, individually tested, must be integrated into an assembled gas generator, which is the heart of the turbine engine, so as demonstrate that predicted advances in technology are feasible in an actual engine environment. Subsequent objectives are to demonstrate a specific shp output to be provided that will be needed to meet a specified light helicopter or light fixed wing requirement. Present efforts are for demonstration of four types of gas generators, two in the 200 to 400 shp category and two in the 600 to 800 shp category. Specific horsepower requirements, when identified, can be obtained in engineering development by scaling the gas generators to achieve a stated shaft horsepower.

In fiscal year 1973, the continuing contractual efforts will be directed toward fabrication and test of the engine gas generator components and the initiation of first test series of the assembled gas generator with these fabricated and tested components.

AIRCRAFT WEAPONS

Chairman ELLENDER. Of the total requested for "Aircraft and related equipment," $6.2 million is for the program entitled "Aircraft Weapons." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

ADVANCED DEVELOPMENT

Description.—The objective of this program element is to obtain data upon which to base ultimate engineering development of new helicopter armament systems and components. This program was established to design, fabricate, test and evaluate experimental hardware components of heliborne armament. Armament under development consists of gun-type weapons, ammunition, missile and rocket components and subsystems; and airborne fire control equipment. Flight tests are conducted of fire control prototype units. Firing tests to evaluate turret improvements, energy absorption devices, new and modified ammunition feed systems, new fuzes, improved projectiles, and improved warheads are performed. This program element (P.E.) has four projects: Aircraft Weapons Fire Control, Aircraft Gun Type Weapons, Aircraft Missiles and Rockets, and Special Purpose Detectors. Special Purpose Detectors was transferred from P.E. #6.32.10.A when the Army restructured its Research and Development Program this year. This project addresses the development of a dual mode fire control radar for helicopter gunships.

Work performed by.—U.S. Army Electronics Command, Fort Monmouth, N.J.; U.S. Army Weapons Command, Rock Island, Ill.; U.S. Army Missile Command, Huntsville, Ala.; U.S. Army Test Evaluation Command, Aberdeen Proving Ground, Md.; U.S. Army Munitions Command, Dover, N.J.; U.S. Army Aviation Systems Command, St. Louis, Mo.; Frankford Arsenal, Philadelphia, Pa.; Harry Diamond Laboratories, Wash., D.C.; General Electric Co., Binghamton, N.Y.;

Emerson Electric, St. Louis, Mo.; Hughes Aircraft Co., Culver City, Calif.; Bell Helicopter Co., Hurst, Tex.; Philco-Ford Corp., Newport Beach, Calif.; Honeywell Inc., Minneapolis, Minn.; Motorola Inc., Scotsdale, Ariz.

Fiscal year 1972 program.—Efforts are continuing on the incorporation of multiple sensor displays and heads-up type displays. Final development efforts are underway in the active accurate rangefinder effort for delivery of fixed forward firing weapons. Efforts on scene stabilized trackers are entering the contract definition phase. Efforts are continuing on utilization of infrared technology for weapons sighting systems at low level and under adverse weather conditions, and use of test bed aircraft in addressing target engagement ranges and employment techniques. The track-while-scan radar technology is being applied to an existing set of airborne equipment for evaluation and test. Turret stabilization using fluidics is being evaluated and a breadboard selective feed system for the 40-millimeters is being fabricated, as is a coaxial barrel. This last task is part of a continuing effort to improve gun barrels through improved materials and fabrication techniques. An effort to increase the range and effectiveness of the 30-millimeter gun was initiated. Advance development of the Selective Effects Armament Subsystem (SEAS) will be initiated. Prototype hardware of the critical components of three candidate SEAS systems (a spin rocket, a finned rocket and a recoilless weapon) will be fabricated for a competitive flight evaluation. The interface between the Helicopter Launched Fire and Forget (HELLFIRE) missile and the attack helicopter will be evaluated and automatic tracking equipment will be developed to permit target acquisition, identification and tracking at the extended ranges required for HELLFIRE and SEAS.

Fiscal year 1973 planned program.—Continue the design and fabrication of a scene stabilizer for integration into a direct view optical sight. A laboratory model of a 20 pulse per second narrow beam divergence neodymium laser rangefinder for accurate computerized helicopter weapons fire control application will be designed, fabricated and tested. Continue the hardware study to reduce imagery infrared sensor systems size, weight and cost for compatability with existing helicopter weapons systems. Expand the Multi-Weapons Fire Control System on a breadboard for application of the advanced fire control computer, night vision devices, helmet sights, and target handoff capabilities. Continue testing of experimental models of displays to provide real time and artificial targeting information for various types of second generation sighting devices. Initiate design studies for an advanced weapon system and optimize design requirements for 30mm and 40mm high velocity projectiles. Complete fabrication and testing of composite and coaxial barrels and continue the work on fluidic turret stabilization. Work will continue to identify areas to best improve the effectiveness of helicopter mounted guns. The prototype SEAS hardware fabricated in fiscal year 1972 will be subjected to a competitive shoot-off to select the best concept for continued development. A prototype fire control system for HELLFIRE will be fabricated for evaluation and test.

Program to completion.—This is a continuing program.

Resources (in millions of dollars):

R.D.T. & E. funds for fiscal year 1963 thru fiscal year 1971, $33.9; fiscal year 1972, $10; fiscal year 1973, 6.2; additional funds to completion are continuing. Total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

Mr. JOHNSON. Yes, sir.

(The information follows:)

[Dollars in millions]

Project	Fiscal year—		
	1971	1972	1973
1F163206DK51—Special purpose dectectors	0.100	0.498	0
1F163206D043—Aircraft weapons fire control	.775	1.648	1.650
1F163206D044—Aircraft gun type weapons	.840	1.100	1.450
1F163206D050—Aircraft missiles and rockets	0	6.718	3.120
Total	1.715	9.964	6.220

Senator YOUNG. The $6.2 million you are requesting for fiscal year 1973 is $3.7 million less than the amount provided for fiscal year 1972. This is a rather substantial decrease. Would you please comment?

Mr. JOHNSON. With one exception, the projects contained in this element, the advanced development of aircraft weapons, have been essentially at a constant level of effort over both years. The one exception, which accounts for the decrease identified, is a drop in the funds required under project DO50, "Aircraft missiles and rockets." Here, in fiscal year 1972 we required $6.7 million with which to initiate the advanced development of the selected effects armament system or SEAS which is to replace our current 2.75-inch aerial rocket. The fire control required for that system and the future fire and forget missile or Hellfire was also to be fabricated. Funds required in fiscal year 1973 for the continuation of this work are $3.6 million less than for the previous year.

AIRCRAFT MISSILES AND ROCKETS

Chairman ELLENDER. We will include in the record paragraphs from the descriptive summary on this "Evaluation of Aircraft Missiles and Rockets" project.

(The information follows:)

ADVANCED DEVELOPMENT

Description.—The objective of this project is to design, fabricate, test and evaluate experimental missile and rocket subsystems and associated components for use on Army aircraft. The results of this work provides a basis for initiation of engineering development of advanced airborne armament systems. The current effort is to initiate advanced development of the Selective Effects Armament Subsystem (SEAS) which is to replace the 2.75" rocket. It will provide a variety of improved munitions and greatly increased range and accuracy which will permit close support of ground forces at standoff ranges which will insure survival in mid intensity conflict. In addition, a fire control system which meets the range and tracking accuracy requirements of the Helicopter Launched Fire and Forget (HELLFIRE) systems will be developed.

Work performed by.—U.S. Army Aviation Systems Command, St. Louis, Mo.; U.S. Army Munitions Command, Dover, N.J.; U.S. Army Test and Evaluation Command, Aberdeen Proving Ground, Md.; U.S. Army Missile Command, Huntsville, Ala.; Frankford Arsenal, Phila., Pa.; Picatinny Arsenal, Dover, N.J.; Naval Weapons Center, China Lake, Calif.; Emerson Electric Co., St. Louis, Mo.; General Dynamics Corp., Pomona, Calif.; Hughes Aircraft Co., Culver City, Calif.; Philco-Ford Corp., Newport Beach, Calif.; LTV Aerospace Corp., Dallas, Tex.; General Electric Co., Syracuse, N.Y.; Nortronics, Palos Verdes, Calif.; Atlantic Research Corp., Alexandria, Va.; Harvey Engineering Labs., Torrance, Calif.; Bell Aerospace, Buffalo, N.Y.; Northrop Corp., Anaheim, Calif.

Fiscal year 1972 program.—Initiate advanced development of the Selective Effects Armament Subsystem (SEAS). Prototype hardware of the critical components of three proposed concepts will be fabricated for evaluation in fiscal year 1973 in a competitive flight test program. A spin rocket, a finned rocket and a recoilless prototype will be fabricated. The problem of interfacing the HELLFIRE will be evaluated and automatic tracking/target acquisition equipment will be evaluated which will fill the fire control requirement for HELLFIRE and other long range systems such as SEAS. Potential approaches will be evaluated and designs will be selected for competitive procurement of two breadboard UH-1 installations, capable of performing all daylight functions required for HELLFIRE. Field test evaluations will be initiated if hardware delivery dates permit.

Fiscal year 1973 program.—The three SEAS prototypes which were fabricated in fiscal year 1972 will be subjected to a competitive shoot-off to select the most promising concept for further development. Sufficient prototype projectiles of

each of the three concepts will be fired, with instrumented conditions, from ground fixtures and from the air, to demonstrate system accuracy, range and aircraft capability. The field tests of the breadboard HELLFIRE fire control systems initiated in fiscal year 1972 will be completed. The most promising components/approach will be selected and a prototype system will be fabricated on the AH–1G COBRA which will include all of the fire control interfaces for daylight operations with HELLFIRE, SEAS and current gun systems.

Program to completion.—This is a continuing program.

Resources (In millions of dollars:)

R.D.T. & E. funds for fiscal year 1971 and prior, $14; fiscal year 1972, $6.7; fiscal year 1973, $3.1; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Please comment on the development of the helicopter launched fire and forget system known as Hellfire.

Mr. JOHNSON. The planned fiscal year 1972 program continues the concept formulation phase for the triservice, laser guided, fire-and-forget missile designed primarily for helicopter launch. These efforts will include initiation of a cost-effectiveness study and critical component work on the system. During this period, flight tests (funded with exploratory development dollars) will be conducted on state-of-the-art laser seekers [deleted] to obtain early information on the achievability of terminal accuracy and designator tracking accuracy. Additionally, the funding will provide for long leadtime components for operational type tests planned for the fiscal year 1974 time frame.

In fiscal year 1973 the concept formulation phase will be continued with the objective of completing the cost-effectiveness study and the critical component work planned including design of warhead and fuzing, the helicopter launcher, and fire control integration. Due to the substantial potential investment in laser guided systems, the Army considers an early operational type test necessary early in the program to determine the true tactical utility of such systems. Test planning will be initiated and the initial phases of the tests will be commenced. [Deleted.]

During these tests, a prototype missile, representative of the capabilities which can be achieved by a laser guided missile system, will be used. The fiscal years 1972 and 1973 concept formulation efforts are designed to provide a basis for entering contract definition in late fiscal year 1974 subsequent to completing the cost-effectiveness study and defining mission and performance envelopes.

The concept formulation phase should be completed during fiscal year 1974. If results provide the necessary positive answers on the tactical utility and cost-effectiveness of such a system, the Army will initiate contract definition for the fire and forget missile. The program would provide for fielding the missile in [deleted]. This is the first system that the Army has under development for use with laser guidance.

AIRCRAFT AVIONICS TECHNOLOGY

Chairman ELLENDER. Of the total requested for "Aircraft and related equipment," $3.1 million is for the program entitled "Aircraft avionics technology." Selected paragraphs from the descriptive summary will be included in the summary at this point.

(The information follows:)

Aircraft Avionics Equipment

ADVANCED DEVELOPMENT

Description.—This advanced development avionics program provides the RDTE for future engineering development aviation electronics equipment and systems to support Army Aviation. It includes both aircraft and ground equipment developments. Principal interest is focused on the Army helicopters and improving their capability to support ground combat forces. The ability to perform combat and combat support missions, such as medical evacuation and resupply, at night and during adverse weather, is presently limited. This limitation is due to the lack of avionics and ground-based equipment necessary to provide the functions of navigation and air traffic control under tactical conditions. The Automated Air Traffic Management System (ATMS) project is composed of tasks for enroute, approach and departure control and airborne subsystems. Priority for development is given to the Air-Ground Digital Data Link Task, and to the Tactical Landing System tasks in order to provide equipment for military potential testing. A task for the development of an Air Traffic Management System Performance Model is included to allow for system trade-off analysis and optimizing of the system. The Collision Warning System tasks provides advance development models of commercial off-the-shelf equipment for evaluation. The Flight Instrument/Display task provides for development and evaluation of Flight Directors, Projected Map Displays, and other situational information devices. The Doppler task provides for the evaluation of new, lightweight, and low cost airborne Doppler radars which can be used to augment and improve existing and planned airborne navigation systems.

Work performed by: Contractors working on the program:

Cutler Hammer, Farmingdale, N.Y.—Tactical Landing System;
Honeywell, Inc., Minneapolis, Minn.—Collision Warning Device.

Anticipated bidders for proposed tasks:

Doppler Radar—Radio Corporation of America, Princeton, N.J.
Ryan-Teledyne, Inc., San Diego, Calif.
Singer-General Precision, Inc., Pleasantville, N.Y.
Canadian Marconi, Inc., Toronto, Canada.

Air Traffic Management System Performance Model
Litton Industries, Los Angeles, California
Hughes Aircraft Company, Fullerton, California
American Electronic Laboratories, Colmar, Pennsylvania

Digital Data Link—Numerous major firms with interest in this area are expected to bid.

In-House organizations responsible for the program:

Project Manager, Navigation Control, Fort Monmouth, N.J.
Avionics Laboratory, U.S. Army Electronics Command, Fort Monmouth, N.J.

Fiscal year 1972 program.—Final evaluation of the SAFOC tests have fully justified the feasibility of an Automated Air Traffic Management System (ATMS) and completed the concept formulation for the enroute, approach and departure control, and airborne subsystems. Advanced development models of the HELMS were designed, developed and installed in UH–1 helicopters and Army acceptance tests completed. At conclusion of the Military Potential Evaluation in late fiscal year 1972, a decision on additional development will be made. Tactical Landing System experimental data will be used to validate the technical characteristics specified in the equipment for Military Potential Test and prepare for Engineering Development in fiscal year 1973.

Fiscal year 1973 planned program.—Accept delivery of Tactical Landing System equipment; plan for and conduct the Military Potential Testing. Contract for the development of a System Performance Model of the Air Traffic Management Automated Center (ATMAC) to conduct system trade-off analysis and system optimization. Contract for the test and evaluation of Air/Ground Digital Data Link systems utilizing direct, ionospheric reflected, and satellite relayed radio waves. Procure and conduct Military Potential Tests of a collision warning device. Procure and conduct Military Potential Tests of Doppler Radars for navigation. Complete work on evaluation of Flight Directors and on adaptation requirements for Horizontal Situation Displays in Helicopters.

Program to Completion.—This is a continuing program.

Resources (In millions of dollars:)

R.D.T. & E. funds for fiscal year 1963 through fiscal year 1971, $31.4; fiscal year 1972, $7; fiscal year 1973, $3.1; additional to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record settling out the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

General GRIBBLE. Yes, sir.

(The information follows:)

[In millions of dollars]

Project	Fiscal year—		
	1971	1972	1973
1F163207DB90—Airborne avionics equipment	0.730	0.943	0.650
1X163207DB91—Navigation and position	.555	1.100	.200
1X163207DB92—Air traffic management	1.967	3.907	.985
1F163207DB93—Aviation communication	.366	.390	.525
1F163207D235—Aircraft systems support	.804	.680	.700
Total	4.422	7.020	3.060

Chairman ELLENDER. Comment on your planned program for fiscal year 1973 and tell us what you will do with the $3.1 million you are requesting.

Mr. JOHNSON. In fiscal year 1973 we will accept delivery of tactical landing system equipment and plan for and conduct the military potential testing. We will contract for the development of a system performance model of the Air Traffic Management Automated Center (ATMAC) to conduct system trade-off analysis and system optimization and also contract for the test and evaluation of Air/Ground Digital Data Link systems utilizing direct, ionospheric reflected, and satellite relayed radio waves. We will also procure and conduct military potential tests of a collision warning device and doppler radars for navigation. We plan to complete work on evaluation of flight directors and on adaptation requirements for horizontal situation displays in helicopters.

AIR MOBILITY SUPPORT

Chairman ELLENDER. $13.2 million is for the program element entitled "Air Mobility Support." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

ADVANCED DEVELOPMENT

Description.—The objective of this program element is to conduct advanced development of items of equipment, excluding aircraft, that support the Air Mobility Concept of the Army. The purpose is to provide an orderly transition of selected items from exploratory to engineering development. This program element contains the following projects:

1. Tactical Aircraft Guidance System (TAGS). This is the major project within this element and the objective is to develop and test an advanced development model of a helicopter integrated flight control and navigation system to determine the feasibility of replacing existing mechanical flight control systems for future helicopter applications. The project will provide evaluation models

from which derivative fly-by-wire systems for helicopters can be defined. This area of work and associated investigations are needed to permit the Army to obtain quantitative, and qualitative data in relation to helicopter guidance and flight control systems performance, flight safety, cost data, and reliability. The size and weight required for mechanical flight controls to move the control surfaces on large helicopters makes it imperative that we explore and investigate the feasibility of replacing the large mechanical systems with electrical systems.

2. Aircraft Survivability. The objective is to develop promising items of equipment that will reduce aircraft vulnerability. The entire project is currently aimed at developing passive infrared suppression kits that will defeat heat seeking ground to air missiles such as the Redeye. In FY 72 this project was reported under P.E. 6.32.08, Aeronautical Evaluation.

3. Reliability and Maintainability. The objective of this project is to investigate promising items of equipment that will increase the reliability and/or reduce the maintenance requirements of Army aircraft. The Army is investigating new types of bearings in main rotors, new transmission concepts, and new materials and methods of making rotor blades. In FY 72 this project was reported under P.E. 6.32.04, Advanced Helicopter Development.

4. Aerial Delivery and Cargo Handling Equipment. The objective of this project is to develop items of equipment to airdrop military equipment from aircraft and to develop internal and external cargo handling systems for helicopters.

Work Performed by.—Vertol Division—Boeing Company, Morton, Pa.; AC Electronics, Milwaukee, Wisc.; International Business Machines, Huntsville, Ala.; Canadian Aircraft and Engineering Industries, Ltd., Montreal, Canada; Instrumentation Laboratories, Massachusetts Institute of Technology, Cambridge, Mass.; and the US Army Aviation Systems Command, St. Louis, Mo.; Garrett Corp., Phoenix, Ariz.; Bell Helicopter, Ft. Worth, Texas; Sikorsky Aircraft, Stratford, Conn.; Natick Laboratories, Natick, Mass.

Fiscal year 1972 program:

(*a*) TAGS. The single channel system was installed in test aircraft No. 1, ground tested, and completed its flight test program. The triplex system, a three channel system with voting and logic circuits, was installed in aircraft No. 2, ground tested, and it is planned to start flight testing in April 1972.

(*b*) Aircraft Survivability. Program was initiated. Infrared suppression kits are being designed to reduce the infrared signature of Army aircraft. Initial efforts will be on design of a system for small helicopters (OH–6A), medium (UH–1H), and large (CH–47C).

(*c*) Reliability and Maintainability. Projects initiated in fiscal year 1971 were continued. A UH–1C was fitted with elastomeric bearings and a flight test conducted. Present bearings have a service life of 200 hours; whereas, the elastomeric bearings have shown a service life of over 2000 hours. A roller gear transmission test was initiated.

(*d*) Aerial Delivery and Cargo Handling Equipment. Continue sling development. Initiate a Parachute Retrorocket Airdrop System, a joint service airdrop platform system.

Fiscal year 1973 planned program:

(*a*) TAGS. Project will be completed in fiscal year 1973. The triplex system will be flight tested. A military potential test will be conducted, and final reports written.

(*b*) Aircraft Survivability. Designs of the three infrared suppression kits will be completed and infrared effectiveness tests conducted. These kits will be third generation kits, the first and second generation having been developed and tested in exploratory development.

(*c*) Reliability and Maintainability. The elastomeric flight test program will be completed. An Advancing Rotor Blade task will be conducted including fabrication, whirl tower and tie down testing, and flight testing initiated. A rotor isolator concept will be pursued including the ground testing phase. A test/evaluation of new drive shaft seal concepts will be initiated. Detail design and initiation of aircraft modifications to conduct operational suitability testing of such systems as fluidic stabilization, electro-mechanical actuators, and improved linkage devices will be initiated.

(*d*) Aerial Delivery and Cargo Handling. Conduct flight testing of helicopter slings. Complete design, fabrication and testing of the Parachute Retrorocket Airdrop System.

Program to completion.—This is a continuing program.

Resources (in millions of dollars) :

R.D.T. & E. funds for fiscal year 1963 through fiscal year 1971, $14.0; fiscal year 1972, $11.9; fiscal year 1973, $13.2; additional funds to completion continuing; and the total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record setting out the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

Mr. JOHNSON. Yes, sir.

(The information follows:)

[In millions of dollars]

Project and title	Fiscal year—		
	1971	1972	1973
1F163209DB32—Ground-support equipment	0.055	0.200	0.100
1F163209DB33—Aerial delivery and cargo-handling equipment	.600	1.900	1.200
1F163209DB38—Reliability and maintainability	1.500	3.660	7.100
1F163209DB52—Aircraft survivability	.500	3.200	2.500
1F163209D177—Tactical aircraft guidance	3.940	2.960	2.300
Total	6.595	11.920	13.200

Chairman ELLENDER. Of the total requested for air mobility support, $7.1 million is for a project entitled "Reliability and Maintainability." Please comment on this project and tell us why you need the increase of $3.4 million you are requesting.

Mr. JOHNSON. The objective of the reliability and maintainability (R. & M.) advanced development project is to develop R. & M. design and test requirements for future aircraft systems, subsystems, and components. This is to insure that Army aircraft are reliable and maintainable to the maximum that technology will allow. Efforts within the project are to demonstrate, by fabrication and test of hardware, R. & M. technology developed in the exploratory level of effort and to demonstrate and verify aircraft design criteria for R. & M. and testing. The project goal is to reduce the required operational, supply and maintenance costs and life cycle costs of aircraft systems. The elastomeric bearing, as an example, is an on-going effort in this project. This new bearing concept has already increased the life of bearing currently used in UH–1 rotor head by fourfold.

The $3.4 million increase is for a series of advanced R. & M. technology efforts to evaluate the R. & M. payoffs offered. These efforts include: a fluidic stabilization augmentation system that shows promise in eliminating the low reliability electronic and hydraulic control circuits used on current systems; an improved hydraulic actuator seal concept; improved drive shaft seal design concepts and materials; control system rod and bearing concepts (elastomeric, flexural pivot, ceramic); improved helicopter windshield design concepts and materials; grease lubricated gear boxes; and, a complete evaluation of the Fiberglas aircraft structure concept.

Senator YOUNG. Please comment on the request of $2.3 million for the Tactical Aircraft Guidance System.

Mr. JOHNSON. I will be happy to do so. The Tactical Aircraft Guidance System, called TAGS, is a 4-year program to flight demonstrate a fly-by-wire flight control system. A fly-by-wire flight control sytem is one in which the push-pull rods and cables found in current mechanical flight control systems are replaced by electrical circuits.

This is an international program with Canada with a cost-sharing ratio of 60/40 between United States and Canada, the United States providing the 60 percent. The $2.3 million fiscal year 1973 request will complete this program. During fiscal year 1973 the fly-by-wire system will be demonstrated in two CH–47 test bed helicopters. Some limited flight testing has been accomplished in one of the helicopters. Some limited flight testing has been accomplished in one of the helicopters during fiscal year 1972. This project has been particularly beneficial to the heavy lift helicopter program since the heavy lift helicopter will be the first operational helicopter that will have a fly-by-wire flight control system.

Chairman ELLENDER. Why do you need the increase of $1.3 million you are requesting for Air Mobility Support for fiscal year 1973?

Mr. JOHNSON. The increase of $1.3 million is for the reliability and maintainability project which was addressed previously.

AIRCRAFT AVIONICS

Chairman ELLENDER. Of the total requested for Aircraft and Related Equipment, $6.9 million is for the program entitled "Aircraft Avionics." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

ENGINEERING DEVELOPMENT

Description.—The objective of this program is to provide aviation electronics systems and equipment to perform avionics functions necessary to improve the night and adverse weather capability of Army Aviation and to improve support to combat forces. There is a continuing need for development and improvement of ground based navigation systems, avionics ground control systems, test equipment, and quick reaction requirements. This program element gives priority for development to a common positioning and navigation system employing the LORAN Position Locator (Manpack) and the LORAN Airborne Receiver, for Army Aircraft. Engineering development of air traffic control tower and nondirectional radio beacon equipment is included as part of the Positioning and Navigation System (PANS) and Air Traffic Management System (ATMS) development. Engineering development of airborne avionics systems such as high frequency radios, radar altimeters, and special devices for developmental aircraft systems are included.

Work performed by.—Contractors working on the program:

Applied Devices, Austin, Texas—LORAN Airborne.
LITCOM, Melville, New York—LORAN Airborne.
Teledyne Systems Co., Northridge, California—LORAN Airborne.
Hoffman Electronics Corp., El Monte, California—Low Frequency Beacon.
Hoffman Electronics Corp., El Monte, California—High Frequency Radio.

Anticipated bidders for proposed tasks—LORAN Manpack.—

Teledyne Systems Co., Northridge, California.
North American Rockwell-Autonetics, Anaheim, California.
LITCOM, Melville, New York.
Applied Devices, Austin, Texas.
ITT, Nutley, New Jersey.
Bendix Co., Southfield, Michigan.

In-house organizations responsible for the program:

Project Manager, Navigation Control, Fort Monmouth, New Jersey.
Avionics Laboratory, U.S. Army Electronics Command, Fort Monmouth, New Jersey.

Fiscal year 1972 program.—Initiate engineering development of the LORAN Manpack Receiver. Type classify the Low Frequency Beacon. AN/TRN–30. Con-

duct engineering test/service test (ET/ST) of the High Frequency Single Sideband (HF–SSB) Airborne Radio Set. Monitor the LORAN Airborne Receiver Contract Definition Program by reviewing the flight test of the validation models and by testing models with a simulator. Evaluate the test results, ED proposals and study efforts of the contract definition contractors in preparation for award of a follow-on engineering development contract. Award LORAN Manpack Receiver engineering development contract for two configurations of the receiver.

Fiscal year 1973 planned program.—Award the second phase of the two phase contract for engineering development (ED) models of the LORAN Manpack Position Location, AN/PSN–6. Evaluate the test results, ED proposals and study efforts of the contract definition contractors and award an engineering contract for ED models of the LORAN Airborne Receivers. Complete the engineering test/expanded service test (ET/EST) of the Low Frequency Beacon, AN/TRN–30 and type classify the item Standard A. Procure 10 commercial Absolute Altimeters (radar altimeters) and evaluate for military potential. Complete testing of the High Frequency Single Sideband Radio (HF SSB) AN/ARC–98 and type classify. Modify the Air Force developed survival radio, AN/PRC–90, for Army use by adding a very high frequency—frequency modulated (VHF–FM) capability. Procure and modify the Air Force developed Air Traffic Control Tower, AN/TSW–7, for Army use. Fabricate in-house an airborne command console to provide additional radio communications for combat commanders while airborne in light observation helicopters. Fabricate in-house a manportable air traffic control communications package for use in tactical landing sites.

Program to completion.—This is a continuing program.

Resources (in millions of dollars:)

R.D.T. & E. funds for fiscal year 1963 through fiscal year 1971, $43.5; fiscal year 1972, $5.4; fiscal year 1973, $6.9; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman Ellender. Please provide a tabulation for the record, listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

Mr. Johnson. Yes, sir.

(The information follows:)

[In millions of dollars]

Project	Fiscal year—		
	1971	1972	1973
1F164201DC90—Airborne avionics equipment	0.025	0	0.200
1X164201DC91—Navigation and position	1.673	3.349	5.130
1X164201DC92—Air traffic management	.150	.600	.300
1X164201DC93—Aviation communication	.372	.989	.700
1F164201D325—System installation and engineering	.500	.450	.600
Total	2.720	5.388	6.930

Senator Young. I note that $25,000 was provided for the project entitled "Airborne Avionics Equipment" in fiscal year 1971, and no funds were provided in fiscal year 1972. For fiscal year 1973, you are requesting $200,000. What happened to this project in fiscal year 1972?

Mr. Johnson. During fiscal year 1971, this project was devoted to the development of an improved voice warning system for Army aircraft. Concurrently with the transfer of the responsibility for this development from the Electronics Command to the Aviation Systems Command, funding was transferred into the diagnostics portion of project No. 1F164204DC32, ground support equipment. This project was not used and therefore unfunded in fiscal year 1972.

Senator Young. What will you be doing with the $200,000 you are requesting in fiscal year 1973?

Mr. JOHNSON. The $200,000 requested for fiscal year 1973 will initiate a program to militarize a version of a commercially developed absolute altimeter for military service testing. The goal of this project is to develop a standardized altimeter for Army aircraft.

NAVIGATION AND POSITION

Chairman ELLENDER. Of the total requested for aircraft avionics, $5.1 million is for the project entitled "Navigation and Position." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

AIRCRAFT AVIONICS

ENGINEERING DEVELOPMENT

Description.—The primary objective of this project is to provide the engineering development of materiel needed to meet a majority of the requirements of the Army for navigation and/or position-fixing user equipments. It is a jointly coordinated project which will provide for development of equipment for all US Army and some US Air Force needs. This is to be accomplished by three categories of PANS equipment. COMMON PANS: Uses externally referenced LORAN signals—meets the largest majority of user requirements. Augmented COMMON PANS: A combination of LORAN and Doppler Radar or Inertial in hybrid—meets most of the remainder of requirements. SPECIAL PANS: Can be self contained systems that do not require externally referenced signals—meet the remainder of all requirements.

Work performed by.—Contractors working on the program:

Applied Devices, Austin, Texas—LORAN Airborne.
LITCOM, Melville, New York—LORAN Airborne.
Teledyne Systems Company, Northridge, California—LORAN Airborne.
Hoffman Electronics Corporation, El Monte, California.

Anticipated bidders for proposed tasks—LORAN Manpack.—
Teledyne Systems Company, Northridge, California.
North American Rockwell-Autonetics, Anaheim, California.
LITCOM, Melville, New York.
Applied Devices, Austin, Texas.
ITT, Nutley, New Jersey.
Bendix Company, Southfield, Michigan.

In-house organizations responsible for the program.—
Project Manager, Navigation Control, Fort Monmouth, New Jersey.
Avionics Laboratory, U.S. Army Electronics Command, Fort Monmouth, New Jersey.

Fiscal Year 1972 Program.—Initiate engineering test/expanded service test (ET/EST) of the AN/TRN-30 Beacon. Award the first phase of a two phase contract for the engineering development of the LORAN Manpack Position Locator AN/PSN-6. Monitor the Loran Airborne Receiver contract definition program by reviewing the flight test of the validation models and by testing models with a simulator.

Fiscal year 1973 planned program.—Award the second phase of the two phase contract for engineering development models of the LORAN Manpack Position Locator AN/PSN-6. Evaluate the test results, engineering development proposals and study efforts of the contract definition contractors and award an engineering contract for ED models of the LORAN Airborne Receiver. Complete the ET/EST of the Low Frequency Beacon AN/TRN-30 and type classify Standard A.

Program to completion.—This is a continuing program.

Resources (in millions of dollars):

R.D.T. & E. funds for fiscal year 1971 and prior, $1.7; fiscal year 1972, $3.3; fiscal year 1973, $5.1; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Why do you need the increase of $1.8 million you are requesting?

Mr. JOHNSON. The additional $1.8 million will be used to award the second phase of the two-phase contract for Engineering Development (ED) models of the LORAN manpack position locator, AN/PSN–6, evaluate the test results, ED proposals and study efforts of the contract definition contractors and award an engineering contract for ED models of the LORAN airborne receivers.

AIRCRAFT WEAPONS

Chairman ELLENDER. Of the total for aircraft and related equipment, $11 million is requested for the program entitled "Aircraft Weapons." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

ENGINEERING DEVELOPMENT

Description.—The objective of this program is to develop and test new aircraft weapon subsystems. The requirement is for reliable, easily maintainable, minimum drag, lightweight armament subsystems of advanced design. Under this program the major effort is responsive to the user requirements for new weapons. Major considerations are made in minimizing aircraft performance degradation by installation of these systems. Hardware is provided by utilizing concepts and components developed in the exploratory and advanced developments stages and integrating, adapting, and developing them into improved armament subsystems. The program consists of the following projects:

Aircraft weapons fire control.—The objective of this project is to develop fire control subsystems and integrated fire control sensors, computers and night vision systems for application to armed Army aircraft to include system integration and interface requirements.

Aircraft gun type weapons.—The objective of this project is to develop and test gun-type armament subsystems for use on Army aircraft. This includes the gun mounts and ammunition feed system and associated ammunition that is developed concurrently.

Aircraft missile and rocket subsystems.—The objective of this project is to develop and test missile and rocket subsystems for use on Army aircraft. The subsystems must provide significantly improved accuracy and lethality against personnel and materiel type targets.

Aerial weapons delivery systems.—The objective of this project is to develop and test aerial weapons delivery subsystems that include flare, target marking, incendiary and high explosive munition, and dispenser systems.

Work performed by.—U.S. Army Aviation Systems Command, St. Louis, Mo.; US Army Weapons Command, Rock Island, Ill.; US Army Munitions Command, Dover, Del.; US Army Frankford Arsenal, Phila., Pa.; Harry Diamond Laboratories, Wash., D.C.; Hughes Aircraft, Culver City, Calif.; Texas Instruments, Dallas, Tex.; Aeronautics, Division of Philco-Ford Corp., Newport Beach, Calif.; Emerson Electric, St. Louis, Mo.; Lake City Ammunition Plant, Lake City, Mo.; US Impact Extrusion, Inc., New Albany, Miss.; Roy S. Sanford Co., Oxford, Conn.; Bell Helicopter Co., Hurst, Tex.; Lear Seigler, Inc., Grand Rapids, Mich.

Fiscal year 1972 program.—Initiate development of the Aerial Scout Program including a daylight/night vision sighting system; an added navigation capability and laser rangefinder/designator for installation and improved survivability aspects for installation on the LOH. Design and fabricate improvements to the M129 40 mm grenade launcher, fabricate and initiate test of the 30mm airburst fuze, initiate improvements to the XM–552 ammunition which will improve graze sensitivity, increase range by 33%, and increase the range of optimized armor penetration. Complete testing and adopt as standard the 30mm aluminum-cased cartridge. Continue the development of the XM–170 aircraft parachute flare and dispenser. Complete the TOW installation on the AH–1G. In accordance with the overall provisions of the restructured CHEYENNE development contract as signed on 17 August 1971, work and funding in FY 72 and beyond as related to

the TOW and Night Vision on CHEYENNE is now covered in the descriptive summary for P.E. 2.36.24.A, Project D192.

Fiscal year 1973 planned program.—Complete the development of the product improved XM–129 40mm grenade launcher. Complete the development and the engineering and service testing of the XM–170 aircraft parachute flare and dispenser system. Continue the development of the airburst fuze for the 30mm cartride to improve weapon effectiveness. Complete the improvements to the XM–552 to include the 30mm graze sensitive fuze; increased range for optimized armor pentration; and increase total range of the projectile. Continue the development of the improved Aerial Scout version of the Light Observation Helicopter (LOH). This is a 3 year funding effort development 4 to 6 prototypes for evaluation, initiated as a FY 72 "New Initiative." The primary effort during FY 73 will be contractor integration of systems, initiated by a FY 72 contract with delivery of systems in FY 74.

Program to completion.—This is a continuing program.

Resources (in millions of dollars:)

R.D.T. & E. funds for fiscal year 1963 through fiscal year 1971, $197.8; fiscal year 1972, $27.5; fiscal year 1973, $11.0; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for fiscal years 1971 and 1972 and the request for fiscal year 1973:

Mr. JOHNSON. Yes, sir.

(The information follows:)

[In millions of dollars]

Project	Fiscal year—		
	1971	1972	1973
1F164202 DE02—Launcher, grenade, XM 129, product improvement	0.000	0.400	0.360
1F164202D124—Aircraft weapons fire control	10.555	8.880	9.120
1F164202D133—Aircraft gun-type weapons	2.400	6.812	1.000
1F164202D134—Aircraft missiles and rockets	18.045	10.700	.000
1F164202D136—Aerial weapons delivery systems	.770	.747	.540
Total	31.770	27.539	11.020

Senator YOUNG. I note that this program element has decreased from a total of $31.8 million provided in fiscal year 1971 to a request of $11 million in fiscal year 1973. This is quite a large decrease. Please comment.

Mr. JOHNSON. There were significant reductions in three of the five projects in this program element. There was an $18 million decrease in Project 1F164202D134, Aircraft Missiles and Rockets, which resulted from the completion of the TOW missile integration on the AH–56 Cheyenne and a reduction in the funding requirements for the TOW/Cobra development. There was a $1.4 million decrease in Project 1F164202D124, Aircraft Weapons Fire Control, resulting from the completion of the PINE night vision equipment for the Cheyenne. There was also a $1.4 million decrease in Project 1F164202D133, Aircraft Gun Type Weapons, brought about by the completion of the XM–140 30-millimeter automatic gun turret, the XM–129 40-millimeter grenade launcher, and the XM–35 20-millimeter gun system.

Chairman ELLENDER. According to the descriptive summary four projects are included in this program. However, in the project listing, I note you are requesting $360,000 for a fifth project entitled "Launchers and Grenades XM–129 Product Improvement Program." Please comment on this request.

Mr. JOHNSON. This project consists of the second and final year's effort on the Product Improvement of the XM–129 40-millimeter grenade launcher. We will complete the fabrication of three prototypes of the weapon with improved design features, and test the improvements. The improvements will not only improve weapon reliability and rate of fire, but will significantly reduce parts and, in turn, cost.

AIRCRAFT WEAPON FIRE CONTROL

Senator YOUNG. Of the total requested for Aircraft Weapons, $9.1 million is for the project entitled "Development of Aircraft Weapon Fire Control". Please describe this program and tell us what you will do with the $9.1 million you are requesting for fiscal year 1973.

Mr. JOHNSON. The total funding in this project will be devoted to the continued development of the improved Aerial Scout version of the current Light Observation Helicopter. The Aerial Scout program was initiated as a fiscal year 1972 new initiative and is a 3-year effort to develop prototypes for testing and evaluation. The primary efforts during fiscal year 1973 will be contractor integration of systems and fabrication of prototypes. These efforts were initiated by fiscal year 1972 contracts and will result in delivery of prototype helicopters in fiscal year 1974.

Chairman ELLENDER. Comment on your need for the increase of $240,000 you are requesting for this project.

Mr. JOHNSON. This increase over the fiscal year 1972 funding simply reflects the fact that the contractors will be accomplishing more work on system integration and prototype fabrication in the Aerial Scout program in fiscal year 1973 than they did in the previous year.

Chairman ELLENDER. I note in the descriptive summary that a total of $197.8 million has been provided for Aircraft Weapons between fiscal year 1963 and fiscal year 1971. What are some of your major accomplishments with these funds?

Mr. JOHNSON. In the period 1963–71, we have developed and standardized: 7.62-millimeter suppressive fire subsystems for the OH–13, OH–23, UH–1B, UH–1C, UH–1D and CH–47; 2.75-inch rocket systems for the UH–1B, UH–1C and AH–1G; a first generation hard point target missile systems for the UH–1B (M–22); a 40-millimeter grenade launcher system for the UH–1B and UH–1C; a new improved 7.62-millimeter machine gun for all systems; and a super-quick fuze for the 2.75-inch rocket. Initiated development of an improved 40-millimeter grenade launcher; a 40-millimeter high explosive anti-tank (HEAT) round; a flexible dual weapon (7.62 and 40-millimeter) system for the AH–1G; an improved second generation hard point target missile system for the UH–1B and the AH–56A; a rocket boosted 40-millimeter grenade to reduce time of flight and to increase range and accuracy; an improved 7.62-millimeter machine gun and a 40-millimeter grenade suppressive system for the OH–6A; illuminating flare and dispenser system for helicopters; and a 20-millimeter automatic gun system for the AH–1G. Provided fire control for all gun-type, rocket and missile systems. Completed the development of the proximity fuze for the 40-millimeter grenade and 2.75-inch rocket. Continued the development of the 30-millimeter automatic gun for the AH–56; the hard point missile system for the AH–56A; the illuminat-

ing flare; and improved fire control. Initiated development of an integrated fire control system utilizing moving target indicator radar for long-range target detection and forward looking infrared for target identification and engagement; a 19-tube and 7-tube, repairable, reusable 2.75-inch aerial rocket launcher; a 48-tube 2.75-inch launcher; a multiple weapon fire control system with optical sight and assisted tracking. Conducted Engineering and Service Test of XM–140 30-millimeter gun, XM–35 20-millimeter gun, XM–28 turret subsystem, 40-millimeter HEAT round, and XM–129 40-millimeter grenade launcher. In fiscal year 1971 the development of the Southeast Asia Multisensor Armament System for the Hueycobra incorporating the XM–35 20-millimeter cannon, a Forward Looking Infrared system and a Moving Target Indicating radar was completed. The Engineering Design Test of the XM–170 FLARE system was initiated. The development of a 30-millimeter aluminum case cartridge was completed. The development of XM–140 40-millimeter automatic gun turret, XM–129 40-millimeter grenade launcher and the daytime TOW/AH–56 control equipment developmental testing was completed. The integration of TOW/AH–56 control equipment and (PINE) Passive Infrared Night Equipment/AH–56 into the swiveling gunner's station was completed. Initiated the development of the TOW system for installation on the AH–1G.

AIR MOBILITY EQUIPMENT

Chairman ELLENDER. Of the total requested for Aircraft and Related Equipment, $3 million is for the program entitled "Air Mobility Equipment." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

ENGINEERING DEVELOPMENT

Description.—The objective of this program is to develop items of equipment, excluding aircraft, that support the air mobility concept of the Army. Specific areas are ground support, maintenance, diagnostic, survivability, flight safety, and environmental equipment for aircraft; and aerial delivery and cargo handling equipment. Equipment developed under this program will reduce maintenance costs and improve survivability and utilization of present and future Army aircraft, and improve airdrop equipment used from U.S. Air Force aircraft.

Work performed by.—Hamilton Standard, New Haven, Conn.; Northrop, Hawthorne, Calif.; Pioneer Recovery Systems, Manchester, Conn.; Stedinthal Co., New York, N.Y.; and Irwin Industries, Glendale, Calif. In-house work is performed at the U.S. Army Natick Laboratories, Natick, Mass.; U.S. Army Aviation Systems Command, St. Louis, Mo.; Eustis Directorate, U.S. Army Air Mobility and Research Laboratory, Ft. Eustis, Va.; and U.S. Army Aeronautical Depot Maintenance Center, Corpus Christi, Tex.

Fiscal year 1972 program.—Complete the test bed program on diagnostics using the UH–1 helicopter. Complete development of the anti-inversion net for personnel parachutes. Type classify aircrewman survival vest, power deployed reserve parachute, platform extraction force transfer coupling, and controlled airdrop cargo system. Initiate a comparison test of free fall parachutes. Initiate development of a new carrier for aircrewman body armor that will also carry survival gear.

Fiscal year 1973 planned program.—Type classify the aircraft aerial recovery kit, free-fall parachute, and 2000-lb capacity low-cost cargo parachute. Continue development of an aircrewman's armor survival vest. Initiate development of a

crash resistant fuel system for the CH–54A/B and new crashworthy troop seat. Initiate prototyping of a diagnostic system for the UH–1 helicopter as a result of the test bed program and concept formulation. Initiate engineering development of a high level container airdrop system and an internal cargo restraint system for helicopters. Conduct a military potential test of United Kingdom helicopter nets and pallet carrying devices.

Program to completion.—This is a continuing program.

Resources (in millions of dollars):

R.D.T. & E. funds for fiscal year 1963 through fiscal year 1971, $26.0; fiscal year 1972, $2.0; fiscal year 1973, $3.0; additional funds to completion, are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record, setting out the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

Mr. JOHNSON. Yes, sir.

(The information follows:)

[In millions of dollars]

Project	Fiscal year—		
	1971	9172	1973
1F164204DC31—Aircraft subsystems and components	.110	0	0
1F164204DC32—Ground support equipment	.505	1.135	1.210
1F164204DC33—Aerial delivery and cargo handling equipment	.702	.625	.730
1F164204DC52—Survivability equipment	.795	.190	1.100
Total	2.112	1.905	3.040

Senator YOUNG. Comment on your need for the increase of $1.1 million you are requesting for fiscal year 1973.

Mr. JOHNSON. This increase is in the area of survivability equipment. The funds will be used to initiate development of a crash-resistant fuel system for the CH–54 A/B helicopter and a new crashworthy troop seat.

Chairman ELLENDER. I note reference to a test of United Kingdom helicopter nets and pallet-carrying devices. Comment on this program.

Mr. JOHNSON. The Army has a requirement for an improved family of helicopter external cargo-carrying devices to be used in carrying bulk supplies such as ammunition, rations, and fortification material. The United Kingdom helicopter nets and pallet-carrying devices will be tested to determine if they meet this requirement. If they do, they will be adopted and no development effort undertaken by the Army.

UTILITY TACTICAL TRANSPORT AIRCRAFT SYSTEM (UTTAS)

Chairman ELLENDER. The request included $64 million for the continuation of the development of the Utility Tactical Transport Aircraft System. Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

ENGINEERING DEVELOPMENT

Background.—The UTTAS program began with a Development Objective in 1965. Concept formulation studies began in 1967 to define the required performance parameters for both the primary mission of delivering troops and supplies during an assault and secondary missions such as medical evacuation.

The aircraft design parameters that are used for UTTAS were derived considering the various levels of warfare. The UTTAS will complement the Army's tactical mobility by providing an organic means to react rapidly to battlefield troop requirements and subsequent support.

Description.—Under the UTTAS program, the Army will develop a tactical utility helicopter squad carrier far superior in reliability, maintainability, survivability and performance than the current utility helicopter, the UH–1. The proposed UTTAS will be a twin engine helicopter, designed for operation in an Army environment and will be fielded in [deleted]. This program includes engine and airframe development as well as key subsystem development. Two contractors will be selected competitively for fabrication of prototypes. The Army will then conduct a competitive fly-off and plan to produce the selected prototype. The fleet size is planned to be approximately [deleted] UTTAS helicopters. The need for the utility helicopter has been vividly confirmed by recent combat experience.

Work performed by.—The engine development is being conducted by General Electric of W. Lynn, Mass. The airframe development contract may be competed for by the following firms that have stated specific interest: Bell Helicopter Co., Ft. Worth, Tex.; Boeing-Vertol, Morton, Pa.; Sikorsky, Stratford, Conn.; Hughes Tool Co., Culver City, Calif.; Kaman, Bloomfield, Conn.; Grumman, Bethpage, N.Y.; Fairchild Hiller, Hagerstown, Md.; Lockheed, Burbank, Calif.; Gyrodyne, Long Island, N.Y.

Fiscal year 1972 program.—The engine development competitive selection was held. General Electric was selected. The airframe Request for Proposals (RFP) was formulated and distributed to industry. Responses are expected on 31 March 1972. The evaluation will be conducted during the 3 to 4 months following receipt of the responses.

Fiscal year 1973 planned program.—The evaluation of airframe development proposals from industry will be completed and contracts will be awarded to two manufacturers for fabrication of competitive prototypes. Prototype engines will be placed on contract to support the aircraft flight evaluation phase.

Program to completion.—This program will continue until the engine is fully developed through military qualification testing (MQT) and until a single aircraft configuration is selected for production. The aircraft will be fielded in fiscal year [deleted].

RESOURCES

[In millions of dollars]

	Fiscal year—			Additional to completion	Total estimated cost
	1971 and prior	1972	1973		
R.D.T. & E. funds	11.4	29.9	64.0	322.4	427.7
R.D.T. & E. procurement: funds and quantities	0	0	0	1,924.5	1,924.5
R.D.T. & E. man-years	47	86	98	(1)	(1)

[1] Not available.

Chairman ELLENDER. As I understand the objectives of this program, they are to develop a replacement for the UH–1 Iroquois helicopter. Am I correct?

Mr. JOHNSON. Partially, sir. The utility tactical transport aircraft system (UTTAS) will replace the UH–1 series helicopters in the tactical movement and control of combat troops in the assault and the resupply of those troops while in enemy contact. This includes the use of the UTTAS in the medical evacuation role. A number of UH–1 helicopters will be retained for combat support missions such as command liaison and administrative support. What we will end up with is a mixed fleet, with the UTTAS handling the combat missions and our older and more vulnerable UH–1's operating primarily in the rear areas.

Senator YOUNG. What capabilities are you looking for in the new helicopter that you do not have in the Iroquois helicopter?

Mr. JOHNSON. First of all, the UH–1 is an outgrowth of the original UH–1 medical evacuation helicopter developed in the 1950's and the best lift capability we were ever able to achieve in Southeast Asia was to carry seven combat equipped American troops. Today's infantry squad is 11 men—and we all acknowledge the benefit of maintaining unit integrity on the battlefield. The UTTAS is our first assault helicopter which will give us the capability to lift one complete squad on each aircraft—and do it in either tropical or mountainous conditions in most of the areas of the world in which we are likely to be fighting. This means that we will be able to lift a given number of combat troops with a significant reduction in the number of helicopters required. Secondly, we will have a helicopter with increased speed—150 knots for the UTTAS as compared to less than 100 knots for the UH–1. Increasing speed results in a decrease in exposure time while in the range of any given enemy weapon. Finally, technological advances achieved in the 1960's and early 1970's will be capitalized upon and result in significant improvements in the operational availability, reliability, maintainability, survivability and air transportability of the UTTAS over the UH–1 helicopter.

Senator YOUNG. Does this effort involve the development of a new engine and a new airframe?

Mr. JOHNSON. Yes, sir.

Chairman ELLENDER. How much of the total requested for fiscal year 1973 is associated with the development of the engine, and how much is associated with the development of the airframe?

Mr. JOHNSON. Of the requested $64 million, $14 million is for engine development and $50 million is for development of the airframe.

Senator YOUNG. What is the current status of the development of this new engine, and what is the current status of the development of the new airframe?

Mr. JOHNSON. The UTTAS engine is an outgrowth of our advanced technology engine program initiated in 1967. The winner of the engine competition, General Electric, was a participant in this program which developed and tested advanced turbine engine components for the UTTAS generation engine. The UTTAS engine development contract was signed with General Electric on March 6, 1972. As for the airframe, we solicited industry in January of this year. Three manufacturers responded in March and we are now in the process of evaluating these proposals at the Aviation Systems Command. We expect to select two contractors in June for initial engineering development and a competitive fly off program. After the competitive fly off, we will select a winning design for production.

Chairman ELLENDER. When do you expect this new helicopter to be operational?

Mr. JOHNSON. Our first unit will be fully equipped and operational in [deleted].

Senator YOUNG. Is this program to be conducted under the competitive prototype concept?

Mr. JOHNSON. Yes, sir. As previously pointed out, we are going to have a competitive fly-off between two airframe manufacturers before we select a winning design for production.

Chairman ELLENDER. What is the total estimated cost of this R. & D. effort, and how much of that represents the cost of the development of this new engine?

Mr. JOHNSON. The total cost of the UTTAS R. & D. effort is $420.1 million. Of this, $34.2 million will have been spent through fiscal year 1972. The cost of the engine development program is $56.5 million.

MISSILES AND RELATED EQUIPMENT

Chairman ELLENDER. The next budget activity to be considered is "Missiles and related equipment" for which you are requesting $964.3 million for fiscal year 1973. How much was provided in fiscal years 1971 and 1972?

Mr. JOHNSON. $848.5 million was provided in fiscal year 1971 and $895.9 million was provided in fiscal year 1972.

Chairman ELLENDER. How much of this total is for the Safeguard ABM system?

Mr. JOHNSON. $340.5 million.

SAFEGUARD ABM SYSTEM

Chairman ELLENDER. The first request under the "Missiles and related equipment" activity is this $340,540,000 for the continuation of the development and testing of the Safeguard ABM system. It is suggested that all discussion and questions on the Safeguard system be deferred until day after tomorrow when General Leber, the Safeguard program manager, will be here.

HAWK SURFACE-TO-AIR MISSILE IMPROVEMENT PROGRAM

$5.6 million is for the Hawk surface-to-air missile improvement. Please describe this program.

Mr. JOHNSON. Technical assessments and operational testing confirmed the [deleted] of the basic Hawk missile, its marginal performance against [deleted] and its [deleted]. In recognition of these deficiencies, the Hawk improvement program (HIP) was initiated in 1964 as the best alternative to meet the [deleted] high performance fighter [deleted] and light bomber [deleted] threats until replaced by SAM–D commencing in fiscal year [deleted]. The basic Hawk system is over 10 years old, costly to maintain [deleted], and cannot meet the existing threat. The Hawk improvement program (HIP) provides a significant increase in Hawk system effectiveness due to a new missile, reduced reaction time by the use of computer techniques, and [deleted]. The new, all-solid state guidance package was designed with the intent to counter the [deleted] and provide an especially responsive missile for effective single and multiple target intercepts. A new blast, fragmentation warhead, having [deleted] more weight, has been added to the missile for a marked gain in lethality.

A new rocket motor increases the range, speed, and altitude of the Hawk missile. A computer has been added to handle the entire radar detection-to-missile launch sequence, with a corresponding 60-percent reduction in reaction time. Modifications to the various radars and other ground support equipment have been developed to incorporate [deleted] built-in test equipment, and achieve compatibility with the

new missile and computer. In addition, a new tactical display and engagement control console for the platoon command post is being developed to provide a mobile, effective fire control facility. The major portion of the R.D.T. & E. for the above baseline improvements was completed, using R. & D. and preproduction prototypes.

Chairman ELLENDER. What will you be doing with the $5.6 million you are requesting for fiscal year 1973?

Mr. JOHNSON. All test objectives for the improved Hawk system, including ET/ST of the IPCP, are scheduled for completion during fiscal year 1973. Deficiencies and shortcomings found as a result of IPT during fiscal year 1972, and those problems revealed by the NATO tests, will be corrected. A tropic service test of an improved Hawk battery, and an Arctic missile firing test, are planned to be connected in fiscal year 1973. Initial operational capability of the improved Hawk system will be achieved, with deployment of the first battalion [deleted].

Senator YOUNG. When do you expect to complete this project?

Mr. JOHNSON. $700,000 in [deleted] completes the planned R.D.T. & E. funding for Improved HAWK. These funds will be used to complete R.D.T. & E. on the improved Platoon Command Post and correct any engineering problems or deficiencies found during the test program.

CHAPARRAL/VULCAN SYSTEM

Chairman ELLENDER. Of the total requested for missiles and related equipment, $9.7 million is for the continued development of the Chaparral/Vulcan system. Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: OPERATIONAL SYSTEM DEVELOPMENT

Description.—The objective of this program is to develop and test an air defense weapon system capable of providing low altitude fair weather air defense protection in the forward areas of the field army. CHAPARRAL/VULCAN composite battalions will be deployed world-wide, providing all active U.S. Army divisions with an organic low altitude air defense capability. These two systems will complement the REDEYE and HAWK missile systems. CHAPARRAL is the name given the Army's adaptation to the ground-to-air role of the Navy's air-to-air SIDEWINDER 1C missile. It is a passive homing, infrared missile system employing four missiles mounted on a newly designed turret carried on the modified M548 cargo carrier. VULCAN is the name given the Army's adaptation of the Air Force's 20mm gatling gun. This gun, consisting of six rotating barrels, and capable of firing 3000 rounds per minute, can be used in both the surface-to-air and ground role. The system is normally mounted on a modified M113 armored personnel carrier, however a towed version is also being produced. Also funded under this program is the Forward Area Alerting Radar (FAAR), which will provide alerting and identification information of aircraft to ranges of [deleted] for the CHAPARRAL/VULCAN system.

Work performed by.—CHAPARRAL ground support equipment is being contracted through U.S. Army Missile Command, Redstone Arsenal, Alabama to Aeronutronic Division of Philco-Ford, Newport Beach, California. The CHAPARRAL missile is procured by MIPR through the Navy. The guidance control group for the missile is contracted to General Electric, Utica, New York and Raytheon, Bedford, Massachusetts. VULCAN is contracted to General Electric Corporation, Burlington, Vermont and managed by the U.S. Army Weapons Command. Contractor for both self-propelled vehicles, XM730–CHAPARRAL and XM741 VULCAN is FMC, San Jose, California. FAAR is contracted to Sanders Associates, Inc., Bedford, Massachusetts, and managed by the U.S. Army Missile Command.

Fiscal year 1972 program.—Continue ET/ST of FAAR and type classify system Standard A. Complete development of VULCAN Field Evaluator. Continue GADES program identifying cost effective improvements to VULCAN. Initiate a product improvement program to provide CHAPARRAL a [deleted].

Fiscal year 1973 planned program.—Complete GADES program. Continue support of on-going product improvement program. Initiate a prototyping program to provide a night vision capability for CHAPARRAL and VULCAN. Initiate a prototyping effort to provide an improved low altitude gun fire control system. Support those product improvement programs for VULCAN/CHAPARRAL/FAAR identified by GADES and/or other study efforts and approved by DA.

Program to completion.—Continue support of prototyping program. Support those product improvement programs for VULCAN/CHAPARRAL/FAAR identified by GADES and/or other study efforts, and approved by DA.

RESOURCES

[Dollars in millions]

	Fiscal year—			Additional to complete	Total estimate cost
	1971 and prior	1972	1973		
R.D.T. & E.: funds	[1] $94.7	$3.4	$9.7	$3	$110.8 ($94.6 on basic systems, $16.2 on product improvement programs, prototyping efforts and GADES.)

[1] Includes funds made available from Mauler (Program Element 6.43.05.A) and Forward Area Air Defense (Program element 6.33.01.A).

Chairman ELLENDER. I note in the descriptive summary that the Chaparral missile is a modified version of the Navy's Sidewinder. What modifications were necessary to make this missile system suitable for use by the Army?

Mr. JOHNSON. The following changes were made in the Sidewinder-1C to adapt that air-to-air missile to the surface-to-air role for Chaparral.

(1) Missile hangers were modified for low aerodynamic drag, (2) two roller-on-equipped wings were replaced with flatplate wings to reduce aerodynamic drag, (3) missile joints were faired to reduce aerodynamic drag and to reduce missile flexing at the joints, (4) self-destruct time was reduced from [deleted], (5) guidance activation was delayed to permit the missile to achieve aerodynamic stability prior to the initiation of guidance commands, (6) canard restraining devices were added, (7) rocket motor nozzle extended for additional thrust, (8) [deleted], and (9) fuze integration level adjusted [deleted].

Senator YOUNG. I note that this missile has been procured since about 1965, and the R. & D. effort has continued on it. What improvements have come about as a result of this R. & D. program?

Mr. JOHNSON. Development acceptance testing on the basic Chaparral Air Defense System ended in 1970 and the system was type classified Standard A in November of that year. Since that time a Chaparral Simulator Evaluator, used to develop, maintain and evaluate gunner proficiency, has been developed. Additionally R. & D. support of a product improvement program to provide Chaparral [deleted] should commence in the near future.

Chairman ELLENDER. The total estimated cost of this program is stated at $110.8 million. What was the original estimated cost?

Mr. JOHNSON. The original estimate was $15.2 million. This estimate was made in 1964 and covered only [deleted] gun/Chaparral battalions. This force was to provide interim air defense for Europe pending development of the Mauler Air Defense System. The estimate was also based on direct use off-the-shelf components with only minor modifications, and prior to selection of Vulcan as the gun complement and the FAAR as the alerting radar to be fielded with the system. In 1965 Vulcan was selected as the gun system and Mauler was terminated resulting in the program being expanded to a worldwide deployment of [deleted] battalions. This caused complete system redesign and the resultant increase in cost.

Senator YOUNG. Comment on your planned program for fiscal year 1973.

Mr. JOHNSON. The largest portion of the fiscal year 1973 program involves two prototyping projects. The first effort will involve the procurement and testing of several different forward looking infrared or FLIR-type night vision devices. This would provide Chaparral and possible Vulcan with a significant increase in effectiveness during nighttime and limited visibility conditions.

The second effort will develop for Government test and evaluation, a long-range gun low altitude air defense system which will fully exploit the improved effectiveness offered by an air defense optimized gun/ammunition/turret subsystem and the latest technology in fire control sensors (infrared and laser) and digital processors. Additionally we will be completing our R. & D. efforts [deleted] the gun air defense effectiveness study, and the Arctic and tropic service tests for the forward area alerting radar.

Chairman ELLENDER. For fiscal year 1972, $3.4 million was provided, and for fiscal year 1973, you are requesting $9.7 million. Just why do you need this very large increase you are requesting?

Mr. JOHNSON. The large increase is a result of initiation of a 2-year prototyping program which requires $7 million in fiscal year 1973. This prototyping program contains two major efforts. First, to procure and test several different forward looking infrared or FLIR-type night vision devices. This would provide Chaparral and possibly Vulcan with a significant increase in effectiveness during nighttime and limited visibility conditions. Second, to build and test an experimental prototype gun fire control system. This program is intended to determine by hardware test and evaluation, the extent to which the advanced technology to be employed in the design has utility against future air defense requirements.

LANCE DIVISION SUPPORT MISSILE

Chairman ELLENDER. The request includes $7,670,000 for continuation of work on the Lance division support missile. Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

OPERATIONAL SYSTEMS DEVELOPMENT

Background.—The original requirements for LANCE were established by a Department of the Army Staff Study in 1956. The purpose of this staff study was to delineate an optium family of surface-to-surface missiles (designated Missiles

A, B, C, D, and E) to be fielded during the 1965–1970 time frame. These systems would be deployed in Europe to assist in countering the Soviet tactical missile and long-range cannon threat.

As a result of this study effort the U.S. Army Missile Command solicited industry for concepts of Missile A. This resulted in 60 proposals from industry which were reduced to the six most promising concepts. In August 1959 an 18-month component development program for Missile A was initiated to demonstrate the optimum guidance and control package for the missile. Autonet, Pre-Spin Automatic Dynamic Alignment (PADA), and Multiple Boost were examined in this component development program. A similar program was instituted during this period for Missile B. In October 1960 the results of the Missile A component development program were incorporated into Missile B.

Because of projected accuracy and size requirements for Missile B, the PADA and Multiple Boost concepts were dropped. Subsequently industry recommended full inertial guidance, or Autonet with Directional Control (DC) during the boost phase of the flight. The full inertial guidance package was discarded due to excessive costs. DC Autonet was accepted as the guidance system for Missile B.

The Military Characteristics were written and accepted in 1961, based upon the nonnuclear role with a [deleted] kilometer range.

A cost plus incentive fee contract was awarded to Ling-Temco-Vought for Engineering Development of Missile B in November 1962.

The Secretary of Defense in December 1967 stated that only the [deleted] kilometer system would be fielded. This decision, plus reduction in FY 68 funds, extended the availability of the training battalion to [deleted].

Description.—The objective of this effort is to develop a complete missile system that will provide the Field Army commander with a significant improvement in capability over the HONEST JOHN Rocket and SERGEANT Missile Systems that LANCE will replace. The missile will have a maximum range of [deleted] kilometers with a nuclear payload, [deleted] kilometers with a nonnuclear payload, and a minimum range of [deleted] kilometers. Accuracy of the system will be [deleted] circular error probable for the nuclear capability and [deleted] for the nonnuclear capability. The self-propelled launcher and associated equipment will be capable of sustained ground operations, possess a water-crossing capability, and be transportable in Phase I airborne operations.

Work performed by:

1. *Contractors* (Development) (in millions of dollars):

Item and contractor:	*Cost to completion (Government estimate)*
Missile propulsion unit and ground support equipment—Vought Missiles and Space Co., Warren, Mich.	[deleted]
Nuclear adaption kit—In-House, NUCOM, Picatinny Arsenal, N.J.	[deleted]
Nonnuclear warheads—In-House, MUCOM, Picatinny Arsenal, N.J., Honeywell, Minneapolis, Minn.	[deleted]

2. The LANCE project office is located at Redstone Arsenal, Ala. The project manager is Brigadier General R. J. Proudfoot.

Fiscal year 1973 planned program: Complete Engineering Test/Service Test of the practice warhead, and complete development and testing of the nonnuclear warhead if approved.

Program to completion: Development program is scheduled for completion in fiscal year 1973.

RESOURCES

[Dollars in millions]

	Fiscal year—				
	1971 and prior	1972	1973	Additional to completion	Total estimated cost
R.D.T. & E.:					
Funds	$416.6	$28.3	$7.7	----------	$452.6
Man-years	445.0	380.0	365.0	Not available	Not available

Senator YOUNG. As I read the tabulation on page 192 of the descriptive summary the $7.7 million requested for fiscal year 1973 will complete the currently planned R. & D. effort on the Lance missile. Am I correct about this?

Mr. JOHNSON. Yes, sir.

Chairman ELLENDER. Tell us exactly what you plan to do with the $7.7 million you are requesting for fiscal year 1973.

Mr. JOHNSON. May I provide that information for the record.

(The information follows:)

Purpose:	*Amount (millions)*
Correction of deficiencies and shortcomings discovered in engineering and service tests	$2.4
Refurbish ground support equipment used in engineering and service tests	1.9
Test support for the practice warhead test	.3
Incentive fee for prime contractor	2.0
In-house costs (salaries, TDY, supplies)	.6
Engineering services to complete practice warhead testing	.5
Total	7.7

Senator YOUNG. I note the current total estimated cost of this R. & D. effort is $452.6 million. How does this compare to the original total estimated cost for this effort?

Mr. JOHNSON. The original total estimated cost in August 1963, was $177.2 million. The increases since then have been due to the decision to extend the range, propulsion, and feed system development problems; fund cuts and delays; and other miscellaneous items. At the time of the decision to extend the range, January 1968, the sunk costs and total estimated R. & D. cost was $420.4 million.

Chairman ELLENDER. What is the current status of the effort to develop a nonnuclear warhead for the Lance missile, and tell us why you feel it is necessary to develop this nonnuclear warhead?

Mr. JOHNSON. The current status is that all work on the nonnuclear warhead has been suspended. However, a reprograming action is currently being staffed by the Office of the Secretary of Defense which requests authority to complete the development of the nonnuclear warhead. The basic reason for continuing development is contained in the reprograming action. The key factor which supports continued development of nonnuclear Lance is that it has demonstrated [deleted].

PERSHING SURFACE-TO-SURFACE MISSILE

Chairman ELLENDER. $8.2 million is requested for the program entitled "Pershing Surface-to-Surface Missile." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

OPERATIONAL SYSTEMS

Background.—PERSHING, a solid propellant, inertially guided nuclear missile with a range of from [deleted] nautical miles was originally developed and fielded (1963–1965) as a Field Army general support weapon to replace the REDSTONE missile. The responsiveness, reliability, and accuracy of that system compared to the Warsaw Pact Threat at that time was less than desirable and made the alternative of PERSHING missile system for the general support role a more favorable one. With this primary role, PERSHING was designed

to be helicopter transportable and possess a maximum degree of cross country mobility. In mid 1963, a Special Study Group of the Joint Chiefs of Staff concluded that PERSHING would be a suitable weapon system for the Quick Reaction Alert (QRA) role in support of the theater nuclear fire programs in the 1966 time frame. By Secretary of Defense Memorandum 10 February 1966, the primary mission of PERSHING was changed to that of QRA which requires the system to be prepared to perform [deleted]. To optimize the ground support equipment for the QRA role, a 1965 development program for the improved equipment called PERSHING Ia (PIa) was initiated and the wheeled configuration of PIa was made available to troop units on QRA status by April 1970. To increase reliability to launch and maintainability, a program of missile and ground support improvements not included in PIa configuration was initiated in 1970. Final testing and evaluation of these modifications are scheduled for completion just prior to the beginning of [deleted].

Description.—The objective of the program is to provide a responsive, accurate, reliable, long range, all weather nuclear Fire Support System for the Army. Additionally, the missile system as established in Europe today must be capable of performing primarily in the Quick Reaction Alert (QRA) role. [Deleted]. While the various platoons are on QRA status, they are subjected to unannounced practice simulated countdowns. Weapon reliability and reaction time data is collected during these practice counts. Similar data and accuracy figures are gathered during annual firings in the United States at the Army missile firing range. [Deleted]. The information is analyzed and when it is determined that the system can be improved by application of certain modifications, these modifications are developed, tested and evaluated for incorporation into the system. This development, testing and evaluating to eventual system incorporation of the various modifications constitutes the research and development program of this operational system.

Work performed by.—Martin-Marietta Corp., Orlando, Florida (prime contractor); Burroughs Corp., Paoli, Pennsylvania (computer); Ford Motor Company, Detroit, Michigan (prime mover); U.S. Army Missile Command, Redstone Arsenal, Alabama (Program Manager).

Fiscal year 1972 program.—Engineering Development on the improved missile components will continue through this fiscal year. The improved components were tested with satisfactory results during missile firings 2d quarter FY 72. New components will be further evaluated during Product Improvement Test Firings monitored by the Army Test and Evaluation Command during the last quarter of this fiscal year. The missile improvement modifications have been scheduled for incorporation in the current stockpile of missiles and new procurement in FY 1972 and/or FY 1973.

Fiscal year 1973 planned program.—The missile improvement modifications and power station improvements testing and development costs will be completed in FY 73. In addition, to improve reaction time during a countdown, and thereby improve tactical survivability and reliability, a [deleted] will be developed for eventual incorporation into the missile system. The [deleted] will allow connection of the [deleted]. Currently, only [deleted]. Development and testing will also begin on an automatic [deleted]. The purpose of this effort is to integrate a [deleted] into the PERSHING [deleted] to make it an autonomous system, not dependent on [deleted] means to point the missile at the correct firing [deleted]. Both low risk systems will require two years development time.

Program to completion.—Improvements in the [deleted] and the automatic [deleted] will be completed in FY 74. Dependent upon the success of an advanced development radar area correlation guidance experiment in FY 1974, [deleted] commencing with engineering development in FY 1975.

RESOURCES

[Dollars in millions]

	Fiscal year—				
	1971 and prior	1972	1973	Additional to completion	Total estimated cost
R.D.T. & E:					
Funds	630.4	4.6	8.2	19.6	662.8
Man-years	0	0	0		

Chairman ELLENDER. Please describe this missile and its mission.

Mr. JOHNSON. Pershing is a solid propellant, inertially guided nuclear missile with a range of from [deleted] nautical miles that was originally developed and fielded as a Field Army general support weapon to replace the Redstone missile. In mid-1963, it was concluded that Pershing would be a suitable weapon system for the quick reaction alert (QRA) role in support of the theater nuclear fire program during the 1966 time frame. On February 10, 1966, the primary mission of Pershing was changed to that of QRA. [Deleted]. While the various platoons are on QRA status, they are subjected to unannounced practice simulated countdowns.

Senator YOUNG. The $8.2 million you are requesting for fiscal year 1973 is an increase of $3.6 million over the amount provided for fiscal year 1972. Why do you need this large increase?

Mr. JOHNSON. The fiscal year 1972 funds provided for Pershing allowed development of improved modifications for the missile guidance and control sections and an improvement to the power station located in each launcher platoon. Of the $6.5 million predicted last year to complete the missile and power station improvement modifications, only $4.2 million will have to be spent in fiscal year 1973 to complete this development. An additional $3 million will be needed for a [deleted] development of a programer test station-launcher switching kit and an automatic azimuth laying (direction pointing) capability. These two items will result in improved reaction time and survivability. The reaction time can be reduced from approximately [deleted] per missile launch to about [deleted] per launch. The automatic azimuth laying device will replace the current manual method of laying the missile, and further allow units to fire from positions previously unoccupied and without the normal required survey thereby providing greater survivability of missile crews and ground support equipment. The total fiscal year 1973 effort in Pershing of $8.2 million is composed of [deleted] to complete missile and power station improvement modifications and [deleted] to initiate development of the automatic azimuth laying and switching kit.

LAND COMBAT SUPPORT SYSTEM

Chairman ELLENDER. $1.9 million is requested for the land combat support system. Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY OPERATIONAL SYSTEMS

Background.—The Land Combat Support Systems (LCSS) is an outgrowth of a long-term development effort of the Army on Automatic Test Equipment. In the past, special test equipment used by maintenance units was designed specifically to support one weapon system. Preliminary studies revealed that, although the configurations and specific test methods were different, approximately 85 percent of the basic functions of each peculiar missile system test equipment were common to all systems. The LCSS was developed to meet the initial requirement to support SHILLELAGH, LANCE, TOW and DRAGON systems.

Description.—LCSS represents a common support concept for missile systems possessing varied tactical and technical characteristics and essentially provides a means for rapid and reliable qualification testing, fault isolation, and repair of designated missile system components. The LCSS is presently providing direct and general maintenance support for designated SHILLELAGH and TOW mis-

sile system materiel and is in various stages of supplementary kit (interface items) development to provide support for the LANCE and DRAGON systems. The system is unique in both concept and development. It represents the first large scale attempt to combine common elements of test equipment required for several complex systems into a single highly reliable, easy to operate and relatively economical automated test system. Its development is unique in that the basic test set and the several interface units are in different stages (from type classification to initial development) simultaneously. Further, the development of LCSS interface items must be scheduled according to the development and production of the systems it must ultimately support. Although schedule changes in the development of the systems to be supported and the addition of several components to be supported have affected the scheduling and cost of the LCSS program, it is continuing in an orderly progression in support of SHILLELAGH, TOW, DRAGON and LANCE development.

Program accomplishments and future plans

Fiscal year 1971 and prior accomplishments.—Feasibility studies completed in 1959 led to a decision in 1961 to develop Multi-Systems Test Equipment. Electronic Test Station-1 was designed and fabricated to support MAULER. With the termination of MAULER, the program was reoriented and in 1965 fabrication of three developmental models of LCSS was initiated for the conduct of engineering design tests and tape validation. (These developmental models are currently being used by the contractor to develop and validate tape programs. In 1966, fabrication of four service test models was initiated to provide a new equipment training facility and for Engineering and Service Tests. In FY 1967, the first limited production was approved for 10 Initial Support Models to support SHILLELAGH deployment. The SHILLELAGH supplemental kit was Type Classified Standard A in January 1971. The basic system was Type Classified Standard in January 1971, procurement of the Authorized Acquisition Objective [deleted] sets) completed with the FY 1971 program, and deployed in CONUS, USARAL and USAREUR. The Engineering/Service Tests were completed and the TOW supplementary kit was classified as standard for Army use in May 1971. Development of the LANCE and DRAGON supplementary kits was initiated in FY 1971.

Fiscal year 1972 program.—Development of LANCE and DRAGON supplementary kits continues. The Engineering/Service Tests for the LANCE supplementary kit will be completed.

Fiscal year 1973 program.—Standardization for Army use of the LANCE supplemental kit and complete development of the DRAGON supplemental kit. Start development of supplementary kits for additional systems as determined cost effective by studies conducted in FY 1971 and FY 1972.

Program to completion.—Complete development of support capability for additional systems.

RESOURCES

[Dollars in millions]

	Fiscal year—				
	1971 and prior	1972	1973	Additional to completion	Total estimated cost
R.D.T. & E.:					
Funds	[1] $46.7	$2.0	$1.9	$2.5	[1] $53.1
Man-years	19.0	5.0	1.0	Not available	Not available

[1] Does not include $13,100,000 expended in earlier development of multisystem test equipment for Mauler which was terminated in 1964. These funds were included in previous LCSS descriptive summaries.

Senator YOUNG. Just what is the land combat support system?

Mr. JOHNSON. LCSS represents a common support concept for missile systems possessing varied tactical and technical characteristics and essentially provides a means for rapid and reliable qualification testing, fault isolation, and repair of designated missile system components. The LCSS is presently providing direct and general maintenance support for designated Shillelagh and Tow missile sys-

tem materiel, and is in various stages of supplementary kit (interface items) a development to provide support for the Lance and Dragon systems. The system is unique in both concept and development. It represents the first large-scale attempt to combine common elements of test equipment required for several complex systems into a single highly reliable, easy to operate, and relatively economical automated test system. Its development is unique in that the basic test set and the several interface units are in different stages (from type classification to initial development) simultaneously. Further, the development of LCSS interface items must be scheduled according to the development and production of the systems it must ultimately support. Although schedule changes in the development of the systems to be supported and the addition of several components to be supported have affected the scheduling and cost of the LCSS program, it is continuing in an orderly progression in support of Shillelagh, Tow, Dragon, and Lance development.

Chairman ELLENDER. What will you do with the $1.9 million you are requesting for fiscal year 1973?

Mr. JOHNSON. In fiscal year 1973, the Lance supplemental kit will be standardized for Army use, and development of the Dragon supplemental kit will be completed. We will start development of supplementary kits for additional systems as determined cost effective by studies conducted in fiscal years 1971 and 1972.

Chairman ELLENDER. How long do you estimate will be required before this program will be terminated?

Mr. JOHNSON. Land combat support system is planned as a continuing program. We plan to expand the land combat support system support for other weapon/vehicle systems to include aerial platforms.

MISSILE EXPLORATORY DEVELOPMENT

Chairman ELLENDER. Of the total requested for missiles and related equipment, $8.1 million is for the program entitled "Missiles." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY EXPLORATORY DEVELOPMENT

Description.—In this program element, exploratory development and supporting research are performed to demonstrate feasibility for future surface-to-surface missiles and control and coordination application of components and concepts in the following areas of technology: nonnuclear warheads, electronic fuzing and support research in materials for these fuzes, electronic counter-countermeasures, terminal homing, and air defense predicted fire techniques. Supporting studies and analyses are performed on potential rocket and missile weapons and control systems. The work includes fundamental applied research, breadboard hardware, and some component and full scale testing, but no major system development. There are eight projects included in the element.

Work performed by.—The laboratories of Picatinny Arsenal, Dover, N.J.; Ballistic Research Laboratory, Aberdeen Proving Ground, Md.; Harry Diamond Laboratories, Washington, D.C.; the U.S. Army Missile Command, Redstone Arsenal, Ala.; the U.S. Army Weapons Command, Rock Island, Illinois; the Stanford Research Institute, Menlo Park, Calif.; the University of Florida, Gainesville, Fla.; Firestone, Akron, Ohio; Martin-Marietta Corp., Orlando, Fla.;

Denver Research Institute, Denver, Colo.; and numerous others with small contracts.

Fiscal year 1972 program.—Exploratory development to be accomplished this fiscal year includes: investigations of defeating armor targets with high [deleted] penetrators and [deleted]; dual mode, [deleted] seekers are being designed and fabricated as potential components for anti-tank missiles; flight tests will continue to be conducted to verify seeker accuracy; telemetry work for monitoring fuze functioning sequences during test firings, and support development of a complex simulator permitting lab assessment of fuzes in an actual dynamic environment without live firings; fuzing investigations include development of an anti-armor fuze to provide [deleted] test of an [deleted] prototype fuze [deleted] employment; completion of changing telemetry frequencies as required; design and fabrication of electronic devices, plastic and metal materials for fuze structures, and power supply components to include low cost fabrication techniques and testing of commercial materials and parts for potential use; continued development of fuze material components; aerodynamic analysis will continue of hypervelocity configurations and cross wind sensitivity, and dynamic stability of roll stabilized bodies; evaluation of Air Defense Gun/Aircraft engagement models and parametric analysis and concept studies of Fire Control for Air Defense guns in being or yet to be developed.

Fiscal year 1973 program.—Effort in Terminal Homing will include continuation of fiscal year 1972 initiated measurement and analysis of characteristics affecting terminal guidance with major emphasis placed on documenting characteristics for laser guidance as it would apply to potential systems such as [deleted] class of weapons; establishing a technology base in sensors and their mechanization for use in strapdown seeker application to include simulated guidance loop completion and low cost laser guidance concepts in weapons where accuracy is in the order of [deleted] are acceptable; and advancing the state-of-the-art of homing seekers in the [deleted] spectrum for use against surface hard point targets, and techniques currently employed in Forward Looking Infrared (FLIR) to increase the [deleted] operational potential against vehicle targets. Wind tunnel exploratory testing for Army Materiel Command is expected to continue with 650 test hours projected use for the hypersonic facility to include effort on low drag and high capacity artillery projectile research and accelerometer and in flight pressure sensor development for long range projectile dynamics. Supporting research effort in new electronic fuze systems will include [deleted] design for Rocket Assist Projectiles (RAP), fuze system requirements studies for [deleted] missiles and projectiles, and a system design study for an [deleted] remote set. Electronic counter-countermeasures (ECCM) plans will continue investigation and application of techniques to optimize fuze performance cost effectiveness. Solid state circuits and components will be exploited to provide low cost proximity fuzes with high [deleted]. Efforts in the guided missile nonnuclear warhead project will include further exploratory work on the improvements to [deleted] with materials other than [deleted]. The Spin Compensation study will continue investigation into control of metallurgical properties and fabrication techniques to reduce performance degradation and the incendiary follow-through study will be continued to increase [deleted] damage. Implosive fragmentation studies will be continued and the final design of the SPAM bomblet will be fabricated and tested. Work in advanced indirect fire anti-armor warheads, anti-material warhead studies, air defense and anti-missile warhead [deleted] concepts will continue. Within the project of supporting research for materials used in electronic fuzes, studies will be continued in the area of solid state high power radio frequency generation circuits, [deleted] and their [deleted]. Supporting research in instrumentation, measurement and simulation of fuzes, a redesign of telemetry [deleted] is planned that will reduce size and cost while increasing efficiency. A microwave telemeter system for monitoring in-borne functioning of fuze components will be designed, breadboarded and tested. The developed artillery simulator will allow continuation of mitigator studies in the higher ranges of impacts and spins, accelerometer program. gun balloting (acceleration effects on fuzes) and fabrication of a miniaturized three-inch artillery simulator. Within the predicted fire technology project, efforts will be concentrated on prior year programs with emphasis on systems that utilize a short line of flight.

Program to completion.—This is a continuing program.

RESOURCES

[Dollars in millions]

	Fiscal year—			Additional to completion	Total estimated cost
	1971	1972	1973		
R.D.T. & E.:					
Funds	$7.9	$8.1	$8.1	Continuing	Not available.
Man-years	384.0	347.0	364.0	Not available	Do.

Chairman ELLENDER. Please provide a tabulation for the record setting out the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

Mr. JOHNSON. Yes, sir.

(The information follows:)

FUNDING

[Dollars in thousands]

Project	Fiscal year—		
	1971	1972	1973
IT26301A099—Vulnerability of aerial targets	$200	$610	0
IM262301A117—Terminal homing system	1,900	410	$1,000
IT262301A201—Aerodynamic research test	1,300	1,490	1,480
IW262301A207—Supporting research, new electronic fuzes	1,300	1,490	1,480
IW262301A208—Supporting research, electronic counter-countermeasures	150	200	210
IM262301A210—Nonnuclear warheads for guided missiles	1,200	1,200	1,270
IW262301A300—Supporting research in new components, materials, and techniques for electronic fuzes and related items	1,356	1,785	1,895
IW262301A301—Supporting instrumentation measuring simulation fuzes	449	450	500
IM262301D698—Predicted fire technology	0	450	225
Total	7,855	8,085	8,060

Senator YOUNG. Are you requesting funds for any new projects?

Mr. JOHNSON. No, sir; there are no new projects within this program element.

Chairman ELLENDER. I note you are requesting $1 million for the project entitled "Terminal homing system," and only $410,000 was provided for this project in fiscal year 1972. Why do you need this rather large increase?

Mr. JOHNSON. In fiscal year 1971, this project included a large effort in exploratory development in Hellfire. Because of demonstrated success, Hellfire was transferred into the advanced development category, 6.33.06.A, "Terminal homing," and funding of the 6.2 exploratory development "Terminal homing systems" was consequently reduced. In fiscal year 1973 exploratory development work for terminal homing and laser guidance application to potential weapon systems—cannon launched guided projectile, division support class of weapons—and establishment of a technological base, terminal homing data bank with various terminal homing energy and target signatures, low cost laser guidance concepts to include passive infrared night vision in terminal homing for terminally guided submissiles, and efforts to more adequately predict location of the reflected centroid of laser beams have caused a greatly increased scope of work which requires the funding increase in this project.

Senator YOUNG. In fiscal year 1972, $1.2 million was provided for the project entitled "Nonnuclear Warheads for Guided Missiles," and you

are requesting $1,270,000 in fiscal year 1973. Why do you need this increase?

Mr. JOHNSON. The increase within this project will fund an increase in effort by the Army's Munitions Command in indirect fire against armor. Studies and testing to date have shown favorable promise in the use of heavy fragments and design of high velocity slug penetrators. In this coming budget year, several full scale test prototype warheads will be fabricated and functioned in an instrumental test area to obtain data under explosive launch conditions.

Chairman ELLENDER. Please comment on the need for the increase of $110,000 you are requesting for "Supporting research in new components, materials, and techniques for electronic fuzes and related items."

Mr. JOHNSON. The $110,000 increase within this project will fund an increase in fuzing effort at the Army Materiel Command's Harry Diamond Laboratory. Effort of work will be increased in development of thin film techniques for modulation, filtering, and amplification functions and the integration of those fuze electronics on a single chip. It is anticipated that application of these microelectronic techniques will improve fuze reliability and simplify existing logistical requirements.

MISSILE TECHNOLOGY EXPLORATORY DEVELOPMENT

Chairman ELLENDER. The next program to be considered is "Missile technology," for which you are requesting $17.4 million. Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

EXPLORATORY DEVELOPMENT

Description.—This single element funding program element includes virtually all exploratory development work conducted by the U.S. Army Missile Command to provide the technological base for future Army tactical missiles. Work is performed in the following areas: inertial guidance and controls, terminal guidance, propellants and propulsion systems, ground support equipment, system concept and analysis studies, missile aerodynamic technology structures, advanced sensors, nuclear weapon effects. While demonstrating the feasibility of advanced concepts, the work includes applied research, breadboard hardware and component development, and limited full scale testing, but no major system development.

Work performed by.—U.S. Army Missile Command, Redstone Arsenal, Ala.; North American Rockwell, Columbus, Ohio; General Electric, Huntsville, Ala.; Thiokol, Huntsville, Ala.; AGA Corp., Secaucus, N.J.; Systems Engineering Labs, Ft. Lauderdale, Fla.; Ling-Temco Vought, Warren, Michigan; Martin-Marietta, Orlando, Fla.; Emerson Electric, St. Louis, Mo. and approximately twenty-five additional contractors.

Fiscal year 1972 program.—Investigation of reaction jet interaction with air flow over missile airframe; optimization techniques for hypervelocity and helicopter launched rocket configurations; investigation of dynamic response and optimal stabilization for heliborne rocket and missile launchers; system design of a small tactical radar for employment with forward air defense; further development of breadboard configuration of radars started in FY 71; investigations of simplified inexpensive [deleted] control for surface and helicopter launched rockets; measurement of target signatures to get a realistic picture of battlefield environment in regions of interest in the electromagnetic spectrum [deleted] further development of propulsion techniques for [deleted] development of improved propellants with low contamination, particularly in the [deleted] investigation of the use of fluidic guidance components for surface-to-surface missiles, demonstration of low cost laser semi-active guidance system for small rockets; further analysis and design and preliminary fabrication of

various terminal homing seekers for missiles; continuation of the fundamental work that is required to define the phenomena and ultimate potential of [deleted] lasers; demonstration of the components of terminally guided sub-missiles for the warheads of surface-to-surface rockets or missiles.

Fiscal year 1973 planned program.—During FY 1973 it is planned to continue in all ongoing fields of exploratory development and greater effort will be expended in the following areas: initiation of a comprehensive general support missile study; nonnuclear [deleted] conduct of aerodynamic wind tunnel tests to very developed missile configuration developed in FY 1972; development of aerodynamic data about various missile configurations at [deleted] of attack; formulation of an analytical method for estimating missile aerodynamics at [deleted] of attack and yaw; establishment of requirements and specifications for missile software and determination of requirements for a simulation data bank that can supply the most up-to-date systems description on major missile items to thrust versus time curves, aerodynamic and guidance description; component definition and development of requirements for an optimized weapon aircraft interface for the sensing, structural, aerodynamic, blast field, stabilization, electrical and jettisoning requirements; design fabrication and testing [deleted] radar that includes tracking accuracy evaluation in [deleted] environment; breadboarding for test and evaluation an all solid-state receiver; continuation of work in missile [deleted] in preparation for future missile flight demonstration programs; test firing of FY 1972 directional control anti-tank missiles at Missile Command firing range; flight demonstration of automatic tracking systems for airborne direct fire; research studies into azimuth gyro and [deleted] of future weapons requirements for trade-off's between propulsion performance level and low temperature strain capability for [deleted] propellant; continuation of development of low cost, high performance smokeless propellant to develop less atmospheric contamination; evaluation of radiation effects on several propellant grains with results from [deleted] tests and with analytical results; flight demonstrations of operational terminal accuracy capability; continuation of target scattering data collection in support of [deleted] guidance concepts development; mortar round accuracy improvement by incorporation of terminal [deleted]; completion of a terminal homing data bank to provide information on call within the mission area; and system development of techniques to measure [deleted] in previously immeasurable scales to include investigations of using Monte Carlo integration technique in dealing with simultaneous transport of [deleted].

Program to completion.—This is a continuing program.

RESOURCES

[Dollars in millions]

	Fiscal year—			Additional to completion	Total estimated cost
	1971	1972	1973		
R.D.T. & E.:					
Funds	$19.0	$18.0	$17.4	Continuing	Not available.
Man-years	335.0	287.0	288.0	Not available	Do.

Chairman ELLENDER. How much of the work on this project is performed in Army in-house facilities?

Mr. JOHNSON. Approximately 60 percent of the exploratory development conducted in this program element has been accomplished in the Army in-house facilities.

AIR DEFENSE ADVANCED DEVELOPMENT

Chairman ELLENDER. $3.6 million is requested for the program entitled "Air Defense Advanced Development." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

ADVANCED DEVELOPMENT

Description.—This program provides necessary development and study effort to define a family of follow-up air defense systems to meet the Army requirements during the post 1975 time period and to develop any needed new target missile capabilities. The Air Defense Advanced Development Program will provide weapons to replace both the CHAPARRAL missile system and the VULCAN 20mm gun system and to serve as complements to the SAM–D. The systems developed will significantly increase effectiveness by providing for forward aspect engagements and possibly an all weather day/night capability on a follow-on Low Altitude Forward Area Air Defense System (LOFAADS). Effort toward a new LOFAADS system has included concept studies, component fabrication, and evaluation of foreign systems. Technical feasibility and characteristics will be determined for each system and trade-off analyses conducted to permit the preparation of Requests for Proposals and the initiation of Contract Definition when warranted. In the Evaluation of Foreign Guns project foreign gun systems such as the Oerlikon B and C twin 35mm gun systems of Germany and the Netherlands are being examined during their system testing in Europe for possible application to a LOFAADS gun program. A joint concept feasibility demonstration program with France is currently in process on the JAVELOT gun system concept as another possible approach to a LOFAADS gun. In the Target Missile project necessary new target missile and ancillary target equipment requirements are filled. Current programs include a Low Altitude Supersonic Target for test and evaluation use and a Variable Speed Training Target to provide a more cost-effective subsonic target.

Work performed by.—The program is managed by the U.S. Army Missile Command, Redstone Arsenal, Alabama and the U.S. Army Weapons Command, Rock Island Arsenal, Illinois. Major participants include Thomson-CSF, Paris, France and Bendix Aerospace Electronic Company, Mishawaka, Indiana. Companies interested in the Variable Speed Training Target program include: Teledyne Ryan, San Diego, California; Northrop Ventura, Newbury Park, California; Beech Aircraft, Wichita, Kansas; and Teledyne Brown, Huntsville, Alabama.

Program accomplishments and future plans

Fiscal year 1972 program.—The evaluation of the Oerlikon system and the work on the Javelot demonstration will continue. The work to modify the TALOS missile to serve as a test and evaluation Low Altitude Supersonic Target (LAST) will continue. The competitive development of a Variable Speed Training Target (VSTT) will continue. Advanced development of the ManPortable Air Defense System (MANPADS) will be completed and the system will enter Engineering Development.

Fiscal year 1973 planned program.—The development of LAST will be completed. The VSTT development will be continued with fabrication of prototypes and conduct of Engineer Design Tests. The Javelot program will be completed.

Program to completion.—This advanced development program is of a continuing nature for establishing the feasibility of new or modified Advanced Forward Area Air Defense Systems and providing new Target capabilities. The VSTT development will require one additional year to complete.

Resources (in millions of dollars):

R.D.T. & E. funds for fiscal year 1963 through fiscal year 1971, $32.3; fiscal year 1972, $5.6; fiscal year 1973, $3.6; additional funds to completion are continuing; and the total estimate is not available.

Chairman ELLENDER. Of the $3.6 million requested for air defense advanced development, $3.1 million is for the project entitled "Target Missiles." Please comment on this project.

Mr. JOHNSON. The $3.1 million for target missiles is for the Variable Speed Training Target (VSTT). The VSTT program will have two contractors performing effort to develop two competitive designs for a low-cost subsonic training target. When development and testing are complete, the performance and the costs will be assessed and the Army plans to procure the most cost-effective system for use in support of air defense missile and gun training firings. In fiscal year 1973, the con-

tractors will be designing and fabricating target missiles for use in the contractor demonstrations and then in the subsequent engineer test.

Senator YOUNG. Comment on your request for $500,000 for the "Evaluation of foreign guns."

Mr. JOHNSON. The $500,000 for the evaluation of foreign guns is for the third and final year of effort on the concept feasibility demonstration of the Javelot gun system concept. These funds also provide for continued examination of the Oerlikon B and C twin 35-millimeter gun systems during their test and evaluation in Europe. This data will be applicable to future decisions for a follow-on gun system to replace Vulcan.

Chairman ELLENDER. Please comment on your joint effort with the French to evaluate the Javelot gun system. Do you expect to complete this effort this year?

Mr. JOHNSON. The Javelot gun system is the subject of a joint United States-French effort. The objective is to demonstrate the feasibility of the Javelot gun system concept. The Javelot concept envisages gun-launched, rocket-assisted projectiles fired in salvos with predetermined dispersion. The feasibility demonstration program is on schedule and will be completed with fiscal year 1973 funds.

SAM–D AIR DEFENSE MISSILE SYSTEM

Chairman ELLENDER. The request includes $171,380,000 for the continuation of the SAM–D air defense missile system. Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

ADVANCED DEVELOPMENT

Background.—The Air Defense Evaluation Board (ADEB) completed its review of SAM–D in November 1970 and is the basis for the following information. The threat to SAM–D is the [deleted] operating in a [deleted.] Alternatives considered to combat the threat were improved versions of HAWK, HERCULES and variations of SAM–D. The life cycle costs for the major alternatives considered were [deleted]. The basis for decision was system cost and effectiveness resulting from analysis of the computer simulation war games.

Description.—SAM–D is an advanced surface-to-air missile weapon system, being developed for deployment in [deleted]. The currently approved program provides for design, fabrication and test of these critical system components required to demonstrate technical feasibility and the initiation of long lead effort to develop the tactical prototypes. SAM–D will be capable of simultaneously detecting, tracking and engaging a number of high performance air-supported targets. It will be complemented by forward area air defense weapons in the field Army. Advanced automation, maintainability and reliability techniques will result in lower personnel requirements and operating costs over the HERCULES and HAWK systems it will replace. The system will be mobile, have very short reaction time, and will result in survivability and high effectiveness on the battlefield. SAM–D will be developed with options for adding an [deleted] and a [deleted] later in the program.

Work performed by.—The Raytheon Company of Bedford, Massachusetts, is prime contractor, with Martin-Marietta Corporation of Orlando, Florida, as missile sub-contractor and Thiokol Chemical Corporation of Huntsville, Alabama, a sub-contractor on the rocket motor.

Fiscal year 1972 program.—The Advanced Development (AD) objectives have been successfully completed. The start of Engineering Development has slipped from October 1971 and is planned to begin March 1972. A result of Engineering Development Definition (EDD) indicated a growth in payload weights for major

components. As a result the Fire Control Group (FCG) has been divided into three separate units, a radar unit, a weapons control unit and a power unit. The Launcher Group (LG) now contains four missiles instead of six missiles. Both FCG and LG units are being designed in modular form and will be mounted on standard Army flatbed trailers and trucks in place of track vehicles. An In-Process Review was held and approved these changes and EDD has been modified to reflect these changes. The contractor proposal to accomplish Engineering Development (ED) has been received, evaluated, and negotiation is underway to sign a contract in order to begin ED in March 1972. The revised Development Concept Paper will be completed for the Defense Systems Acquisition Review Council (DSARC) to be held in mid-February 72 to approve entry into ED. The Selected Acquisition Report covering SAM–D will be updated once the DSARC makes its decision. Design of missile subsytems (autopilot, control, propulsion, radome and air frame) will be completed and released for fabrication. Fabrication of the tactical Fire Control Group will begin based upon the design of the AD model. Work will begin on those items (Launcher Group, Battalion Control Group, Support Equipment) which were not addressed during AD, but which are now required for development of the tactical system. Work will also be initiated on general support test equipment, training aids, logistic support requirements, training plan, system test and evaluation plan and required management plans. Significant support by government agencies outside the project manager will begin.

Fiscal year 1973 planned program.—The fiscal year 1973 planned program will require an additional $55 million increase in funds over fiscal year 1972. Fiscal year 1973 will be the first year of Engineering Development (ED) and will continue the effort begun in fiscal year 1972. Fabrication on all ED model airborne guidance sections will begin, and integration and test of the first three will be initiated. Delivery of the autopilot and guidance for the first ED missile flight will be completed. All ED missile work will be initiated to support early ED missile flights in fiscal year [deleted]. Rocket motor prequalification tests will be initiated and three fly out canister tests will be completed. Work will continue on planning for a certified round assembly facility. Effort will continue on retrofit of the Advanced Development (AD) radar in preparation for its shipment to White Sands Missile Range to support missile firing in [deleted]. The ED model interim ground guidance processor will be fabricated and integrated with the AD model radar. Production and installation of radar array elements will be started and acceptance testing of the first antenna group initiated. Fabrication, integration and test of the first Weapon Control Computer will be completed. The first display console and control assembly will be fabricated. Fabrication of shelters and environmental control items will continue. Procurement of component parts and assemblies for additional weapon control units will continue. Launcher unit electronics and mechanical design will be completed and fabrication of the electronics brassboard will be completed. Detail design concept of the Battalion Control Group will be completed in fiscal year 1973. Purchase and development of component parts will continue. The integration of computer displays, communications, shelters and vehicles will be developed in detail. Hardware design of support equipment will proceed including conduct of studies for major support hardware items. These studies will assure compatibility for such major items as the Battery Maintenance Group, Battalion Maintenance Equipment, field maintenance test equipment, special tools, handling equipment, training and calibration equipment. Design effort will be initiated on the communications relay equipment interfaces, switching logic and voice patch assemblies for use with the Government furnished radio equipment as well as overall electrical configuration and mechanical design. Testing of the radar and control unit will continue to support early missile flights. Testing will continue on missile components and other subsystems. Government agencies will provide support in the areas of armaments, vehicles, generators, communications and testing.

Chairman ELLENDER. I think that this program was thoroughly discussed earlier, however, I wish you would provide for the record a detailed statement on exactly how you plan to spend the $171,380,000 you are requesting for fiscal year 1973.

Mr. JOHNSON. The fiscal year 1973 planned program will require $171.4 million in R.D.T. & E. funds. This will be the first full year of

engineering development (ED) and these funds will be required to continue effort which began in fiscal year 1972 and includes effort concentrated on the initiation and/or completion of necessary missile hardware to permit deliveries in time to conduct the first ED missile flight test in fiscal [deleted]. Radar effort will begin with the completion of retrofit effort for the advanced development (AD) radar unit, to include integration and testing of the contractors plant. The radar will be prepared for shipment to White Sands Missile Range to support the first ED model missile flight tests. Work on the control units will include fabrication, integration and test of weapon control computer number one will be completed. The first display console and control assembly will be fabricated. Human factors analysis of the control unit will be completed. Design of the communications data link will be initiated and completed.

Launcher work will include unit electronics and mechanical design to be completed and fabrication of the electronics breadboard will be completed.

Design concept of the Battalion Control Group (BCG) will be completed during fiscal year 1973. Purchase and development of component parts will continue. Human factors analysis will continue. Software development to integrate firing doctrine and command and control functions will be performed throughout the fiscal year.

By fiscal year 1973 hardware design activities will have progressed sufficiently to allow the conduct of support equipment studies for major hardware items. These studies will assure design compatibility for such items as the battery maintenance group, battalion maintenance equipment and field maintenance test equipment.

Effort during the year will also include design effort on the communications relay unit, system test and evaluation and personnel and training.

Government effort will include design and development of the fuzing system, warhead, analysis of vehicles, planning of test programs, and communications design and development for equipment to be utilized in the firing unit, battalion control group and the communications relay unit.

Advanced Ballistic Missile Defense Program

Chairman Ellender. The request includes $102,110,000 for the advanced ballistic missile defense program. Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY ADVANCED DEVELOPMENT

Description.—ABMDA performs advanced development in ballistic missile defense (BMD) technology to define new system concepts and components to attain significant improvements in BMD effectiveness; to extend the lifetime and upgrade the capabilities of SAFEGUARD components; to reduce component costs; to reduce lead times of new hardware; to demonstrate real-time discrimination; to provide techniques to accommodate high traffic rate threats; to solve radar blackout; and to upgrade general BMD technology to provide an important hedge against technological surprise. Defense system concepts responsive to the spectrum of possible ballistic missile threats are selected, synthesized and evaluated, in light of fiscal or other imposed constraints, to identify the advanced development activities to be pursued and to specify system performance to be achieved.

Work performed by.—ABMDA performs system definition, establishes program plans, determines contract requirements and provides supervision to accom-

plish its objectives. The SAFEGUARD System Command acts as principal contracting agent with the U.S. Army Missile Command, U.S. Army Electronics Command, U.S. Army Research Office—Durham, U.S. Air Force Electronic Systems Division, U.S. Air Force Rome Air Development Center, U.S. Air Force Space and Missile Systems Organization and the U.S. Navy Strategic Systems Project Office as secondary contracting agents for related programs. Major contractors are: Philco Ford, Newport Beach, Cal.; McDonnell-Douglas Astronautics Co., Huntington Beach, Cal.; General Research Corporation, Santa Barbara, Cal.; Boeing Co., Seattle, Washington; Cornell Aeronautical Laboratory Incorporated, Buffalo, N.Y.; Control Data Corporation, Minneapolis, Minn.; TRW, Incorporated, Redondo Beach, Cal.; LTV Aerospace Corporation, Dallas, Texas; RCA, Moorestown, N.J.; Stanford Research Institute, Menlo Park, Cal.; Hughes Aircraft Co.; Fullerton, Cal.; and MIT Lincoln Laboratory, Lexington, Mass. There are approximately twenty other contractors with programs of $200 to $500K each.

Fiscal year 1972 program.—Accomplishments realized or anticipated in fiscal year 1972 include: restructuring of program to achieve Light Area Defense (LAD) against a [deleted] advanced Terminal Defense (TD) capability through developments of critical radar, data processor and software, and interceptor components to handle a [deleted]. Development and exploitation of New Concepts and Advanced Technology (NCAT) as a basis for high pay off future BMD systems. *LAD Program*—The LAD program includes: system definition; a high performance interceptor (SPARTAN derivative) with [deleted] a radar design study for long range target acquisition enforcing command guided miss distances at long ranges, [deleted] capability for CONUS coverage; and data processing, command-control and communications required for operation and battle management. Supporting studies and technologies include: the successfully completed FAIR I flight program for [deleted] and FAIR II, to measure [deleted] continued development of [deleted] and a flight program initiated to [deleted]. On going technology developments include: mechanization studies of [deleted] mechanization studies of the [deleted] development of the [deleted] applicable to versions of modified SPARTAN. *TD Program*—Completion of the algorithms for a [deleted] completion of a reentry test complex at KREMS including radar modifications, real-time computer and operational software; initiation of planning for a phased array radar field test facility at KMR to test and verify software logic designation and discrimination functions; completion of baseline design for a solid state array radar and initiation of its demonstration array; establishment of the ABMDA Data Processing Testbed Center (ADTEC) for software/hardware evaluation through simulation; selection of a 4th generation data processor; evaluation of [deleted] and advanced interceptors; upgrade HSD against [deleted] continue evaluation of [deleted]. *NCAT*[1] *Program*—Synthesize and evaluate new system concepts which apply technology to achieve [deleted] SLBM defense systems for [deleted] and define integrated defense system effectiveness against [deleted]. Development of hemispheric dome radar to significantly reduce deployment costs; completion and transfer of transmitter devices to be used as a basis for the HSD prototype development; development of acoustic microwave devices to achieve required radar signal processing capability, successful flight testing of advanced interceptor capability (UpSTAGE), continued development of associative parallel element processor module (PEPE) to increase data processor throughput and application of [deleted]. Research leading to improved, lower cost BMD radar and interceptor silo structures; handover from [deleted] development of [deleted] including initiation of a target flight test program; [deleted] and real-time propagation [deleted].

Fiscal year 1973 planned program.—LAD Program—System Definition Studies, to define system components, performance requirements and interfaces including: the interceptor, radar, [deleted] both independently and in consonance with the maintenance of the Safeguard System mobilization base; a forward sensor, and related command control and communications. Initiate component preliminary design. Complete Fair II flights for [deleted]. The hardware for [deleted] will complete its first flight. Continue related [deleted] and sensor mechanization studies in support of [deleted] to be added to an advanced development flight vehicle representative of the experimental prototype interceptor. Continue [deleted] mechanization to develop a [deleted] in closed loop, free flight ground experiments. *TD Program*—Continue the evaluation and

[1] New Concepts and Advanced Technology.

development of advanced technologies critical to terminal defense systems including: completion of [deleted] conducting live testing of these schema at KREMS facilities; initiation of construction planning for the phased array radar test facility at KMR: continuation of CONUS construction of the solid state phased array radar; completion of a preliminary version of prototype BMD software and initiation of more complete versions; initiation of simulation runs to test this software at ADTEC against postulated [deleted] evaluation of other terminal defense systems including rapidly deployable systems and combined area/terminal defense of urban/industrial targets. *NCAT Program*—Exploit high pay off new system concepts identified during FY 72 program through continued system definition and evaluation, and initiate required component performance specifications and technology developments including: continued development of [deleted] for improved national value defense; real-time [deleted] complete advanced interceptor flight testing and evaluation (UpSTAGE); initiate field testing of low cost dome radar; develop new surface acoustic wave devices to achieve required designation and discrimination waveforms, continue development of PAR simulation with the ALTAIR radar (SIMPAR); continue flight program for evaluation of [deleted] and advanced data processing methods (PEPE); continue [deleted] and improve BMD structures research. Develop advanced hardened materials for BMD, improved cost and evaluation models and evaluate [deleted] to provide a basis for future system developments.

Program to completion.—Continuing program for advanced development of BMD technology.

Resources (in millions of dollars):

R.D.T. & E. Funds for fiscal year 1963 thru fiscal year 1971, 407.1; fiscal year 1972, 96.1; fiscal year 1973, 102.1; Additional funds to completion are, continuing; and the total estimated cost is not available.

Senator YOUNG. Briefly, what is the objective of this effort?

Mr. JOHNSON. ABMDA performs advanced development in ballistic missile defense (BMD) technology to define new system concepts and components to attain significant improvements in BMD effectiveness; to extend the lifetime and upgrade the capabilities of Safeguard components; to reduce component costs; to reduce leadtimes of new hardware; to demonstrate real-time discrimination; to provide techniques to accommodate high traffic rate threats; to solve radar blackout; and to upgrade general BMD technology to provide an important hedge against technological surprise. Defense system concepts responsive to the spectrum of possible ballistic missile threats are selected, synthesized and evaluated, in light of fiscal or other imposed constraints, to identify the advanced development activities to be pursued and to specify system performance to be achieved.

Chairman ELLENDER. Just how is this project related to the Safeguard program?

Mr. JOHNSON. This project seeks to develop the technology, concepts and components that will support both the upgrading of Safeguard and the orderly development of follow-on systems which can handle threats more severe than those for which Safeguard is designed.

Chairman ELLENDER. Please provide a statement for the record telling us just how you plan to use the $102.1 million you are requesting for fiscal year 1973.

Mr. JOHNSON. We would be glad to.

(The information follows:)

We plan to accomplish the following activities within the FY 73 budget: A Light Area Defense (LAD) Program which includes System Definition Studies, to define system components, performance requirements and interfaces including: the interceptor, radar, satellite sensor, both independently and in consonance with the maintenance of the SAFEGUARD System mobilization base; a forward sensor, and related command control and communications. Initiate component preliminary design. Complete Fly Along Infrared II flights

for [deleted]. The hardware for [deleted] will complete its first flight. Continue related [deleted] and sensor mechanization studies in support of [deleted] to be added to an advanced development flight vehicle representative of the experimental prototype interceptor. Continue [deleted] mechanization to develop a [deleted] in closed loop, free flight ground experiments. A Terminal Defense Program which will continue the evaluation and development of advanced technologies critical to terminal defense systems including: completion of [deleted] conducting live testing of these schema at Kiernan Re-entry Measurements Site facilities; initiation of construction planning for the phased array radar test facility at Kwajalein Missile Range; continuation of CONUS construction of the solid state phased array radar; completion of a preliminary version of prototype Ballistic Missile Defense software and initiation of more complete versions; initiation of simulation runs to test this software at ADTEC against postulated [deleted] evaluation of other terminal defense systems including rapidly deployable systems and combined area/terminal defense of urban/industrial targets.

A New Concepts and Advanced Technology (NCAT) Program to exploit high pay off new system concepts identified during FY 72 program through continued system definition and evaluation, and initiate required component performance specifications and technology developments including: continued development of [deleted] for improved national value defense; real-time [deleted] complete advanced interceptor flight testing and evaluation (UpSTAGE); initiate field testing of low cost dome radar; develop new surface acoustic wave devices to achieve required designation and discrimination waveforms, continue development of Perimeter Acquisition Radar simulation with the ARPA Long-Range Tracking and Instrumentation Radar (SIMPAR); continue flight program for evaluation of [deleted] and advanced data processing methods (PEPE); continue [deleted] and improved BMD structures research, develop advanced hardened materials for BMD, cost and evaluation models and evaluate [deleted] to provide a basis for future system developments.

Senator YOUNG. I note that the military construction request includes $7.6 million associated with this program. Just what are those funds for?

Mr. JOHNSON. The funds are for the construction of a facility on Illeginni Island, to support development of ballistic missile defense radar and data processing systems capable of meeting an evolving threat with high reliability and reduced costs. The hardware installed will provide operational verification of solid state radar and fourth generation data processor capability in a system context and in addition will serve as a vehicle for verification of advanced BMD system software techniques in a live environment, verification of agile beam and array dependent designation and discrimination processes, and calibration of BMD system simulations of reentry target/radar complexes.

TERMINAL HOMING AND WARHEAD ADVANCED DEVELOPMENT

Chairman ELLENDER. The request includes $33,330,000 for the program entitled "Terminal Homing and Warhead Advanced Development." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY ADVANCED DEVELOPMENT

Description.—This program element provides for the advanced development of five candidate systems or sub-system configurations, all of which employ terminal homing techniques to accurately attack discrete, point, surface targets such as tanks, armored personnel carriers or bunkers and field fortifications. This program element also provides for nonnuclear missile warhead work. Included terminal homing systems are: laser target designators for surface or airborne mounting to illuminate a chosen target so that ordnance with [deleted] can home on it, a cannon-launched guided projectile employing a [deleted] a heli-

borne mounting to illuminate a chosen target so that ordnance with [deleted] can home on it, a cannon launched guided projectile employing a [deleted] a Heliborne missile employing a [deleted], terminally guided sub-missiles with [deleted] for inclusion in the warheads of larger surface-to-surface missiles such as LANCE, and a radar area correlation guidance and control system that could provide greatly increased accuracy for longer range surface-to-surface missile such as PERSHING. The nonnuclear warhead work includes efforts to increase the lethality of warheads for surface-to-surface and surface-to-air missiles.

Work performed by.—The in-house work is performed by the U.S. Army Missile Command, Redstone Arsenal, Alabama; U.S. Army Electronics Command, Fort Monmouth, New Jersey; U.S. Army Weapons Command, Rock Island, Illinois; U.S. Army Munitions Command, Picatinny Arsenal, New Jersey; and the Aberdeen Research and Development Center, Aberdeen, Maryland. Companies under contract are Martin Marietta, Goodyear Aerospace Corporation, Singer Company (Kearfott Division), Brunswick, Ling-Temco-Vought, Sperry Rand, Aero-Jet General, and Chrysler Corporation. Anticipated bidders include companies under contract and Texas Instruments, Hughes Aircraft, Philco Ford, North American Rockwell, Boeing, General Dynamics, Raytheon, General Precision, Thiokol and International Business Machine.

Fiscal year 1971 and prior accomplishments.—This was a new program element in fiscal year 1972 which recently incorporated the nonnuclear warhead development project. Work was initiated in fiscal year 1971 with emergency funds on the Cannon Launched Guided Projectile Project. This effort resulted in a system and design study for the project in which the U.S. Navy made a significant contribution which was funded by the Army. The nonnuclear warhead work expanded efforts to examine methods of achieving greatly increased effectiveness against hard targets.

Fiscal year 1972 program:

(*a*) *Laser designators.*—Development of heliborne and surface mounted laser designator components, sub-system, and system configurations to provide the target illumination necessary to guide Army, Navy, and Air Force laser guided ordnance. This funding accelerated the development of a family of laser designators for use by forward combat units, field artillery forward observers and Army helicopters. Contracts are scheduled for March and April of 1972.

(*b*) *Cannon launched guided projectiles.*—Initiation of a [deleted] operational demonstration of projectiles using [deleted] proportional guidance to have a [deleted] a point target such as a tank [deleted]. After initial component testing under high g conditions, the program will provide the first flights of a fully guided round in [deleted]. Contracts will be let for this effort in February 1972.

(*c*) *Heliborne missile.*—This project has been redirected from a two-year operational demonstration of a dual mode, [deleted] to a laser only helicopter launched missile. The fiscal year 1972 program provides the first year of funding for the long lead time items for a Military Potential Test of a prototype helicopter launched laser guided missile by a troop unit. The hardware for the test will be funded over a three-year period and the test will be conducted in [deleted]. The laser only system is based on a highly successful exploratory development program which has demonstrated technical feasibility of a laser guided missile.

(*d*) *Terminally guided submissiles.*—Continued development of components started in fiscal year 1971 in exploratory development for individually guided submissiles suitable for inclusion in the warhead of a LANCE or division support missile. Included will be development of [deleted] captive, drop and flight tests of candidate airframes and seekers.

(*e*) *Radar area correlation.*—Complete preliminary design of a guidance and control system using radar area correlation guidance techniques suitable for mid to long range surface-to-surface missiles. Design of components, including the area correlator, the inertial guidance package and the re-entry vehicle, laboratory and wind tunnel tests will be initiated.

(*f*) *Nonnuclear warhead development.*—Emphasis was placed on release and dispersion methods for bomblets, fuzing, and improved single and multiple-purpose kill mechanisms for surface-to-surface and surface-to-air weapons system.

Fiscal year 1973 program:

(*a*) *Laser designators.*—Second year funding provides for continuing development of heliborne and surface mounted laser designator components, sub-system and system configurations to provide the target illuminators necessary to guide Army, Navy and Air Force laser guided ordnance. Primary emphasis will be

placed on the ground mounted and helicopter designators for the Cannon Launched Guided Projectile and the helicopter launched missile.

(*b*) *Cannon launched guided projectile.*—Provides for the second year funding for the operational demonstration initiated in fiscal year 1972. The two year funding effort is scheduled to provide prototype hardware from two contractors (12 projectiles each) [deleted].

(*c*) *Heliborne missile.*—Funding provides the second increment for conducting Military Potential Test with a prototype helicopter launched laser guided weapon. Due to the substantial potential investment in laser guided systems, the Army considers such an operational test necessary early in the program to preclude going through an expensive development cycle before the true tactical utility of a laser guided system is known. The test will be conducted in [deleted].

(*d*) *Terminally guided submissiles.*—Five flights of the terminally guided submissile warhead are scheduled for fiscal year 1973 to verify dispersal and target seeking characteristics. Work will continue on [deleted] seekers for flight testing in [deleted].

(*e*) *Radar area correlation.*—This year's funding provides for completion of fabrication of a breadboard system and for the conduct of captive flight tests to demonstrate feasibility of attaining a circular error probable of approximately [deleted] meters with a radar area correlator.

(*f*) *Nonnuclear warhead development.*—Emphasis will be placed on the single purpose anti-armor munition for surface-to-surface munitions and the focus fragmentation warhead for the surface-to-air missiles.

Program to completion.—As each of the six terminal guidance projects completes its initial operational demonstration, decisions will be made for entering further developmental stages. The nonnuclear warhead project is a continuing effort.

Resources (in millions of dollars):

R.D.T. & E. funds for fiscal year 1963 through 1971, 4.1; fiscal year 1972, 24.9; fiscal year 1973, 33.3; additional funds to completion [deleted]; total estimated cost [deleted].

Chairman ELLENDER. Please provide a tabulation for the record, listing each of the specific projects funded under this program for fiscal years 1971, 1972, and 1973.

Mr. JOHNSON. Yes, sir.

(The information follows:)

FUNDING

[Dollars in thousands]

	Fiscal year—		
	1971	1972	1973
Laser designators/illuminators	0	1,800	4,300
Cannon launched guided projectile	1,600	7,250	7,280
Hellfire	0	5,000	11,000
Terminally guided submissiles	0	2,730	2,600
Radar area correlation	0	6,300	6,000
General support missile	875	0	0
Nonnuclear warhead development	1,575	1,900	2,150
Total	4,050	24,980	33,330

Chairman ELLENDER. Please comment briefly on the objectives of each of the six projects funded under this program, and tell us what you plan to do with the funds requested for each for fiscal year 1973.

Mr. JOHNSON. The second year funding for the laser illuminator/designator provides for continuing development of heliborne and surface mounted laser designator components, subsystem and system configurations to provide the target illuminators necessary to guide Army, Navy, and Air Force laser guided ordnance. Primary emphasis will be placed on the ground mounted and helicopter designators for the cannon-launched guided projectile and the helicopter launched missile. The second year funding provides for the operational demonstration

of the cannon-launched guided projectile which was initiated in fiscal year 1972. The 2-year funding effort is scheduled to provide prototype hardware from two contractors (12 projectiles each) in fiscal year 1974. The funding for the heliborne missile provides the second increment for conducting a military potential test with a prototype helicopter launched laser guided weapon. Due to the substantial potential investment in laser guided systems, the Army considers such an operational test necessary early in the program to preclude going through an expensive development cycle before the true tactical utility of a laser-guided system is known. The test will be conducted in [deleted].

Five flights of the terminally guided submissile warheard are scheduled for fiscal year 1973 to verify dispersal and target seeking characteristics. Work will continue on [deleted] seekers for flight testing in [deleted]. This year's funding for radar area correlation provides for completion of fabrication of a breadboard system and for the conduct of captive flight tests to demonstrate feasibility of attaining a circular error probable of approximately [deleted] meters. In nonnuclear warhead development emphasis will be placed on the single purpose antiarmor munition for surface-to-surface munitions and the focus fragmentation warheard for the surface-to-air missiles.

AIR DEFENSE SUPPRESSION, LETHAL DEGRADATION

Chairman ELLENDER. $2.9 million is requested for the program entitled "Air Defense Suppression, Lethal Degradation." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

ADVANCED DEVELOPMENT

Description.—This new program element provides for advanced development and the conduct of operational demonstrations of two candidate systems, all of which are directed to the destruction of enemy air defenses such as radar controlled guns and surface-to-air missile sites. Included projects are Laser Guided HONEST JOHN employing a laser seeker and the Air Defense Suppression missile using a [deleted]. In view of the need for countering sophisticated [deleted], the Army considers it important to have available materiel to suppress such defenses in order to realize the full potential of air mobility and to insure continued effective close air support from the Air Force. The two candidate systems included in this program will provide for either components or systems to achieve the capability of destroying such targets.

Related activities.—This program is closely related to terminal homing programs of the Air Force and Navy and to two Army Program elements: 6.23.03.A, Missile Technology and 6.33.06.A, Terminal Homing. Coordination among the Services is effected through technology coordination groups, frequent liaison visits and by exchange of components and sub-systems for evaluation, and by exchange of program and technical information. The Laser Guided HONEST JOHN Project was transferred to this new program element from 6.33.06.A, Terminal Homing.

Work performed by.—The U.S. Army Missile Command, Redstone Arsenal, Alabama and Munitions Command, Picatinny Arsenal. Present contractors are Texas Instruments, North American Rockwell Autonetics, and International Laser System. Potential bidders on outstanding work are General Dynamics, Martin-Marietta, International Business Machines, North American Rockwell, Raytheon and Northrop.

Fiscal year 1971 and prior accomplishments.—The only project funded in FY 1971 was the Laser Guided HONEST JOHN. This project was initiated with FY

1971 emergency funds to demonstrate the capability of using a laser guided HONEST JOHN rocket to attack enemy surface-to-air missile sites. The project equips the warhead of the Army's operational HONEST JOHN rocket with the laser guidance package developed by the Air Force for the PAVEWAY bomb system. Funds also provide for a heliborne mounted laser designator to illuminate targets from long ranges for use in the system. The funds were provided in April 1971 and contracts were let by July 1971.

Fiscal year 1972 program.—The FY 1971 funds provided for a flight test program of 12 HONEST JOHN rockets equipped with laser guidance. The firings will include six firings complete with warhead. These firings were initiated in September 1971 and are scheduled for completion in July 1972. The targets will be laser designated from distances of [deleted] by the helicopter mounted laser designator.

Fiscal year 1973 planned program.—a. *Laser Guided HONEST JOHN:* The prior year efforts will result in a final report on HONEST JOHN flight program. A decision would then be made as to whether or not a selected number of weapons in the present and near future inventory, such as HONEST JOHN or LANCE, would be modified to provide a surface-to-surface laser guided missile capability to destroy targets such as air defense sites.

Air Defense Suppression Missile: This prototype effort is to provide a feasibility demonstration of a dual mode, helicopter launched, air defense suppression missile for the air-to-ground attack of the [deleted]. The desired technology is the missile sensor which consists of a dual mode, [deleted]. The sensor will have a capability of initially guiding a missile with the [deleted]. The seeker will be fabricated and then tested on an existing missile such as the REDEYE in a 10-round flight test program over a 12-month period.

Program to completion.—As the prototype demonstrations are completed for each of the three candidate systems, decisions will be made on contract definition or engineering development as appropriate.

Resources (in millions of dollars):

R.D.T. & E. funds for fiscal year 1963 through fiscal year 1971, $2.5; fiscal year 1972, $0.0; fiscal year 1973, $2.9; additional funds to completion is not available and the total estimated cost is not available.

Chairman ELLENDER. I note that the entire amount requested is for the project entitled "Air Defense Suppression Missile." Please describe this program, and tell us what you will do with the $2.9 million you are requesting for fiscal year 1973.

Mr. JOHNSON. This new program element provides for advanced development and the conduct of operational demonstrations of two-candidate systems, all of which are directed to the destruction of enemy air defenses such as radar controlled guns and surface-to-air missile sites. Included projects are laser-guided Honest John employing a laser seeker and the air defense suppression missile using a [deleted] the Army considers it important to have available materiel to suppress such defenses in order to realize the full potential of air mobility and to insure continued effective close air support from the Air Force. The two-candidate systems included in this program will provide either components or systems to achieve the capability of destroying such targets.

Senator YOUNG. What is the relationship between this project and the ones entitled Missile Technology and Terminal Homing which we have just discussed?

Mr. JOHNSON. This program is closely related to terminal homing programs of the Air Force and Navy and to two Army program elements: 6.23.03.A, Missile Technology and 6.33.06.A, Terminal Homing. Coordination among the services is effected through technology coordination groups, frequent liaison visits and by exchange of components and subsystems for evaluation, and by exchange of program and technical information. The laser-guided Honest John project was transferred to this new program element from 6.33.06.A, Terminal Homing.

Senator YOUNG. How much of the work on this project is performed by Army in-house facilities?

Mr. JOHNSON. Of the $2.9 million requested for this project (Air Defense Suppression Missile), approximately [deleted] will be used in-house and [deleted] will go to contractors. Of the [deleted] in-house, about [deleted] will provide Government-furnished equipment to the contractors. The remainder of the in-house dollars will be used by the U.S. Army Missile Command [deleted] the project manager for Aircraft Weapons System [deleted] and the Yuma Proving Ground [deleted] for the flight testing of the program.

Chairman ELLENDER. Please comment on the results of your laser guided Honest John flight program.

Mr. JOHNSON. To date, the results of the laser guided Honest John flight program have not been encouraging. Only two flights have been flown and both resulted in [deleted]. The first flight flew on September 9, 1971. [Deleted.] Subsequently, the contractor, Texas Instruments, and the U.S. Army Missile Command personnel analyzed [deleted]. After this modification, we flew the second ballistic flight on December 7, 1971, [deleted]. The next flight is scheduled for [deleted]. This flight is a programed ballistic flight which should demonstrate two items: [Deleted.] The Army presently has this project under review [deleted].

PROTOTYPE HARDSITE DEVELOPMENT

Chairman ELLENDER. The next item is the request of $80,060,000 for the prototype hardsite development, which involves the development of a new system to augment the Safeguard system for the protection of additional Minuteman silos. It is suggested that all questions and discussion of this project be deferred until General Leber, the Safeguard program manager, is before the subcommittee.

MAN-PORTABLE AIR DEFENSE SYSTEM (MANPADS)

Chairman ELLENDER. The request includes $18 million for the continuation of the development of the Man-Portable Air Defense System. Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: ENGINEERING DEVELOPMENT

Description.—The purpose of this program is to develop, test, and field a successor to the current REDEYE. The MANPADS candidate, REDEYE II, will be deployed with both Army and Marine Corps forward combat elements and is expected to replace the current REDEYE on a one-for-one basis. REDEYE II is similar to current REDEYE in that it is a shoulder-fired, passive, infra-red homing guided missile system. REDEYE II will have a higher performance rocket motor, an advanced seeker, and a new launcher. The total weight of the missile and its launcher in the ready-to-fire configuration will be [deleted] pounds. The fire unit will be a two-man team, carrying a basic load of six missiles. Provision to use a lightweight Identification, Friend or Foe, and a night vision device to enhance system capabilities is being considered in the development cycle.

Work performed by.—Development of the REDEYE II system is under the direction of the U.S. Army Missile Command, Redstone Arsenal, Alabama. The prime contractor is the Pomona Division of General Dynamics, Pomona, Califor-

nia. Atlantic Research division of the Susquehanna Corporation, Greenville, Virginia, is expected to be the developer and producer of the rocket motor. Other government agencies which will contribute during the development phase are the U.S. Army Munition Command, Dover, New Jersey (missile warhead), and U.S. Army Electronics Command, Fort Monmouth, New Jersey (electronics and battery).

PROGRAM ACCOMPLISHMENTS AND FUTURE PLANS

Fiscal year 1972 program.—Entry into engineering development during the 4th quarter, FY 1972. Additional activity being carried on includes preparation of the Development Concept Paper and formal establishment of an approved Material Need. Refinement of REDEYE II system capabilities against current and postulated targets based on computer simulations is being carried out.

Fiscal year 1973 planned program.—The majority of component development will be completed during FY 1973. Extensive component testing will be conducted.

Program to completion.—Finish component and system development and conduct all required testing (Research and Development Acceptance Testing, Engineering Tests, Expanded Service Tests). Initiate procurement.

RESOURCES

[In millions of dollars]

	Fiscal year—				
	1971 and prior	1972	1973	Additional to completion	Total estimated cost
R.D.T. & E. funds	11.6	6.9	18.0	[Deleted.]	
R.D.T. & E. man-years	10	7	7		

Senator YOUNG. It is my understanding that the objective of this effort is to develop a system to replace the existing Redeye air defense missile system. Am I correct about this?

Mr. JOHNSON. Yes, sir; you are correct.

Senator YOUNG. Just what are you looking for in this new system that you do not have in the Redeye?

Mr. JOHNSON. The Redeye has [deleted].

Chairman ELLENDER. Tell us exactly what you plan to do with the $18 million you are requesting for fiscal year 1973.

Mr. JOHNSON. Fiscal year 1973 will be the first year of engineering development. System design will be finalized, wind tunnel investigations completed, rocket motor qualification will be started, and the eject motor fabricated and demonstrated. Long leadtime items will be procured. These activities will lead to engineering design flights and full system flights scheduled for fiscal year [deleted].

Chairman ELLENDER. On page 237 of the descriptive summary, I note the following statement: "Redeye II will have a high performance rocket motor, an advanced seeker, and a new launcher." Which of these three components do you determine to be the pacing item in the development of this new air defense missile?

Mr. JOHNSON. The advanced seeker is considered to be the pacing item in development.

Chairman ELLENDER. I note that, through fiscal year 1972, about $18.5 million has been made available for this R. & D. effort. What has been accomplished with those funds?

Mr. JOHNSON. The $18.5 million has been expended to develop critical components since 1965. Extensive measurements of jet aircraft infrared characteristics were conducted to define required seeker per-

formance. Seekers were fabricated for laboratory and field tests to prove their adequacy. [Deleted.] Heavy wall and flight weight dual thrust motors have been assembled and fired. An extensive computer simulation has been developed to predict missile performance prior to and during tests. These activities have verified the technical feasibility of all critical components to permit an orderly engineering development program.

KWAJALEIN MISSILE RANGE (KMR)

Chairman ELLENDER. Of the total requested for "Missiles and related equipment," $77.1 million is for the management and support of the Kwajalein Missile Range. Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: MANAGEMENT AND SUPPORT

Description.—Kwajalein Missile Range (KMR) is a national missile range managed and operated by the Army for the purpose of strategic offensive missile, ballistic missile, defense and space defense testing. The Commanding General, U.S. Army SAFEGUARD System Command is the National Range Commander for KMR. KMR utilizes fifteen islands in the Kwajalein Atoll which is located some 2100 miles southwest of Honolulu. Most of the activities and population of KMR are located on the islands of Kwajalein, at the southern tip of the Atoll, Roi-Namur, at the northern tip, and Meck, 17 miles northeast of Kwajalein. This isolated civilian community of almost 5000 people is under the direction of the Commanding Officer, KMR with a small Army and civil service staff of approximately 50 personnel. The remaining operating personnel are predominantly civilian contractor personnel who fall into four general categories: logistic support, technical range support, construction, and the prime and sub-contractors for the major range-user programs. The principal range-user programs with sizeable concentrations of equipment and personnel at KMR are the SAFEGUARD System and the Advanced Ballistic Missile Defense Program. The other major users are the Air Force and Navy ICBM/SLBM programs which fire ATLAS, TITAN, MINUTEMAN, POLARIS and POSEIDON missiles into the KMR area.

Work performed by.—Military, civil service, and contractor personnel. The current logistical support and technical support contractors are Global Associates, Inc., Oakland, California, and Kentron Hawaii, Ltd., Honolulu, Hawaii, respectively. The MIT Lincoln Laboratory, Lexington, Massachusetts; Radio Corporation of America, Moorestown, New Jersey and Sylvania Electric Company, Inc., Waltham, Massachusetts perform the operation and maintenance for the Kiernan Re-entry Measurements Site (KREMS) on Roi-Namur. Other major contractors are Philco-Ford of Palo Alto, California and Control Data Corporation of Minneapolis, Minnesota. Government agencies providing support are the U.S. Army Missile Command, Redstone Arsenal, Alabama; Military Airlift Command, Scott AFB, Illinois; Military Sealift Command, Washington, D.C.; Federal Aviation Agency, Washington, D.C.; and National Weather Service, Washington, D.C. The Martin Zachry Company, Honolulu, Hawaii, under contracts administered by the Corps of Engineers, is performing KMR, SAFEGUARD System and Advanced Ballistic Missile Defense Program construction on Kwajalein Atoll. The major contractors for range-user programs include Western Electric Company, New York, New York; McDonnell-Douglas Aircraft Company, Santa Monica, California; and Martin-Orlando, Orlando, Florida (SAFEGUARD System).

Fiscal year 1972 program.—KMR continues to provide support, on a nonreimbursable basis, to all range users. The fiscal year 1972 workload is slightly reduced from fiscal year 1971. However, the missions are much more complex because of the increasing sophistication and numbers of experiments on each missile test. The SAFEGUARD remote launch facilities on Illeginni became operational in October 1971 with the first launches scheduled for the [deleted]. The newly modified TRADEX Radar and recently acquired MPS-36 metric radar

became operational in October 1971. Because the Discrimination Radar (DR) and Target Tracking Radar (TTR), represented redundant capabilities at a very high operational cost, these radars, were inactivated as range sensors. Savings realized have been used to absorb contract cost increases and cost of taxes enacted by legislative bodies of the Trust Territory of the Pacific Islands. Essential modernization and equipment are continuing with emphasis on improvement of telemetry and timing, expansion of the real-time target tracking capability and upgrading the satellite communications terminal to be compatible with DCS Phase II satellites.

Fiscal year 1973 planned program.—The KMR will continue to provide, maintain and operate a national range to support strategic offensive and defensive test programs and to operate re-entry radars to support all DOD re-entry programs. The workload in fiscal year 1973 is projected to be equivalent to the fiscal year 1972 workload. Projections of missile launches into KMR in support of strategic offensive systems show [deleted] while support to defensive programs, primarily SAFEGUARD, Hardsite and ABMA will [deleted] in fiscal year 1973. The nature of the workload will continue to increase in complexity, requiring the operation and maintenance of additional instrumentation sites and achievement of better accuracy and precision. Off-line modifications to ALTAIR to provide a simulation of the Perimeter Acquisition Radar (PAR) for the SAFEGUARD System are scheduled for completion in the third quarter fiscal year 73. Modernization and equipment improvements to support user test requirements will continue. Emphasis will be on telemetry, photo-optics and communications improvements, and expansion of the real-time target tracking capability.

Program to completion.—This is a continuing program.

RESOURCES

[In millions of dollars]

	Fiscal year—			Additional to completion	Total estimated cost
	1971	1972	1973		
R.D.T. & E.	77.3	79.7	77.1	Continuing	Not available.
R.D.T. & E. man-years	120	151	143	Not available	Do.

Chairman ELLENDER. I note that your request of $77.1 million for fiscal year 1973 is $2.6 million less than the sum provided for fiscal year 1972. Comment on this decrease in funds requested.

Mr. JOHNSON. The $2.6 million reduction in funding required at Kwajalein Missile Range between fiscal years 1972 and 1973 is attributable to a reduction in contract costs for operation and maintenance of two radars. The ARPA long-range tracking and instrumentation radar will be closed down 3 to 4 months in mid-fiscal year 1973 for modifications, thus saving $1.6 million in operation costs. The discrimination radar was completely phased out of operation in fiscal year 1972. This has provided a savings of $1 million in the fiscal year 1973 program.

Senator YOUNG. In fiscal year 1973, how much of the total effort of the Kwajalein Missile Range will be concerned with the development of the Safeguard system?

Mr. JOHNSON. In fiscal year 1973, approximately 50 percent of the total Kwajalein Missile Range effort will be in support of the Safeguard system tests.

Chairman ELLENDER. Do the $77.1 million you are requesting in the R.D.T. & E. appropriation and the $5.7 million in the military construction appropriation make up the total funding of the Kwajalein Missile Range?

Mr. JOHNSON. No. There is an additional $293,000 of military personnel appropriation funds for the 30 military personnel assigned to the range.

Senator YOUNG. How many civilian employees are at the Kwajalein Missile Range and how much of the $77.1 million you are requesting is for their compensation and benefits?

Mr. JOHNSON. There are 120 civilian employees at the Kwajalein Missile Range. In fiscal year 1973, $2,616,000 is required for the pay and benefits of these personnel.

WHITE SANDS MISSILE RANGE (WSMR)

Chairman ELLENDER. The last item to be considered in the "Missiles and Related Equipment" budget activity is the request for $77 million for the management and support of the White Sands Missile Range. Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: MANAGEMENT AND SUPPORT

Description.—WSMR is a national missile range managed and operated by the Test and Evaluation Command of the Army Materiel Command for the purpose of supporting missile, aircraft and space vehicle tests of various national programs. WSMR is located in south central New Mexico, north of El Paso, Texas, and occupies a land area about 40 miles wide (E–W by 100 miles long (N–S). A leased range extension about 40 miles square lies adjacent to the northern boundary. Several off-range launch and impact areas in New Mexico and Utah are also used under lease agreements. WSMR supports field tests for the military services, Advanced Research Projects Agency (ARPA), National Aeronautics and Space Administration (NASA) and the Atomic Energy Commission (AEC). Additionally, laboratory tests of Army missile systems and associated equipment are conducted. WSMR currently supports 120 to 130 different programs. Types of tests include: surface-to-surface, surface-to-air, air-to-air, and air-to-surface missile firings; space vehicle and target development; re-entry physics research; upper atmosphere research; bomb drop tests; aircraft systems development; advanced radar research; and missile unit training firings.

Work performed by.—Military, civil service, and contractor personnel. Major contractors include: Computing and Software, Inc., El Paso, Texas; New Mexico State University (Physical Science Laboratory), Las Cruces, New Mexico; Dynalectron Corp., Washington, D.C.; Lockheed Electronics Co., Plainfield, New Jersey; Radio Corporation of America, Moorestown and Camden, New Jersey; Southwest Aviation, Inc., Las Cruces, New Mexico; Riverside Research Institute, New York, New York. In addition there are 40 other contractors with contracts totaling approximately $2.0M. Government agencies providing support are the U.S. Army Electronics Command, Fort Monmouth, New Jersey; U.S. Army Strategic Communications Command, Fort Huachuca, Arizona; U.S. Army Topographic Command, Washington, D.C.; U.S. Army Research Office, Durham, North Carolina; U.S. Army Corps of Engineers, Albuquerque, New Mexico; Lexington Army Depot, Lexington, Kentucky; U.S. Air Force Special Weapons Test Center, Kirkland and Holloman Air Force Bases, New Mexico; Department of Commerce, National Bureau of Standards, Washington, D.C.

Fiscal year 1972 program.—WSMR continues to provide support, on a non-reimbursable basis, to range users. The FY 72 workload is projected to remain at approximately the FY 71 level. Major projects include: LANCE, Improved HAWK, REDEYE, ASROV, PERSHING, SHILLELAGH, ATHENA, CHAPARRAL, AEROBEE, MAVERICK, TALOS and UpSTAGE. Essential improvements and modifications to range sensors and support equipment are being provided at a level of $7.0M. Emphasis in the FY 72 modernization program is

in optical measurement and tracking, radar and telemetry equipment improvements, communications, timing and improved data handling and processing.

Fiscal year 1973 planned program.—WSMR will continue to operate a national range providing common user support to DOD and NASA programs. In 1973, these will include programs such as ATHENA, LANCE, REDEYE, PERSHING, ASROV, AEROBEE, CHAPARRAL, Navy Fleet Weapon Systems Testing, Short Range Attack Missile (SRAM), and Surface-to-Air Missile Development (SAM–D). The range workload is projected to remain at about the FY 72 level. Modernization procurement in FY 73 is estimated at $5 million. Range modernization will continue in order to provide more accurate and timely missile flight performance data, emphasizing improvements to the fixed telescope system, timing system, and communications equipment, as well as upgrading data accuracy, handling and processing techniques.

Program to completion.—This is a continuing program.

RESOURCES

[In millions of dollars]

	Fiscal year—			Additional to completion	Total estimated cost
	1971	1972	1973		
R.D.T. & E. funds	75.0	78.9	76.9	Continuing	Not available.
R.D.T. & E. man-years	3,240	3,173	3,088	Not available	Do.

Chairman ELLENDER. In the descriptive summary, I note the following statement:

WSMR supports field tests for the military services, Advanced Research Projects Agency (ARPA), National Aeronautics and Space Administration (NASA) and the Atomic Energy Commission (AEC).

Are you reimbursed by these agencies for the use of the range?

Mr. JOHNSON. The Advanced Research Projects Agency is a Department of Defense activity and does not normally reimburse the range for test support. The National Aeronautics and Space Administration and the Atomic Energy Commission provide reimbursement in accordance with support agreements between these agencies and the White Sands Missile Range. The agreements require reimbursement for any additional costs that White Sands incurs as a result of providing support to their programs.

Senator YOUNG. Describe some of the major systems to be tested at this range in fiscal year 1973.

Mr. JOHNSON. In 1973, Athena, Lance, Redeye, Pershing, Asrov, Aerobee, Chaparral, Navy fleet weapon systems testing, short-range attack missile (SRAM), and surface-to-air missile development (SAM–D) will be tested at White Sands Missile Range. The range workload is projected to remain at about the fiscal year 1972 level. Modernization procurement in fiscal year 1973 is estimated at $5 million. Range modernization will continue in order to provide more accurate and timely missile flight performance data, emphasizing improvements to the fixed telescope system, timing system, and communications equipment, as well as upgrading data accuracy, handling and processing techniques.

Senator YOUNG. How many civilian employees are there at WSMR and how much of the funds requested is for their compensation and benefits?

Mr. JOHNSON. Including all range users and tenant activities, a total of 5,906 civilian employees are currently employed at White

Sands Missile Range; 2,478 of these are associated with the national range mission and $36,759,000 of this request is for the pay and benefits of these 2,478 employees.

Chairman ELLENDER. What will you do with the $500,000 you are requesting under the "Military construction" appropriation for fiscal year 1973?

Mr. JOHNSON. The $500,000 is required for the construction of three instrumentation sites for the distant optical attitude measurement system.

MILITARY ASTRONAUTICS AND RELATED EQUIPMENT

Chairman ELLENDER. The next budget activity to be considered is "Military Astronautics and Related Equipment" for which you are requesting $18.9 million. How much was provided for this budget activity in fiscal years 1971 and 1972?

Mr. JOHNSON. In fiscal year 1971 $6,120,000 was provided and in fiscal year 1972 $10,810,000 was provided for this budget activity.

SATELLITE COMMUNICATIONS GROUND TERMINALS

Chairman ELLENDER. The entire amount requested for "Military Astronautics" for fiscal year 1973 is for a program entitled "Satellite Communications Ground Terminals." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: OPERATIONAL SYSTEMS

Description.—This program includes the development of strategic and tactical ground terminals for use with satellite communications systems. Two projects are included in this program element: The Defense Satellite Communications System (DSCS) and the Tactical Satellite Communication System (TACSATCOM). Ground terminals for all of the services are developed within this program.

Work performed by.—The U.S. Army Satellite Communications Agency, Fort Monmouth, New Jersey. Contractors include: TRW, Redondo Beach, California; AIL, Nutley, New Jersey; Collins Radio, Cedar Rapids, Iowa; and Philco-Ford, Palo Alto, California. Anticipated bidders for a TACSATCOM SHF terminal development are: ITT, Nutley, New Jersey; Collins Radio, Cedar Rapids, Iowa; RCA, Camden, New Jersey; and Radiation, Inc., Melbourne, Fla.

Fiscal year 1972 program.—DSCS: Begin engineering test/service test (ET/ST) of the new heavy and medium terminals; award engineering development contracts for time division multiple access (TDMA) and modulation equipment. TACSATCOM: Award contracts for engineering development of ¼ and 1¼ ton terminals, and associated efforts on antennas and modulators—demodulators.

Fiscal year 1973 planned program.—DSCS: Continue ET/ST of the heavy and medium terminals and development of TDMA and modulation equipment. Initiate developmen tof a light terminal. TACSATCOM: Initiate engineering development of an ultra high frequency (UHF) manpack terminal and a super high frequency (SHF) communications control facility.

Program to completion.—This is a continuing program.

Resources (in millions of dollars):

R.D.T. & E. funds for fiscal year 1971 and prior, $33.6; fiscal year 1972, $10.8; fiscal year 1973, $18.9; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. There are two projects to be funded under this program element. The first is entitled "Defense Satellite Communi-

cations System—Defense Communications System (phase II)," for which you are requesting $9.4 million. Please describe this project.

Mr. JOHNSON. This project is to provide for the development of improved equipment for the DSCS in response to requirements placed on the Army by the Defense Communications Agency (DCA). In the DSCS project, the Army develops the satellite ground terminals and associated equipment for the satellite subsystem of the Defense Communications System (DCS). The DSCS ground complex (phase I) consists of two types of terminals—the heavy and medium terminals. In phase II, DSCS, the Army is to develop a new heavy and medium terminal and associated modulation equipment with high capacity and reliability. These terminals are required to satisfy known and contingency operational needs of the Worldwide Military Command and Control System, the National Communications System, and other elements of the DCS.

Senator YOUNG. How much of the work on this project is performed in Army in-house facilities?

Mr. JOHNSON. Approximately 16 percent, the remaining 84 percent being accomplished under contract.

Chairman ELLENDER. Describe the relationship between this project and the Defense Communications Agency.

Mr. JOHNSON. The Defense Communications Agency has appointed the project manager who has tasked the services to develop various subsystems. The Army has been tasked to develop the ground terminals and earth subsystems.

Senator YOUNG. Tell us exactly what you will be doing with the $9.4 million you are requesting for fiscal year 1973, and comment on your need for the increase of $1.7 million you are requesting.

Mr. JOHNSON. We will be using the $9.4 million to continue funding the contracts let during the late fiscal year 1972 in development of the time division multiple access, the [deleted] equipment for transmission, the encoder-decoder effort, testing, and internal programs support. The $1.7 million will be used for new engineering development contracts for the light ground terminal and a command and control system.

TACTICAL SATELLITE COMMUNICATIONS

Chairman ELLENDER. The second project to be funded under the satellite communications ground terminals program element is entitled "Tactical Satellite Communications" for which you are requesting $9.5 million. Please describe this project.

Mr. JOHNSON. The Army, along with the other services, requires a family of manpack and mobile tactical satellite communications terminals to improve the effectiveness and reliability of the communications equipment to meet selected tactical requirements. The objectives of this program are (*a*) to develop engineering and service test models of tactical communications terminals, (*b*) to develop operational concepts, and (*c*) to support military operational needs. This equipment will replace existing equipment where it is more cost effective or to fulfill important requirements that are not being accomplished by other means. Items under development include a manpack transceiver, two sizes of vehicular terminals, and associated control equipment.

Senator YOUNG. How are your efforts in this field and those of the Air Force and the Navy coordinated?

Mr. JOHNSON. This is a triservice program with the Army responsible for ground terminals, the Navy responsible for shipboard terminals, and the Air Force responsible for the space subsystem, or satellites. Intensive management is provided by the Office of the Assistant Secretary of Defense (Telecommunications).

Chairman ELLENDER. What will you do with the $9.5 million you are requesting for fiscal year 1973?

Mr. JOHNSON. We will continue engineering development of two vehicular mounted terminals and initiate engineering development on the manpack terminal, control subsystem [deleted] and time division multiple access equipment.

Senator YOUNG. In fiscal year 1972, $3.1 million was provided for this effort, and you are requesting $9.5 million in fiscal year 1973. Why do you need this extremely large increase?

Mr. JOHNSON. The fiscal year 1972 program provided the first year effort on the long leadtime vehicular terminal development. The balance of items in the program will begin engineering development in fiscal year 1973. The initiation of effort on these items accounts for the increase in funds.

ORDNANCE, COMBAT VEHICLES, AND RELATED EQUIPMENT

Chairman ELLENDER. The next budget activity to be considered is "Ordnance Combat Vehicles and Related Equipment" for which you are requesting $189.1 million. How much was provided for this activity in fiscal years 1971 and 1972?

General GRIBBLE. $142.6 million in fiscal year 1971 and $187 million in fiscal year 1972 were provided for this budget activity.

SHILLELAGH ANTITANK WEAPON

Chairman ELLENDER. $5,900,000 is requested for additional R. & D. work on the Shillelagh antitank weapon system. Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

OPERATIONAL SYSTEMS

Background.—The Army has developed a balanced program to improve its antitank capability worldwide but with special attention to the European theater where a serious and well recognized enemy armor threat has existed since the end of World War II. The tactical relationship between tank and antitank systems and armored and infantry forces is central to the determination of the kinds and numbers of weapons required to meet this threat. The SHILLELAGH was designed as a direct fire, guided missile type weapon system for use on combat vehicles. The system was to be distinguished by its capability of destroying the heaviest enemy armored vehicles and to be characterized by a significant improvement over conventional gun-type tank armament in its probability of hitting and its adaptability to vehicular installation and employment.

Description.—The objective of the program is to conclude Research and Development on the vehicle mounted SHILLELAGH Guided Missile System Improvements. Improvements will be in reliability, performance and maintainability. In addition, [deleted]. The SHILLELAGH Weapon System, utilizing a 152mm integrated gun/launcher, includes a direct fire, line-of-sight guided missile for employment in the programed armored combat vehicles, M551 GENERAL

SHERIDAN, the M60A2 tank and future tanks. The SHILLELAGH Missile System was accepted as standard for Army use in May 1966. During 1971 the 152mm conventional family of ammunition was moved to program 6.46.08.A. The conventional family of ammunition includes high-explosive antitank (HEAT), high-explosive (HE), training, and antipersonnel (canister) rounds.

PROGRAM ACCOMPLISHMENTS AND FUTURE PLANS

Fiscal year 1972 program.—Design and fabrication of the product improved missile system was initiated. Improvements will be in reliability, performance and maintainability. The system will be more [deleted].

Fiscal year 1973 planned program.—The development of the improved system will continue. Flight tests will be conducted to evaluate the performance of hardware designed and fabricated to date.

Chairman ELLENDER. The Shillelagh system has been operational for a number of years. Just what are you trying to accomplish in this new R. & D. effort?

General GRIBBLE. The objective of this program is to conclude research and development on the Shillelagh Guided Missile System Improvements initiated in fiscal year 1972. Improvements will be in reliability, performance and maintainability. In addition, the present missile beacon (Xenon) will be replaced by a Gallium Arsenide beacon to provide countermeasure hardening.

TOW ANTITANK ASSAULT WEAPON

Chairman ELLENDER. Of the total requested for "Ordnance, combat vehicles and related equipment," $200,000 is for the project entitled "Heavy Antitank Assault Weapon—TOW." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: OPERATIONAL SYSTEMS

Background.—The Army has developed a balanced program to improve its antitank capability worldwide but with special attention to the European theater where a serious and well recognized enemy armor threat has existed since the end of World War II. The tactical relationship between tank and antitank systems and armored and infantry forces is central to the determination of the kinds and numbers of weapons required to meet this threat. The mechanized infantry battalions must be able to stand their ground to canalize enemy attacks into narrow sectors for destruction by air strikes and counterattack by our own tank forces. The TOW is part of a family of infantry antitank weapons consisting of the Light Antitank Weapon (LAW), the Medium Antitank Weapon (DRAGON), and the Heavy Antitank Weapon (TOW). The planned system is designed to defeat attacking armor laterally and in depth. Each weapon is a vital link in the family and the elimination of any part would seriously degrade our antitank capability. The TOW provides a heavy antitank/assault capability for the infantry, airborne infantry, airmobile and mechanized infantry battalion. Its primary purpose is to defeat the heaviest known enemy armor at ranges out to 3,000 meters.

Description.—TOW is an acronym for Tube Launched, Optically tracked, Wire guided Antitank/Assault Weapon. After launch the missile is tracked with an infrared sensor seeking emissions from an infrared flare in the base of the missile. Signals from the flare through the sensor are converted into command corrections to the missile through the wire link. The system is air droppable and crew transportable. In addition to the ground mount capability it can be mounted in a ¼ ton truck, a ½ ton Army mule, and an M113 Armored Personnel Carrier. The missile can be used on helicopters when necessary airborne control equipment is provided. Its minimum range is 65 meters and its maximum

3000 meters. Significant performance characteristics of TOW vs. the system it replaces, the 106mm Recoilless Rifle, are: effective range, 3000 vs. 1100 meters; system weight, 228 vs. 460 pounds; accuracy (stationary target), [deleted] percent at 3000 meters vs. [deleted] percent at 850 meters; and armor penetration, [deleted] inches vs. [deleted] inches.

Fiscal year 1972 program.—Environmental testing in extreme temperatures and environments continued.

Fiscal year 1973 planned program.—The present weapon development program will be completed. The night sight development will continue under program 6.47.23.A.

Program to completion.—The present development program will be completed in fiscal year 1973. The night sight program will continue under program 6.47.23.A.

Resources (in millions of dollars):

R.D.T. & E. funds for fiscal year 1971 and prior, $102.0; fiscal year 1972, $0.7; fiscal year 1973, $0.2; additional funds to completion are $0.0; and the total estimated cost is $102.9.

Chairman ELLENDER. The TOW missile has been procured for several years now. What is included in your development program for fiscal year 1973, and what will you do with the $200,000 you are requesting?

General GRIBBLE. In fiscal year 1973 we will complete the final service test report and prepare and store the research and development hardware used during the development program.

MEDIUM ANTITANK ASSAULT WEAPON (DRAGON)

Chairman ELLENDER. $3,420,000 is requested for the continuation of the R. & D. on the Dragon Medium Antitank Assault Weapon. Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: OPERATIONAL SYSTEMS

Background.—The Army has developed a balanced program to improve its antitank capability worldwide but with special attention to the European theater where a serious and well recognized enemy armor threat has existed since the end of World War II. The tactical relationship between tank and antitank systems and armored and infantry forces is central to the determination of the kinds and numbers of weapons required to meet this threat. The infantry battalions must be able to stand their ground to canalize enemy attacks into narrow sectors for destruction by air strikes and counterattack by our own tank forces. The DRAGON is part of a system of antitank weapons consisting of the Light Antitank Weapon (LAW), the Medium Antitank Weapon (DRAGON), and the Heavy Antitank Weapon (TOW). Each weapon is a vital link in the system and the elimination of any part, especially the higher density weapons, would seriously degrade our antitank capability. The DRAGON is a result of a long standing requirement for a weapon which would provide the infantryman with improved capability against tanks and hard targets over that provided by its predecessor (90mm Recoilless Rifle M67). The Army has a requirement for a medium antitank/assault weapon that is lightweight, man-portable, accurate, and that will provide an antitank/assault capability for all infantry platoons. The primary purpose of the weapon is to defeat armored vehicles at a range of out to [deleted] meters. It will be employed against fortifications, emplacements, and other materiel targets. The [deleted] meter range is considered the critical range at which the tank may be engaged before it can effectively employ its secondary armament.

Description.—The DRAGON is a man-portable 30.5 pound system utilizing a command to line-of-sight guided missile, launched (recoilless) and automati-

cally guided to the target by a tracker which issues electronic commands by wire link to the missile. The weapon is comprised of a 23.8 pound "round" made up of a launcher and missile, both expendable, and a non-expendable tracker weighing 6.7 pounds. The DRAGON will provide the primary antitank capability for rifle platoons and will be employed within platoon areas. The system will accompany dismounted infantry as a man-carried weapon and will provide assault fire against hard point targets, such as weapon emplacements and field fortifications, in addition to its antitank role. It will replace the 90mm Recoilless Rifle. Some significant statistics of DRAGON versus the 90mm recoilless weapon are: Weight loaded 30.5 pounds vs 44.0 pounds; range [deleted] meters vs 450 meters; lethality penetration in excess of [deleted]. Single Shot Hit Probability (SSHP) against a moving target of [deleted] at [deleted] meters for DRAGON and [deleted] at 275 meters for the 90mm Recoilless Rifle.

PROGRAM ACCOMPLISHMENTS AND FUTURE PLANS

Fiscal year 1971 and prior accomplishments.—The DRAGON is undergoing a concurrent engineering and production engineering development effort initiated in 1966. The pilot line was completed in October 1970. Guided Flight Tests were completed in February 1971. The test to determine the best of two possible concepts for a night sight was completed in June 1971. The thermal imaging night sight was selected for continuation in Engineering Development.

Fiscal year 1972 program.—Prototype Flight Tests were completed in November 1971. A ten-pound thermal imaging night sight with a required range of [deleted] meters entered Engineering Development in October 1971. The Expanded Service Test commenced in January 1972.

Fiscal year 1973 planned program.—The temperate portion of the Engineering/Expanded Service Tests are scheduled to be completed in November 1972 (Weapon). Type Classification Standard A is scheduled in January 1973 (Weapon). The Engineering/Service Tests are scheduled to commence in June 1973 (Night Sight).

Program to completion.—Environmental tests are scheduled for completion in July 1973. The First Unit Equip date is scheduled in January [deleted]. Work on the night sight will continue. The first unit is scheduled to be equipped with the night sight in November [deleted].

Senator YOUNG. Funds were provided in fiscal year 1972 for the initiation of production of Dragon, and substantial funds are included in the 1973 request for the production of this missile. What is the current status of the Dragon R. & D. program?

General GRIBBLE. The Dragon R. & D. program is currently undergoing engineering/expanded service tests.

Chairman ELLENDER. When do you expect this system to be fielded with the troops?

General GRIBBLE. The first unit to be equipped with the Dragon is scheduled for January 1975.

Chairman ELLENDER. What is the current status of the effort to develop a night sight for the Dragon missile system?

General GRIBBLE. The thermal imaging night sight is currently in engineering development.

SURFACE MOBILITY COMPONENTS AND TECHNIQUES

Chairman ELLENDER. Of the total requested for "Ordnance, combat vehicles and related equipment," $6.9 million is requested for the program element entitled "Surface Mobility Components and Techniques." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

SURFACE MOBILITY COMPONENTS AND TECHNIQUES

EXPLORATORY DEVELOPMENT

Description.—Exploratory development of tactical and combat vehicle components is directed toward increased reliability, increased probability of mission accomplishment, and techniques for longer life in tires, tracks, electrical components, suspension systems, long range concepts for combat vehicles, vehicle armor protection against mines, shaped charges, and kinetic energy projectiles, long range tactical vehicle concepts, vehicle compatibility with CBR and nuclear detection kits, and miscellaneous kits such as heaters. Completed component developments are included in major sub-assemblies and total system design either; during product improvement to eliminate deficiencies or improve performance, reliability, maintainability and safety; or integrated in major vehicle development. Also included is exploratory development to support the US Army marine mission of providing logistical transportation from ocean transport vessels to inland transfer points and support studies to establish Army Marine equipment in the 1975–1985 time frame, and diagnostic and test equipment for surface systems.

PROGRAM ACCOMPLISHMENTS AND FUTURE PLANS

Fiscal year 1972 program.—Tasks previously started are continuing; e.g., work on a water-activated battery; work on radiological armor has been reduced to "maintaining data" on the state-of-the-art; there is increased exploratory development in combat and tactical mine armor; studies have been initiated on the use of physical phenomena which can be utilized to defeat shaped charges; continued work on non-metallic coatings to inhibit vehicle corrosion; experimentation with new metal joining methods; study new concepts for isolation and damage miniaturization of fuel and ammunition fires; continue studies and testing of vehicle fire suppression; vehicle noise attenuation; traction over snow and ice; compact 24-volt military vehicle battery; solid state vehicle ignition system; assist US Army Combat Development Command in technical feasibility studies of 5 candidate craft in Trans-Hydro study; laboratory experimentation on improved track rubber; initiation of testing of an experimental variable spring rate ball screw suspension system; continued study of the sealed disc type brake; vehicle noise attenuation including vehicle signature analysis; continued development on a multifuel vehicle heater family; cold weather starting kits and cold weather combat vehicle windscreens.

Fiscal year 1973 planned program.—Tasks previously started will continue. There will be increased effort on improved vehicle reliability through exploratory development in automatic diagnostic and test equipment; combat 24-volt military batteries; solid state ignition; multi-fuel military vehicle heater and winterization kits; sealed disc brakes; automatic electrical component protection; improved heat treatment of steels to minimize gear failures, fatigue failure, metal crushing and failure; computer simulation of electrical systems; improved engine rating systems; improved cooling system design; improved air cleaners; optimized springing components; improved roadwheels; temperature controlled battery charging; improved vehicle instruments—all related to a proposed project "Engineering Audit". There will be increased effort in combat and tactical vehicle mine protection armor. Studies on phenomena to defeat shaped charges will continue. Increased effort is planned for vehicle noise attenuation. There will be continuing work on improving craft for "logistics-over-the-shore" with actual development performed by the US Navy. A new concept of a light-weight spaced kinetic energy projectile armor pioneered by Frankford Arsenal will be studied for future vehicle application.

Program to completion.—This is a continuing program.

Resources (in millions of dollars):

R.D.T. & E. funds for fiscal year 1971, $6.1; fiscal year 1972, $6.9; fiscal year 1973, $6.9; additional funds to completion are continuing; total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972 and the request for fiscal year 1973.

General GRIBBLE. Yes, sir.

(The information follows:)

FUNDING

[Dollars in millions]

Project	Fiscal year— 1971	1972	1973
1G562601AF02—Vehicle armor techniques	$0.600	$0.623	$0.620
1G562601DF03—Automotive vehicle investigations	1.000	1.059	1.530
1G562601DF04—Automitive components techniques	1.165	1.443	1.490
1G562601AJ29—Testing, measuring, and diagnostic equipment	.250	.850	1.100
1T562601A259—AntiArmor systems and armor vulnerability	1.100	1.105	.500
1G562601D263—Vehicle tracking and suspension technology	1.220	1.267	1.470
1G562601A412—Sea-to-inland logistics systems	.500	.592	.230
2M562601A724—Studies extreme region	.250	0	0
Total	6.085	6.939	6.940

Senator YOUNG. The other armed services seem to be engaged in related efforts. How are these efforts coordinated?

General GRIBBLE. The coordination that takes place is dependent upon the requirements of the task involved. The Army is the primary proponent for Ground Surface Mobility. In the case cited in the descriptive summary the Air Force and Navy came to the Army with a firm requirement to develop vehicle tires that were peculiar to their needs. The coordination in these cases took place at the lowest possible level to insure that the other service requirements were, in fact, understood and met. The coordination with the Navy on the transhydro study takes place at the studies advisory group level. A Navy adviser provides the Navy input and insures with the Army members that the interface points are understood and clearly defined.

Chairman ELLENDER. Describe some of the major efforts to be considered during fiscal year 1973 under this program.

General GRIBBLE. There will be increased effort to improve vehicle reliability through exploratory development in automatic diagnostic and test equipment. Work will continue in such fields as combat 24-volt military batteries; solid state ignition systems; multifuel military vehicle heater and winterization kits; sealed disc brakes; improved heat treatment of steels to minimize gear failures and fatigue failures; improved engine rating systems; improved cooling system design; improved air cleaners; optimized springing components; improved roadwheels; and improved vehicle instruments. There will be increased effort in combat and tactical vehicle mine protection armor. Studies on phenomena to defeat shaped charges will continue. Increased effort is planned for vehicle noise attenuation. There will be continuing work on improving craft for "logistics-over-the-shore" with actual development performed by the U.S. Navy. A new concept of a lightweight spaced armor pioneered by Frankford Arsenal to defeat kenetic energy projectiles will be studied for future vehicle application.

Chairman ELLENDER. It would appear that this program will be continued at roughly the same level in fiscal year 1973 as in fiscal year 1972. Am I correct?

General GRIBBLE. Yes; you are correct.

FIREPOWER OTHER THAN MISSILES

Chairman ELLENDER. $13.8 million is requested for the program entitled "Firepower Other Than Missiles." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

This program enables the Army to keep abreast of and advance the state-of-the-art across the entire spectrum of Army weapons and ammunition, except missiles, in order to permit timely initiation of development projects for improved weapon systems. The program also enables the Army to recognize and exploit technical breakthroughs to insure early availability of the most modern and effective weapon systems. To enhance management, this program element has been restructured and consolidated into the following areas:

1. *Vehicle Fire Control Technology, Tank/Antitank.*—Exploratory development of systems and/or components for target acquisition and fire direction of vehicle mounted weapons.

2. *Armor Weapon Systems Technology.*—Advance the state-of-the-art of tank cannon and tank cannon ammunition.

3. *Field Artillery Weapon Systems Technology.*—Design, fabrication and test of artillery cannon, mortar and rocket materials; components and weapons.

4. *Infantry Support Weapons Systems Technology.*—Investigation of techniques to improve the performance and safety of hand grenades, pyrotechnics, mortars and mortar ammunition, propellant actuated devices (PAD), heavy machine gun systems, and recoilless weaponry.

5. *Effectiveness of Land Combat Weapons Systems and Firing Tables and Ballistic Data for Land Combat Weapons.*—Analyze the most vulnerable aspects of potential land targets, and provide systematic, scientific means for identifying the most desirable characteristics of land combat weapons. Provide firing tables and associated ballistic data for all land combat weapons.

6. *Scientific Research for Future Antitank Assault Weapons.*—Determine system oriented target and background signatures. Investigate signature of acoustic and seismic sources and the feasibility of passive methods for guiding antitank missiles. Conduct theoretical and experimental research to meet long range requirements for target acquisition and antitank missile guidance.

7. *Improved Conventional Munitions.*—Investigate new techniques and material that will greatly increase the effectiveness of artillery and hand-held weapons against material and personnel targets. Effort will be directed toward providing increased effectiveness against armor and material targets through improved kill mechanisms for submissiles as well as target acquiring submunitions.

8. *Gun Propellants and Explosives.*—Exploratory development of new explosives, new applications of explosives, new explosive systems, tests for the characterization of explosives and new propellant systems for gun fired ammunition. The increased funding for FY 73 includes an explosives project, that represents the Army portion of the Joint Services Explosive Fill Program and includes effort in pollution abatement and control at Army explosive facilities.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

General GRIBBLE. Yes, sir, I will be glad to.

(The information follows:)

FUNDING

[Thousands of dollars]

Project	Fiscal year—		
	1971	1972	1973
1G562603DF06—Vehicle fire control technology	$670	$780	$770
1W562603A003—Armor weapons systems technology	1,400	1,400	1,180
1W562603A004—Field artillery weapons systems technology	2,220	3,750	2,500
1W562603A005—Infantry support weapons system technology	1,300	1,700	1,680
1W562603A024—Cannon launched guided projectile	0	4,000	0
1T562603A041—Weapons effectiveness, target vulnerability	3,114	3,098	2,670
1M562603A286—Future antitank weapons	400	390	470
1X562603A312—Improved conventional munitions	700	1,100	1,040
1T562603A558—Gun propellants	400	400	400
1T565603A559—Explosives	700	1,950	3,090
Total	10,904	18,568	13,800

Senator YOUNG. I note that the project entitled "Cannon Launched Guided Projectile" was funded in fiscal year 1972 but not in fiscal year 1971 and you are not requesting any funds for fiscal year 1973. Please comment on this.

General GRIBBLE. Funding was not provided in fiscal year 1971 due to budgetary constraints. Four million dollars has been requested in fiscal year 1972 as a portion of the Army's supplemental request.

Chairman ELLENDER. Of the total requested for "Firepower Other Than Missiles," $3.1 million is for the project entitled "Explosives Exploratory Development." Please describe the major efforts to be undertaken in this project in fiscal year 1973.

General GRIBBLE. Three major areas of work (with approximate percentages of fiscal year 1973 dollar effort in parentheses) are being performed under this project: (1) Materials, processes and detonation studies for explosives (25 percent); (2) long-range explosives fill program (45 percent); and (3) pollution abatement (30 percent). Utilization rates of explosives in Vietnam revealed a need for cheaper and more plentiful alternative explosive fills for bombs, shells, and munitions. Increased emphasis is being placed upon obtaining these alternate explosive fills. Further, a number of changes may be necessary in the processes used in Government-Owned, Contractor-Operated (GOCO) explosives manufacturing facilities to reduce air and water pollution as directed by Executive Order 11507, "Prevention, Control, and Abatement of Air and Water Pollution at Federal Facilities." New investigations for this purpose have been added. Both the explosive fill and the pollution abatement investigations need to be performed during fiscal year 1973 and subsequent years to provide information for GOCO explosive facility modernization programs being planned for the mid and late 1970's.

Chairman ELLENDER. How is the work on this project allocated among Army in-house facilities, academic institutions, and industrial organizations?

General GRIBBLE. In fiscal year 1972 about 75 percent of the project was performed in-house by the explosives laboratory in Picatinny Arsenal, Dover, N.J. Another Army laboratory, the Ballistic Research Laboratories, Aberdeen, Md., performed 15 percent of the work. About 10 percent of the funding went to the following contractors—ranging from $25,000 to $40,000 per contract: University of Idaho, Moscow, Idaho; Case Western Reserve, Cleveland, Ohio; University of Illinois, Urbana, Ill.; and the Stanford Research Institute, Stanford, Calif.

Senator YOUNG. The $3.1 million you are requesting for fiscal year 1973 is about $1.1 million more than was provided in fiscal year 1972. Comment on your need for this increase.

General GRIBBLE. The increase of $1.1 million for fiscal year 1973 over the funds provided for fiscal year 1972 does not constitute a new start but rather a continuation of programs initiated in fiscal years 1971 and 1972. The increase goes to support pollution abatement studies in explosives manufacture and the alternate fills program. The alternate fills program involves the development of cheaper and more readily available explosives that may be used in emergency in most nonnuclear weapons. Utilization rates of explosives in Vietnam revealed a need for alternate explosive fills for bombs, shells, and munitions. Tests are being performed on a number of alternate explosive

fills for high use munitions. These investigations must be done during fiscal years 1973 to 1975 in order to provide data for explosive facility modernization planned for the mid and late 1970's. The following specific efforts must be accomplished by this time: Search for new manufacturing processes; improve existing processes; characterize new formulation of selected alternate explosives for high use munitions.

ARMY SMALL ARMS PROGRAM (ARSAP)

Chairman ELLENDER. $6.2 million is requested for the exploratory development program entitled "Army Small Arms Program." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

EXPLORATORY DEVELOPMENT

Description.—This Program Element (PE) encompasses all of the exploratory development projects that support ARSAP. Currently in this PE are applied research (AR) projects in the following fields; Small Arms Ammunition (lightweight ammunition and tactical packaging); Individual Weapons (rifles, and self-defense weapons); Crew Served Weapons (machineguns); Components; and Special Purpose Weapons (grenade launchers and low signature weapons).

Work performed by.—The US Army Material Command (USAMC) is responsible to HQ Department of the Army for the entire PE. USAMC manages, coordinates and supervises this PE through the US Army Small Arms Systems Agency (USASASA). The work is performed by the major subordinate commands of USAMC, the US Army Weapons Command (USAWECOM), the US Army Munitions Command (USAMUCOM), either through in-house efforts of subordinates agencies or through contractors. Major contractors are: Stanford Research Institute, Menlo Park, Calif.; Whittaker Corp., Concord, Mass.; Alcoa Aluminum, Pittsburgh, Pa.; Olin Corp., East Alton, Ill.; Remington Arms Co., Bridgeport, Conn.; MBA Associates, Sam Ramon, Calif.; AAI Corp., Cockeysville, Md.; Rocketdyne Corp., Canoga Park, Calif.; Thiokol Wassatch, Brigham City, Utah; General Electric Co., Burlington, Vt.

Fiscal year 1972 program.—Fabricate sufficient advanced aluminum alloy or clad aluminum alloy cartridge cases to provide preliminary safety, reliability and productibility data. Test HITP caseless cartridges for ignition, vulnerability, erosion and cook-off characteristics. Test 30mm and Ring Airfoil grenades for velocity, range, dispersion, and lethal area uniformity. Transfer coextruded barrels to 6.3 for application to existing and future weapons. Conduct Engineer Design Test of low light level sight and verify improved daylight target acquisition.

Fiscal year 1973 planned program.—Study will continue in fiscal year 1973 in extended and interior ballistics; ignition, high energy/density projectiles to include penetration effect. Work will be continued to develop lightweight cases to include thin steel and plastic cases currently being investigated by ARPA. Tactical packaging concepts will be advanced with field testing and the development of a new 5.56mm sealed bandoleer will be completed. Develop practical weapon design parameters and obtain, with contractor support neuromuscular responses relevant to man/weapon interaction. Continue development of physical simulators to aid in improving theoretical prediction. Investigate conceptual designs of feed and firing mechanisms to meet future requirements for machineguns. Preview concepts for advanced machineguns capable of defeating armored personnel carriers at 1500 meters. New weapon gas systems will be devised and investigated in a test fixture to improve system reliability and to minimize sensitivity of tolerance variations. Complete testing and report on the reflex collimator day/night sight to increase hit probability by faster, more accurate aiming of small arms. Conduct laboratory test of material treatment to reduce erosion. Continue exploratory development of small grenade munitions and launcher systems.

Program to completion.—This is a continuing program.

RESOURCES

[In millions of dollars]

	Fiscal year—			Additional to completion	Total estimated cost
	1971	1972	1973		
R.D.T. & E.:					
Funds	5.1	5.2	6.2	Continuing	Not available.
Man-years	196	244	255	Not available	Do.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972 and the request for fiscal year 1973.

General GRIBBLE. Yes, sir.

(The information follows) :

FUNDING

[In millions of dollars]

Project	Fiscal year—		
	1971	1972	1973
1J26206A010—Small-arms ammunition technology	1.6	1.5	1.7
1J262604A543—Individual weapons	.7	.7	.7
1J262604A600—Crew-served weapons	.7	.7	.8
1J262604A607—Components	1.6	1.7	2.2
1J262604A621—Special-purpose weapons	.5	.6	.8
Total	5.1	5.2	6.2

Senator YOUNG. Why do you need the increase of almost $1 million you are requesting?

General GRIBBLE. The principle increase in funds for fiscal year 1973 is to be used to advance tactical packaging techniques for small arms ammunition. This effort should result in lighter, more effective packaging produced at a lower cost.

CHEMICAL MUNITIONS CONCEPTS

Chairman ELLENDER. $2.4 million is requested for the program entitled "Chemical Munitions Technology." Please provide a tabulation for the record listing the projects to be funded under this program element, the amounts for each for fiscal years 1971 and 1972 and the request for fiscal year 1973.

General GRIBBLE. Yes, sir.

(The information follows:)

[In millions of dollars]

Project	Fiscal year—		
	1971	1972	1973
1W562607AD11—Lethal chemical agent investigations	0.665	0.547	0.650
1W562607AD12—Incapacitating chemical agent investigations	.350	.400	.500
1W562607AD14—Lethal chemical weapons technology	1.035	.885	1.030
1W562607AD17—Incapacitating chemical weapons technology	.300	.280	.200
Total	2.350	2.112	2.380

Chairman ELLENDER. Can you give us a brief unclassified description of this program and your planned program for fiscal year 1973?

General GRIBBLE. Yes, sir. The objective of this program is to discover and evaluate nonlethal incapacitating and lethal chemical agents that meet the needs of the Army and to conduct exploratory development to determine the feasibility of tactical chemical agents munitions. The fiscal year 1973 planned program includes studies on new incapacitating chemical agents with higher potency, improved margin of safety and greater preponderance of physical—as opposed to mental—symptoms of incapacitation than that obtained with agents presently available; studies on the synthesis of V agents by the binary process; and exploratory development on the delivery of lethal binary and nonlethal incapacitating agents with submunitions.

Senator YOUNG. Why do you need the increase of almost $270,000 you are requesting?

General GRIBBLE. This program element provides the technological base for the chemical weapons program. The $270,000 increase has been requested to strengthen this base and bring it back in line with the fiscal year 1971 and earlier level of effort. Specific emphasis will be placed on the development of new binary agents and the associated weaponization of these agents.

NUCLEAR MUNITIONS DEVELOPMENT

Chairman ELLENDER. $820,000 is requested for the program entitled "Nuclear Munitions Development." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

ADVANCED DEVELOPMENT

Description.—This program supports advanced development effort in Radiacs, Atomic Demolition Munitions, and Adaption Kits for Surface-to-Surface and Surface-to-Air Missiles. Utilizing many of the concepts and components developed, prototype systems are fabricated for test and evaluation. The purpose is to investigate component interfaces and interrelationships and to prove that a complete system synthesized from these concepts or components is or is not feasible. Problems discovered may require further investigation, and in some cases may even cause the project to revert to exploratory development.

Work performed by.—Picatinny Arsenal, Dover, N.J.; Canadian Commercial Corporation, Canada; U.S. Army Electronic Command, Ft. Monmouth, N.J.; Harry Diamond Laboratories, Washington, D.C.

Fiscal year 1972 program.—[Deleted.] The basis feasibility associated with all the major subsystems and components required for adaption kit prototyping has been demonstrated; however, additional development and modifications are required in order to satisfy system peculiar restraints. Efforts will be concentrated on items for nuclear warhead sections on future [deleted]. This will include investigation, design, and testing of [deleted]. Completed a project agreement between the Army and the Canadian Department of Defense Production for the development of a Recording Radiation Monitor and Automatic Radiation Alarm System AN/GDQ-3.

Fiscal year 1973 planned program.—[Deleted.] Implement Phase I of the project agreement with Canada for the design and fabrication of five models of a Recording Radiation Monitor and Automatic Alarm System.

Program to completion.—This is a continuing program. Selected projects advancing into engineering development status will be replaced by those advancing from exploratory development.

Resources (in million of dollars):

R.D.T. & E. funds for FY 1963 through FY 1971, 7.1; FY 1972, 0.7; FY 1973, 0.8; additional to completion, continuing; and the total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record setting out the projects to be funded, the amounts for each for fiscal years 1971 and 1972 and the request for fiscal year 1973.

General GRIBBLE. Yes, sir.

(The information follows:)

FUNDING

[In millions of dollars]

Project	Fiscal year—		
	1971	1972	1973
1W563604D443—Nuclear projectiles	0.300	0.100	0
1W563604D444—Atomic demolitions munitions	.100	.210	0.410
1W563604D445—Adaption kit surface-to-surface missile	.200	.100	.210
1W563604D446—Adaption kit surface-to-air missile	0	.200	.200
1W563604D483—Radiation detection measurement equipment	0	.100	0
Total	.600	.710	.820

[1] In fiscal year 1972 this project was included in program element 6.37.11.A.

Senator YOUNG. I note a reference to a joint Army-Canada project. Would you describe it for us, please?

General GRIBBLE. Yes, sir. The joint project agreement is to develop a recording radiation monitor and automatic radiation alarm system. The development is to fulfill an established requirement for a high-range gamma dose rate measuring system to provide a means for continuous monitoring at fixed and semifixed installations outside the field Army area.

Chairman ELLENDER. What will you be doing with the $820,000 you are requesting for fiscal year 1973?

General GRIBBLE. In fiscal year 1973 testing of a prototype [deleted].

Phase 1 of the project agreement with Canada for the design and fabrication of a recording radiation monitor and automatic alarm system will be implemented.

MINE WARFARE

Chairman ELLENDER. Of the total requested for "Ordnance, Combat Vehicles and Related Equipment," $9.2 million is for the program entitled "Mine Warfare." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

ADVANCED DEVELOPMENT

Description.—This program element contains projects designed to improve the Army's land mine warfare capability and to counter enemy attempts at land mine warfare. With respect to mine detection and neutralization, this program investigates and exploits materiels, techniques, and technology evolving from exploratory development to detect and/or neutralize mines and booby traps. This work will involve evaluation of various components and systems leading to engineering development of suitable mine detectors and neutralizers. The mine systems development project is oriented on developing components and concepts applicable, in particular to the development of the family of self-destructing scatterable mines.

Work performed by.—The US Army Mobility Equipment Research and Development Center has been assigned as the lead laboratory for mine detection and neutralization. The Project Manager for Selected Ammunition is responsible for the technical development of the Army land mine warfare program. Much of the developmental work is performed at the Mobility Equipment Research and Development Center and Picatinny Arsenal. Other governmental agencies involved in these projects are the: Ballistics Research Laboratory, Army Materiel Systems Analysis Agency, Harry Diamond Laboratories, Electronics Command, Behavioral Science Research Laboratory, US Navy Weapons Center, China Lake, California, and portions of the Test and Evaluation Command. Industrial contractors include: Texas Nuclear Corporation, Electro Optical Systems, Los Angeles, California; Aerojet General, Los Angeles, California; Texas Instruments, Dallas, Texas; Honeywell, Hopkins, Minnesota; Food Machinery Corporation, Santa Clara, California; Olin Corporation, East Alton, Illinois; Chamberlain Manufacturing Corporation, Waterloo, Iowa; and Burroughs Corporation, Paoli, Pennsylvania.

Fiscal year 1972 program.—Investigation and development of suitable components for scatterable mines and scatterable delivery means continue to be pursued with emphasis on developing the cannon artillery delivered antitank mine to the point of being ready for engineering development in [deleted]. A comprehensive systems effectiveness study is underway in conjunction with the US Army Combat Developments Command and agencies of the Army Material Command. Development of components for ground delivered scatterable mine systems is being undertaken. An interim portable [deleted] mine detector is being readied for entry into engineering development. Work will continue on developing the metal radar mine and booby trap detector, the portable [deleted] antipersonnel mine detector, the wired mine detector, the vehicle mounted road interdiction and offroad mine detector, canine mine and booby trap detection technique. The track width mine clearing plow and the fuel air explosive mine clearing system will be continued in development. The plow will be prepared to enter engineering development late in [deleted].

Fiscal year 1973 planned program.—Continue the efforts described in the FY 1972 program. Emphasis in the development of scatterable land mines will shift more to the development of components for a ground vehicle deployed scatterable mine system. A set of components for a suitable [deleted] antitank mine system will be developed with the aim of entering this system into engineering development in [deleted]. Development of components for scatterable systems for aircraft delivery will be initiated. Systems effectiveness studies will be continued. In the area of mine detection/neutralization, the wired mine detector will be readied for entry into engineering development. The vehicle mounted off road mine and road interdiction mine detectors will continue. The canine mine and booby trap detection system will be prepared for entry into engineering development. The fuel air explosive mine neutralization ground delivered system will be continued toward entry into engineering development early in [deleted]. Advanced development of a scheme to bridge minefields using [deleted] will be initiated.

Program to completion.—This is a continuing program.

Resources (in millions of dollars):

R.D.T. & E. funds for FY 1963 through FY 1971, 15.9; FY 1972, 11.2; FY 1973, 9.2; additional to completion, continuing; and the total estimated cost is not available.

Chairman Ellender. $8 million is for the project on mine systems development. Please describe this project and tell us how you will use the funds you are requesting.

General Gribble. The objective of this project is to develop components and concepts applicable to landmine warfare, in particular, the family of self-destructing scatterable mines. These components, when integrated, will provide a system of mines and delivery means compatible with user requirements. The requested funds will provide for the continuation of development of components for the mines included in the family of scatterable mines. This is essentially a continuation of the fiscal year 1972 new initiative "Dynamic Defense." Development of efficient dispensing means for these mines are included in the project. A repeating Claymore type antipersonnel mine and

development of an [deleted] antitank mine are also part of this work. Improvement of system effectiveness, to include the interaction between the target tank and the mine, as well as the mines ability to effectively sense the presence of a proper target, are part of this project.

Senator YOUNG. The $8 million you are requesting for fiscal year 1973 is $2.5 million more than the amount provided for fiscal year 1972. Why do you need this rather large increase?

General GRIBBLE. The priority in fiscal year 1972 was for the development of artillery delivered antitank mines. The increase is needed to continue the tasks initiated in the previous fiscal year and to expand this work into developments of components for ground vehicle-delivered scatterable mines and helicopter delivered scatterable mines.

Chairman ELLENDER. Please comment on your request for $1.2 million for the project entitled "Mine Neutralization."

General GRIBBLE. These funds will be used to continue the development of the effective fuel-air explosive mine neutralization task. The majority of the funds will support the advanced development of the critical mine detection equipment and techniques.

ARMY SMALL ARMS PROGRAM (ARSAP)

Chairman ELLENDER. Of the total requested for "Ordnance, combat vehicles and related equipment," $4.3 million is for the Army's Advanced Development Small Arms program. Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

ADVANCED DEVELOPMENT

Description.—This Program Element (PE) encompasses all the advanced development projects that support ARSAP. Currently in this PE are active projects in the following fields: Component Development, Individual Weapons (future rifle, personal defense weapon), Crew Served Weapons (machineguns), Special Purpose Weapons (grenade launchers and ammunition, sniper rifles, and low signature weapons).

Work performed by.—The US Army Materiel Command (USAMC) is responsible to HQ Department of the Army for the entire PE. USAMC manages, coordinates and supervises this PE thru the US Army Small Arms Systems Agency (USASASA). The work is performed by the major subordinate commands of USAMC, the US Army Weapons Command (USAWECOM), the US Army Munitions Command (USAMUCOM), ths US Army Test and Evaluation Command (USATECOM), through in-house efforts of subordinate agencies or through contractors. Major contractors are: Olin-Mathieson Corp., East Alton, Ill.; AAI Corp. Cockeysville, Md.; Aeroject General Corp., Downey, Calif.; Cadillac Cage Co., Warren, Michigan; TRW, Redondo Beach, Calif.; Research Analysis Corp., McLean, Va.

Fiscal year 1972 program.—Continuation and/or initiation of these specific major tasks: Engineer Design Test (EDT) of future rifle candidates (to include an improved conventional alternative) to determine which candidates should continue in advanced development; continue evaluation of prototype armor machineguns proposed by industry; design studies of a grenade launcher for the future rifle; work on improved fuzes for grenade launcher ammunition. Continue advanced development of a squad automatic weapon.

Fiscal year 1973 planned program.—Continue advanced development of contenders for the future rifle system directed toward initiation of Engineering Development of one system in FY 1975. Reduce within round dispersion of the multiple flechette round. Fabricate prototypes of a 4.32mm rifled barrel designed

to fire saboted ammunition. Develop a dual cycle mechanism that fires at a high rate and loads at a lower rate to take advantage of both desirable characteristics. Accumulate and categorize data from applied research as a basis for a personal defense weapon. Continue to update and supply new input to the small arms information system. Develop a low-risk, short-time-frame weapon system capable of meeting the lower limits of the requirement for a squad automatic weapon. Concurrently, pursue high-risk contenders that could meet the upper limits established by the material need document. Continue development of minigrenades, multiple projectiles, proximity fuzes and launcher for the area fire attachment for the future rifle system.

Program to completion.—This is a continuing program.

Resources (in millions of dollars):

R.D.T. & E. funds for FY 1963 through 1971, $8.1; FY 1972, $4.9; FY 1973, $4.3; additional to completion, continuing; and the total estimated cost is NA.

Chairman ELLENDER. Please provide a tabulation for the record setting out the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

General GRIBBLE. Yes, sir. I will be glad to.

(The information follows:)

FUNDING

[In millions of dollars]

Project	Fiscal year—		
	1971	1972	1973
1J263607D013—Individual weapons system development	2.0	1.8	1.6
1J263607D627—Components development	.6	.6	.4
1J263607D640—Crew served weapons development	.9	1.7	2.0
1J263607D642—Special purpose weapons	.2	.8	.3
Total	3.7	4.9	4.3

Senator YOUNG. What relationship has this small arms program to the one we discussed just a short time ago?

General GRIBBLE. The small arms program we discussed previously was the exploratory phase of small arms development. Technological advances, proven theories, and concepts resulting from exploratory development are incorporated into weapons system design and prototypes in this advanced development program.

Chairman ELLENDER. Of the $4.3 million requested, $1.6 million is for a project entitled "Individual Weapons Systems Development." Please describe this project.

General GRIBBLE. The objective of this project is to provide an individual infantry rifle that will eventually replace the M16A1 in the 1980's. There are several contending concepts being pursued. These include single and multiple flechettes and small-caliber bullets as well as more conventional weapon and ammunition systems. The single flechette rifle has a high rate of fire and is designed to launch flechettes in a three-round burst per trigger pull. The multiple flechette rifle fires several flechettes from a single cartridge. The small bullet rifle is a .17 caliber rifle that operates on the same principle as the single flechette rifle.

Chairman ELLENDER. $2 million is for the project entitled "Crew Served Weapons Development." What are the objectives of this project?

General GRIBBLE. The objective of this project is to develop a lightweight, one-man machinegun and ammunition to be employed by the rifle squad. This Squad Automatic Weapon (SAW) is to be employed as an individual, hand-carried weapon capable of being fired from both

supported and unsupported positions. One SAW will be authorized for each fire team of the rifle squad for a total of six per rifle platoon. The SAW is the single, most important weapon currently under development in the small arms area.

WEAPONS AND AMMUNITION

Chairman ELLENDER. $6.9 million is requested for the program entitled "Weapons and Ammunition." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

The overall objectives are to design and develop more reliable field artillery and mortar weapons and munitions with increased range, greater accuracy, higher rates of fire, improved lethality and enhanced maintainability. Additionally this program allows the Army to apply advanced techniques, and componentry to artillery, tank and mortar fuzes. In this latter area, the program provides development for high reliability point detonating fuzes, BEEHIVE fuzes, short intrusion proximity fuzes, mortar time fuzes, and proximity fuzes for improved conventional munitions.

The fiscal year 1973 program involves the following activities:

(*a*) The lightweight company mortar system is scheduled to enter engineering development and will be moved to Program Element 6.46.02.A.

(*b*) Continue to exploit the antipersonnel and antimaterial capabilities offered by improved conventional munitions in the areas of mortar ammunition, artillery ammunition and self-destruct munitions.

(*c*) Laboratory tests of advanced power sources for fuzes will be continued. Continue investigations for a fail safe mechanism for the Rocket Assisted Projectile (RAP). Investigate the feasibility of improving High Explosive Anti-Tank (HEAT) Ammunition by optimizing stand-off distance. Continue test and evaluation of advanced small caliber fuzing. Tests will commence on hand grenade fuzes. These tests will include vibration, shock and temperature.

(*d*) Development of the new 105-millimeter towed howitzer, XM204 will continue under program element 6.46.02.A, Weapons and Ammunition.

Chairman ELLENDER. Please provide a tabulation for the record setting out the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

General GRIBBLE. I will be happy to do so.

(The information follows:)

FUNDING

[In thousands of dollars]

Project	Fiscal year—		
	1971	1972	1973
1W563608DE55—Advanced artillery and mortar fuzing		1,465	950
1W563608D007—Field artillery ammunition development	690	683	290
1563608D009—Lightweight mortar system	400	650	510
1X563608D276—Improved conventional munitions	1,573	1,520	1,830
1W563608D376—Field artillery direct support weapons systems	700	1,825	3,300
Total	3,363	6,143	6,880

Senator YOUNG. The $6.9 million you are requesting is $737,000 more than the amount provided for fiscal year 1972. Why do you need this increase?

General GRIBBLE. The increase of $737,000 from fiscal year 1972 to fiscal year 1973 is the net increase for the program. The bulk of that increase is required to manufacture and test two prototypes of the new, lightweight 105-millimeter towed howitzer, XM–204.

Chairman ELLENDER. Of the $6.9 million requested, $3.3 million is for the project entitled "Field Artillery Direct Support Weapon System". Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

The objective of this project is to develop a new, towed 105mm howitzer that will be helicopter transportable and capable of firing standard and developmental ammunition to extended ranges. This weapon, designated the XM204, will employ a new type recoil mechanism (soft recoil) based on the fire-out-of-battery technique that produces very low recoil forces and eliminates the need for positive ground anchors. This weapon is intended to replace the current 105mm towed howitzer, M101 and M102. The advantages to be gained by the use of soft recoil are:

1. Recoil forces are reduced approximately [deleted] of that of conventional recoil mechanisms.
2. Lower recoil forces mean that firing stability is improved to the extent that trails or stakes are no longer required. Lack of stability in sandy soil is one of the principal objections to the present standard 105mm howitzer, M102.
3. The entire weapon is more compact—generally very little longer than the length of the cannon.
4. Recoil cycle time is reduced [deleted].
5. The recoil mechanism is simpler, cheaper to manufacture and potentially more reliable.

Senator YOUNG. Please describe your planned program for fiscal year 1973 and tell us exactly what you will be doing with the $3.3 million you are requesting.

General GRIBBLE. I will be glad to. Engineering Development prototypes one and two will be manufactured and tested. Results of these tests will be used to finalize the design package for Engineering Test and Expanded Service Test (ET/EST) and hardware. Orders for long leadtime items for ET/EST prototypes three through 10 will be placed. This development program will result in an artillery weapon with significant improvements over our current standard direct support weapons in the following areas: stability, range, rate of fire, reliability, and reaction time.

Chairman ELLENDER. The $3.3 million you are requesting is $1.5 million more than was provided in fiscal year 1972. Why do you need this large increase?

General GRIBBLE. The $1.5 million funding increase from fiscal year 1972 to fiscal year 1973 is required to manufacture and commence testing of engineering development models 1 and 2.

HIGH ENERGY LASERS

Chairman ELLENDER. Of the total requested for Ordnance, Combat Vehicles and related equipment, [deleted] is for the advanced development program entitled "High Energy Lasers." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

ADVANCE DEVELOPMENT

Description.—This development work is aimed to establish a strong capability in high energy laser [deleted]. Such high energy lasers are expected to have application [Deleted]. The Army, as are the other Services, is procuring a gas dynamic laser under a Tri-Service Laser contract. The Army program for its Tri-Service Laser is directed toward Army operational needs and toward those

factors leading to satisfaction of Army missions. There is only one project in this program element.

Work performed by.—Approximately 75 percent of the funds are used in in-house activity under direction of the Army lead laboratory for high energy lasers, the Physical Sciences Directorate at the Army Missile Command, Redstone Arsenal, Alabama. The work is accomplished at that directorate, the Electronics Technology and Devices Laboratory, Army Electronics Command, Fort Monmouth, New Jersey, the Ballistic Research Laboratories, Aberdeen Proving Ground, Maryland, and Frankford Arsenal, Philadelphia, Pennsylvania. The balance is performed by contractors; four contracts having value of $25,000 or more are with AVCO Systems Division, Wilmington, Massachusetts (the Tri-Service Laser contract, administered by the Air Force); Hughes Aircraft Company, Culver City, California; United Aircraft Research Laboratories, East Hartford, Connecticut; and Jet Propulsion Laboratory, Purdue University,, West Lafayette, Indiana. There are also four other proposed contracts now in the procurement cycle, each being sent to a considerable number of prospective bidders, and each having value exceeding $25,000.

Fiscal year 1972 program.—The Army Tri-Service Laser is undergoing continued testing at the contractor's facility. It is expected that this laser will be disassembled, shipped to Redstone Arsenal, and reassembled after which final acceptance tests will be made. [Deleted.]

Fiscal year 1973 planned program.—A substantial portion of the program will be devoted to the operation and maintenance of the Tri-Service Laser in a continued extensive experimental test program [deleted]. A variety of investigations will be undertaken with a view to improve and refine gas dynamic lasers for future designs. [Deleted.] Analysis and conceptual designs will be undertaken for other applications as they are identified, taking into account the latest developments in laser and supporting technology. [Deleted.]

Program to completion.—This is a continuing program.

Resources (in millions of dollars):

R.D.T. & E. funds for FY 1963 through FY 1971, [deleted]; FY 1972, [deleted]; FY 1973 [deleted]; additional to completion, continuing; and the total estimated cost is not available.

Chairman ELLENDER. I note that the entire amount requested is for the project entitled "Advanced Laser Development." Can you give us a brief, unclassified description of this project?

General GRIBBLE. Yes, sir. This development work is aimed at the establishment within the Army of a strong capability in the systems applications of high energy lasers. High energy lasers are expected to have many military applications, and the Army, as are the other services, is procuring a gas dynamic laser under a Tri-Service Laser contract. The gas dynamic laser will be used to conduct extensive tests directed toward satisfying the Army's operational needs and mission requirements.

Senaor YOUNG. Just what will you do with the [deleted] you are requesting for fiscal year 1973?

General GRIBBLE. In brief, much of the requested funds will be used for the operation and maintenance of the Tri-Service Laser. The Army Tri-Service Laser has been fabricated under a contract to provide three such lasers, one per service, and has received preliminary testing. An instrumented test range has been completed at Redstone Arsenal and we are now ready to conduct an extensive test program with this laser in the areas of [deleted].

CHEMICAL MUNITIONS CONCEPTS

Chairman ELLENDER. $3.6 million is requested for the program entitled "Chemical Munitions Concepts." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CHEMICAL MUNITIONS CONCEPTS

ADVANCED DEVELOPMENT

Description.—The objective of the restructured program is to conduct advanced development on non-lethal incapacitating and binary lethal chemical agents which have advanced from exploratory development by exhibiting potential for casualty production through either the respiratory tract and/or penetration of environmental and protective clothing. Small scale pilot units are designed and installed to obtain process engineering data for application to future production facilities. Chemical warfare munitions concepts that employ the binary principle are investigated. This program element contains four projects devoted to development of lethal chemical agent processes, lethal chemical munitions concepts, incapacitating chemical agent processes and incapacitating chemical materiel.

Work performed by.—Edgewood Arsenal, Md. is the primary Army developer for chemical munitions with participation by Picatinny Arsenal, N.J.

Fiscal year 1972 program.—[Deleted.]

Fiscal year 1973 planned program.—[Deleted.]

Program to completion.—This is a continuing program designed to provide a sound basis of data and performance through advanced development for future engineering development of lethal binary and non-lethal incapacitating chemical agents and munitions. The development of the binary concept for lethal munitions and on incapacitating munitions will require several years to integrate into effective weapons systems to provide a safe, effective capability for the Army.

Resources (in millions of dollars):

R.D.T. & E. funds for FY 1971 and prior, 1.0; FY 1972, 3.3; FY 1973, 3.6; additional to completion, continuing; and the total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record setting out the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

General GRIBBLE. Yes, sir.

(The information follows:)

FUNDING

[In millions of dollars]

Project	Fiscal year—		
	1971	1972	1973
1W563614DE73—Incapacitating chemical materiel	0.200	1.500	0.500
1W563614DE74—Incapacitating chemical agent processes	.060	.500	.250
1W563614DE76—Lethal chemical materiel	.460	.969	2.640
1W563614DE77—Lethal chemical agent processes	.240	.351	.250
Total	.960	3.320	3.640

Senator YOUNG. The $3.6 million you are requesting for fiscal year 1973 is $320,000 more than was provided in fiscal year 1972. Why do you need this increase?

General GRIBBLE. The requested increase partially offsets the development cost of [deleted] which enters advanced development in the 4th quarter of fiscal year 1972. The total fiscal year 1973 development costs for the [deleted] is $1.7 million with the majority of the increase being taken from other projects in this program element.

Chairman ELLENDER. Has the committee been provided with full details on your planned program for fiscal year 1973?

General GRIBBLE. Yes, sir; it has.

TANK SYSTEMS

Chairman ELLENDER. The next item is the request of $19.68 million for "Tank systems." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

ADVANCED DEVELOPMENT

Background.—The Congress has provided $40 million in FY 1972 for termination of the XM803 program and for initiation of a new tank prototype program. Since costs associated with termination of the XM803 program will amount to roughly $20 million, an additional $20 million remains in FY 1972 for the initiation of the new program. The establishment of this program element constitutes a preliminary step toward the initiation of that new program.

Description.—The overall objective of this program element, then, is to provide for the development of a new main battle tank in order to insure that this objective will be achieved in the most effective manner, the Army has formed a special task force whose mission is to review the Army's overall tank requirements and to formulate an appropriate requirements document. The resulting requirements document will provide the basis on which the new tank program will be structured. It is currently estimated that the special task force will complete its work by 1 August 1972. Meanwhile, the Army will expedite development of those tank subsystems and components which it considers likely candidates for use in the new tank development program.

Fiscal year 1972 program.—During the remainder of FY 1972, the Army will expedite the development of those tank components and subsystems (e.g., power train, suspension system, etc.) which are considered likely candidates for use in the new tank program. The identification of those components and subsystems into which additional effort should be put in FY 1972 is a first order of business for the special task force. Its recommendations concerning the FY 1972 effort are currently scheduled for submission to the DA Staff on or before 1 April 1972.

Fiscal year 1973 program.—To be determined, based on recommendations of special task force.

Program to completion.—To be determined, based on recommendations of special task force.

Resources (in millions of dollars):

R.D.T. & E. funds for FY 1963 thru FY 1971, 0; FY 1972, 20.0; FY 1973, 19.7; additional to completion, to be determined, based on recommendations of special task force; and the total estimated cost is to be determined, based on recommendations of special task force.

Chairman ELLENDER. I think this request has been pretty well covered, however I note on page 295 of the descriptive summary in connection with the planned fiscal year 1973 program the following statement: "To be determined, based on recommendations of special task force." As soon as your planned program for fiscal year 1973 is established, be sure to provide the committee with information on this matter.

General GRIBBLE. We will be sure to do that.

WEAPONS AND AMMUNITION

Chairman ELLENDER. $32 million is requested for the engineering development program entitled "Weapons and Ammunition." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

The purpose of this program is to develop mortar and artillery weapons and ammunition, and fire control equipment permitting significantly increased lethality, accuracy, range, reliability, and speed in delivering fires. It consists of seven active projects covering: Weapons and ammunition for 105mm, 155mm, and 8-inch howitzers; ammunition for the 105mm and 152mm tank guns; improved fuzes for artillery and mortar projectiles; the 40mm cartridge; fire direction and control equipment such as graphical firing tables; and improved conventional munitions.

During fiscal year 1973 the following activities are planned:

(*a*) Engineering development of the 105mm soft recoil howitzer, XM204 will continue. Prototypes one and two will be manufactured and tested. Results of these tests will be used to finalize the design package. Orders for long lead time items for prototypes three through ten will be placed.

(*b*) Engineering development of the 155mm towed howitzer, XM198, will continue. Prototypes three through ten will be manufactured and tested. Ammunition tests will begin in the 2d Quarter. Maintenance evaluation will begin in the 1st Quarter.

(*c*) Engineering tests and service tests of the 8-inch self-propelled howitzer, M110E2, will continue.

(*d*) Initiate engineering development of a new lightweight mortar system for the Infantry Company.

(*e*) Continue engineering development of the following projects: 8-inch rocket assisted projectile, XM650E1; improved conventional munitions for the 105mm howitzer; electronic time fuze, XM587; proximity mortar fuze, XM588; 105mm High Explosive Anti-Tank (HEAT) round XM622; the 152mm conventional ammunition program and the 40mm signaling and marking grenades.

(*f*) Initiate engineering development of a highly reliable, point detonating artillery and mortar fuze.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal year 1971 and 1972, and the request for fiscal year 1973.

General GRIBBLE. Yes, sir; I will be glad to.

(The information follows:)

FUNDING

[In thousands of dollars]

Project	Fiscal year—		
	1971	1972	1973
1W564602D008—Field artillery weapon development	2,400	3,815	1,790
1W564602D028—Field artillery ammunition	3,893	3,405	8,400
1J564602D029—Lightweight mortar system	0	0	1,350
1X564602D369—Improved conventional munitions	1,780	4,908	5,170
1W564602D373—Ammunition, cannon, 155 mm. howitzer	990	650	1,430
1W564602D379—Howitzers, medium, 155 mm	3,500	7,756	12,030
1X564602D524—152 mm. ammunition	793	802	1,600
1W564602D679—Cartridge, 40 mm	1,000	1,000	180
Total	14,356	22,336	31,950

Senator YOUNG. Can you give us a brief description of your total planned program for fiscal year 1973?

General GRIBBLE. In fiscal year 1973 we will continue engineering development of the following projects: 105-millimeter soft recoil howitzer, XM–204; 155-millimeter towed howitzer, XM–198; 8-inch rocket assisted projectile, XM–650E1; improved conventional munitions for the 105-millimeter howitzer; electronic time fuze, XM–587; proximity mortar fuze, XM–588; 105-millimeter High Explosive Anti-Tank (HEAT) round XM–622; the 152-millimeter conventional ammunition program; and the 40-millimeter signaling and marking

grenades. The engineering tests and service tests of the 8-inch self-propelled howitzer, M110E2, will continue.

Chairman ELLENDER. Are you requesting funds for any projects which were not previously funded?

General GRIBBLE. No; we are not.

FIELD ARTILLERY AMMUNITION

Chairman ELLENDER. Of the total requested for "Weapons and Ammunition," $8.4 million is for the project entitled "Field Artillery Ammunition." Please describe this effort.

General GRIBBLE. I will be glad to. The objective of this project is to develop artillery projectiles, propelling charges and fuzes for all calibers. This development effort is designed to improve field artillery capabilities in range, payload and lethality. The major tasks include development of the new propelling charge, XM–188 for the improved 8-inch howitzer, M110E2; development of the 8-inch rocket assisted XM–673 nuclear projectile; development of a 105–millimeter BEEHIVE round for the M–60 tank; development of the XM–587 electronic time fuze; development of a near surface burst proximity fuze for the 81-millimeter mortar; and development, beginning in fiscal year 1973, of a point detonating fuze for all artillery and mortar high explosives and smoke projectiles.

Chairman ELLENDER. I note a statement on page 302 of the descriptive summary, that, and I quote, "The items under development in this project are for use with current and development hardware." What is for use with current and what for use with development hardware?

General GRIBBLE. The XM–188 propelling charge is being developed to provide an increased range capability for the improved 8-inch self-propelled howitzer (SPH), M110E2 that is currently under development. The XM–188 cannot be used with the older 8-inch SPH, M110. The XM650E1 8-inch rocket assisted projectile (RAP) will be for use in both the older and improved weapons just mentioned. The 105 mm BEEHIVE round will be for use in all of the M–60 series of tanks. The XM–587 electronic time fuze will be for use in all non-nuclear artillery and mortar projectiles. The high performance, or low dud rate, point detonating fuze will be for use in all non-nuclear artillery and mortar high explosive and smoke projectiles.

Senator YOUNG. What are you planning to do with the $8.4 million you are requesting for fiscal year 1973?

General GRIBBLE. During fiscal year 1973, we plan the following activities:

Continue engineering development of the new propelling charge, XM–188, for the 8-inch self-propelled howitzer, M110E2.

Fabricate 3,060 8-inch rocket assisted projectiles, XM650E1, for continuation of engineering tests and service tests. Flight tests of projectiles fired from the M110E2 using the XM–188 propelling charge will be conducted.

Re-initiate development of the 105-millimeter Heat round, XM–622. Penetration and accuracy tests will be conducted.

Continue component tests of the electronic time fuze, XM–587. Gun firing tests will be performed. A total of 100 fuzes will be assembled for engineering design tests.

Initiate engineering development of a high performance (low-dud rate), point detonating fuze for all artillery and mortar high explosive and smoke ammunition.

Senator YOUNG. Why do you need the very large increase of almost $5 million you are requesting for this project?

General GRIBBLE. The $5 million funding increase from fiscal year 1972 to fiscal year 1973 is required first, for the planned fabrication and testing of 3,060 8-inch rocket assisted projectiles, XM650E1, and second, for the planned initiation of an engineering development program to develop a high performance, or low-dud rate, artillery and mortar point detonating fuze.

IMPROVED CONVENTIONAL MUNITIONS

Chairman ELLENDER. Of the total requested for Weapons and Ammunition, $5.2 million is for the project entitled "Improved Conventional Munitions". Tell us what you intend to do with the $5.2 million you are requesting for fiscal year 1973.

General GRIBBLE. This project provides for the development of selected munitions having increased effectiveness against personnel targets. In particular, it provides for:

[Deleted.]

Senator YOUNG. For what do you need the increase of over $250,000 you are requesting?

General GRIBBLE. As I just indicated, the project provides for the development of [deleted] anti-personnel projectiles. The second generation [deleted] round moved into engineering development in the last half of fiscal year 1972 so that the considerable costs of testing hardware appears in the fiscal year 1973 budget rather than 1972. These costs, coupled with the sustaining level of funding required for the other projectiles, account for the increase.

MEDIUM 155-MILLIMETER HOWITZER

Chairman ELLENDER. The sum of $12 million is for the advanced development of the medium 155-millimeter howitzer. Please describe our need for this weapon.

General GRIBBLE. The towed 155-millimeter howitzer XM-198 [deleted.] The latter system will have completed approximately 35 years of operational inventory life when the XM-198 is delivered to the first unit in the fourth quarter of fiscal year 1976. In addition, the [deleted] to be achieved by the XM-198 will more than [deleted] that of the [deleted] thereby making the XM-198 competitive with its Soviet counterpart. The XM-198 will also be helicopter liftable using the CH47C.

Chairman ELLENDER. I note a statement in the descriptive summary to the effect that, and I quote, "Cooperative agreements exist with NATO nations on the characteristics of 155-millimeter howitzers to include the requirement for ammunition interchangeability." Please comment on this statement, and tell us what countries are involved.

General GRIBBLE. A Memorandum of Understanding exists among the United States, the United Kingdom, and the Federal Republic of Germany agreeing to the internal ballistics of all future 155 mm. howitzers. This agreement insures the interchangeability of any round of 155 mm. ammunition developed by a signatory nation.

Senator YOUNG. How much of the work on this project is to be performed by Army in-house facilities?

General GRIBBLE. One hundred percent of the fiscal year 1973 request is for work to be performed by Army in-house facilities.

Chairman ELLENDER. When do you expect this weapon to be in operational use?

General GRIBBLE. The initial operational capability is [deleted].

Chairman ELLENDER. Comment on your planned program for fiscal year 1973 and tell us why you need the increase of $4.3 million you are requesting.

General GRIBBLE. Fiscal year 1973 funds are required to continue engineering design tests through the year with engineering models 1 and 2; to fabricate engineering and expanded service test (ET/EST) models 3 through 10 and begin engineering tests in the fourth quarter. Additionally, procurement of nonstandard ammunition items required for test firings will be initiated. The $4.3 million funding increase from fiscal year 1972 to fiscal year 1973 is required to fabricate and commence testing of ET/EST models 3 through 10.

Senator YOUNG. For Weapons and Ammunition, $22.336 million was provided in fiscal year 1972, and you are requesting $31.95 million for fiscal year 1973. Comment on your need for this increase.

General GRIBBLE. The increase of $9.6 million from fiscal year 1972 to fiscal year 1973 is prmarily due to movement of the new towed 155-millimeter howitzer, XM198 from Advanced Development to Engineering Development. The need for and use of the funds required for the XM198 have been previously addressed.

NUCLEAR MUNITIONS AND SURVEILLANCE

Chairman ELLENDER. Of the total requested for "Ordnance, combat vehicles and related equipment," [deleted] is for the engineering development program entitled "Nuclear Munitions and Surveillance." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

ENGINEERING DEVELOPMENT

Description.—The Army requires new and improved nuclear munitions and radiation detection systems to broaden and enhance its capabilities on the tactical battlefield. This program element funds engineering development of an improved 155mm nuclear projectile, XM517, an improved 8-inch nuclear projectile, XM673, and an Advanced Firing System (AFS), XM50 (for Atomic Demolition Munitions (ADM), and a family of radiological detection devices to provide information on nuclear radiation levels for tactical use. Both the improved 155mm and 8-inch nuclear projectiles will represent significant improvements in the state-of-the-art in that they will have [deleted]. The AFS is being designed to provide an extremely flexible, simple and versatile firing system for [deleted]. It will provide major improvements over the present firing device which has many limitations. These improvements are: [deleted]. Radiac work will permit the detection of a nuclear environment which might incapacitate personnel or render equipment inoperative. The family includes an Aerial Radiac Surveillance System, a dual purpose Individual and Vehicular Survey Meter, and Individual Tactical Dosimeters with the capability of recording both total gamma and neutron radiation. New instruments are being developed to replace the existing generation of radiacs that were developed in the 1950s.

Work performed by.—Picatinny Arsenal, Dover, N.J.; Harry Diamond Laboratory, Washington, D.C.; Army Materiel and Mechanics Research Center,

Watertown, Mass.; Aberdeen Proving Ground, Aberdeen, Md.; Fairchild Defense Products, Copaigue, Long Island, N.Y.; Motorola, Scottsdale, Ariz.; Union Carbide, Bennington, Vt.; U.S. Army Electronics Command, Fort Monmouth, N.J.; North American Rockwell Corp., Los Angeles, Calif.; Nuclear Corporation of America, Denville, N.J.

Fiscal year 1972 program.—For the AFS, XM50, fabrication and testing of prototype system began. For the XM517 primary emphasis will be on the development of the [deleted]. For the XM673 the primary effort is on the [deleted]. Procure new engineering models of the AN/VDR–1 for testing, evaluate the pilot models of the AN/ADR–6, and begin engineering development of the IM–185. Support testing of the Navy-developed Radiation Analyzer (AN/PDR 71) and the Alpha Meter AN/PDR–56.

Fiscal year 1973 planned program.—AFS, XM50: [Deleted]. XM517: Engineering design of fuze, programmer, power supplies, safety circuits and structural case will continue. Flight and structural integrity tests will be conducted. XM673: Engineering design of fuze, programmer, power supplies, safety circuits and structural case will continue. Emphasis will be on [deleted]. Begin ET/EST on the AN/VDR–1. Integrate the Navy RO–32 recorder into the system. Continue testing of pilot models of the AN/VDR–6. Continue engineering development of the IM–185. Adopt as standard the AN/PDR–71 and continue analyzing the Navy's progress on the AN/PDR–56.

Program to completion.—XM50: [Deleted]. XM517: [Deleted]. Radiacs: This is a continuing project. The current items in this project will be standardized over the next several years. More advanced equipment utilizing integrated chips, laser beam scanning and other advanced technologies will progress into this program from exploratory and advanced development programs.

Resources (in millions of dollars):

R.D.T. & E. funds for FY 1963 thru FY 1971, $52.6; FY 1972, $17.1; FY 1973 [deleted]; additional to completion continuing; and the total estimated cost is NA.

Chairman Ellender. Please provide a tabulation for the record, listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

General Gribble. Yes, sir.

(The information follows:)

[In millions of dollars]

Project	Fiscal year— 1971	1972	1973
1W564603D382—Atomic demolition munition	4.000	3.955	
1W564603D385—Projectile XM517	4.906	6.370	
1W564603D517—Radiation detection equipment *	.920	1.021	[Deleted]
1W564603D663—8-inch projectile XM673	1.300	5.712	
Total	11.126	17.058	

* This project was previously reported under program element 6.47.06.A.

Atomic Demolition Munition

Chairman Ellender. Of the total requested for "Nuclear Munitions and Surveillance" [deleted] is for the project entitled "Atomic Demolition Munition." Please describe this program for us, and tell us what you will be doing with the [deleted] you have requested.

General Gribble. This project supports engineering development of an advanced firing system (AFS), XM–50, that will be used for firing the [deleted]. The AFS is being designed to provide [deleted]. During fiscal year 1973 fabrication of all engineering development models will be completed. Testing of engineering development models will be finalized. Procurement of the remaining parts for 22 engineering test/expanded service test (ET/EST) models will be completed. Pro-

duction of the ET/EST units will be initiated, with approximately 13 of the scheduled 22 systems delivered. Preparation of the technical data package product configuration identification will proceed with drawings and specifications prepared and revised as necessary. Action will be taken to obtain type classification for limited production (urgent). Fiscal year 1973 is the last full year of engineering development.

Senator YOUNG. I note a reference in the descriptive summary to the interest of the Navy and the Marine Corps in this development program. Have they contributed anything in the way of funds or personnel toward the development of these munitions?

General GRIBBLE. Neither the Navy nor the Marine Corps has directly contributed funds or personnel to the development of the advanced firing system (AFS), XM-50. However, both services have interest in this development since they are potential users of atomic demolition munitions for which the AFS is the firing system. Accordingly, their requirements have been integrated with those of the Army. The Marine Corps is actively monitoring the Army development effort.

XM-517 PROJECTILE

Chairman ELLENDER. Of the [deleted] requested, [deleted] is for the engineering development of the XM-517 projectile. Please describe this effort, and tell us what you will be doing with the [deleted] you are requesting.

General GRIBBLE. This project supports engineering development of an improved 155 mm. nuclear projectile, XM-517. This projectile will replace the currently fielded M-454, which has many serious shortcomings, such as: [deleted]. This new projectile represents a major improvement in that it will have [deleted]. Engineering tests will be conducted on prototype designs of these items to insure that they meet all design objectives. Flight tests will be conducted to insure proper design, structual integrity and the proper degree of [deleted].

Senator YOUNG. I note in the descriptive summary that this is a joint Atomic Energy Commission-U.S. Army development program. How is this project coordinated, and how is the work divided between these two agencies?

General GRIBBLE. This project is coordinated by a project officer group (POG) that operates in accordance with a memorandum of understanding among the Atomic Energy Commission (AEC), the Defense Nuclear Agency, and the three services. For this development the Army is the cognizant service. As such it organized and chairs the POG that includes AEC, Army, Navy, and Marine Corps representatives. This group meets periodically to insure effective coordination of the development activities of the AEC and the Army. This development effort is divided such that the AEC develops and produces the nuclear warhead and its fire set while the Army develops and produces the fuze, programer, power supplies, safety devices and the ballistic case.

RADIOLOGICAL DETECTION EQUIPMENT

Chairman ELLENDER. [Deleted] is requested for the engineering development of radiological detection equipment. Describe this project.

General GRIBBLE. The radiological detection equipment project is to develop a family of radiological detection equipment and systems to detect and measure nuclear radiation on the battlefield. This includes air and ground systems and unit and individual systems. The Army's interest in this area is for tactical systems. Specifically, development is proceeding on a tactical survey meter and vehicular radiac set, an individual dosimeter and reader, a tactical dosimeter and charger, and a radiation analyzer.

EIGHT-INCH PROJECTILE XM673

Chairman ELLENDER. [Deleted] is requested for the project entitled "8-Inch Projectile XM673". Give us a brief description of your planned program for fiscal year 1973 in this project.

General GRIBBLE. In fiscal year 1973 engineering development of Army-provided components (fuze, programer, power supplies, safety circuits, and ballistic case) will continue. Initial development tests will be conducted.

Senator YOUNG. I note this is a joint effort between the Army and the Atomic Energy Commission. How is the work divided between these two organizations?

General GRIBBLE. The Atomic Energy Commission is responsible for developing the physics package and the fire set for the projectiles and the Army develops the adaption kits and fuzing systems for the projectiles.

MOBILITY

Chairman ELLENDER. The next item is the request for $40,980,000 for the program entitled "Mobility". Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY ENGINEERING DEVELOPMENT

Description.—The objective of this program element provides for engineering development and testing of a variety of combat vehicles and related supporting equipment. It consists of six major projects: (1) Mechanized Infantry Combat vehicle (MICV) XM723. This will be a follow-on to the M113A1 Armored Personnel Carrier (APC) which will provide much improved combat effectiveness for mechanized infantry. In addition to retaining all the present desirable characteristics of the M113A1, the MICV will be armed with the Vehicle Rapid Fire Weapon System-Successor, permit firing of individual weapons from within the vehicle, be amphibious, air transportable in C–141A and C–5A aircraft, [deleted] (2) Armored Reconnaissance Scout Vehicle (ARSV) XM800. This vehicle will be the follow-on to the M114 Command and Reconnaissance Vehicle. The ARSV will [deleted] (3) Vehicle Rapid Fire Weapons System-Successor (VRFWS–S) (Bushmaster). This 20–30mm weapon system will be developed to replace the .50 cal machinegun and the M139, 20mm cannon. It will be capable of firing ammunition of increased range and lethality from a dual feed system which will allow instaneous selection of the most effective ammunition. (4) The Automatic Test Equipment for Internal Combustion Engines (ATE/ICE) program will develop automatic test equipment which will fault isolate automotive equipment failures or malfunction. (5) Trucks Military Transport. This project provides the RDTE effort for developing the Army's tactical wheel fleet. (6) The M60A1 Tank Product Improvement Program (PIP). The RDTE funded portion of the M60A1 (PIP) provides for development of three major product improvements for application to M60 Series tanks. These improvements are the laser rangefinder, solid-state computer, and the tube-over-bar suspension. Application

of these improvements will afford M60-series tanks increased capabilities in firepower and mobility. FY73 funds will be used for continued development of these product improvements and for a thermal sight prototype program.

Work performed by.—In-House: US Army Tank Automotive Command, Warren, Michigan is responsible for development of the Armored Reconnaissance Scout Vehicle (ARSV) and the Mechanized Infantry Combat Vehicle (MICV); US Army Weapons Command, Rock Island Arsenal is responsible for development of the fire controls and relate armaments systems; US Army Munitions Command, Dover, New Jersey is responsible for the development of ammunition for the Bushmaster weapon system. Contractors will be selected based on their proposals. Typical potential contractors for the ARSV and MICV are Allison Division, General Motors Corporation, Cleveland, Ohio; Chrysler Defense Engineering, Centerline, Michigan; FMC Corporation, San Jose, California and Lockheed Missile and Space Company, Sunnyvale, California. The potential contractors for the Bushmaster competitive shoot-off are the AAI Corporation, Cockeysville, Maryland: Colt Industries, Hartford, Connecticut; Hughes Tool Company, Culver City, California; General Electric, Burlington, Vermont; Maremont Corporation, Saco, Maine; Philco-Ford Corporation, Newport Beach, California; and AMF Corporation, York, Pennsylvania. Contractors for the Automotive Test Equipment for Internal Combustion Engines (ATE/ICE) are Dynosciences Corporation, Chatsworth, California and Radio Corporation of America, Burlington, Massachusetts. The Chrysler Corporation, Centerline, Michigan is the prime contractor for the M60A1 Product Improvement Program.

FY 1972 program.—The ARSV and Bushmaster Requests for Proposal were released to industry. The RFP for MICV is scheduled for release in the 3rd Qtr, FY 72. These requests cover expanded contract definition for the ARSV; engineering development for MICV and a competitive shoot-off of prototype hardware for the Bushmaster. Engineering development for the ATE/ICE Organizational sets will be completed. Prototype Direct Support and General Support hardware will be prepared for evaluation prior to initial development contracts in FY 73. The Trucks Military Transport program efforts were terminated. A follow-on vehicle program is being evaluated. Development of the M60A1 product improvements is continuing. Hardware qualification testing is being accomplished.

FY 1973 planned program.—Armored Reconnaissance Scout Vehicle (ARSV) program prototype vehicle fabrication will be completed and vehicle evaluation initiated. The Mechanized Infantry Combat Vehicle (MICV) program will initiate engineering development and three prototype vehicles will be delivered for design testing. A competitive shoot-off will be conducted followed in FY 74 by the award of an Engineering Development contract for the Bushmaster program. The Automatic Test Equipment for Internal Combustion Engines (ATE/ICE) program will complete Engineering Development of the Organizational sets and prototype hardware will be subjected to Engineering Service Testing. Prototype design work will be initiated on the Direct and General Support Test equipment while the development of a second and third generation of built-in test equipment will continue. In the Truck Military Transport program, an investigation of a 30 ton vehicle designed to handle containerized cargo forward of depot areas will be started. M60A1 Product Improvement Program (PIP) will be continued. The laser rangefinder and solid state computer integration work will be accomplished. Contractor testing of the product improvement hardware will be completed. Tests of thermal sight prototypes will be initiated.

Program to completion.—This is a continuing program.

RESOURCES

[Dollar amounts in millions]

	Fiscal year 1963 through 1971	Fiscal year 1972	Fiscal year 1973	Additional to completion	Total estimated cost
R.D.T. & E. funds	$86.4	[1] $20.3	$41.0	[2]	[2]
R.D.T. & E. man-years	279	305	277	[2]	[2]

[1] Includes supplemental of $4,000,000.
[2] Continuing.
[3] Not available.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded under this program, the amounts for each for fiscal year 1971 and 1972, and the request for 1973.

General GRIBBLE. Yes, sir. This list which I will provide for the record depicts the projects and associated funds contained within the mobility program element 6.46.04.A.

(The information follows:)

[In millions of dollars]

Project	Fiscal year—		
	1971	1972	1973
1X564604DE01—M60A1 tank PIP	0	7.3	6.4
1X564604D258—Mechanized infantry combat vehicle	.9	2.2	10.8
1X564604D340—Vehicle rapid fire weapons system	5.1	0	5.6
1G564604D403—Trucks military transport	2.0	.9	.1
1X564604D417—Armor reconnaissance scout vehicle	1.5	6.4	15.6
1X564604D632—Automatic test equipment for internal combustion engine	1.6	3.5	2.5
1X564604D409—Adverse terrain remote armor vehicles	.3	0	0
Total	11.4	20.3	41.0

Chairman ELLENDER. Of the total requested for mobility, $6,400,000 is for "M60A1 Tank Product Improvement Program." Please comment on the objectives of this project, and tell us what you plan to do with the $6.4 million you are requesting for fiscal year 1973.

General GRIBBLE. The M60A1 tank product improvement program provides for the development/engineering and application to M60-series tanks of nine major product improvements. These are add-on stabilization, a solid-state ballistic computer, a laser rangefinder, a tube-over-bar suspension system, an improved reliability engine, a crew-served weapon sight mount, T142 track, an improved electrical system, and top-loading air cleaners. The application of these nine improvements will provide M60-series tanks increased capabilities in the areas of reliability, mobility, and firepower. In addition, the program provides for the fabrication and feasibility testing of a thermal sight for use in M60A1 tanks.

The development/engineering effort associated with the program is funded from both R.D.T. & E. and PEMA resources. R.D.T. & E. funds are required for the development of the solid-state computer, laser rangefinder, and tube-over-bar suspension improvements and for the support of engineering and expanded service tests of the resulting tank weapon system.

In fiscal year 1973, development of the solid-state computer, laser rangefinder, and tube-over-bar suspension will be continued. Engineering design tests and qualification and reliability tests will be completed. Fourteen solid-state computers, 14 laser rangefinders, and 12 tube-over-bar suspension systems including spares will be delivered. Engineering and expanded service tests will be initiated. Three thermal sight prototypes will be delivered for feasibility testing. The requested $6.4 million is required to support this fiscal year 1973 effort.

Senator YOUNG. The total requested for mobility includes $10,800,000 for the mechanized infantry combat vehicle. What is the

objective of this project, and what do you plan to do with the $10.8 million you are requesting?

General GRIBBLE. The approved objective of this project is to produce [deleted] MICV's to replace the M113 armored personnel carriers [deleted]. This vehicle will be developed as a lightly armored, fully tracked, amphibious infantry combat squad carrier. It will be designed to operate as part of a mechanized infantry and tank vehicle team and provide the option to the commander to engage in mounted or dismounted combat. Technical design requirements call for increased combat effectiveness in cross-country mobility, ballistic protection, and improved stabilized weaponization. The fiscal year 1973 funds requested for the MICV program will be used to support a cost-plus-incentive-fee contract awarded for engineering development, and pay for the Army source selection board activities. They will provide for continued development efforts on selected supplemental components and are required for long-lead-time hardware items, the design and fabrication of three test rigs, and to initiate the design development and fabrication of the first of 12 engineering pilot/prototype vehicles. These funds are also required to provide the salaries of the project manager's staff.

Chairman ELLENDER. I note that the total requested includes $5,600,000 for the "Vehicle Rapid Fire Weapon System." What is the objective of this effort, and what do you plan to do with this $5,600,000?

General GRIBBLE. The objective of this effort is to develop the BUSHMASTER, an automatic weapon system consisting of gun, ammunition, and supporting equipment for use as the primary armament on the mechanized infantry combat vehicle XM723. This system will provide a significant increase in firepower and lethality against light armored vehicles, material, personnel, and some types of aircraft. The caliber of the BUSHMASTER will be between 20 millimeters and 30 millimeters. A selected feed system will permit instantaneous selection of two of the three types of ammunition: armor-piercing-tracer (APT), high explosive incendiary-tracer (HEIT), and multiple flechette (MF). The $5.6 million requested in fiscal year 1973 will be used to conduct the evaluation of data derived from the development suitability tests and for the selection of one contractor for full scale engineering development of the weapon and ammunition. The funds will also be used to continue investigations of armor penetrators by the Weapons Laboratory and the Frankford Arsenal.

Senator YOUNG. The request for mobility includes $15,550,000 for the "Armored Reconnaissance Scout Vehicle". What is the objective of this project?

General GRIBBLE. The objective of this project is to develop a follow-on vehicle to the M114A1 command and reconnaissance vehicle. The ARSV will be employed in armed cavalry regiments and in scout platoons of armor and infantry units. It will have a three-man crew, be inherently amphibious and air transportable by medium helicopter and provide protection against artillery fragments and small arms fire. The primary weapon for the ARSV will be the M139 weapons system. The ARSV will also provide a significant increase in mobility over the M114A1, and will be equipped with [deleted] for use during day and night operations.

MINE AND COUNTERMINE

Chairman ELLENDER. Of the total requested for "Ordnance, combat vehicles, and related equipment," $13 million is for the engineering development program entitled "Mine/Countermine". Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

ENGINEERING DEVELOPMENT

DESCRIPTION: The objective of this program element is to provide a family of scatterable, self destructing antipersonnel and antitank/antivehicle mines, capable of [deleted] as deemed efficient and cost effective. All scatterable mines will incorporate a self destruct feature assisting future friendly offensive operations and clearing of battlegrounds following the cessation of hostilities. This new family of scatterable, self destructing mines will satisfy new and modern concepts in barrier operations as well as offer commanders the capability of using mines in offensive roles. This program element also will develop equipment that will provide the capability of neutralizing mines, booby traps, explosive charges and explosive devices. It will provide the means of detecting all types of antipersonnel mines, antimateriel mines, explosive devices and mine peculiar items. In addition, demolition related equipment, explosive ordnance disposal hardware and items for use by Special Forces are developed in this program element.

WORK PERFORMED BY: Principal technical responsibility for development of mines rests with the Project Manager for Selected Ammunition. The principal Army agency involved is Picatinny Arsenal at Dover, New Jersey. In addition, the following are contractors: Honeywell Incorporated, Minneapolis, Minnesota; Metric Systems Incorporated, Fort Walton Beach, Florida; Southwest Research Institute, Texas; Magnavox Co., New Jersey. US Navy Laboratories, the Night Vision Laboratory, the Army Materiel Command Testing Agencies, and the US Army Infantry School Scout Dog Command, also participate in this project.

FY 1972 program.—Testing of the XM616 antitank mine fuze will be completed in anticipation of type classification in FY 73. The XM56 helicopter delivered antitank mine system will enter engineer service testing late in this fiscal year after the completion of the engineering development testing phase. The engineering development and engineering development testing phases for the XM692E1 cannon delivery scatterable antipersonnel mine will have been completed. Continued development of the XM58 helicopter minefield marking and recording system has been delayed pending the results of reassessment of the requirement for the system. Engineering development of an interim portable mine detector using [deleted] principles was initiated. The portable antipersonnel mine detector using [deleted] technology entered engineering development. The vehicle mounted road interdiction mine detector entered engineering development. The non-expendable mine clearing roller is scheduled for engineering design testing. The tank mounted track width mine clearing plow entered engineering development. This is a [deleted]. Fuel air explosives have proven to have significant potential in mine clearing capabilities. Engineering development of an air delivered fuel air explosives system for mine clearing is planned to be [deleted]. The XM180 Demolition Kit, Cratering will be continued in its final testing phases. The XM122 remote, wireless firing device will be entered into the engineering testing. Engineering testing for the XM252 explosive and ordnance disposal entry kit will be initiated.

FY 1973 planned program.—The XM692E1 will enter into engineering and expanded service testin. The XM56 [antitank] s ystem is scheduled for [deleted]. The cannon artillery delivered [deleted] will enter engineering development. Initiate engineering development of tank mounted and helicopter mounted [deleted] mine detection system. Continue development of the portable [deleted] antipersonnel mine detector. Enter the wired mine detector into engineering development. Enter a program for standardization and development of canine mine detection techniques into engineering development. Continue development

of the non-expendable mine clearing roller and the mine clearing tank mounted track width plow. Initiate development of ground to ground delivery of [deleted] and continue the development of the helicopter delivery mode. The XM180 Demolition Kit, Cratering, is scheduled for completion of testing and type classification. Testing of the XM122 remote, wireless firing device and the XM252 explosive ordnance disposal entry kit will be completed.

Program to completion.—This is a continuing program.

Resources (in millions of dollars):

R.D.T. & E. funds for FY 1971 and Prior, $64.4; FY 1972, $6.8; FY 1973, $13.0; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972 and the request for fiscal year 1973.

General GRIBBLE. Yes, sir.

(The information follows:)

[In thousands of dollars]

Project	Fiscal year—		
	1971	1972	1973
1X564606D016—Mine systems	6,070	5,060	9,400
1W564606D021—Demolition systems	974	765	800
1J564606D415—Mine neutralization	280	1,000	2,800
1J564606D464—Fortifications and obstacles	10	20	0
Total	7,334	6,845	13,000

Senator YOUNG. I note in the descriptive summary among the Army organizations participating in this development program, the Army Infantry School Scout Dog Command is listed. What functions does the Scout Dog Command have in this project?

General GRIBBLE. The Army Infantry School Scout Dog Command provides handlers and training of the research and development prototype dogs and supplies support for the testing phases in the development of this capability.

Chairman ELLENDER. The $13 million you are requesting for mine and countermine for fiscal year 1973 is $6.2 million more than was provided in fiscal year 1972. Please comment on your need for this increase.

General GRIBBLE. The increase in funding supports the continuing development of the mine detection and neutralization program and the family of scatterable mines. The increase occurs since the XM718 artillery delivered antitank mine will be introduced into engineering development in fiscal year [deleted] and the requirement to procure engineering test hardware for the XM692E1 artillery delivered antipersonnel mine. In addition, several new countermine items are being introduced into engineering development to include fuel air explosive in the ground launched configuration, the mine clearing plow, the [deleted] mine detector, the portable antipersonnel mine detector, the wire detector and the canine mine and booby trap detector.

Chairman ELLENDER. Of the total requested for mine and countermine $9.4 million is for the project entitled "Mine System." Can you give us a brief, unclassified description of this project, and tell us what you will do with the $9.4 million you are requesting for fiscal year 1973?

General GRIBBLE. The objectives of this project are to provide a family of scatterable, self-destructing antipersonnel and antitank/antivehicle mines, capable of rapid and remote delivery by a variety of means as deemed efficient and cost effective. These systems will supplement available hand emplaced mines. All scatterable mines will incorporate a self-destruct feature assisting future friendly offensive operations and clearing of battlegrounds following the cessation of hostilities. This new family of scatterable, self-destructing mines will satisfy new and modern concepts in barrier operations as well as offer commanders the capability of using mines in offensive roles. The scatterable minefields will tend to increase the efficiency of supporting weapons by causing target vehicles to stay in range for a longer period of time, as well as improve the Army's ability to emplace minefields. The $9.4 million will continue the development of the XM56 helicopter delivered antitank mine system through the testing phases.

These funds will also allow for procurement of test items to permit the XM692E1 artillery delivered antipersonnel mine system to enter into engineering testing and expanded service testing. The XM718 artillery delivered [deleted] will begin engineering development and the XM58 helicopter delivered scatterable minefield marking system will continue in engineering development.

Senator YOUNG. Why do you need the increase of $4.3 million you are requesting for fiscal year 1973?

General GRIBBLE. There are two basic reasons. The first is the introduction of the XM718 artillery delivered [deleted] into engineering development and secondly, the requirement to fund the procurement of the required quantities of XM692E1 artillery delivered antipersonnel mines to support the engineering testing phase of the development.

CHEMICAL DEVICES

Chairman ELLENDER. The last item to be considered under the ordnance, combat vehicles and related equipment budget activity is the program entitled "Chemical Devices" for which you are requesting $1.1 million. Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: ENGINEERING DEVELOPMENT

Description.—The objective of this program is to develop new chemical weapons and equipment for the Army and for other Services when use is also common to the Army. The objectives of the lethal chemical weapons program were changed in 1970 and currently support only the development of chemical munitions that produce the toxic agent via the binary mode. A binary weapon is one in which the agent is produced from its constituents by means of a chemical reaction occuring during the time of flight of the munition to the target. This system will provide for maximum safety in handling, storage, transportation and demilitarization and at the same time optimize state-of-the-art advances to ensure maximum target effectiveness. This program element contains four projects devoted to development of binary lethal chemical ground munitions, binary lethal chemical missile warheads, incapacitating chemical ground munitions and incapacitating chemical aerial munitions.

Work performed by.—Edgewood Arsenal, Md. is the primary Army development laboratory with participation by Picatinny Arsenal, N.J.

FY 1972 programs.—[Deleted.]

CHEMICAL DEVICES

FY 1973 planned program.—[Deleted.]
Program to completion.—This is a continuing program designed to provide effective chemical weapons systems for the Army emphasizing safety in handling, storage and transportation through the use of the binary weapons concept.
Resources (In millions of dollars):
R.D.T. & E. funds for FY 1971 and Prior, 0.03; FY 1972, 1.3; FY 1973, 1.1; Additional to completion continuing; Total estimated cost, not available.

Chairman ELLENDER. I note that the entire $1.1 million is for the project entitled "Lethal Chemical Ground Munitions." Please describe this project and tell us what you will do with the funds you are requesting.

General GRIBBLE. This project supports engineering development of the [deleted] we now have. Since this munition will not contain a lethal agent until after it has been fired from the howitzer and is enroute to the target, it will greatly improve safety in production, handling, storage and transportation.

Senator YOUNG. Is this project in accordance with announced criteria for the manufacture of chemical warfare munitions?

General GRIBBLE. The development of the [deleted] is in consonance with national policy as outlined by President Nixon on November 25, 1969. Before this projectile is procured, the appropriate provisions of section 506 of Public Law 91–441 will be complied with.

OTHER EQUIPMENT

Chairman ELLENDER. The next budget activity to be considered is "Other Equipment" for which you are requesting $384,980,000. How much was provided for this budget activity in fiscal years 1971 and 1972?

General GRIBBLE. In fiscal year 1971, $297,379,000 was provided, and in fiscal year 1972, $360,681,000 was provided for this budget activity.

TACTICAL FIRE DIRECTION SYSTEM (TACFIRE)

Chairman ELLENDER. The first program to be considered under "Other Equipment" is the Tactical Fire Direction System, known as TACFIRE, for which you are requesting $5.3 million. Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: OPERATIONAL SYSTEMS

Background.—Commanders in future conflicts will face a sophisticated enemy with advantages in the size of forces, fire support, armor capability and tactical air. These enemy advantages can be minimized by improving the accuracy and speed of the commanders' decisions and execution of firepower. The objective of the program is to provide the advantages of automatic data processing to certain tactical functions of field artillery. The Tactical Fire Direction System (TACFIRE) will increase the effectiveness of artillery fire support through increased accuracy, better and more rapid use of target information, reduced reaction time, and greater efficiency in the determination of fire capabilities and the allocation of fire units to targets. It replaces the Manual/Field Artillery Digital Automatic Computer (FADAC) method for computation in fire direction centers.

Description.—TACFIRE consists of a completely integrated system of tactical computer elements located at the artillery battalion and at division artillery which will provide for automatic transmission, receipt, and computation of firing data. Artillery functions to be automated include tactical fire control, nuclear and non-nuclear fire planning, processing of artillery target intelligence, preliminary target analysis, fallout predictions, distribution of weather data, and maintaining the status of ammunition and fire units. TACFIRE will interface with the Tactical Operations System (TOS) and possibly other Army Tactical Data Systems (ARTADS), when they are fielded. TACFIRE will use an integrated system of computers, local and remote input/output devices, digital data storage and retrieval units, display devices, and control consoles.

Work performed by.—Project Manager, Army Tactical Data Systems, Electronics Command, US Army Materiel Command, Fort Monmouth, New Jersey, has been designated the directing agency for this program. The US Army Computer Systems Command, Fort Belvoir, Virginia, provides software technical assistance. The contractor is the Data Systems Division of Litton Industries, Van Nuys, California. Technical assistance is being performed by Auerbach Assoc., Inc., Philadelphia, Pennsylvania, and Meta Systems Corporation, Trenton, New Jersey.

FY 1972 program.—The planned program for FY 72 is to complete the prototype system and commence Engineering Test and Expanded Service Test (ET/EST). RDAT will be completed prior to ET/EST.

FY 1973 planned program.—It is planned to complete ET/EST and make the production decision. The technical publications will be completed and approval is expected on the repair parts provisioning and logistics support plans. TACFIRE ET/EST equipment will be refurbished by the contractor so that testing of the systems with the Integrated Battlefield Control (IBCS) concept and under arctic and tropic conditions can be accomplished.

Program to completion.—The following are scheduled milestones: Type Classify—Mar 73 First Production Equipment Delivered—Mar 75, Initial Operational Capability—Jun 75.

RESOURCES

[Dollar amounts in millions]

	Fiscal year 1963 through 1971	Fiscal year 1972	Fiscal year 1973	Additional to completion	Total estimated cost
R.D.T. & E. funds	$55.6	$4.7	$5.3	none [1]	$65.6
R.D.T. & E. man-years	25	7	7	[2]	[2]

[1] Does not include $1,300,000 reported in the Dec. 31, 1971 selected acquisition report which is currently an unfunded requirement.
[2] Not available.

Senator YOUNG. I note in the descriptive summary under the program for fiscal year 1972 that you plan to complete the prototype system and commence engineering test and expanded service test for this system. Does it look as if you will be able to meet this schedule during fiscal year 1972?

General GRIBBLE. Yes, sir. Research and development acceptance tests are expected to be completed by March 31, 1972. Engineering test and expanded service testing will commence immediately thereafter.

Chairman ELLENDER. According to last year's hearings, you expect to make a production decision on this system 11 months after the start of engineering test/service test. Do you still expect to meet this schedule, and if so, when will the production decision be made?

General GRIBBLE. Through a change to the contract for TACFIRE, we now have 12 months in which to make a production decision. The production decision is scheduled to be made during March 1973.

Senator YOUNG. $8.5 million was provided for this program in fiscal year 1971 and $4.7 million was provided in fiscal year 1972.

For fiscal year 1973, you are requesting $5.3 million, an increase of $600,000 over last year. Please comment on this.

General GRIBBLE. Yes, sir. The increase of $600,000 is the result of a combination of several efforts. Those items are: improvements to the TACFIRE system brought about as a result of research and development acceptance testing; development of a final maintenance support plan; initiation and completion of a physical configuration audit review; and support for engineering test/expanded service testing.

TRI-SERVICE TACTICAL COMMUNICATIONS SYSTEM (TRI-TAC)

Chairman ELLENDER. The request includes $11,520,000 for the Tri-Service Tactical Communications System. Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: OPERATIONAL SYSTEMS

Background.—TRI-TAC has been established as a joint Army, Navy, Marine Corps and Air Force program to: (1) assure compatibility and a high degree of commonality of tactical communications systems and devices used in joint combat force operations; and (2) achieve maximum economy through joint service development, acquisition and follow-on support of tactical communication equipment. TRI-TAC fills the void in the development of U.S. tactical communications capability created by the cancellation of Project MALLARD.

Description.—TRI-TAC will provide a single multichannel Tactical Communications System for trunking and switching to support joint operations of U.S. combat forces in the early 1980s. It will interconnect with the Defense Communications System (DCS) and have the capability to interface with systems of our allies (i.e., NATO).

The proposed TRI-TAC system will provide a joint service tactical switching trunking capability for voice and record communications and for data communications to support the employment of evolving computerized weapon systems. Advances in integrated circuit technology and the increasing availability of low cost wide band transmission media will be exploited to obtain: (1) faster rate of information transfer; (2) a higher degree of transmission security; (3) better mobility through size and weight reductions; and (4) improved reliability and maintainability consistent with manpower limitations resulting from a voluntary force. Detailed systems characteristics are being formulated.

Work performed by.—TRI-TAC Office, Ft. Monmouth, New Jersey. Personnel originally assigned to Project MALLARD have been transferred to the TRI-TAC Office. These personnel have been supplemented by new assignments from the Air Force, Navy and Marine Corps.

In Fiscal Year 1971, Congress directed MALLARD be reoriented to give first priority to joint development and operation for the Communications needs of our three military departments. No Fiscal Year 1971 funds were appropriated for MALLARD. U.S. participation in MALLARD was terminated in October 1970. Reorientation of Project MALLARD to Project TRI-TAC was successfully undertaken by the Assistant to the Secretary of Defense (Telecommunications).

Fiscal year 1972 program.—The TRI-TAC program is oriented toward meeting those U.S. tactical communication needs which have assumed a higher degree of urgency due to the time lost as result of the cancellation of the MALLARD program. TRI-TAC has moved forward in Fiscal Year 1972 to initiate development of those long lead time items which have been defined for TRI-TAC. The $10M requested in Fiscal Year 1972 plus the $8M reprogrammed from Fiscal Year 70 $18M available for TRI-TAC during Fiscal Year 1972. These funds are needed for: operation of the TRI-TAC office; development of a TRI-TAC automatic switch, transmission and system control equipment; system studies and experimentation. Emphasis has been placed on development of the automatic switch and system control. Contract award is planned for 4th Qtr Fiscal Year 1972.

Fiscal year 1973 planned program.—During Fiscal Year 1973, development of the automatic switch and technical control will continue. New supporting devel-

opments such as unit level switchboards will be initiated. Funds for Fiscal Year 1973 are required to support the multi-year contracts for the automatic switch and technical control and for new supporting equipment. Funds are also required for operation of the TRI–TAC Office.

Program to completion.—Future program will consist of the evolutionary integration of all Service multi-channel communication equipment.

RESOURCES

[Dollar amounts in millions]

	Fiscal year—				
	1971 and prior	1972	1973	Additional to completion	Total estimated cost
R.D.T. & E. funds	$8	$5.2	$11.5	Continuing	Not available.
R.D.T. & E. man-years	147	116	142	Not available	Do.

Chairman ELLENDER. How does this effort differ from the old Project MALLARD that was terminated by Congress?

General GRIBBLE. It differs in three ways. It is not international in scope. It is more truly a joint effort on a national basis. Lastly, the Director, TRI–TAC, is the system architect and not the developer; development is carried out by the services.

Senator YOUNG. Tell us what you plan to do with the $11.5 million you are requesting for fiscal year 1973.

General GRIBBLE. The major task is the development of the AN/TTC–39 switch as directed by the Secretary of Defense for use by all services. Engineering development of the time division digital multiplexer, TD–1069 will begin. In addition, the funds will provide for engineering support services, administrative support, review, planning, and contracting officer technical representation in support of the Triservice Tactical Communications System.

CRYPTOLOGIC ACTIVITIES

Chairman ELLENDER. For fiscal year 1973, [deleted] is requested for the classified program entitled "Cryptologic activities". Has the committee been provided with full details on this program?

General GRIBBLE. Yes, sir; full information has been provided.

COMMUNICATIONS SECURITY EQUIPMENT

Chairman ELLENDER. Of the total requested for "Other equipment" [deleted] is for the program entitled "Communications Security Equipment". Has the Committee been provided with the details of this program?

General GRIBBLE. Yes, sir.

COMMUNICATIONS ELECTRONICS

Chairman ELLENDER. $13.1 million is requested for the exploratory development program entitled "Communications Electronics." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

COMMUNICATIONS ELECTRONICS

EXPLORATORY DEVELOPMENT

Description.—This program element consists of twelve projects: Studies and Investigations for Communications-Electronics: This project provides for continuing studies and investigations of concepts and techniques in support of communications-electronics research and development.

Tactical Radio Communications System: This project provides for development of a coordinated, nonfragmented approach for a system of net communications equipment and maintains a concentrated effort in exploring specific areas of technology applicable to net radio equipment in the 1980–85 time frame.

Information Transmission: This project provides for the exploratory development of improved techniques for information transmission.

Radio Frequency Compatibility Program: This project provides research and development support for the Army's radio frequency compatibility program, and development of improved techniques, devices and components for the reduction of electromagnetic interference.

Satellite Communications: This project provides development of improved techniques and design for ground satellite communications terminals.

Information Acquisition: This project provides for exploratory development of improved techniques for converting various forms of information into electrical signals and back to their original form. It includes speech, printed and pictorial information.

Communications System Theory: This project investigates problems in the areas of system organization, system control, and system standards and characteristics to increase utilization of communication systems.

IFF Studies and Investigations: This program supports exploratory development of two systems, primarily: The Synchronous Identification System (SID) and the hybrid optical-microwave system. The SID modulates a portion of the radar beam reflected from the targets and has potential as a secure, passive air defense IFF. The optical-microwave looks promising for Battlefield IFF (BIFF) as well as for REDEYE-type air defense systems.

Night Vision (2 projects): This program develops new techniques, components and devices to improve combat operations under conditions of darkness. Studies in the basic and applied field of visionics and systems analysis techniques are conducted to optimize the design of the latest generation of image intensifiers and far infrared viewing systems. Three technologies for improving night vision are being pursued. Image intensifiers amplify night light by a factor of 30 to 50 thousand. Far infrared techniques detect naturally occurring heat emissions from military targets. The development of both visible and infrared light sources to extend the range of other night viewing systems is also included in this program.

Electronic Warfare (2 projects): The objective of this program is two-fold: first, to investigate and develop improved techniques and components for detecting, jamming and deceiving enemy electromagnetic equipments (e.g., communications systems, battlefield surveillance and countermortar radars, fire control systems, radar controlled artillery and missile fuzes and optical surveillance and guidance devices); second, to reduce the vulnerability of our electromagnetic equipment to enemy electronic countermeasures. Feasibility studies are conducted on proposed sophisticated electronic countermeasures systems. New receivers, transmitters, control systems, antenna and other components unique to electronic warfare are developed. Specialized components such as high power broadband transmitter tubes and infrared detection techniques are developed.

Work performed by.—The projects are conducted by the U.S. Army Electronics Command, Fort Monmouth, New Jersey; the U.S. Army Satellite Communications Agency, Fort Monmouth, New Jersey; and the U.S. Army Combat Developments Command, Fort Belvoir, Virginia. Contractors: Radio Corporation of America, Camden, New Jersey; Lockheed Electronics, Tucson, Arizona; AVCO, Cincinnati, Ohio; Litton Industries, Van Nuys, California; General Electric, Syracuse, New York; Stanford Research Institute, Menlo Park, California; Magnavox, Fort Wayne, Indiana; University of Michigan, Ann Arbor, Michigan; and Columbia University, New York, New York.

Fiscal year 1972 program.—Lighter weight and stronger materials have been adapted for use in tactical antenna masts. Studies on lasers for high bit rate laser communication system have been completed. Electronic speech recognition and speaker authentication studies have been completed. Preliminary efforts on

multi-color displays using light emitting diodes for military automatic data processing (ADP) systems have been completed. Development of an exploratory airborne and ground based high power directional electronic countermeasures (ECM) antennas has been completed. General performance specifications for a deceptive jamming system against tactical FM communications net have been developed. Scatter ECM techniques study is being conducted. Jamming techniques against digital communications are being studied.

Fiscal year 1973 planned program.—Studies and investigations begun on the Tactical Radio Communications System, Information Transmission, and Communications System Theory and Operation will be continued. New investigations will be started in analyzing technical control operations and signal parameters to establish qualitative digital standards. Possible uses of light diodes and continuously tunable laser devices will be investigated for application to large screen displays. Techniques for optical character recognition to produce high speed readers will be continued.

Tests will be run on models of the SID and analysis of data will be made. It is planned to develop a number of simple devices called BIFF tricks. Exploratory development of high performance third generation III–V type materials and silicon photo cathodes will continue. The work on silicon transmission, secondary electron multiplier diodes for use as low noise, high gain, high resolution amplifier elements will be integrated with photo cathode materials to design improved highly efficient, low weight, small size image intensifier tubes. Intensive in-house and contractual work will develop the technological basis for infrared direct view tube imaging devices. Emphasis will be placed on development of high radiance and low beam divergence in laser diodes with increased reliability and reduced manufacturing costs. A selection will be made between the silicon-doped gallium arsenide and the multi-layer large optical cavity laser devices for further development for a new generation of night operation systems. Electronic warfare investigations will include communications and noncommunications items in the following areas:

a. Propagation.
b. Antenna techniques.
c. Receiver techniques.
d. Data analysis, recording and display techniques.
e. Radio direction finding techniques.
f. Selective, deceptive and adaptive jamming techniques.
g. Scatter ECM techniques.
h. Microminiaturization.
i. LEFIERCE TROJAN data analysis.
j. Analysis of threat for exploitation of ECM vulnerability.
k. Radar Countermeasures techniques.
l. ECM vs Optically Guided Weapons.
m. Electro Optical Countermeasures techniques.
n. VT fuze jamming techniques.
o. ECCM techniques developments.

RESOURCES

[Dollar amounts in millions]

	Fiscal year—				
	1971	1972	1973	Additional to completion	Total estimated cost
R.D.T. & E. funds	$10.6	$13.9	$13.1	Continuing	Not available.
R.D.T. & E. man-years	600	510	478	Not available	Do.

Chairman ELLENDER. Please provide a tabulation for the record listing the project to be funded, the amounts for each for fiscal years 1971 and 1972 and request for fiscal year 1973.

General GRIBBLE. Yes, sir.

(The information follows:)

[In thousands of dollars]

Project	Fiscal year 1971	Fiscal year 1972	Fiscal year 1973
1S662701A042—Studies and investigations—Electronic warfare	1,641	1,655	2,000
1S662701A173—Studies and investigations for communications—electronics	300	300	200
1S662701A220—Identification, friend or foe studies and investigations	75	100	100
1S662701A350—Tactical radio communication system	650	1,556	1,700
1S662701A448—Information transmission	500	600	600
1S662701D449—Radio frequency compatibility program	1,007	1,350	1,100
1X662701A450—Satellite communications electronics	800	800	900
1S662701D466—Night vision	2,600	3,383	3,510
1S662701A484—Information acquisition	460	500	600
1S662701A485—Communication system theory	500	950	500
1S662701D617—Visionics	1,000	1,450	1,400
5A662701A904—Exploratory development electronic counter-countermeasures	1,043	1,224	500
Total	10,576	13,868	13,110

Senator YOUNG. Of the total requested for Communications Electronics $2 million is for the project entitled "Studies and Investigations—Electronic Warfare." What are the objectives of this project?

General GRIBBLE. This project includes a program of applied research in both active and passive electronic countermeasures and electronic counter countermeasures techniques. The objective is to provide the technology base for the development of electronic warfare systems to support the tactical command. Technology under investigation includes components, signal processing, direction finding and propagation.

Chairman ELLENDER. Comment on the project entitled "Tactical Radio Communication System" for which you are requesting $1.7 million.

General GRIBBLE. The tactical radio communication system is a program to develop a new system of tactical net radios for the 1985 time frame to replace those presently in use. The new system emphasizes a great reduction in size and weight, simplified operation and maintenance, and much improved reliability. The new system is less vulnerable to enemy interference, interception, and deception. Versions of radios are to be utilized in Army aircraft, on vehicles and as a man-pack. The development of the system provides for least life cycle costs of equipment. Two parallel contracts are presently in effect to produce concept studies. These studies will define the user's communication needs, define the characteristics and capabilities of equipment, assess the technology available in the 1975–80 time frame, define the configuration of the system and provide the results of experimental validation where required.

Senator YOUNG. What are the objectives of the Radio Frequency Compatibility Project for which you are requesting $1.1 million?

General GRIBBLE. Our objective in radio frequency compatibility, also called electromagnetic compatibility (EMC), is to insure that the increasing interdependence of communications-electronics devices takes place without receiving or causing interference in their intended operational environments. This effort requires a tremendous R.D.T. & E. program for positive action.

Chairman ELLENDER. Of the total requested for Communications Electronics, $3.5 million is for the project entitled "Night Vision."

Describe the objectives of this project and tell us what you will do with the funds you are requesting.

General GRIBBLE. The objective of this project is to develop new techniques, components, and devices to enhance night combat operations. The funds will be used to develop direct and remote view image intensifier tubes, coherent and incoherent light sources, and thermal imaging devices.

Senator YOUNG. Why do you need the increase of $127,000 you are requesting for fiscal year 1973?

General GRIBBLE. The increase is necessary to accommodate the January 1972 civilian pay raise.

COMBAT SURVEILLANCE AND TARGET ACQUISITION AND ELECTRONIC DEVICES

Chairman ELLENDER. The next program to be considered under the other equipment budget activity is "Combat Surveillance and Target Acquisition and Electronic Devices" for which you are requesting [deleted]. Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: EXPLORATORY DEVELOPMENT

Description.—Exploratory development is carried out in four general areas: (1) Surveillance and target acquisition: moving target indicator radar for very light forward area radar sets to locate slowly moving vehicles and personnel under jungle foliage, hostile mortar, artillery, and rocket positions; infrared, optical, acoustic, and geophysical sensors for covert target acquisition; photographic and image conversion techniques for prompt image processing; lasers for battlefield illumination and scanning systems, target ranging and designation, and optical radars; and real-time data transfer, processing, and display for intrusion detection systems. (2) Electronic devices: thermionic tubes and devices for microwave communications systems, radar, and electronic warfare; solid-state devices for electronic circuits; electronic parts for faster, cheaper, and more reliable switching, filtering and tuning; frequency control devices for more stable, flexible, and rapid tuning by means of crystals with improved capabilities or atomic/molecular clocks; integrated electronics for extremely compact and economical circuitry with drastically reduced maintenance requirements; [deleted]. (3) Fluidics: fluidic component investigations for sensors, amplifiers, logic elements, and transducers; fluidic technology to adapt components to the power, environmental, radiation reliability, and cost requirements of Army materiel; fluidic systems for specific military system functions such as safing-arming-fusing and control of attitude, direction, and power plant performance in missiles, aircraft, vehicles, weapons, and munitions. (4) Information processing: automatic data processing techniques for tactical data systems and digital communications systems; intelligence information processing for fast and comprehensive tactical applications; automation of concept and design tasks to speed the development of military systems; and the initial publication and periodic revision of engineering design handbooks to preserve Army design experience and resources, and provide a reference for design information.

Work performed by.—78 percent of the work is accomplished internally at the Combat Surveillance and Target Asquisition Laboratory, Electronic Technology and Devices Laboratory, and Communications and Automatic Data Processing Laboratory, Fort Monmouth, New Jersey; Harry Diamond Laboratories, Washington, D.C.; Missile Command Physical Sciences Directorate, Redstone Arsenal, Alabama; Picatinny Arsenal, Dover, New Jersey; Frankford Arsenal, Philadelphia, Pennsylvania; Watervliet Arsenal, New York; Rock Island Arsenal, Illinois; Tank and Automotive Command Laboratory, Warren, Michigan; Ballistic Research Laboratories, Aberdeen, Maryland; Materials and Mechanics Research Center, Watertown, Massachusetts; Air Mobility Research and Devel-

opment Laboratory, Fort Eustis, Virginia; and the Behavior and Systems Research Laboratory, Arlington, Virginia. Ten contractors hold contracts of $60,000 or more: Forge Aerospace Incorporated, Washington, D.C.; Westinghouse Corporation, Pittsburgh, Pennsylvania; Hughes Tool Company, Culver City, California; KMS Technological Center, Van Nuys, California; Cornell Aerospace Laboratory, Buffalo, New York; Sedco Systems Incorporated, Farmingdale, New York; Research Triangle Institute, Research Triangle Park, North Carolina; ARINC Research Corporation, Annapolis, Maryland; Northrup Aircraft Corporation, Palos Verde, California; and TRW Corporation, Redondo Beach, California. An additional 60 contracts total $2,549,000.

Fiscal year 1972 program.—a. Surveillance and Target Acquisition: Complete computer simulation of airborne foliage-penetration radar designs and construct a model. Initiate analysis of airborne phased array antennas to solve current mechanical stability problems. Field test weapon-locating radar's vulnerability to chaff. Begin investigation of techniques for discriminating against sky clutter. Complete modeling of a lightweight electronic scanning radar. Consider intrusion detection methods based on radar technology. Measure radar reflection patterns of artillery projectiles [deleted] modulation of radar cross-section by intermittent metal-to-metal contact in moving vehicles and weapons; formulate radar designs [deleted]. Continue analyses of techniques of processing color photographic materials. Determine feasibility of simplified, cheaper, aerial camera designs and of image intensified cameras. Continue evaluations of dry-processed photographic materials for economies in processing equipment. Field test the Three-Dimensional Laser Line Scan Surveillance Set. Design, fabricate, and test a second-generation handheld laser rangefinder. [Deleted.] Begin field experiments related to a small arms fire locator. Continue improvements in unattended ground sensor circuitry design for greater reliability and ruggedness and reduced size and weight. Test concepts for displaying data from unattended ground sensors.

b. Electronic Devices: Continue research on electron tube design for communications, countermeasures, avionics, radar, and battlefield surveillance equipment. Optimize cathode processing and parameters to achieve significant emissions at low temperatures. Continue investigations of special electron devices such as optical jammer sources, lasers, optical pumps, negative grid devices, and hybrid electron beam semiconductor devices to reduce the inventory of components. Analyze linear beam tubes, crossed field tubes, and other microwave devices to raise the reliability, life, and performance while lowering size, weight, and cost of electronic warfare and radar systems. Investigate semiconductor devices and schemes for their integration in the search for higher power at higher operating frequencies. Investigate bulk effect microwave oscillators and avalanche transit time diode oscillators and amplifiers for use in future communications and radar applications. Continue analysis of acoustic surface-wave technology, active filters, and phase shifters. Fabricate hybrid microcircuits for current and future electronic equipment. Investigate integrated circuits, solid state devices, and passive components for new low-power applications and integrable passive elements. Develop and exploit flat panel display techniques for compact, high speed, computer-compatible display needs of avionics, surveillance, and target acquisition systems. Develop temperature and vibration control and compensation circuits for crystal oscillators for station timekeeping and frequency control for secure communication nets.

c. Fluidics: Continue design of vortex rate sensors possessing reduced signal drift for use in stabilization systems. Investigate and develop new concepts in acceleration and concentration sensors for use in defense plant modernization. Continue testing of amplifiers and logic elements for application in Army materiel. Initiate the development and test of a monopropellant gas generator and the laboratory determination of gamma and neutron influence effects on fluidic systems in the atmosphere. Continue design of hydrofluidic servoactuators, determination of parametric values for bistable and vortex valves, for rocket directional control, and development of a fluidic temperature control system to schedule turbine nozzle areas, a single-axis stabilization system for cupola-mounted weapons, and a self-contained power supply system for the mortar repositioning device.

d. Information Processing: Build an automatic voice-frequency circuit quality monitor. Complete studies of data line performance estimating techniques to allow assessing the quality of digital links without interrupting traffic. Develop a family of interactive tactical intelligence models for computer-aided analysis

and interpretation of intelligence information. Model and analyze microwave semiconductor devices and communications terminal designs. Publish eleven engineering design handbooks, including *Design Engineers' Nuclear Effects Manual* (4 Vol.), *Principles of Explosive Behavior*, and *Armor and Its Applications* (revised).

Fiscal year 1973 planned program.—In addition to continuing the promising fiscal year 1972 investigations, the following new efforts will be started.

a. Surveillance and Target Acquisition: Investigate polarization gratings to improve rain clutter cancellation; evaluate electromagnetically focused-image intensifier tubes for high-resolution low-light-level photography; analyze techniques for reducing pollutants from photoprocessing equipment; test and evaluate laser rotational sensors for three-axis altitude reference systems. Investigate low-power, face-pumped lasers for reduced heat, increased light absorption, and reduced beam divergence. Field test sensor assemblies [deleted]. Test combinations intrusion detection sensors incorporating two or more different sensing elements. Incorporate seismic detectors in 105 millimeter howitzer shells.

b. Electronic Devices: Investigate electro-optic devices for wavelength conversion and continuously tunable laser devices. Improve the carbon dioxide laser in terms of peak-pulse power, pulse repetition, phase coherence, and frequency stability. Develop microwave acoustic techniques as small and inexpensive pulse compression filters and delay lines for tactical communication and surveillance systems. Initiate work on novel, precision piezoelectric filters for high density radio nets. Investigate advanced microcircuit interconnection and packaging techniques to provide maximum heat transfer, reliability, and assembly integrated circuits, micropower functional assemblies, and novel large scale integrated circuits for digital communications systems. [deleted]

c. Fluidics: Apply concepts of improved vortex rate sensors in weapons and aircraft stabilization, safing-arming-fusing, and missile autopilot systems. Fabricate and test improved gravity acceleration sensors preparatory to flight testing. Design and test an operational miniature fluidic ignitor for fuel-air-explosives, and test a monopropellant gas generator for flight worthiness. Amalgamate previously separate fluidic subsystem programs for missiles into a combined missile flight test program. Develop a self-contained mortar repositioning device for field tests.

d. Information Processing: Develop equipment for voice circuit monitoring experiments. Study military applicability of control processing techniques, including avionics and automatic test equipment. Develop computer-graphic display techniques for evaluating enemy situation data, estimating strike and movement capabilities, and anticipating intent. Develop computer analyses for fracture resistance of metals and for x-ray assessment of microstrain and material texture. Begin development of computer routines for non-linear problems and off-axial loading. Publish ten engineering design handbooks, including: *Development Guide for Reliability* (6 volumes), *Military Pyrotechnics, Part Four*, and *Military Vehicle Electrical Systems.*

Program to completion.—This is a continuing program.

RESOURCES

[Dollar amounts in millions]

	Fiscal year—			Additional to completion	Total estimated cost
	1971	1972	1973		
R.D.T. & E. funds	$18.5	[Deleted]	[Deleted]	Continuing	Not available.
R.D.T. & E. man-years	737	721	638	Not available	Do.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

General GRIBBLE. I will be glad to do so.

(The information follows:)

[In millions of dollars]

Project	Fiscal year— 1971	1972	1973
1S662703A055—Thermionic applied research and engineering	2.780	3.049	2.750
1S662703A056—Solid state devices applied research and engineering	2.120	2.025	1.700
1S662703A057—Electronic parts applied research and engineering	1.430	1.440	1.100
1S662703A058—Frequency control devices applied research and engineering	.950	1.145	.900
1E662703A090—Automation of concept/design of military systems	0	1.990	1.760
1S662703A175—Airborne surveillance and target acquisition radar techniques	1.538	1.568	1.550
1S662703A176—Passive air borne surveillance and target acquisition techniques	1.567	1.270	1.200
1S662703A186—Surveillance and target acquisition electrooptical techniques	.915	1.109	1.180
1S662703A187—Data transfer interpretation system techniques	.790	.770	.700
1T662703A308—High energy laster research	1.220	[Deleted]	[Deleted]
1S662703A327—Automatic data processing technology	1.150	1.554	1.300
1S662703A440—Integrated electronic devices, circuits, and assemblies	2.620	2.900	2.480
1T662703A582—Army Materiel Command engineering design handbooks	.378	.455	.380
1T662703A643—Fluidic component investigations	.335	.300	.270
1T662703A644—Supporting fluidic technology	.330	.280	.250
1T662703A645—Fluidic systems	.335	.500	.480
20662703A754—Intelligence information processing techniques	0	.195	.400
Total	18.458	[Deleted]	[Deleted]

Chairman ELLENDER. I note in the descriptive summary that these projects fall into four general areas. Would you describe these areas and tell us what major projects you will undertake in each of them in fiscal year 1973?

General GRIBBLE. Surveillance and target acquisition concepts involve mainly radar, laser, infrared detection, and photographic techniques. Our major efforts are directed at identifying promising means for surveillance of the battlefield from the ground and air, particularly the detection and recognition of targets and their accurate location. The electronic device area is directed toward filling the gaps in our components and circuits capabilities. We are deeply involved in communications and other electronics applications where we have such problems as size and weight compression, reduced cost, and more efficient information handling. For solutions we will be placing major emphasis in our program on solid-state devices for generators, amplifiers, sensors, and for display and information processing. We will also be commencing a new initiative to develop the technology for a chemical high energy laser. Fluidics technology, another area, complements electronics by providing cheaper and more effective means for doing some of the tasks now done by electronic or electromechanical techniques. Our major efforts will be to extend the fluidics technology base and establish subsystem feasibility for munitions, missiles, aircraft, weapons, and ground vehicle applications. In the area of information processing we will be exploiting the advantages of the computer to process the growing volume of battlefield information available to our field commanders and to solve the rigorous design problems confronting our engineers engaged in research and development.

Senator YOUNG. In the description of your planned program for fiscal year 1972 I note reference to the three-dimensional laser line scan surveillance set. Describe this set and your fiscal year 1972 field test program on it.

General GRIBBLE. The three-dimensional laser line scan surveillance set is in the exploratory phase of development and is designed to provide a TV image of the area forward of a helicopter during darkness. The laser beam which illuminates the area to be observed is invisable and the display on the TV-like screen is similar to a radar image but this set provides better definition than radar. The set was field tested last fall on a ground mount. The test results were not good and the set has been redesigned and rebuilt to operate in a different mode and will be retested in June and July of 1972.

entitled "High Energy Laser Research". Please describe this project and tell us what you hope to accomplish in fiscal year 1973.

General GRIBBLE. New efforts to be supported include: The advancement of surveillance and target acquisition techniques by, for example, the development of seismic intrusion detectors that can be delivered by small bore howitzer; the improvement of electronic device capabilities by, for example, microwave acoustic devices that are capable of complex signal processing and are smaller, simpler, and less expensive than currently used devices; the exploitation of fluidics techniques, such as the adaptation of fluidics technology to rapidly and accurately reposition mortars; and the extension of information processing concepts to wider tactical applications by, for example, the development of graphic display techniques for the evaluation of friendly and enemy situation data.

Senator YOUNG. Of the total requested for combat surveillance and target acquisition and electronic devices, [deleted] is for the project entitled "High Energy Laser Research". Please describe this project and tell us what you hope to accomplish in fiscal year 1973.

General GRIBBLE. This project on high energy laser research is devoted to providing technical data, techniques, and experimental experience leading toward development of versatile and efficient high energy laser devices and associated components for use in Army [deleted]. In fiscal year 1973, the effort will be in two major parts. In the first part, effort will include continued exploratory development for high energy/power laser systems to provide these devices with a high degree of versatility, reliability, and operational usefulness for application to [deleted], and for continued theoretical and experimental study of the fundamental physical phenomena of high energy lasers. Work will include further development and exploitation of both the high power electrical discharge and chemical laser principles and associated techniques and components such as internal and external optics; high power-short pulse techniques, such as electron beam preionization, and decreased beam divergence; further theoretical and experimental investigations of physical phenomena of solid, gaseous, and chemical lasers; and further consideration of laser systems to advance the state of the art and evaluate the potential for Army use.

Full scale operation of the enginering scale, 1 pound/second mass flow chemical laser is expected to generate data for [deleted]. High pressure electrical discharge gas lasers using electron beam preionization will be combined with existing laboratory high-mass-flow capability and operated at single pulse energies about [deleted] and average powers greater than [deleted]. Work will be initiated on compact, high speed, [deleted], turbogenerator sets for laser field use. Experimental work on the nature of the laser beam will be

conducted to avoid the large losses of power now associated with current transverse mode suppression techniques. In the second part of this program, particular emphasis is to be put on the technology of chemical lasers. This work represents a new initiative and a greatly expanded effort. This program, will, over the next few years, develop and demonstrate a high energy chemical laser for [deleted], operating at an advantageous wavelength for atmospheric transmission. This laser will have an output of [deleted] of continuous laser power, be portable, and be capable of demonstrating a high effectiveness in a direct support role against personnel and a variety of sensors and other soft targets, as a night vision system searchlight, and as a [deleted]. This effort in fiscal year 1973 will expand and compress in time the effort, to provide additional in-house facilities for handling the various fuels needed for chemical lasers, to allow investigation of more fuels and mixing procedures, and to provide additional propagation and vulnerability experiments. Also, it will be possible to scale up the engineering scale model from [deleted] using a deuterium fluoride system.

Additional effort will be funded on engineering technology of diffusers, pumping, cavity design, and nozzles in gas flowing laser systems. Further work will be devoted to consideration of [deleted] militarization of these chemical laser systems. A large scale carbon monoxide combustion device, a type of chemical laser, will be fabricated and demonstrated.

Topographic and Geographic Investigations

Chairman Ellender. You are requesting $3.2 million for the program entitled "Topographic and Geographic Investigations." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: EXPLORATORY DEVELOPMENT

Description.—Objectives are to develop new means for rapid acquisition, processing and dissemination of position location and mapping data on a global scale in direct support of future strategic and tactical deployment of forces, weapon system effectiveness, and crisis management. This program element covers the following areas: (1) Field Army Mapping and Surveying; (2) Mapping and Geodetic Research; (3) Mapping and Geodesy Development; (4) Military Geographic Analysis; and (5) Improved Topographic Support Systems. This program element has been restructured for FY 1973 resulting in the title being changed from Mapping and Geodesy and the inclusion of the Military Geographic Analysis area which was previously reported under program element 6.21.12.A. This element supports development of new techniques and equipment needed to support:

a. DOD's assignment for improved position location data for long-range weapons and mapping of world areas where potential threats exist to the nation's security.

b. Mapping, geographic intelligence and position location for Army operations in response to contingency, limited war and rescue operations.

Work performed by.—Approximately 75% of the work is accomplished internally at the US Army Engineer Topographic Laboratories (USAETL) at Fort Belvoir, Virginia. The balance is performed by the following contractors: (1) Bunker-Ramo Corporation, Westlake Village, California; (2) University of Kansas, Lawrence, Kansas; (3) University of Iowa, Iowa City, Iowa; (4) Wolf Research and Development Incorporated, Riverdale, Maryland; (5) North American Rockwell Information Systems Company, Anaheim, California; (6)

Raytheon Company, Alexandria, Virginia; (7) DBA Systems, Melbourne, Florida; (8) Keuffel & Esser Company, Morristown, New York; (9) Perkin Elmer Corporation, South Pasadena, California; and (10) Philco-Ford Corporation, Newport Beach, California. All of these contracts exceed $25,000. There are two additional small contracts which total $20,000.

Fiscal year 1972 program.—a. New Programs Initiated: Investigate new techniques for electronic correlation of radar as well as infrared imagery. Investigate the potential Army utilization of the Defense Navigational Satellite System (DNSS). Techniques and designs to optimize photographic point measurement for analytical triangulation.

b. Continuing Effort: Exploratory development of equipment and techniques for radar mapping, automating the mapping processes, analysis of geographic data, preparing digital map data for new weapon systems and determining techniques for automatic recognition of terrain features.

c. Major Items Planned for Completion: Complete analysis and evaluation of candidate systems for the DNSS. Complete the 1985 time frame Geographic Intelligence and Topographic Support System study. Complete a laboratory model of an advanced all-electronic map compilation system.

Fiscal year 1973 planned program.—Emphasis will be directed toward exploring technology advancements and the applications to problems in radar mapping, geodetic and survey applications of the proposed DNSS and applying the photo measuring equipment and techniques to the rapid positioning of tactical weapons and target location, and placement and location of unattended ground sensors.

Program to completion.—This is a continuing program.

RESOURCES

[Dollar amounts in millions]

	Fiscal year—			Additional to completion	Total estimated cost
	1971	1972	1973		
R.D.T. & E. funds	$4.1	$2.9	$3.2	Not available	Not available.
R.D.T. & E. man-years	102	79	79	do	Do.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

General GRIBBLE. Yes, sir.

(The information follows:)

[In millions of dollars]

Project	Fiscal year—		
	1971	1972	1973
1G662707A576—Field Army mapping and surveying	0.450	0.310	0.340
4A662707A852—Mapping and geodetic research	.572	.400	.300
4A662707D853—Mapping and geodesy development	1.554	1.030	1.350
4A662707A854—Military geographic analysis	1.415	1.020	1.060
6A662707A974—Improved topographic system support	.118	.100	.100
Total	4.109	2.860	3.150

Senator YOUNG. Does the request for this program include funds for any project that has not been funded in prior fiscal years?

General GRIBBLE. No, sir.

COMBAT SUPPORT

Chairman ELLENDER. $10.1 million is requested for the program entitled "Combat Support." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

COMBAT SUPPORT

CATEGORY: EXPLORATORY DEVELOPMENT

Description.—This Program Element supports twelve separate exploratory development projects that produce materials and techniques required in support of combat operations and major weapons systems. These projects, principally concentrated in the combat engineering and logistical areas, include personnel marking and identification systems, combat engineer equipment, demolition technology, fuel handling equipment, bulk materials handling equipment, engineer maintenance technology (previously under P.E. 6.26.01.A), riot control (previously under P.E.'s 6.26.05.A and 6.26.06.A), flame and incendiary (previously under P.E. 2.26.03A), and other general support technology and studies in support of these areas. These projects concentrate on satisfying the stringent Army requirements for increased mobility, reduced weight, ruggedness, improved maintainability and reliability, and conservation of manpower and time. Materials and techniques developed under this program element are incorporated in hardware items developed principally under Program Element 6.47.17.A, General Combat Support.

Work performed by.—In-house laboratory work is performed at the USA Mobility Equipment Research and Development Center, Fort Belvoir, Virginia; Picatinny Arsenal, Dover, New Jersey; Edgewood Arsenal, Maryland; Watervliet Arsenal, Watervleit, New York; and Ballistic Research Laboratories, Aberdeen Proving Grounds, Maryland. Contractors include Southern Research Institute, Birmingham, Alabama (Data Processing of Comparative Analysis of Detectors); Southwest Research Institute, San Antonio, Texas (Data Processing of Comparative Analysis of Detectors and the Repetitive Explosive Device for Soil Displacement); University of New York, Buffalo, New York (Soil Disagreegation Studies); Stanford Research Institute, Menlo Park, California [deleted], Varo Incorporated, Garland, Texas [deleted], Dare Technology, San Diego, California [deleted], Dow Chemical Company (Spiral Generation System); Columbia Research Corporation, Gaithersburg, Maryland (Non-Newtonian Additives); Lowell Research Institute, Lowell, Massachusetts (Collapsible Tank Materials); Atomics International, Conoga Park, California (Electrokinetics); Duke University, Durham, North Carolina (Engineer Design Handbooks); and Vanderbilt University, Nashville, Tennessee (Bridge-Terrain Mathematical Model Study).

Fiscal year 1972 program.—The program includes the continuation of studies and investigations of improved concepts in support equipment. Improvements to the basic REDSOD and redesign of components continues and a complete REDSOD unit has been constructed. Development is continuing on improved environmental control systems to include investigation of the Brayton Cycle Concept, Vortex cooling-heating concepts, and on specific applications. [Deleted.] The development of field fabricated plastic pipe and collapsible tank materials is being continued, and techniques for more completely removing contaminants from conventional and advanced fuels are being studied. Design study of Cybernetic Anthropomorphic Machine System Controls is being completed and development of the Modular Army Container System is being continued. The system engineering plan for an Army Supply Distribution System is being completed. Approximately 15 new or revised Engineering Design Handbooks are being completed. The Bridge Design Contest, which was conducted by the Society of American Military Engineers for the Army, has been completed and designs are being reviewed for application in bridging concepts for the 1980's. The International Bridging Concept Study Team is being established in United Kingdom for a period of two years. US will have one civilian and one military member on the team. Other members are from United Kingdom and Federal Republic of Germany. The purpose is to formulate bridging concepts for the 1980's which will be useful to all participants. Hardware contract awarded for a triple-fold concept prototype bridge for use with the Main Battle Tank over 90 foot gaps. A lighter class medium tank launched bridge, using a new design approach requiring less material, is being fabricated at Watervliet Arsenal, New York.

Fiscal year 1973 planned program.—A program will be initiated to provide a capability for high-speed excavation; high pressure water cannons will be evaluated. Rapid Explosive Device for Soil Displacement development will be continued. [Deleted.] Work on the field fabricated plastic pipe and on collapsible tank materials will be continued. The development of more effective fuel decon-

taminants will be continued. A plan for the development of an Integrated Supply Distribution and Materials Handling System will be completed. Intermodal Modular Container Development will be monitored. The Trans-Hydro studies will be supported by Materials Handling Equipment candidate investigations. New or revised Engineering Design Handbooks will be published.

Program to completion.—This is a continuing program.

RESOURCES

[Dollar amounts in millions]

	Fiscal years—			Additional to completion	Total estimated cost
	1971	1973	1973		
R.D.T. & E. funds	$5.2	$7.6	$10.1	Continuing	Not available.
R.D.T. & E. man-years	381	168	171	Not available	Do.

Senator YOUNG. Are you requesting funds for any new projects? If so, please comment on them.

General GRIBBLE. Yes, one new project, nonnuclear target vulnerability and vulnerability reduction, funded in the amount of $2.98 million is now included in this program. This project represents, beginning in fiscal year 1973, the consolidation under one project of that vulnerability and vulnerability reduction work done previously under a number of separate projects and tasks. It does not, therefore, represent a new effort. This is a continuing project which develops vulnerability and vulnerability information essential in the development of all types of materiel and equipment.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

General GRIBBLE. I will be glad to.

(The information follows:)

[In thousands of dollars]

Project	Fiscal year—		
	1971	1972	1973
1W662708AD13—Riot control agent investigations	450	450	400
1W662708AD16—Riot control agent material technology	360	415	308
1W662708AD18—Personnel marking and identification techniques	420	385	290
1W662708AD28—Vegetative control chemical investigations	475	1,500	900
1G662708DF01—Combat engineer technology	770	845	1,010
1G662708DJ39—General support technology	645	670	760
1W662708A011—Demolitions techniques	630	1,145	1,100
1W662708D065—Flame and incendiary technology	936	1,035	770
1T662708A068—Nonnuclear target vulnerability and vulnerability reduction	0	0	2,980
1G662708D506—Petroleum, oil, and lubricants (POL) equipment	145	505	1,090
1G662708D507—Materials handling equipment	275	548	400
1G662708D549—Engineering maintance techniques	50	68	110
Total	5,156	7,566	10,100

Chairman ELLENDER. How is the work on this program divided among Army in-house facilities, industrial organizations and academic institutions?

General GRIBBLE. The work proposed in this program is to be accomplished as follows: Approximately 81 percent with Army in-house resources; 18 percent through contracts with industrial organization; and 1 percent by academic institutions.

Senator YOUNG. I note a reference in the descriptive summary for the fiscal year 1972 planned program to a hardware contract awarded for a "triplefold concept prototype bridge for use with the main battle tank over 90-foot gaps". What has happened to this project pending a decision on the continuation of development of the main battle tank?

General GRIBBLE. The exploratory development being done here refers to feasibility studies and fabrication of a prototype armored vehicle launched bridge—AVLB—with a 50-percent greater length than the current standard 60-foot AVLB. The current AVLB uses a modified M60A1 tank chassis as a launching vehicle. The improved AVLB will be matched with whatever main battle tank is standard for the Army at the time the project is recommended for engineering development.

Chairman ELLENDER. Comment on your need for the rather large increase of $2.5 million you are requesting.

General GRIBBLE. As indicated above, the $2.98 million for nonnuclear target vulnerability actually represents a transfer of funds from projects other than combat support rather than an overall increase. The substantial increase in the petroleum, oils and lubricants equipment results from increased funding of exploratory development efforts which were previously funded under an associated project in program element 6.47.17.A. Changes in the other 10 projects (three increases, seven reductions) result in a net decrease primarily from the transfer of efforts to more advanced stages of development.

DEFENSE AGAINST CHEMICAL AND BIOLOGICAL AGENTS

Chairman ELLENDER. Of the total requested for other equipment, $8.5 million is for the program entitled "Defense Against Chemical and Biological Agents". Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: EXPLORATORY DEVELOPMENT

Description.—The objective of this element is to investigate problems related to defense against chemical and biological agents. The results of these investigations are applied to the Advanced and Engineering development of equipment such as alarms, and to the improvement of individual components of the chemical defense system. This element includes a broad spectrum of effort such as point sampling and area scanning alarms; detection principles; sampling and identification techniques; individual protective equipment against both respiratory and percutaneous hazards; collective protection; principles and techniques of filtration and purification of air; decontamination. Medical aspects include rapid diagnosis of chemical casualties and techniques and materials for their prevention and treatment; and investigation of vaccines, prophylaxis and therapy for biological agents.

Work Performed By.—U.S. Army Edgewood Arsenal, Md. Major contractors are: Southern Research Institute; Birmingham, Ala.; ITTRI, Block Engineering, Inc.; Bendix Corp.; Stanford Research Institute; D. H. Litten Co., Litten Systems, Inc., and others not yet selected.

Fiscal year 1972 program.—Effort will continue in the above area with emphasis on prevention and treatment of chemical agent casualties; area scanning techniques for detection of chemical agents; automatic alarm technology for chemical incapacitating agents; collective protection studies; and improved personnel de-

contamination techniques and materials; biological area scanning techniques and new detection concepts.

Fiscal year 1973 planned program.—Continued effort to identify new-improved concepts and principles for more effective chemical and biological defense aimed at detection and protection.

Program to completion.—This is a continuing program leading to chemical and biological area scanning alarms, an improved point alarm, and multi-purpose detection kits, liquid agent detectors, and better decontaminants for Advanced Development.

RESOURCES

[Dollar amounts in millions]

	Fiscal year—				
	1971	1972	1973	Additional to completion	Total estimated cost
R.D.T.&E. funds	$14.8	$9.1	$8.5	Continuing	Not available.
R.D.T.&E. man-years	758	621	624	Not available	Do.

Chairman ELLENDER. Are you requesting funds for any projects which have not been funded previously?

General GRIBBLE. No, sir.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

General GRIBBLE. Yes, sir.

(The information follows:)

[In millions of dollars]

Projects	Fiscal year—		
	1971	1972	1973
1W662710AD25—Medical defense against chemical agents	2.000	2.160	2.170
1W662710AD27—Chemical agent alarm technology	1.700	1.526	1.500
1W662710AD29—Chemical detection and identification technology	1.250	.875	.850
1W662710AD34—Physical defense against biological attack	0	1.435	1.450
1W662710AD60—Chemical decontamination investigations	.700	.500	.200
1W662710AD61—Technical assessment of foreign chemical warfare potential	.350	.300	.250
1W662710AD62—Chemical simulant and training agent investigation	.050	.250	.500
1W662710AD63—Chemical safety investigations	.300	.300	.150
1W662710AD66—Physical protection against biological agents	.185	0	0
1W662710AD67—Assessment of foreign biological potential	.121	0	0
1W662710AD68—Biological simulant and training agent investigations	.329	0	0
1W662710AO59—Biological agent threat investigations	1.696	0	0
1W662710AO71—Biological agent detection investigations	2.114	0	0
1W662710AO72—Biological safety investigations	2.040	0	0
1W662710AO95—Physical protection against chemical agents	1.930	1.784	1.400
Total	14.765	9.130	8.470

Senator YOUNG. In looking at the hearings for fiscal year 1972, it seems to me that this program was divided into several parts which were funded separately last year. Am I correct?

General GRIBBLE. Yes, sir, you are correct.

Senator YOUNG. Why were these parts consolidated into one program element?

General GRIBBLE. The work in this program was previously reported separately for chemical defense and biological defense. The transfer of the biological defense work to Edgewood Arsenal, Md., where

the chemical defense work is performed, permitted the consolidation of all the defense projects for more effective management.

Chairman ELLENDER. Please describe your planned program for fiscal year 1973 and tell us what you will be doing with the $8.5 million you are requesting.

General GRIBBLE. Work in this program will investigate problems related to defense against chemical and biological agents. The results of these investigations are applied to the advanced and engineering development of equipment such as alarms, and to the improvement of individual components of the chemical defense system. This element includes a broad spectrum of effort such as point sampling and area scanning alarms; detection principles; sampling and identification techniques; individual protective equipment against both respiratory and percutaneous hazards; collective protection; principles and techniques of filtration and purification of air; and decontamination. Medical aspects include rapid diagnosis of chemical casualties and techniques and materials for their prevention and treatment; and investigation of vaccines, prophylaxis and therapy for biological agents.

Chairman ELLENDER. I note that the $8.5 million you are requesting for fiscal year 1973 is almost $700,000 less than the amount provided for fiscal year 1972. Please comment on this decrease.

General GRIBBLE. Yes, sir. The major portion of this difference stems from a funding reduction in projects AO95, Physical Protection Against Chemical Agents ($384,000), and AD60, Chemical Decontamination investigations ($300,000). Support for these projects was reduced to provide funds for other higher priority programs.

MINE DETECTION AND NEUTRALIZATION

Chairman ELLENDER. The next program to be considered is "Mine Detection and Neutralization," for which you are requesting $4.4 million. Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: EXPLORATORY DEVELOPMENT

Description.—The objectives of this research are to foster progressively improved technology in the fields of mine detection/neutralization, barriers, obstacles and related concepts and to develop techniques for more effective use of countermine equipment as systems in likely mine threat situations. Fundamental knowledge is required: to provide and exploit new phenomena and approaches for mine and booby trap detection/neutralization; to develop new barrier concepts; and, to furnish support for items in advanced and engineering development which must obtain acceptable operational status in the 1973–1985 time frame. The countermine program constitutes a comprehensive and orderly investigation which addresses all technologies that show promise of contributing new approaches to mine and booby trap detection/neutralization.

Work performed by.—The in-house effort represents approximately one-third of the program and is conducted at the Mobility Equipment Research and Development Center, Fort Belvoir, Virginia; Cold Regions Research and Engineering Laboratories, Hanover, New Hampshire; Redstone Arsenal, Huntsville, Alabama; Naval Ordnance Laboratory, White Oak, Maryland; Ballistic Research Laboratory, Aberdeen Proving Ground, Maryland; Picatinny Arsenal, Dover, New Jersey; Edgewood Arsenal, Edgewood, Maryland; Electronics Command, Fort Monmouth, New Jersey; Frankford Arsenal, Philadelphia, Pennsylvania; Rock Island Arsenal, Rock Island, Illinois; and Waterways Experiment Station, Vicksburg, Mississippi. Fourteen contracts, at an average cost of $180,000 each, are held by the following nine contractors; Southwest Research Institute, San Antonio, Texas; Texas Nuclear Corporation, San Antonio, Texas; Cubic Incorporated,

San Diego, California; Martin-Orlando, Florida; Globe Universal Sciences, El Paso, Texas; Randomline, Incorporated, Willow Grove, Pennsylvania; McCormic-Selph, Los Angeles, California; RPC Corporation, Los Angeles, California; and Foster-Miller Associates, Waltham, Massachusetts.

FY 1972 Program:

a. New Programs Initiated: Assessment is being made of all [deleted] detection approaches, including the: [deleted.] New contractual efforts will utilize computer models and simulations to evaluate mine detection/neutralization systems. A prototype laser system for barrier application is under study. Experiments on fuel air explosives as a barrier are being made. Phase II of the Concepts and Analysis Investigation was initiated to provide detailed evaluation of all existing and many projected barrier systems.

b. Continuing Efforts: Explorations on: the [deleted] properties are continuing. [Deleted] barrier research is underway with particular emphasis on generation, focusing and propagation.

c. Major Items Planned for Completion: None.

FY 1973 Planned Program: Exploratory development will be conducted on a variable parameter Metal Radar (METRA) system to investigate the capability of detecting a spectrum of booby trap targets of various sizes. Multi-special [deleted] equipment will be investigated to extend the usefulness of [deleted] mine detectors over a significantly greater portion of day-night [deleted] cycle. Investigations will continue on chemical, electro-magnetic and electrical anomalies encountered by prototype mine detectors in various soils and under various environments. A comprehensive review of all [deleted] detection approaches will be conducted and a decision made as to the focus for future efforts. In-house computer simulation and coordination activities will continue in order to provide operating guidance for future programs. Participation with the Naval Ordnance Laboratory and Missile Command on the Field Demonstration—[deleted] will continue. The [deleted] barrier research will be completed and determination made on whether to continue the program. Phase II, Final Analysis and Barrier Model Development of the barrier program will be completed. Efforts will be initiated on fighting emplacements with emphasis on [deleted] structures. In [deleted] homing, new sensors will be investigated and the most promising one selected and developed.

Program to Completion: This is a continuing program.

RESOURCES

[Dollar amounts in millions]

	Fiscal year—			Additional to completion	Total estimated cost
	1971	1972	1973		
R.D.T. & E. funds	$3.2	$3.8	$4.4	Continuing	Not available.
R.D.T. & E. man-years	36	52	52	Not available	Do.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

General GRIBBLE. Yes, sir.

(The information follows:)

[In millions of dollars]

Project	Fiscal year—		
	1971	1972	1973
1J662712AJ20—Barrier concepts	0.150	0.060	0.100
1J662712AJ21—Barrier research	.380	.540	.300
1J662712AJ22—Mine detection research	1.690	2.020	2.240
1J662712AJ23—Mine neutralization research	.830	1.000	1.600
1J662712AJ24—Fabrication and obstacle research	.020	.180	.200
1J662712AJ25—Barrier systems coordination	.100	0	0
Total	3.170	3.800	4.440

Senator YOUNG. What is the connection between this program element and the one entitled "Mine Warfare" which are discussed under the Ordnance, Combat Vehicles, and Related Equipment budget activity?

General GRIBBLE. There is a direct relationship between this program element and the one entitled "Mine Warfare." This program element provides the basic underlying technology needed to support the advanced development of countermine hardware items in the mine warfare program element.

Chairman ELLENDER. I note in the descriptive summary that the Marine Corps and several other Government agencies have an interest in research in this field. How is coordination maintained between the Army and these other Government agencies?

General GRIBBLE. The Army has designated the Mobility Equipment Research and Development Center at Fort Belvoir, Va., as its lead laboratory for mine detection and neutralization. Other Government agencies with interest in research in this field have recognized the Center as the governmental repository for technical information in countermine and explosive detection activities. The Center periodically sponsors symposia for an exchange of information among developers and users, and these are customarily attended by representatives of the Marine Corps and other Government agencies.

Senator YOUNG. Please comment on the interest of the British Army and the Army of the Federal Republic of Germany in this program.

General GRIBBLE. The complexities of mine warfare doctrine, minefield systems effectiveness, target vulnerability, and the requirements by various elements of the United States and foreign military forces make it imperative that maximum liaison and coordination of effort be maintained between the United States and its allies. The British Army and the Army of the Federal Republic of Germany have a special interest in this program because of the potential threat that mutually faces these nations and their corresponding responsibility in meeting this threat.

Chairman ELLENDER. Please comment on the objectives of this program.

General GRIBBLE. The objectives of this research are to foster progressively improved technology in the fields of mine detection/neutralization, barriers, obstacles, and related concepts and to develop techniques for more effective use of countermine equipment as systems in likely mine threat situations.

Senator YOUNG. Why do you need the increase of $648,000 you are requesting?

General GRIBBLE. Mine detection/neutralization constitutes one of our more pressing problems. The increase is to provide urgently needed technology that will contribute directly toward accelerated development of new countermine hardware. Specific increases include work on: sophisticated instruments for mine detection that utilize such techniques as nuclear quadrupole and nuclear magnetic resonance; and, modeling and systems analysis for directing mine neutralization total system development.

Chairman ELLENDER. Of the total requested for other equipment, $14.8 million is for the program entitled "Technology for Support of the Military Man." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY EXPLORATORY DEVELOPMENT

Description.—This is a new program element and constitutes a consolidation of projects from other elements. Consolidation was to clearly identify in one program element the exploratory development efforts in Technology for Support of the Military Man. Major efforts are in Clothing and Equipment Technology and support of the Department of Defense Food Research, Development, Testing and Engineering Program (DOD RDT&Eng Prog). Exploratory development is being accomplished to provide: (1) High quality perishable type food in a shelf stable form and reduce refrigeration requirements; (2) improved methods for production of quality food in a compressed dehydrated form that can be readily reconstituted under adverse conditions to a highly palatible nutritious meal; (3) improved food service equipment; (4) the capability for extending the shelf life and quality of processed foods through improved protection and early detection of harmful or quality degrading microbes, insects or rodents; (5) improved Department of Defense (DOD) system for feeding military personnel; (6) flexible packaging systems to reduce weight and volume, lighten the load of the individual soldier and lower transportation costs; (7) protection for military material from microbiological degradation and development of means for reducing waste disposal problems; (8) human factors engineering for the design and development of Army material; (9) improved body armor and helmets; (10) improved living conditions for the individual soldier in the field and garrison, and increased survivability in combat.

Related activities.—The food portion of this program is unique. The Army has been appointed Executive Agent for Food RDT&Eng for all DOD agencies. Effort by other services is extremely limited and pertains to technical service-peculiar requirements. Industry and universities have complementary research programs. Work is coordinated by the Director of Defense Research and Engineering through a Joint Formulation Board (JFB) consisting of representatives of all military services and DOD agencies. Coordination with industry and universities is provided through the Research and Development Associates and the National Research Council.

Work performed by.—Approximately 85 percent of the work is accomplished internally at the NLABS and the US Army Human Engineering Laboratories. The balance of the program is performed by contractors, universities, and other Government agencies, including: (1) Department of the Interior; (2) Department of Agriculture; (3) Atomic Energy Commission; (4) Swift and Company, Oak Brooks, Illinois; (5) American Cyanamid Company, Stanford, Connecticut; (6) Stanford Research Institute, Menlo Park, California; (7) UniRoyal Corporation, Naugatuck, Connecticut; (8) E. I. du Pont de Nemours & Co., Wilmington, Delaware; (9) AVCO Corporation, Lowell, Massachusetts; (10) General Electric Company, Syracuse, New York.

Fiscal year 1972 program.—FY 1972 funding level at $12.9 million is approximately $5.0 million higher than the FY 1971 level of $7.9 million. The majority of this increase, $3.5 million, is for an increased level of effort in Clothing and Equipment Technology. The FY 1971 effort will continue and in FY 1972, there will be an increased comprehensive, multilaboratory effort concerned with new helmets and personnel body armor. This will include the exploitation of new textile materials, a new combat helmet program, novel design approaches for body armor, and a substantial non-textile materials effort. In addition, a program for more positive identification of deceased personnel will be initiated. An increase of $1.8 million was necessary in Military Feeding Requirements and Military Food Service and Subsistence Technology in order to support the increased requirements of the other military services and Department of Defense (DOD) agencies. Part of this increase is the result of restructuring of other program elements to clearly identify food related exploratory development. The FY 1972 program will continue investigations to evaluate the total DOD feeding

system as a basis for improving current feeding techniques. Close liaison with industry will continue in order to evaluate and apply commercially developed mass feeding techniques to military feeding. Initiated work to develop a uniform method for determining ration allowances for enlisted personnel. Evaluate factors responsible for changes in texture, color, and flavor in fresh, processed and stored foods; determine mechanisms of, and means for preventing microbial deterioration of packaged food; increase garrison equipment studies, and conduct research on parameters of food acceptance and sensory evaluation. Evaluate flexible packages for multiple servings of processed food and determine reliability of flexible food packaging. Conduct human engineering evaluations of military material and combat environment. Investigate the biodegradability of various waste materials and expand effort to determine feasibility of biologically treating propellant and explosive wastes.

Fiscal year 1973 planned program.—The FY 1973 funding level of $14.8 million is approximately $1.9 million higher than FY 1972 funding level of $12.9 million. Within the net change of $1.9M, $2.5 million is for an increased level of effort in Military Food Service and Subsistence Technology and Packaging Technology in order to continue to support increased requirements of other military services and Department of Defense (DOD) agencies, as part of the DOD Food Research, Development, Test and Engineering (RDT&Eng) program. A funding increase of $1.6 million is included in FY 1973 for increased efforts to alleviate military disposal problems. Human factors engineering principles will be applied to determine total weapon system performance and to develop instrumentation and techniques to obtain accurate performance data on systems and improved individual equipment. In the area of Clothing and Equipment, major efforts involve: Energy conservation through lightweight clothing and equipment systems; exploratory testing of new fibers for increased flame protection in clothing; physiological evaluations and studies to determine the effects of new helmet designs; and continued improvement effort on Personnel Armor Systems, chemical and biological protective clothing systems, mechanics of tentage materials and structures, and studies in field service equipment. In support of the DOD Food Program the Radiation Preservation of Food effort will continue with primary emphasis on planning the wholesomeness effort for additional foods while continuing basic exploratory effort for improved quality. In Military Food Service and Subsistence Technology the program includes increased efforts to develop techniques for maximizing retention of essential nutrients, improve troop acceptability and quality, reduce weight and volume of ration components, prevent food contamination and deterioration and a major effort to improve garrison and field food service equipment. Military Feeding Requirements includes investigations and experiments initiated in FY 1971 to effect improved feeding systems for DOD through increased food quality and acceptability, reduced manpower requirements, and reduced operating costs.

Program to completion.—This is a continuing program.

RESOURCES

[Dollar amounts in millions]

	Fiscal year—			Additional to completion	Total estimated cost
	1971	1972	1973		
R.D.T. & E. funds	$7.9	$12.9	$14.8	Continuing	Not available.
R.D.T. & E. man-years	129	438	403	Not available.	Do.

Chairman ELLENDER. Are you requesting funds for any projects not funded in prior fiscal years?

General GRIBBLE. No, funds have not been requested for any projects in fiscal year 1973 that were not funded in fiscal year 1972.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the requested for fiscal year 1973.

General GRIBBLE. Yes, sir.

(The information follows:)

PROGRAM ELEMENT—6.27.13.A—TECHNOLOGY FOR SUPPORT OF THE MILITARY MAN

[In thousands of dollars]

	Fiscal year—		
	1971	1972	1973
DJ40—Clothing and equipment technology	1,473	5,138	3,580
AJ45—Military feeding requirements	0	980	890
A027—Wound ballistics	860	820	0
A031—Microbiology applied research	300	180	1,790
A033—Radiation preservation of food	1,825	1,389	1,150
A034—Military food service and subsistence technology	206	1,993	4,470
A121—Army human factors engineering	1,260	1,542	1,600
D552—Packaging technology	608	750	1,350
D553—Food processing and preservation techniques	947	0	0
A585—Biological research, protection of materiel	245	65	0
Total	7,924	12,857	14,830

CLOTHING AND EQUIPMENT TECHNOLOGY

Senator YOUNG. Of the total requested for this program, $3.6 million is for the program entitled "Clothing and equipment technology." Please describe the objective of this project.

General GRIBBLE. The objective of this project is to conduct exploratory studies on clothing and equipment systems directed toward increased human performance, environmental protection, personal comfort, and lightening the weight of combat items; to upgrade the level of protection against chemical warfare agents, flame, and fragmentation weapons to investigate countermeasure systems in order to provide broad camouflage against visual and electro-optical detection. Included also are investigations designed to develop a new generation of ground troop protective personnel armor. Exploration of materials and designs to protect the eyes against nuclear flash, laser and ballistic threats are additional goals. Also included are studies for the improvement of bath, laundry, and clothing renovation type field service equipment. Investigations are also conducted on the mechanics of materials and structures basic to the development of design criteria for field shelters.

Senator YOUNG. What do you hope to accomplish with the funds provided for fiscal year 1972?

General GRIBBLE. We expect to accomplish the following in the fiscal year 1972 program: Continuing on new combat footwear resistant to water penetration under pressure; clothing design for insulating liners that employ reflective layers in addition to normal insulating materials; and evaluation of candidate flame resistant textile fibers under JP–4 fuel fire conditions. Will complete study of gloss and sheen attributes and methods of control in textile fabrics as a factor in camouflage response. Will continue studies for camouflage materiel for night operations against low luminescence and the night vision devices. Will develop a mathematical model of the head required for the development of a new helmet. Will initiate development of casualty reduction criteria and study the effect of helmet form on hearing and sight. Will conduct investigations of materials, or combination of materials, for use as "sound cells" to improve acoustic transmission in cold weather headgear. For personnel armor, will develop polymers into sheet and thin film armor, reactive processing and design methodology for fabricating ceramic composites in body armor and helmet

components; will conduct materials processing for armor configurations, quantity energy dissipation and absorption mechanisms; conduct toxicity screenings of body armor materials and initiate human factors engineering support to determine effect of personal armor on combat performance. Will continue studies relative to environmental load, stress/strain theory for maximum strength with minimum weight, and fabricate models in support of improved field tentage and structures. Will investigate new processes for field cleaning of garments in lieu of wet laundering. Will initiate exploratory investigations designed to provide a more rapid and reliable method for identification of deceased military personnel lost as a result of cataclysmic weapons effects.

Chairman ELLENDER. Are you undertaking any new projects for fiscal year 1973, and if you are, will you comment on them?

General GRIBBLE. No; we are not undertaking any new projects for fiscal year 1973.

Senator YOUNG. I note that the $3.6 million you are requesting for fiscal year 1973 is $1.5 million less than was provided for fiscal year 1972. Have you completed some major efforts which caused this decrease?

General GRIBBLE. The $1.5 million funding request increase for fiscal year 1973 is due to the transfer of a materials research and development effort essential for the development of new ballistic protective armor for the individual combat soldier to program element 6.21.05.A (Materials) in fiscal year 1973.

MILITARY FOOD SERVICE AND SUBSISTENCE TECHNOLOGY

Chairman ELLENDER. The largest single project to be funded under this program element is entitled "Military Food Service and Subsistence Technology" for which you are requesting $4.5 million. What are the objectives of this project?

General GRIBBLE. The objectives of the project, military food service and subsistence technology, are to:

(1) Overcome process and storage deteriorations of foods treated by heat, dehydration, freezing, and other processes in manufacture of military subsistence;

(2) Overcome textural deterioration of low and intermediate moisture foods;

(3) Control processing, preservation, and packaging techniques to meet new feeding requirements and improve military rations;

(4) Reduce volume and weight for ration components;

(5) Control properties of foods in large scale commercial production for military procurement;

(6) Improve military feeding systems with new and improved food service equipment for garrison, field, afloat, and specific unusual environs;

(7) Minimize or eliminate health problems for Department of Defense (DOD) due to microbial contamination of fresh foods, individual water supplies, and food handling equipment and food spoilage due to microbial deterioration of packaging materials;

(8) Protect military subsistence from damage and destruction by insects and rodents; and to

(9) Conduct human factors research and analysis of food service systems and food acceptance.

Senator YOUNG. I note in the descriptive summary that the Army is the executive agent for the Department of Defense funded research, development, test and engineering program. Precisely what is the Army's function?

General GRIBBLE. The Army's functions as executive agent for the Department of Defense food research, development, testing, and engineering program (DOD food R.D.T. & E. program) include:

1. Prescribing nutritional standards and establishing daily dietary allowances for members of the military services.

2. Formulating the DOD food R.D.T. & E. program subject to the review and approval of the Director of Defense Research and Engineering.

3. Executing the approved program in coordination with the other military services and appropriate DOD components.

4. Establishing and coordinating with other military services and the Defense Supply Agency the system to obtain the requirements of all military services and appropriate DOD components and to assign priorities to all requirements within the DOD program.

5. Programing and budgeting within DOD guidance to accomplish the approved DOD food R.D.T. & E. program.

6. Providing a voting member on the Joint Formulation Board, consisting of representatives of all military services and the Defense Supply Agency.

Chairman ELLENDER. What are some of the major accomplishments under this program up to the present?

General GRIBBLE. The major accomplishments in the DOD food research, development, testing, and engineering program which includes four projects in this program element, include the following:

(1) A comprehensive long-range feeding test was begun to determine the wholesomeness of irradiated beef.

(2) Evaluation began of a system developed to automatically form, fill and seal flexible packages of heat-processed foods. Flexible food packaging was proven highly durable under rough handling tests.

(3) A survey of commercial mass feeding systems for application to military feeding was conducted and food preference surveys and extensive consumer attitude surveys were completed. These provided a basis for design of a feeding system experiment at Fort Lewis, Wash., and for other changes in Army food service. The Fort Lewis experiment of a central food preparation facility provided improved food quality and service with potential for future reductions in manpower and total feeding costs.

(4) Reversible compression techniques were developed for freeze-dried fruits and vegetables which provide significant volume reductions ranging from fourfold for peas to sixteenfold for green beans. A variety of compressed items have been developed and tested for eventual introduction into Armed Forces menus.

Senator YOUNG. Comment on your planned program for fiscal year 1973 and tell us what you will do with the $4.5 million you are requesting.

General GRIBBLE. The $4,470,000 request for project A034 for fiscal year 1973 is to provide the level of effort needed to support all the serv-

ices in the DOD food R.D.T. & E. program. The program is intended to effect major improvements in present military food service in garrison, afloat, field, and specific operational feeding situations. The fiscal year 1973 program continues work begun in previous years and provides increased support to other services and the Defense Supply Agency as part of the DOD program. Examples of activities in this project are evaluation of changes in texture, color, and flavor of fresh, processed, and stored foods; investigation of optimum moisture levels in low moisture foods and various production techniques on food quality; development of techniques and equipment for improved food preparation, serving, and sanitation under all conditions; fabrication of food products to ease kitchen and field preparation and meet service requirements for reduced volume and weight; investigation of techniques for more centralized food preparation; protection of food and food packaging from contamination, deterioration, insects and rodents; and evaluation of food acceptance and customer attitudes in military food service.

Chairman ELLENDER. Why do you need the increase of approximately $2.5 million you are requesting?

General GRIBBLE. The increase requested for military food service and subsistence technology is primarily to support the other services and the Defense Supply Agency in the DOD food R.D.T. & E. program. The Army program now includes all requirements for food research, except for limited technical service-peculiar requirements. The requested increase in funding for fiscal year 1973 is for:

Increased effort on garrison/shipboard rations and food items, including expanded effort for compressed, freeze-dried items and intermediate moisture foods and for multiservices of preprepared entrees. Long-term storage evaluation of new ration items will be started.

Increased response to other services for exploratory evaluation of equipment for improved large scale and continuous food production, automation of food preparation and serving, disposable mess gear, automated scullery systems, and waste disposal/management.

Increased human factors applications to military feeding to include expansion of food acceptance and customer attitude surveys to other military services, human factors evaluation of central feeding concepts; and initiation of a continuous feedback system for food preferences.

MICROBIOLOGY APPLIED RESEARCH

Chairman ELLENDER. In fiscal year 1972, $180,000 was provided for a project entitled "Microbiology Applied Research," and you are requesting $1.8 million for fiscal year 1973. Describe this project, and tell us why you need this very large increase of $1.6 million you are requesting.

General GRIBBLE. The bulk of the increase is initial funding of the newly established task 10, biodegradation processes for pollutants. This effort is required to address specific problems unique to the military. For example, it is necessary to investigate the biodegradability of various machine oils and machine and equipment cleaning solutions to provide biodegradable formulations that can be readily treated in wastewater disposal facilities. Also there is a requirement to investigate the feasibility of biologically treating propellant and explosive wastes. The chemical characteristics of waters polluted with these

wastes will be studied to identify polluting compounds and to determine their effect on micro-organisms involved in the biodegradation process. New synthetic polymeric Army packaging materials that are biodegradable must be developed. Means of altering the chemical nature of biologically resistant polymers will be investigated to provide new formulations that can be degraded. The end products of degradation by either incineration or microbial processes will be identified and studied to determine whether harmful air or water contaminants are products.

PACKAGING TECHNOLOGY

Senator YOUNG. You are requesting $1.4 million for the project entitled "Packaging Technology". For this project in fiscal year 1972, only $750,000 was provided. Describe this project and your need for the increase of $600,000 you are requesting.

General GRIBBLE. The packaging technology project includes research and exploratory development necessary to assure that containers and lightweight packaging systems for a wide variety of food and food-related items facilitate use and prevent damage or loss in military supply channels. Included is establishment of design criteria for containers to provide improved systems of packaging and packing subsistence, clothing, munitions, and other commodity items for worldwide distribution under varying shipping, storage, and handling conditions. Research will be undertaken to reduce package disposal problems and to evaluate new designs, materials, and treatments for munitions packaging. The increased funding requested for the fiscal year 1973 program includes a new task in pollution abatement intended to reduce package disposal problems, to facilitate reclamation or recycling/reuse of current packaging materials and to explore new materials and design concepts to reduce the amount of waste materials and aid disposal of materials after use. Also included in fiscal year 1973 is expansion of efforts to eliminate rigid containers for new and modified subsistence items in order to improve shelf life, ease disposal and reduce weight and volume of ration items and development of storage-shelf life indicators suitable to reflect exposure history for specific commodity items.

U.S. ARMY LAND WARFARE LABORATORY (USALWL)

Chairman ELLENDER. You are requesting $6.3 million for the program entitled "U.S. Army Land Warfare Laboratory." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: ADVANCED DEVELOPMENT

Description.—The USALWL is a small, multi-disciplined, soldier oriented laboratory reporting directly to the Chief of Army Research and Development with the mission to provide a centralized quick reaction research and development facility for accomplishing development of specialized military items and for the generation of new ideas for such materiel. To accomplish this mission the laboratory is staffed with 12 officers, 6 enlisted men, and 124 civilian scientists and engineers. LWL maintains full-time liaison officers with RVN and HQ, MASSTER. Additionally, liaison officers are sent to USAREUR, USARAL and to U.S. Army elements in Korea and Thailand. The principal objective of this liaison is to provide prompt, undiluted interchange of technical information

between requiring and using agencies. With the draw down of U.S. Forces in Vietnam the emphasis of USALWL efforts has shifted more toward the solution of worldwide military materiel problems and to the problems of civil disturbance and drug detection.

Work performed by.—Since the USALWL has a limited in-house R&D capability, its facilities can accommodate only about 33%, measured in dollar terms, of the task work in execution. A preponderance of the R&D effort is performed by contract with industry (about 59%), while approximately 8% is performed by other Army and Government agencies. Judged primarily in terms of dollar value, following are typical prime contractors supporting USALWL tasks: LITCOM Systems, Inc., Melville, Long Island, New York; Aerospace Research Inc., Boston, Massachusetts; Syracuse University Research Corporation, Syracuse, New York; Westinghouse Electric Corporation, Baltimore, Maryland; Varian Associates, Palo Alto, California; General Electric Co., Pittsfield, Massachusetts; Thiokol Chemical Corporation, Brigham City, Utah; AAI Corporation, Cockeysville, Maryland; Resources Planning and Control Corporation, El Segundo, California.

Fiscal year 1972 program.—It is estimated that 14 hardware developments will be shipped to field users Outside Continental United States (OCONUS), to include Vietnam, USARAL and USAREUR, during the remainder of FY 72. Additionally, four items will be evaluated by HQ, MASSTER and another seven by various agencies of CONARC prior to the end of FY 72. The current work of the USALWL emphasizes small developments capable of delivery for field evaluation within 18 months. Examples of items recently tested by users in the field are: One-half size smoke grenades, rapid detection of heroin/morphine in urine kits, arms room security device and the 40 mm target marker floating.

Fiscal year 1973 planned program.—Certain of the high cost more complex tasks in execution in FY 72 will continue into FY 73; however, in response to its mission, operational requirements made known to USALWL should result in prompt initiation of new FY 72 tasks—rather than delay initiation of required work until FY 73. Accordingly, USALWL will not formalize its FY 73 program until late in FY 72 to assure that its work is responsive to operational needs at that time. An example of the continuing type of item would be the Multi-Purpose Foliage Penetration (FOPEN) Radar System.

Resources (In millions of dollars):

R.D.T. & E. funds for fiscal year 1971, 6.3; fiscal year 1972, 6.4; fiscal year 1973, 6.3; Additional funds to completion are continuing; and the total estimated cost is not available.

Senator YOUNG. I note that you expect to have 124 civilian employees, 12 officers, and six enlisted personnel employed at this laboratory in fiscal year 1973. How much of the $6.3 million requested is for the compensation and benefits of the civilian employees?

General GRIBBLE. The U.S. Army Land Warfare Laboratory will employ 112 full-time permanent civilians and 12 temporary and part-time civilians during fiscal year 1973. Approximately $2.3 million will be required for the compensation and benefits for these civilians.

Chairman ELLENDER. On page 391 of the descriptive summary, I note the following statement: "* * * USALWL will not formalize its fiscal year 1973 program until late in fiscal year 1972 to assure that its work is responsive to operational needs at that time." I assume that you have formulated your fiscal year 1973 program by this time. Please describe it for us and tell us what you will do with the $6.3 million you are requesting.

General GRIBBLE. The fiscal year 1973 program of the Land Warfare Laboratory is in final stages of preparation. In keeping with its multidiscipline quick response mission, the lab program for fiscal year 1973 includes a wide variety of small tasks reflecting attack on problems of current concern to the Army. The program encompasses work in specific communications problems, in improving firepower, in both ground and air navigation, in detection and surveillance—including

chemical, electronic, and biological sensors—in small items for the individual survival kit, in improved mobility, and a substantial effort in detection and control of drugs and in the control of civil disturbances.

COMBAT SUPPORT EQUIPMENT

Chairman ELLENDER. You are requesting $19.8 million for the program entitled "Combat Support Equipment." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: ADVANCED DEVELOPMENT

Description.—The major objectives of this program are to provide improved engines, transmissions, power trains and electric power source for military equipment. Specific objectives include improvements in performance and operation in extreme climatic environments; economy; weight and size reduction, pollutant emissivity reduction; and reliability and durability. In addition, this program element includes development of weapon and protection-associated components. This program is directed toward those items for which there is no commercial market and limited industrial development effort.

Fiscal year 1972 program.—Continue AGT–1500 turbine engine development toward completion in FY 1974. Testing of the redesigned X–700 and Hydromechanical Transmission (XHM) 1500–2 track vehicle transmissions to continue. Advanced development will start on hybrid (combined cycle) four cylinder engine to replace the present M151 engine by FY 1975. Complete test and evaluation of Ford Model 707 turbine engine in 10-ton, truck, tractor. Investigation of an advanced developmental model of a simplified stabilization system integrated with a combat vehicle fire control system will continue. Development of the improved periscope will continue. Solid state computer and laser range finder for M60 tank will be completed. Work continues on a family of lightweight, high capacity primary and secondary zinc-air batteries; component development for 60 watt and 300 watt hydrazine fuel cells is continuing; breadboard models of hydrocarbon fuel cells with thermal cracking of the fuel are under test; contracts are being continued for development of the 1.5 kilowatt Rankin generator set and the 10 horsepower high speed diesel; component development and noise reduction studies are continuing. Phase I (competitive development) of Advanced Development models and of a 1.5 kilowatt hydrocarbon fuel cell will be completed. Advanced development of the 100 kilowatt Turbo-Alternator will begin.

Fiscal year 1973 planned programs.—Continue development of advanced electric power generation systems, including turbo-alternators, zinc-air batteries, fuel cells and Rankin cycle generators. Initiate advanced development on the 152mm flame round and the 2.75-inch air to ground incendiary rocket. Continue the development of the Army Gas Turbine-1500. Work will continue in the areas of turbo charging, full injection and emission controls for compression ignition engines. Evaluate a 100 gallons per minute (GPM) experimental/pilot model fuels decontaminator employing a electrokinetic principle. Design and fabrication of advanced development prototype (compressible fluids) recoil mechanisms for armored weapon systems. Evaluation of truck transmission systems such as the Fuller 909 and 613 will continue. The redesign effort on the X–700 tank transmission will continue. The duty cycle reliability and durability criteria for the 2½ and 5 ton truck transmissions will be completed.

Program to completion.—This is a continuing program.

Resources. (In millions of dollars):

R.D.T.&E. funds for fiscal year 1973 through fiscal year 1971, 63.0; fiscal year 1972, 13.2; fiscal year 1973, 19.8; additional to completion are, continuing; and the total estimated cost is not available.

Chairman ELLENDER. Are you requesting funds for any new project in fiscal year 1973? If so, please describe them.

General GRIBBLE. Yes, we have two new projects in fiscal year 1973. Both have moved from exploratory development to advanced development. For the project titled "Flame-Incendiary Material," we are

requesting $200,000 in fiscal year 1973 to develop a 152-millimeter flame round and a 2.75-inch air-to-ground incendiary rocket. For the project titled "Petroleum Distribution Systems," we are requesting $80,000 in fiscal year 1973 for continued development of a new fuel filtering system, based on a electrokinetic principle.

Chairman ELLENDER. Please provide a tabulation for the record, setting out the projects to be funded in fiscal year 1973, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

General GRIBBLE. Yes; sir.

(The information follows:)

[In millions of dollars]

Project	Fiscal year—		
	1971	1972	1973
1W663702DE82—Flame-incendiary material	0	0	.200
1G663702DG07—Vehicle engineer development	8.140	9.482	14.900
1G663702DG10—Electrochemical power source development	2.222	.735	.800
1G663702DG11—Electromechanical power source systems	1.728	2.400	3.000
1G663702DK41—Petroleum distribution system	0	0	.080
1G663702D380—Tank turrett components development	1.310	.288	.380
1G663702D395—Vehicle transmission-steering unit development	.450	.285	.430
Total	13.850	13.190	19.790

Senator YOUNG. How much of the work in this program element is performed in Army in-house facilities?

General GRIBBLE. In fiscal year 1973 approximately 25 percent of the work in this program element will be performed in-house.

VEHICLE ENGINE DEVELOPMENT

Chairman ELLENDER. The $19.8 million you are requesting for this program for fiscal year 1973 is an increase of $6.6 million over the sum provided for fiscal year 1972. Of this increase, $5.4 million seems to be associated with the project entitled "Vehicle Engine Development". Please describe this project.

General GRIBBLE. This project is for the development of advanced concept turbine, rotary and combined cycle power source. These type engines offer high output, lightweight, low fuel consumption, low pollutant emissivity, and compact characteristics combined with improved reliability and maintainability as well as simplicity in design and construction. Advanced technology is provided so that evaluations may be conducted to determine potential advantages of the type propulsion systems for future vehicles. This project also monitors the state-of-the-art in commercial spark ignition and compression ignition engines.

Senator YOUNG. What vehicles are involved in this development program?

General GRIBBLE. We are developing a turbine engine for possible future use in our tank program and a stratified charge engine for future use in the ¼-ton jeep vehicle. This stratified charge engine will meet the expected 1976 emission standards. We are also examining the feasibility of rotary combustion engines for military use.

Chairman ELLENDER. I note in the descriptive summary that one

of the major efforts in fiscal year 1972 is development of the AGT–1500 engine for the XM–803 tank, and this development program is also listed as one of the major undertakings for fiscal year 1973. Now that the XM–803 has been terminated, do you plan to continue work on this development program?

General GRIBBLE. We do plan to continue developmental work on the AGT–1500 turbine engine because it is a prime candidate as an engine for the next Army main battle tank.

Chairman ELLENDER. Please tell us what you will do with the increase you are requesting for this program.

General GRIBBLE. The increase requested is for the development of a stratified charge engine for the ¼-ton jeep vehicle. This engine will meet the expected Federal emission standards for 1976. It is expected that this engine will be in production by 1976.

ELECTRO-MECHANICAL POWER SOURCE SYSTEMS

Chairman ELLENDER. $3 million is requested for the project entitled "Electro-Mechanical Power Source Systems." Please describe your planned program for fiscal year 1973.

General GRIBBLE. The objective of this project is to conduct advanced development of more reliable, efficient and lighter weight portable electric powerplants, better components, controls, and accessories. The planned program for fiscal year 1973 is as follows:

Continue investigations of turbo-alternator components and systems to maintain technology base for further development of turbo-alternator family. Investigations will include a new concept centrifugal compressor, rotating diffusers, rotor dynamics for very small turbo-alternators, various turbo-alternator configuration concepts, silencing, high speed cam clutch and fluidic controls. Initiate development of advanced development model 30 kilowatt (kw.) turbo-alternator. Continue development of advanced development model 10 and 20 horsepower lightweight combustion ignition engines for industrial applications. Continue investigation of uninterruptable portable power supplies. Complete in-house evaluation of low noise level 1.5-kw. Wankel engine generator set. Complete development of advanced development model 1.5-kw. organic Rankine cycle unit and contract for development of 3-kw. unit. Complete advanced development model 10-kw. direct current (d.c.) converter for 10-kw. turbo-alternator and continue development of 30–100-kw. d.c. link converter. Initiate development of high voltage input inverter. 3–5-kw. Complete test of 250 ampere transformer rectifier and 15-kw. power conditioner.

Chairman ELLENDER. Why do you need the increase of $600,000 you are requesting?

General GRIBBLE. The funds requested for fiscal year 1972 are required to support continuation of work underway in the previous year. The additional funds requested for fiscal year 1973 are required to support a new start on advanced development of components for a 60-kilowatt turbine generator, and to initiate advanced development of power conditioners for use with the 1.5-kilowatt Rankine cycle generator and the 1.5-kilowatt open cycle fuel cell. Other efforts will continue in advanced development.

COMMUNICATIONS DEVELOPMENT

Chairman ELLENDER. $3.2 million is for the program element entitled "Communications Development." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY ADVANCED DEVELOPMENT

Description: The advanced development of tactical and strategic communications equipments is conducted under this effort. Effort is divided among projects as tactical, strategic, and that common to all types of communications. Examples of efforts include electronic equipment packaging techniques, supports for antennas, field wire and cables, electronic test equipment, transmission equipment, switching equipment, and multiplexers for telephone teletypewriter and data circuits. Subsystem reliability is being investigated to determine electronic system design that will result in the least life cycle cost of ownership.

Work performed by.—U.S. Army Electronics Command, Fort Monmouth, New Jersey and the U.S. Army Communications Systems Agency, Fort Monmouth, New Jersey. Contractors include: Martin-Marietta, Orlando, Florida; Braddock, Dunn and McDonald, McLean, Virginia; Motorola C&E, Inc., Chicago, Illinois; AVCO, Cincinnati, Ohio; and RCA, Camden, New Jersey.

Fiscal year 1972 program.—Collect aircraft vibration data; test models of 30 foot pneumatic antenna mast; evaluate the time-domain vocoder; initiate development of a teletypewriter/data interleaver; continue development of the Master Group Multiplexer and Automatic Voice Frequency Circuit Quality Monitor; continue competitive contracts on the ultra-reliable radio set; and [deleted].

Fiscal year 1973 planned programs.—Investigate electromagnetic pulse shielding for cables used in the Army Area Communications System; investigate nonmetallic packaging techniques; initiate development of a vehicular roll-up antenna mast; initiate effort on a non-impact high speed printer; and continue competitive contracts on the ultra-reliable radio set.

Program to completion.—This is a Continuing Program.

Resources (in millions of dollars):

R.D.T. & E. funds for fiscal year 1963 through fiscal 1971, 25.6; fiscal year 1972, 2.7; fiscal year 1973, 3.2; additional to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

General GRIBBLE. Yes, sir.

(The information follows:)

[In millions of dollars]

Project	Fiscal year—		
	1971	1972	1973
1S663707D064—Minimum essential emergency commmunications network	0.100	0	0
1S663707D244—Communications—electronics development	.630	.400	.400
IX663707D245—Strategic communications development	.830	.300	.800
1S663707D246—Tactical communications development	1.030	1.000	0
1S663707D437—Subsystem reliability	1.325	.960	1.980
Total	3.915	2.660	3.180

Senator YOUNG. Describe your planned program for fiscal year 1973 and tell us what you will do with the $3.2 million you are requesting.

General GRIBBLE. In our fiscal year 1973 program we will investigate electromagnetic pulse shielding for cables used in the Army Area

Communications System; investigate nonmetallic packaging techniques; initiate development of a vehicular rollup antenna mast; initiate effort on a nonimpact high-speed printer; and continue competitive contracts on the ultrareliable radio set.

ELECTRONIC WARFARE

Chairman ELLENDER. Of the total requested for "Other Equipment," [deleted] is for the program entitled "Electronic Warfare." Can you give us a brief unclassified description of this program?

General GRIBBLE. Yes, sir, these funds are used to develop electronic warfare equipment to support the tactical forces. The program includes the development of electronic warfare self-protection-type devices, offensive radar and communications electronic countermeasures system, and electronic counter countermeasures techniques for the protection of our communications and electronic devices from the effects of enemy electronic warfare operations.

Chairman ELLENDER. Has the committee been provided with full details on this program and your planned fiscal year 1973 program?

General GRIBBLE. Yes, sir, full details have been provided.

MAPPING AND GEODESY

Chairman ELLENDER. $4.3 million is requested for the program entitled "Mapping and Geodesy." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY ADVANCED DEVELOPMENT

Description.—Objectives are to develop techniques and material to support rapid acquisition, processing and dissemination of position location and mapping data on a global scale in direct support of DOD strategic and tactical deployment of forces, weapon system operation and crises management of national defense. This program element and program element 6.47.16.A together include systems developments assigned to the Army by the Office of the Director of Defense Research and Engineering. These include: (1) Joint Army/Navy development and testing of the prototype backpack doppler translocation system which uses the Navy Transit Satellite to obtain precise positions for tactical navigation stations, communication stations and long range weapon systems utilization; (2) Joint Army/Air Force development of a Topographic All-Weather Radar Map System by FY 1974; (3) [deleted] (4) Army development of an Automatic Cartographic System by FY 1976 to automate the manual feature delineation and formatting process of mapping; (5) To develop by FY 1976 a DOD Topographic Readiness Capability, a concept to meet DOD Topographic needs through rapid storage, retrieval and processing of a family of map type products which are acceptable for tactical operation at a minimum cost and time response; and (6) Also included in this element is the advanced development of one of the field army surveying and positioning equipments, the Position and Azimuth Determining System (PADS), a jeep mounted inertial survey platform. This instrument will move with mobile artillery units and promises as much as 50 percent reduction in manpower and equipment cost required to provide survey data to artillery weapon and target acquisition systems.

Work Performed By.—Approximately 40 percent of the work is accomplished internally at the US Army Engineer Topographic Laboratories (USAETL) at Fort Belvoir, Virginia, and the remainder is performed by contractors. The ten major contractors are: (1) Litton Systems, Inc., Woodland Hills, California; (2) IBM, Gaithersburg, Maryland and Kingston, New York; (3) Latady Devel-

opment Co., Philadelphia, Pennsylvania; (4) Bunker-Ramo Inc., Westlake Village, California; (5) DBA Systems, Melbourne, Florida; (6) Concord Controls, Inc., Boston, Massachusetts; (7) BAI Corp., Stamford, Connecticut; (8) Honeywell, Inc., Minneapolis, Minnesota; (9) Mosler Information Systems Division, Milford, Ohio; and (10) TRW Inc., McLean, Virginia. All contracts exceed $25,000.

FY 1972 program:

(a) New Programs Initiated: The contractual design and development of an enlarging printer, an automatic reseau (grid) measuring device and a device for the production of high resolution orthophotomaps were initiated.

(b) Continuing Effort: Advanced developments of equipment and software for radar mapping, automatic cartography, exploitation of reconnaissance photography for mapping and the topographic readiness capability were continued. Development of the Position and Azimuth Determining System and the World-Wide Topographic Data Bank was also continued. The program element funding level for FY 1971 and FY 1972 are essentially the same and include major procurement actions for the Topographic All-Weather Radar Mapping System and the New Capability. The reduced funding level in FY 1973 is due to the fact that these two areas will be nearing completion and the major effort in these two areas will be on the internal evaluation and testing of the previously procured equipment.

c. Major Items Planned for Completion: The Advanced Development Doppler Translocation System to determine tactical point positions for field troops will be completed. The device for obtaining digital elevation data from a Gigas-Zeiss map plotter will be completed. Prototype military geographic intelligence products to support battlefield sensor operations will be completed.

Fiscal year 1973 planned program.—Advanced development efforts will continue on equipments and software for a new capability to utilize reconnaissance photography for mapping production beginning in [deleted] for the radar map production by FY 1974, for the automatic cartographic capability in FY 1976, and the Topographic Readiness Capability by [deleted]. These dates were established to coincide with the needs of the Unified and Specified Command and the Department of Defense contingency plans and parallel with photographic and radar acquisition systems which will be operating and providing mapping imagery during this time period. Advance development will also continue on the Position and Azimuth Determining System for deployment with and in support of tube artillery and field army missile systems and on the backpack doppler translocation test for use by engineer survey troops in determining precise positions for command and control system locations.

Program to completion.—This is a continuing program.

Resources (In millions of dollars):

R.D.T. & E. funds for fiscal year 1963 through fiscal year 1971, 18.2; fiscal year 1972, 6.3; fiscal year 1973, 4.3; and additional funds to completion and total estimated cost are not available.

Senator YOUNG. Are you requesting funds for any projects not previously funded? If you are, will you please describe them?

General GRIBBLE. Yes, project 4A663712D862, Engineer Terrain Information Systems is being initially funded in fiscal year 1973. This project was established approximately 2 years ago in order to split out the field army portion of the military geographic analysis requirement. It is not new work but was previously accomplished under project 4A663712D860, Military Geographic Systems. This new project will address the development of a field system which will provide the field army information to satisfy its requirement for military geographic intelligence.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amount for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

General GRIBBLE. Yes, I will be glad to.

(The information follows:)

[In millions of dollars]

Project	Fiscal year— 1971	1972	1973
1G663712D580—Field army mapping	0	0.425	0.120
1G663712D673—Field army surveying	0.400	.400	.320
4A663712D855—Global mapping and geodesy	.790	.420	.750
4A663712D860—Military geographic systems	1.872	.600	1.220
4A663712D861—Worldwide topographic data bank	.225	.300	.340
4A663712D862—Engineer terrain information system	0	0	.120
4A663712D863—Topographic all-weather mapping system	.355	.775	.330
4A663712D864—Semiautomated cartographic system	.640	.500	.570
4A663712D865—New capability	1.071	2.845	.500
Total	5.353	6.265	4.270

Chairman ELLENDER. Comment on the decrease of almost $2 million in your request for fiscal year 1973.

General GRIBBLE. The decrease of almost $2 million in the fiscal year 1973 request is because during fiscal year 1972 contracts were awarded for approximately $2 million for specialized hardware items for the new capability. These items will be fabricated and tested during fiscal years 1973 and 1974 and the costs related to the new capability project will be for small procurements and internal expenses.

THERAPEUTIC DEVELOPMENT

Chairman ELLENDER. $9.1 million is for the program entitled "Therapeutic Development." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY ADVANCED DEVELOPMENT

Description.—A program of laboratory and field trial effort to develop new drugs to prevent and treat the parasitic diseases known as malaria. Primary effort is on development of drugs to combat the phenomena of development of drug resistance which the malaria organisms of the plasmodium species are capable. Experience shows that the organism has approximately a five year cycle from introduction of a new drug until a resistant strain of the organisms is observed. Work is divided into eight stages: (1) Chemistry—receipt of samples from industry and synthesis of specific variants of known active compounds; (2) Initial activity screening in mice, chickens and tissue cultures; (3) Efficacy testing in monkeys; (4) Acute toxicity testing in mice, rats, guinea pigs, dogs, and monkeys; (5) Sub-acute toxicity testing in rats and monkeys; (6) Pharmacology tests (dose levels, distribution in tissues, metabolism) in dogs and monkeys; (7) Clinical evaluation in volunteers for efficacy against human malaria species; (8) Long term tolerance testing in volunteers. These stages are all sequential. Work is also done on a limited scale on immunity to malaria and mechanisms by which organisms develops resistance.

Work performed by.—Approximately 35 percent of the work is conducted in-house by the Walter Reed Army Institute of Research (WRAIR). The remaining 65 percent of the funds are used in support of contracts and grants. Fourteen contractors with contracts over $100,000 each are: (1) Germantown Laboratories, Inc., Philadelphia, Pennsylvania; (2) Aerojet-General Corporation, Sacramento, California; (3) Aldrich Chemical Company, Inc., Milwaukee, Wisconsin; (4) Monsanto Research Corporation, Dayon, Ohio; (5) Starks Associates, Inc., Buffalo, New York; (6) University of Miami, Coral Gables, Florida; (7) University of Cincinnati, Cincinnati, Ohio; (8) Southern Research Institute, Birmingham, Alabama; (9) Stanford Research Institute, Menlo Park, California; (10) Midwest Research Institute, Kansas City, Missouri; (11) Herner and Company, Bethesda, Maryland; (12) University of Chicago, Chicago, Illinois; (13) University of Maryland, Baltimore, Maryland; (14) University of Missouri, Columbia, Missouri. There are an additional 75 contractors totaling $2.7 million.

Fiscal year 1972 program.—The integrated, drug development program will continue with emphasis on synthesis of selected candidate chemicals or analogs of those showing antimalarial properties. Emphasis will continue on search for new preventive drugs with less toxic reactions. Two major problems yet unsolved are suppression of side effects (gastro-intestinal symptoms, headache, etc.) associated with presently used drugs, and motivation of returnees from Vietnam to complete their drug series after discharge or while on leave. To date 180,000 compounds have been actively screened for antimalarial activity using rodent malaria systems. Automatic data processing systems are under review and will be updated to expand system for control and increase flexibility of search of data amassed in the program.

Fiscal year 1973 planned program.—The integrated program will be continued. Emphasis will continue on: Completion of the processing of compounds already in the system; synthesis and test of selected candidate compounds, development of preventive drugs for routine administration to troops at risk; reduction of side effects. This integrated program is unique among worldwide health organizations. For the foreseeable future, malaria will always pose an especially serious threat to military operations in the tropics and sub-tropics. Widespread use of available drugs by indigenous peoples will contiue to generate resistant strains of the parasites thus making a continuing new drug program mandatory.

Program to completion.—This is a continuing program.

Resources (in millions of dollars):

R.D.T.&E. funds for fiscal year 1963 through fiscal year 1971, 49.7; fiscal year 1972, 9.0; fiscal year 1973, 9.1; additional funds to completion are Continuing; and the total estimated cost is not available.

Chairman ELLENDER. The entire amount requested for fiscal year 1973 is for the project concerned with "Malaria Prophylaxis." What success have you achieved in treating some of the more resistant forms of malaria which have appeared in recent years—such as those encountered in Vietnam?

General GRIBBLE. In the years 1965 until June 1971, the Army has experienced 55,651 cases of malaria with 79 deaths. These figures are for worldwide incidence, however, most represent Southeast Asian origin. The low death rate demonstrates the success of our aggressive medical program with early evacuation of drug resistant cases to major hospital centers where they may be treated under controlled conditions. The addition of the drug dapsone to the previously used chloroquine—primaquine combination as a routine preventive regime has markedly reduced the otherwise anticipated much higher attack rate. Based on World War II experience and that with unprotected personnel exposed in certain areas of Southeast Asia, military operations without this protection would have been impossible due to malaria

SURVEILLANCE, TARGET ACQUISITION, AND NIGHT OBSERVATION (STANO)

Chairman ELLENDER. $34.9 million is requested for the program entitled "Surveillance, Target Acquisition and Night Observation" known as STANO. Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: ADVANCED DEVELOPMENT

Description.—The purpose of this Program Element is to conduct the advance development of surveillance target acquisition and night observation (STANO) devices. The program presently is concentrating on night vision devices, special purpose detectors, unattended ground sensors, radars, and remotely piloted vehicles/drones. The object of the program is to provide the Army with a badly

needed capability to locate and engage targets during all conditions of weather and visibility. Specific tasks include development of [deleted] for the individual soldier and for combat vehicles; development of a weapons locating radar, counterbattery; [deleted] the Protection of Key Public Figures; and the development of prototypes of a Remotely Piloted Aerial Observer/Designator System and a Forward Area Tactical Surveillance System.

Work performed by.—In-house work is performed by U.S. Army Electronics Command, Ft. Monmouth, New Jersey; U.S. Army Mobility Equipment Research & Development Center, Ft. Belvoir, Virginia; and U.S. Army Night Vision Laboratories, Ft. Belvoir, Virginia. Major contractors are: Bendix Research Southfield, Michigan; Machlett Labs, Springfield, Connecticut; ITT, Ft. Wayne, Indiana; Lockheed Electronics Company, Plainfield, New Jersey; Technology Services Corporation, Santa Monica, California; and MITRE Corporation, Bedford, Massachusetts. Anticipated bidders for radar contracts are: Sperry Corporation, Great Neck, Long Island, New York; Hazelton, Little Neck, Long Island, New York; General Electronics, Syracuse, New York; ITT Gilfillan, Van Nuys, California; Sanders Associates, Bedford, Massachusetts; and RCA, Moorestown, New Jersey. The anticipated bidders for the Remotely Piloted Aerial Observer/Designator System and the Forward Area Tactical Surveillance System are: Northrop Corporation, Anaheim, California; LTV Aerospace Corporation, Dallas, Texas; Teledyne Ryan, San Diego, California; Canadair Limited Montreal, Canada; Martin Marietta Corporation, Orlando, Florida; Goodyear Aerospace Corporation, Akron, Ohio and Texas Instruments, Dallas, Texas. There are approximately 20 additional contractors involved in this program element with about $2 million being spent on these smaller contracts.

Fiscal year 1972 program.—The counterbattery radar program was accelerated and contracting for competitive prototype models is expected during FY 72. The prototype model of the metal detecting radar is being modified with improved antenna design. Development of second generation image intensifier night vision devices will continue. Field evaluation of a far infrared lightweight weapons sight will be conducted. Advanced components of far infrared devices (e.g., coolers) will be breadboard tested. A new task to investigate optical and electro-optical countermeasures is being undertaken. Continued work on the concept formulation of the Remotely Monitored Battlefield Sensor System (REMBASS), the Army's unattended ground sensor program.

Fiscal year 1973 planned program.—Competitive prototype models of the counterbattery radar will be built, starting in FY 73. Contract Definition on the metal detecting radar will begin in FY 73. In Image Intensification night vision devices, advantages will be taken of a recent technological breakthrough in photocathode surfaces by applying the techniques to second generation and third generation devices. Efforts will continue to exploit the potential of infrared detectors as solutions are found to critical technical problems affecting the cost and complexity of these devices. Advanced development will continue on elements of the Remotely Monitored Battlefield Sensor System (REMBASS), an unattended ground sensor system. The use of sensors in the conduct of planned delaying actions will be investigated as a part of the Dynamic Defense New Initiative Program. Other tasks will focus on laser applications and a turret integrated night vision thermal system for combat vehicles. Prototype development of the Remotely Piloted Aerial Observer System and the Forward Area Tactical Surveillance System will be initiated.

Program to completion.—These are continuing programs.

Resources (In millions of dollars:)

R.D.T. & E. funds for fiscal year 1963 through fiscal year 1970, $103.8; fiscal year 1972, $28.5[1]; fiscal year 1973, $34.9; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

General GRIBBLE. Yes, sir.

(The information follows:)

[1] Includes supplemental of $4 million.

[In millions of dollars]

Projects	Fiscal year— 1971	1972	1973
1S663719DK52—Aerial radars	0.4	2.2	0
1S663719K61—Remotely P. veh/drones	0	0	12.5
1S663719DK70—Night vision devices	8.8	13.3	9.3
1S663719DK71—Special-purpose detectors	.3	1.2	.3
1S663719DK72—Radars	1.8	5.4	6.8
1S663719DK73—Unattended ground sensors	0	2.9	6.0
1S663719D570—STANO operational development	5.0	3.6	0
1X663719D628—DEFCOMM Planning Group	6.0	0	0
Total [1]	22.4	28.5	34.9

[1] May not add due to rounding.

Remotely Piloted Vehicles and Drones

Chairman Ellender. Of the total requested for STANO, $12.5 million is for what appears to be a new project entitled "Remotely Piloted Vehicles and Drones." Please describe this project for us.

General Gribble. The objective of this project is the prototyping of remotely piloted aerial vehicles and drones to provide a capability for surveillance, target acquisition and laser target designation in high enemy hostile air defense threat environments and when such systems provide a more effective capability as compared to manned systems. The two specific tasks to be initiated in fiscal year 1973 are a remotely piloted aerial observer/designator system (RPAODS) and the forward area tactical surveillance system (FATSS). The RPAODS is a relatively simple, small, low cost remotely piloted system for use by the division artillery for real-time artillery target acquisition, artillery fire adjustment, and laser target designation in a hostile air defense threat environment, such as in the Middle East or Europe, where manned systems may not effectively operate in this essential mission role. The RPAODS is a relatively short range system oriented to meet the close-in needs for more effective utilization of the conventional and laser guided artillery. The FATSS is a simple, high speed, highly survivable surveillance drone for forward tactical employment that carries either a photographic camera or an infrared line scan sensor. This drone will provide the target acquisition and target recognition capability to the 60 kilometer range of the division area of influence needed to effectively employ long-range weapons such as the Lance. It will provide a highly responsive capability for the forward tactical commander to employ aerial imaging sensors to identify the type of enemy activity detected from other activity indicator sensors, such as unattended ground sensors or radar, as well as responding to other intelligence information. This is needed for timely troop deployments and target/weapon selection.

Senator Young. Please tell us what you expect to do with the $12.5 million you are requesting for fiscal year 1973.

General Gribble. We will initiate the development of prototypes of the remotely piloted aerial observer/designator system and the forward area tactical surveillance system as previously discussed. These are prototype development efforts. The present fiscal year 1973 program projects $7 million for a dual competitive prototype contract for the remotely piloted aerial observer/designator system and $5.5 million for the forward area surveillance system prototype development.

NIGHT VISION DEVICES

Chairman ELLENDER. Of the total requested for STANO, $9.3 million is for the project entitled "Night Vision Devices." What are its objectives?

General GRIBBLE. The objective of this project is to conduct the advanced development of components, devices and accessories for providing the Army with a capability of conducting aerial missions, combat vehicle operations, missile firing and individual soldiers tasks at night.

Chairman ELLENDER. I note a reference in the descriptive summary to a request of $4 million to be considered in your supplemental request for fiscal year 1972 for the development of thermal night sights for the Tow and Dragon antitank missiles. What is the status of this program now, and what effect would failure by the Congress to provide this $4 million have on the program?

General GRIBBLE. A [deleted] night sight for Dragon that can also be used on Tow is in engineering development. The advanced development of a thermal sight that will provide a full range nighttime capability for the Tow and yet be small and light enough to be used on Dragon cannot commence without the additional funds.

Senator YOUNG. For fiscal year 1972, $13.3 million was provided for this project, and you are requesting only $9.3 million for fiscal year 1973. What has caused this rather large decrease in your request?

General GRIBBLE. The request in fiscal year 1972 was for $9.3 million plus an additional $4 million supplemental request for the Tow night sight. The $4 million fiscal year 1972 supplemental funding request has not been granted for fiscal year 1972 which decreases the fiscal year 1972 funding to $9.3 million. An increase in fiscal year 1973 funds will therefore be required for this project.

RADARS

Senator YOUNG. Of the total requested for STANO $6.8 million is for the project entitled "Radars." What are the objectives of this project?

General GRIBBLE. The objective of this project is to conduct advanced development of combat surveillance and target acquisition radar equipment to meet the varied and expanding requirements of the battlefield commander in all types of warfare. Two radar systems are being developed in this project. An artillery-locating radar is needed to detect and automatically locate enemy artillery and rocket launch sites. The radar under development will provide a high degree of location accuracy, at increased ranges, so that rapid and responsive counterfire can be directed against enemy weapons. The other radar development is for a metal-detecting radar to locate targets of military interest which are obscured by camouflage or foliage.

Chairman ELLENDER. Please describe your planned program for fiscal year 1973 and tell us what you will do with the $6.8 million you are requesting.

General GRIBBLE. The metal detecting radar program will enter the contract definition phase in fiscal year 1973. In the artillery locating radar program in fiscal year 1973 we will award contracts to two con-

tractors, each of which will build a model of the radar. There will be a competitive test phase of the two models in fiscal year 1975. Of the $6.8 million we are requesting, $800,000 will be used to improve the antennas on the metal detecting radar and to analyze test data to improve target signaturing. The remaining $6 million will be used in fiscal year 1973 as the first increment of funding on the artillery locating radar contracts.

UNATTENDED GROUND SENSORS

Chairman ELLENDER. $6 million is for the project entitled "Unattended Ground Sensors." Please describe this program, and tell us why you need the rather large increase of $3.1 million you are requesting for fiscal year 1973.

General GRIBBLE. This project is for development of an unattended ground sensor system. The objective of this project, as a followup to the defense special projects group effort, is to conduct advanced development efforts for a ground-based battlefield surveillance system capable of remote operation anywhere by the Army in the field and in any level of conflict. The system is called the remotely monitored battlefield sensor system (REMBASS). Remote sensors may be emplaced by hand, aircraft, and [deleted]. The REMBASS may be configured for a variety of operations. [Deleted]. This system must be compatible with the tactical communications sysem of the Army. Equipment will be compatible with other military services to include common frequencies, modulation and sensor communication language. With the disastablishment of the defense special projects group (DSPG) in fiscal year 1972 the Army is taking over selected unattended ground sensors research and development efforts and related funding that were previously in the DSPG program. The advance development effort will be increased in fiscal year 1973 to initiate advance sensor investigations, [deleted] display and processing investigations, and [deleted]. The objective of these efforts is twofold: to improve our ability to detect, locate, and identify targets and to examine the requirements for processing and displaying sensor-derived information so that detailed equipment specification can be developed. The work on the detection, location and identification of targets will concentrate on providing a target acquisition capability not adequately addressed in present sensors. The process and display work will address integration with other Army systems and interoperability with other services.

DEFENSIVE CHEMICAL BIOLOGICAL MATERIEL CONCEPTS

Chairman ELLENDER. $3.1 million is requested for the program entitled "Defensive Chemical Biological Materiel Concepts." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: ADVANCED DEVELOPMENT

Description.—The objective of this element is to develop and demonstrate techniques and equipment that are essential to the improvement of the chemical and biological defensive capabilities of all Services. The results of these efforts are applied to the engineering development of all types of chemical defensive

equipment. This element, composed of five projects, involves the detection and warning of, and protection against, a chemically and biologically contaminated environment and decontamination; it provides an analysis of the problems involved and procedures for their solution, development and modification of prototypes, and necessary testing to demonstrate operational suitability.

Work performed by.—USA Edgewood Arsenal, Maryland. Contractors are: Bendix (Environmental Division), Towson, Maryland; Litton Systems, Inc.; Donaldson Co., Inc., Minneapolis, Minn.; and others to be selected.

Fiscal year 1972 program.—Using the M8 automatic chemical agent alarm, newly adopted as standard, as the basic component, work will continue on the warning and detection system for vehicles, vans, and shelters. Work on the chemical area scanning alarm (LOPAIR) will be initiated, and work on the biological alarm will continue.

Fiscal year 1973 planned program.—The LOPAIR alarm will complete Advanced Development and the improved point source alarm will enter AD.

Program to completion.—The multipurpose mask, universal decontamination system, area scanning alarm, automatic liquid agent detector, incapacitating agent alarm, and multipurpose detector kits must be completed.

R.D.T. & E. funds for fiscal year 1971 and prior, $24.3; fiscal year 1972, $4.2; fiscal year 1973, $3.1; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Please provide a listing for the record of the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

General GRIBBLE. Yes, sir.

(The information follows:)

[In millions of dollars]

Projects	Fiscal year—		
	1971	1972	1973
1W663720DE80—Individual chemical protection materiel	0.000	0.375	0.000
1W663720DE81—Chemical decontamination materiel	.200	.200	.000
1W663720D165—Biological detection and warning materiel	2.973	2.130	1.840
1W663720D601—Chemical detection and warning materiel	1.100	1.500	1.100
1W663720D604—Collective chemical protective materiel	.500	.000	.200
Total	4.773	4.205	3.140

Senator YOUNG. Comment on your planned program for fiscal year 1973.

General GRIBBLE. The emphasis in this program for fiscal year 1973 will be on projects D165, biological detection and warning materiel and D601, chemical detection and warning materiel. Work will be directed toward producing a passive long path infrared (passive LOPAIR) system which will satisfy the requirement for an area scanning alarm capable of monitoring for the presence of nerve agents; producing a liquid agent detector for field use; and on biological aerosol detection devices to detect a biological attack and warning personnel in sufficient time to take protective measures.

COMMAND AND CONTROL

Chairman ELLENDER. $19.2 million is requested for the program entitled "Command and control." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

COMMAND AND CONTROL

CATEGORY: ADVANCED DEVELOPMENT

Description.—There are six projects in the Command and Control Program Element. The Application of Automation Technology to Engineering/Testing Project is the use of automated techniques enabling the engineer to accomplish his normal functions in concept development, design and design evaluation. By using the computer to perform these functions the designer and engineer will be released from laborious and repetitive tasks, better and more comprehensive solutions of design problems will be found, more alternatives will be available from which to select the most effective solution, and final decisions will be reached more quickly. The Integration of Army Tactical Data Systems (ART ADS) project is designed to take an intergrated approach to Army Tactical Data Systems by providing a total conceptual framework and an operational test bed for "hands-on" testing of all ARTADS as a practical method of insuring an interoperable and coherent total program. The Identification, Friend or Foe (IFF) Developments project is for advanced development of an Army identification system suitable for positive and automatic recognition and identification. The project covers Battlefield Identification (BIFF), ground-by-ground and ground-by-air; and Air Defense IFF, air-by-ground. The Tactical Automatic Data Processing Systems Equipment—Tactical Operations System (TOS) project is to provide commanders and their staffs within the field army and information processing system that will significantly increase the effectiveness of tactical operations. Specific objectives are to provide a system that will: improve command and control capabilities, reduce reaction time and integrate fire support and maneuver operations, improve operational and decision making capabilities, provide improved capability for use of operations and intelligence data, and improve the speed and accuracy of plans and estimates. The Automatic Data Processing Equipment Development project is to develop advanced automatic data processing (ADP) equipments for experimental and operational tests to prove the feasibility of advancing these equipments into engineering development and then fielding in the growing number of Army tactical systems employing automatic data processing (ADP). This project encompasses the advanced development of such equipments as a modular family of processing elements for small scale tactical applications, non-mechanical memories, automatic panel displays and input/output devices. The Defense Navigation Satellite System project is to provide for the Army an increased capability of three dimensional, high accuracy, navigation and position location. This project examines and analyzes Army missions and concepts related to precise position location, navigation and terminal guidance and determines which Army requirements can be met most effectively by navigation satellites.

Work performed by.—The projects are monitored by the U.S. Army Electronics Command, Fort Monmouth, New Jersey, and the U.S. Army Satellite Communications Agency, Fort Monmouth, New Jersey. Contractors are: Cutler-Hammer (Airborne Instrument Laboratories), Deer Park, Long Island, New York; TRW Systems Group, Redondo Beach, California; Cornell Aeronautical Laboratory, Inc., Buffalo, New York; Grumman Aircraft Corporation, Bethpage, New York; Litton Industries, Van Nuys, California; Singer-General Precision, Inc., New Jersey; Burroughs Corporation, Paoli, Pennsylvania; Raytheon Corporation, Sudbury, Massachusetts; Stelma Corporation, Stamford, Connecticut; and Louis Allis Corporation, Greendale, Wisconsin. Numerous contracts are expected to be awarded in FY 1972.

Fiscal year 1972 program. Efforts are being directed toward (1) enhancing man-computer communications, (2) developing automated design, design testing, and fabrication capabilities, and (3) deriving techniques for automatic acquisition and analysis. The Tele-processing Design Center is being established and advanced development efforts are being expanded and expedited to support the ARTADS program and to fill critical hardware gaps in militarized tactical data systems. The Air Traffic Control Radar Beacon System Identification Friend or Foe MARK XII System (AIMS) math model is being expanded to include REDEYE II Identification Friend or Foe (IFF) systems. The Tactical Operations System (TOS) System Engineering Study will be completed and will provide hardware and software specifications for the TOS Operable Segment. The

hardware contract for the TOS Operable Segment is to be awarded. Development of the software in-house by Computer Systems Command is to be initiated. Development of two modules of the family of processing elements, the FIFO[1] communications buffer, and the PUDL[2] memory is to be completed and evaluation is to be started. Development is to be initiated on additional modules for a family of processing elements and a Tactical Line Printer. A joint experiment with the USAF is to be conducted at White Sands Missile Range in a simulated satellite constellation. Typical user equipment systems are being modeled and their performance being examined under typical operational conditions.

Fiscal year 1973 planned program.—Work will continue to extend capabilities and sophistication for interactive graphics technology and systems. A graphics language for preparation of technical data packages will be completed and multiple independent cathode ray tubes at a single terminal connected to a host time sharing system will be demonstrated. Additional hardware will be obtained for the Teleprocessing Design Center. Additional advanced development efforts will be expanded and expedited to support the Army Tactical Data Systems (ARTADS) program and to fill critical hardware gaps in militarized tactical data systems and those efforts started in FY 1972 will continue. Development of a [deleted] will be initiated. Development of the Tactical Operations System (TOS) Operable Segment will continue. The development of the baseline set of modules for a family of processing elements will be completed and individual test and evaluation will begin. In addition, the modules will be integrated into various system configuration to verify and demonstrate the design's adherence to the concept of expansibility via a flexible modular interconnection philosophy. Development of several different displays will be completed and testing and evaluation will begin. Development will be initiated on a Tactical Page Reader using solid state scanning techniques; recognizing multifonts if cost feasible; and having automatic routing indicator/header preparation capabilities. Joint experiments of user equipments will be conducted following the launch of an experimental navigation satellite. Efforts will be initiated to identify technical objectives and US Army peculiar requirements in user equipments for participation in a system demonstration of a Defense Navigation Satellite System (DNSS).

Program to completion.—This is a continuing program, consisting of a large number of projects and as tasks are completed, new tasks are added.

Resources (In millions of dollars:)

R.D.T. & E. funds for fiscal year 1963 through fiscal year 1971, $23.6; fiscal year 1972, $20.6; fiscal year 1973, $19.2; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

General GRIBBLE. Yes.

(The information follows:)

[In millions of dollars]

Projects	Fiscal year—		
	1971	1972	1973
1E663723D091—Application of automation technology to engineering/testing	0	3.460	2.600
1X663723D101—Integration of Army tactical data systems (ARTADS)	0.700	6.600	4.600
1S663723D243—IFF developments	.100	.302	.300
1X663723D494—Tactical ADPS equipment tactical operatings system	3.560	8.400	8.400
1S663723D654—ADPE development	1.150	1.300	1.300
1X663723D656—Defense navigation satellite system	.100	.500	2.000
Total	5.610	20.562	19.200

Chairman ELLENDER. Of the $19.2 million requested for command and control, $4.6 million is for the project entitled "Integration of

[1] First-in first out.
[2] Push-down-list.

Army Tactical Data Systems," known as ARTADS. What are the objectives of this project?

General GRIBBLE. This program is designed to take an integrated approach to Army tactical data systems—(ARTADS)—by providing a total conceptual framework and an operational test bed for "hands-on" testing of all ARTADS as a practical method of insuring an interoperable and coherent total program. The objective is to accelerate the development and implementation of the integrated battlefield control system—(IBCS)—concept to improve the ability of combat commanders to obtain, correlate and use intelligence and operational data to employ tactical maneuver forces and firepower in the quickest and most efficient manner. The philosophy behind the IBCS package is to integrate present separate programs.

Senator YOUNG. I note that your request for ARTADS for fiscal year 1973 is $2 million less than was provided for fiscal year 1972. Please comment on this decrease.

General GRIBBLE. At the beginning of fiscal year 1972 the Army established the Project Manager for Army Tactical Data Systems. It took longer to staff the project manager's office than originally envisioned and, as a result, some of the efforts planned for fiscal year 1972 were delayed in starting. Some of these fiscal year 1972 efforts will carry over into fiscal year 1973. This plus requirements for higher priority projects resulted in the decrease for fiscal year 1973.

Senator YOUNG. I note in the descriptive summary under the program accomplishments for fiscal year 1972 that you are expecting to establish a teleprocessing design center at Fort Monmouth, N.J. Comment on this center.

General GRIBBLE. The teleprocessing design center is to be a laboratory-type facility and will be used to support experimentation in developing and validating Army tactical data systems configurations. The design center will provide facilities to test and evaluate technical concepts, systems, integration, man/machine relationships, and confirm communications interoperability alternatives by "hands-on" experimentation and demonstration with innovative hardware and software techniques.

Chairman ELLENDER. Comment on your planned program for fiscal year 1973 for the ARTADS effort.

General GRIBBLE. Interface, advanced development and human factor efforts started in fiscal year 1972 will continue. Additional hardware in the areas of displays and other input/output devices will be obtained for the teleprocessing design center and additional advanced development efforts will be expanded and expedited. Efforts will begin to integrate equipment into the tactical operations system—TOS—Operable segment for testing at modern Army selected systems test and review (MASSTER).

Chairman ELLENDER. $8.4 million is being requested for the project entitled "Tactical Operations System." What are the objectives of this project?

General GRIBBLE. The overall objective of this program is to provide commanders and their staffs within the field army an information processing system that will significantly increase the effectiveness of tactical operations. Specific objectives are to provide a system that

will: improve command and control capabilities, reduce reaction time and integrate fire support and maneuver operations, improve operational and decisionmaking capabilities, provide improved capability for use of operations and intelligence data, and improve the speed and accuracy of plans and estimates.

Senator YOUNG. It would appear that work on this project is being carried on at roughly the same level as in fiscal year 1972. Am I correct?

General GRIBBLE. Yes, sir.

ENGINEERING DEVELOPMENT—COMMUNICATIONS

Chairman ELLENDER. Of the total requested for Other Equipment, $5.7 is for the program element entitled "Engineering Development—Communications." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: ENGINEERING DEVELOPMENT

Description.—The objective of this program is the engineering development of all strategic and tactical communications equipment exclusive of satellite communications (PE #3.31.42.A) and tri-departmental tactical communications (PE #2.80.10.A). The major project is the Army Area Communications System (AACOMS). Five other projects include developments supporting the Defense Communication System (DCS), the non-DCS systems operated by the US Army Strategic Communications Command (STRATCOM), divisional communications, special warfare, and those common to several or all of these categories.

Work performed by.—The US Army Electronics Command, Fort Monmouth, New Jersey and the US Army Communications System Agency, Fort Monmouth, New Jersey. Contractors include: Kleinschmidt Division of SCM, Deerfield, Illinois; Martin Marietta, Orlando, Florida; General Research Corporation, Santa Barbara, California; Canadian Commercial Corportion, Montreal, Canada; AVCO, Cincinnati, Ohio and Varian, Inc., Palo Alto, California.

Fiscal year 1972 program.—AACOMS developments continue effort on the AN/TSQ–85 and forward area tactical teletypewriter. AACOMS developments being initiated include a Band IV tuning head for the AN/GRC–103, digital data and teletypewriter multiplex equipments, and a technical control facility AN/TSQ–84. Strategic communications developments continue the PCM Multiplexer and initiate effort on optical character readers, a family of regenerative repeaters, and a strategic version of the forward area tactical teletypewriter. Special warfare efforts continue development of the Radio Set AN/PRC–70. Supporting developments include initiating test on the Mast AB–864 and continue installation engineering of communications items in new weapon systems, vehicles and aircraft.

Fiscal year 1973 planned programs.—AACOMS effort will begin testing of the AN/TSQ–85 and the AN/TSQ–84. Testing of the forward area tactical teletypewriter will be completed. Development will continue on the Band IV Tuning Head for AN/GRC–103, digital data buffer, and data/teletypewriter multiplexer.

Strategic developments include award of contract for engineering development of a family of regenerative repeaters, testing of PCM Multiplexer, and investigation of input-output devices for a high speed message entry system. Special warfare efforts include acceptance testing of AN/PRC–70 and initiation of jungle antenna development. Supporting developments will continue installation engineering of communications equipment in support of project managers for weapon systems, vehicles and aircraft.

Program to completion.—This is a continuing program.

Resources (In millions of dollars:)

R.D.T. & E. funds for fiscal year 1963 through fiscal year 1971, $100.8 fiscal year 1972, $10.8; fiscal year 1973, $5.7: Additional to Completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. I note that the $5.7 million you are requesting provides funding for six different projects. Would you please comment briefly on each of them.

General GRIBBLE. I would like to provide that information for the record.

(The information follows:)

Project 1X664701 D149 Support of DCS (Army).—This project consists of several individual tasks directed towards the improvement of the Defense Communications System (DCS). The studies, technical investigations and resulting equipment development associated with each task are directed toward new techniques which are required to update and modernize the existing DCS in accordance with DCA requirements. In fiscal year 1973, the following developments are planned: Multiplexer for analog-to-digital conversion for 3, 6, 12, and 24 channels; centralized automatic message entry and addressal; and, digital equipment to support the all-digital DCS.

Project 15664701 D481 Strategic Communications.—The individual tasks of this project are oriented toward the improvement of transmission facilities and equipment, terminal equipment and the development of related techniques. Developments are closely related to D149, Army Support of DCS. Fiscal Year 1973 developments include High Speed Message Entry Equipment and a High Speed Page Printer. In addition, a test bed for intra-headquarters message distribution will be established.

Project 18664701 D487 Corps—Army Area Communications.—This project contains equipment for use at Army tactical levels down to and including brigade. The area of greatest effort is in the Army Area Communications System. Developments during fiscal year 1973 include testing of technical control facilities and the forward area tactical teletypewriter; continuation of extended frequency range radio set AN/GRC–103, digital data buffer and data multiplexer; and initiation of effort on a new switchboard for use in the division. These developments provide a minimum essential transitional capability until the introduction of a digital communication system and all developments are monitored by the Joint Tactical Communications (TRI–TAC) Office.

Project 18664701 D488 Divisional Communications.—For fiscal year 1973, the following tasks are planned: fabrication of Engineering Test/Expanded Service Test models of a high frequency radio to provide extended communications range for Special Forces; arctic retest of Site Marker, AM/GRT–13; complete testing of High Speed Morse Telegraph Terminal, AN/GSA–124; and modernization of Communications—Electronics items aboard Army marine craft.

Project 18664701 D536 Supporting Developments—Communications.—This is a continuing project to provide for development of equipment common to several communications systems. Fiscal year 1973 efforts are planned for development of a lightweight, quick erectable, antenna mast (AB–864), check test on a test set for Cable (CX–4566) and installation of Radiac Set An/VDR–1 on Army vehicles.

Project 18664701 D535 Communication—Electronics Items for Special Warfare.—The objective of this program is to provide Special Forces with Communications—Electronics equipment for their peculiar requirements. During fiscal year 1973, the major work will be the continuing development of the AN/PRC–70 Radio. This radio is a multi-mode, man-pack set which will replace three radios presently being used in Special Forces units.

ELECTRONIC WARFARE

Chairman ELLENDER. Of the total requested for other equipment, [deleted] is for the program entitled "Electronic Warfare." Can you give us a brief, unclassified description of this program?

General GRIBBLE. Yes, sir; these funds are used to develop electronic warfare equipment to support the tactical forces. The program includes the development of electronic warfare self protection type devices, offensive radar and communications electronic countermeasures system, and electronic counter countermeasures techniques for the protection of our communications and electronic devices from the effects of enemy electronic warfare operations.

Chairman ELLENDER. Has the committee been provided with complete details on this program?

General GRIBBLE. Yes, sir.

Senator YOUNG. Are you requesting funds for any projects not previously funded?

General GRIBBLE. No, sir.

COMBAT FEEDING, CLOTHING, AND EQUIPMENT

Chairman ELLENDER. $4.7 million is requested for the program entitled "Combat Feeding, Clothing, and Equipment." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: ENGINEERING DEVELOPMENT

Description.—This program provides for the development of individual combat protective clothing and equipment that will maximize combat efficiency and provide the requisite degree of protection for the combat soldier against battlefield hazards and the natural environment; the development of operational rations, recipes, and menus; and supports the Department of Defense Uniform Food Service Program. This element also includes funds to execute the Irradiated Food Wholesomeness Test Program, the development of improved field shelters and field printing equipment required for the conduct of worldwide, special warfare operations. There are three projects within this program element, and these directly affect the military individual's safety, prestige, effectiveness, comfort, and survivability. Many of the items developed under this program are used by all other military services.

Work performed by.—Inhouse laboratory work is performed at the US Army Natick Laboratories, Natick, Massachusetts. Representative contractors include Research and Development Design Corporation, Worcester, Massachusetts; Air Lock Incorporated, Milford, Connecticut; Edmont-Wilson Company, Coshocton, Ohio; GENTEX Corporation, Carbondale, Pennsylvania; American Optical Corporation, Southbridge, Massachusetts; J. P. Stevens Company Incorporated, New York, New York; Westinghouse Electric Corporation, Pittsburg, Pennsylvania; Industrial Bio-Test Laboratories, Incorporated, Northbrook, Illinois; Mid-West Research Institute, Kansas City, Missouri; Shankman Laboratories, Los Angeles, California; American Air Filter, St. Louis, Miessouri; Orange County Vacuum Forming, Ceritos, California; and Riegel Textile Corporation, New York, New York.

Fiscal year 1972 program.—Engineering development continued on the components for operational rations to include new food items, recipes, and menus. Level of effort in support of the Department of Defense (DOD) Food Program has been increased to respond to the Armed Services Recipe Committee requirements as well as the development of technical data to support the procurement of perishable and nonperishable convenience type foods. Other significant actions are to continue the development of a microbial contamination biodetection device; the engineering design of a mobile field food preparation kitchen; complete engineering design of the lightweight insulated food container, and initiate development of a lightweight refrigeration system in response to a Marine Corps requirement. Will initiate animal feeding tests for the wholesomeness testing of irradiated foods which will be continuing in accordance with the revised protocol design as required by the Food and Drug Administration and Department of Agriculture. Engineering development continued on the lightweight overshoe; Mask, Cold Weather; Handwear, Wet Weather; Sleeping Gear, Cold Weather, desert combat clothing, chemical-biological protective handwear, and type fonts and type masters for three African languages. The following items will complete engineering design and undergo testing: flame protective jackets for aircrewmen, chemical-biological protective overgarment or Explosive Ordnance Demolition personnel; Parka and Trouser, Wet Weather; POL Protective Handwear, Cold Weather; Combat Vehicle Crewmen Helmet; Loadcarrying Equipment; Anti-Laser Goggles and durable press service type uniforms. Type classification will be accomplished for the prisoner of war identification kit, flame

protective underwear for the aircrewmen, and machete. Insulated Food container prototypes for schedule testing were not available due to contractor default. Testing and type classification of this item will slip one year. For personnel armor, will complete the engineering design and engineering design test on an improved suspension system for the M1 Helmet and Liner Assembly, will develop new lightweight fragmentation as well as Improved Conventional Munition (ICM) ballistic protective, body armor vests.

Fiscal year 1973 planned program.—Will continue development of components for the operational rations to include new food products, recipes, and menus; emphasis will be placed upon engineering developments in response to the Department of Defense Food Program's food service equipment requirements. Will complete the engineering development, type classification, and preparation of technical data (procurement) packages for: the Aircrewmen's Cold Weather, Flame Protective jackets; Lightweight, Wet Weather Parka and Trousers; POL Protective Handwear, Cold Weather; the redesigned Infantry soldier Load Carrying Equipment System; Anti-Laser Goggles; the language type fonts and type masters required for composition of special warfare material in all major languages and dialects, and the Insulated Food Container. Engineering Test/Expanded Service Test will continue for the Explosive Demolition (EOD) Personnel protective ensemble and life support system. In addition, test and evaluation programs (ET/EST) are scheduled for the following items: LNCLOE Overshoe; Mask, Cold Weather; Lightweight, Wet Weather Handwear; Desert Clothing; Chemical-Biological Protective Gloves; Combat Vehicle Crewmen's Helmet; and the LINCLOE Cold Weather Sleeping Gear. Work will be continued on Oversnow protective clothing and equipment, and improved field shelters. Plans exist whereby contracts will be made for the fabrication of an optimized Infantry helmet suspension system; munitions protective armor will be improved by significantly reducing weight, employing newly developed construction methods, and better ballistic protective materials; compatibility analyses for ground troops body armor will be made and a new armor system design initiated based upon optimized materials and configurations. Wholesomeness testing of irradiated foods will be continued in accordance with revised protocol design to comply with current Food and Drug Administration regulations that require safety and wholesomeness of the test food being demonstrated in three species of animals.

Program to completion.—This is a continuing program.

Resources. (In millions in dollars:)

R.D.T. & E. funds for *fiscal year 1963 thru fiscal year 1971*, $27.8; *fiscal year 1972*, $5.4; *fiscal year 1973*, $4.7; *additional funds to completion* are continuing; and the *total estimated cost* is not available.

Senator YOUNG. What is the difference between these three projects and those similar projects which we have previously discussed under the technology for support of the military man program element?

General GRIBBLE. The difference is best defined by an explanation of the appropriate R.D.T. & E. category.

The projects discussed previously under technology for support of the military man is categorized as exploratory development. All effort here is directed toward the solution of specific military problems, short of major developments. The dominant characteristic is that it is pointed toward specific problem areas with a view toward developing and evaluating the feasibility and practicability of proposed solutions and determining their parameters.

The projects discussed within this program element are categorized as engineer developments. Work within this research, development, test, and evaluation category focuses on items being engineered for military service use, but which have not yet been approved for procurement and use within the Field Army.

Chairman ELLENDER. Please comment briefly on each of the three projects for which you are requesting funds.

General GRIBBLE. Project Clothing and Equipment provides for the development of individual combat protective clothing and equipment that will maximize combat efficiency and provide the requisite degree of protection for the combat soldier against battlefield hazards and the

natural environments. Also included in the development of improved field shelters and field printing equipment required for the conduct of worldwide, special warfare operations.

Project Wholesomeness Testing of Irradiated Foods is being pursued to provide evidence through long-term feeding studies, chemical and physical tests, and other measures as required by the Food and Drug Administration and Department of Agriculture, to demonstrate the wholesomeness of radiation sterilized foods. This must be done in order to obtain clearance of these foods for unrestricted consumption by military and civilian populations. Project Combat Feeding Systems supports the Department of Defense (DOD) uniform food service program, by providing the development and engineering required to meet military service, Armed Forces Product Evaluation Committee, and DOD Food Planning Board requirements for new, significantly improved subsistence and food service equipment items.

Mapping and Geodesy

Chairman Ellender. $2.5 million is requested for the engineering development program entitled "Mapping and Geodesy." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

CATEGORY: ENGINEERING DEVELOPMENT

Description.—Objectives of this program are the engineering development and testing of material in support of the field army in the areas of survey, map distribution, revision and reproduction, and improved means for rapid acquisition and processing of mapping and position location data. These developments will be used in direct support of DOD strategic and tactical deployment of forces, weapon system operation, crises management of national defense, and rescue operations. This program element provides the necessary follow-on engineering developments of the systems and equipments originating in program element 6.37.12.A. The DOD systems requiring follow-on engineering developments of specific equipment assigned to the Army by the Office of the Director of Defense Research and Engineering include: (1) Field Army Mapping and Survey for rapid revision and reproduction of topographic maps in the field; (2) Topographic All-Weather Radar Mapping System to be developed by [deleted] and (3) the Automatic Cartographic System to automate the manual feature delineation and formating process of mapping by [deleted] included in this element is the engineering development of the Long Range Position Determining System (LRPDS), an electronic, airborne to ground survey system which extends survey control rapidly over long ranges and to multiple users; this will be developed by [deleted.] The LRPDS used to extend survey control over long distances, and the program element 6.37.12.A jeep mounted inertial survey platform, used with mobile artillery and missile systems to give real time survey control, together, will provide a 50 percent reduction in manpower and equipment cost required to give the needed accurate survey control to tactical weapon systems, target location systems, and command and control systems. In addition this element includes the development of the photogrammetric facility capability to determine position coordinates of weapon systems and potential targets for surface to surface missiles [deleted.]

Work performed by.—Approximately 25 percent of the work is accomplished internally at the US Army Engineer Topographic Laboratories (USAETL), Fort Belvoir, Virginia, and the remainder is performed by contractors. The four major contractors are (1) Lear Siegler, Inc., Santa Monica, California; (2) Goodyear Aerospace Corp., Litchfield, Arizona; (3) Motorola, Inc., Scottsdale, Arizona; and (4) Concord Controls, Boston, Massachusetts, all exceeding $25,000. There are no other contractors.

Fiscal year 1972 program.—a. New Programs Initiated: Design and development of a Digital Input/Output Display Device and a production Flatbed Cartographic Plotter which are components of the Automatic Cartographic System, were initiated. The engineer design test of the Topographic All-Weather Mapping System was initiated. The development of a Photogrammetric Facility to determine position coordinates of weapons systems and potential targets for surface to surface missiles was initiated.

b. Continuing Effort: The engineering development and testing continued on the Long Range Position Determining System and small off-the-shelf components were procured for the Automatic Cartographic System.

c. Major Items Planned for Completion: The Lightweight Gyro Azimuth Theodolite will be tested and type classified for troop use. This instrument, which is also being procured by NATO countries, automatically determines true north by sensing the earth's rotation. The instrument weighs 40 pounds replacing an instrument of 1955 vintage which weighs 200 pounds. All tests, to date, give every indication of meeting the requirement to determine rapid, accurate true azimuths for survey, fire direction, and target acquisition purposes.

Fiscal year 1973 planned program.—Engineering development of the major components of the Topographic All-Weather Radar Mapping System, and of the Automatic Cartographic System will be continued. These components will be integrated into their respective systems in order to begin production tests and personnel training in [deleted.] The development efforts and testing of the Long Range Position Determining System will be continued. The Photogrammetric Facility development will be continued with type classification scheduled for fiscal year 1973. In-house efforts to test off-the-shelf equipments to support the rapid reproduction of topographic maps at the production facilities and in the field will be instituted. The program element funding level for fiscal year 1972 is the same as fiscal year 1973; however, the fluctuations in the project levels reflect a planned effort to balance and schedule the major contract equipment developments and follow-on in-house test and systems integration within a constant program element funding level and to assure that the target dates for systems completion are met.

Program to completion.—This is a continuing program.

Resources (In millions of dollars):

R.D.T. & E. funds for fiscal year 1963 through fiscal year 1971, $21.6; fiscal year 1972, $2.5; fiscal year 1973, $2.5; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Are you requesting funds for any projects that have not been previously funded?

Mr. JOHNSON. No.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

Mr. JOHNSON. Yes, sir.

(The information follows:)

[In thousands of dollars]

Projects	Fiscal year 1971 actual	Fiscal year 1972 estimated	Fiscal year 1973 estimated
1G664716D577—Field army map reproduction	0	9	120
1G664716D578—Surveying equipment for the field army	1,275	925	1,150
1G664716D579—Field army mapping systems	100	0	300
4A664716D856—Global mapping and geodesy equipment	0	0	180
4A664716D866—Topographic all-weather mapping system	115	610	150
4A664716D867—Semiautomated cartography	55	1,000	600
Total	1,545	2,544	2,500

Senator YOUNG. I note that, for the project entitled "Field Army Map Reproduction," $9,000 was provided in fiscal year 1972 and you are requesting $120,000 for fiscal year 1973. Describe this project and tell us why you need such a large increase.

Mr. JOHNSON. This project is for the development of more efficient materials, techniques, and equipment to increase the rate of field map reproduction and to develop equipment and processes for quantity storage of and rapid access to map information. The $120,000 requested for fiscal year 1973 is for the development of a tactical display device for storing maps in miniaturized chip format, retrieving and displaying an enlargement of a specific map sheet on call, and of making hard copies of the map being displayed.

Chairman ELLENDER. Please describe the project entitled "Surveying equipment for the field army" for which you are requesting $1.2 million and comment on the need for the increase you are requesting.

Mr. JOHNSON. This project addresses three significant developments which support the field army in the area of survey and position location. These are (1) the long range position determining system, an electronic, airborne-to-ground survey system which extends survey control rapidly over long distances and to multiple users, (2) the Photogrammetric Facility which will determine position coordinates of weapon systems and potential targets for surface-to-surface missiles and (3) the lightweight gyro azimuth surveying instrument which will provide an accurate azimuth reference for the artillery. The increase in funding of $225,000 is specifically for the development of the Photogrammetric Facility which has progressed through the development cycle to engineering development in fiscal year 1973.

Chairman ELLENDER. Of the total requested for other equipment, $11.4 million is for the program entitled "General combat support". Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

GENERAL COMBAT SUPPORT

CATEGORY: ENGINEERING DEVELOPMENT

Description.—The basic goal of this program is to develop equipment for combat support that will increase the Army's combat effectiveness. The element contains nine different projects relating to a variety of support equipment. Major projects include the development of combat engineer equipment to include bridging,, earthmoving equipment, prefabricated airfield surfacing and dust control material; bulk material handling equipment; fuels distribution systems; general support equipment to include environmental control equipment, camouflage devices, simulating devices, and field water supply equipment; and portable power plants. These projects meet the Army requirements for equipment with high reliability, long life, and increased mobility, and the conservation of time and manpower.

Work performed by.—In-house laboratory work is performed at the US Army Mobility Equipment Research and Development Center, Fort Belvoir, Virginia; the Waterways Experiment Station, Vicksburg, Mississippi; the Army Tank Automotive Command, Warren, Michigan; Edgewood Arsenal, Maryland; and Frankford Arsenal, Pennsylvania. Contractors include the Western Company, Richardson, Texas (Dust Control Material); Barnes and Reinecke, Chicago, Illinois (Liquid Distributor); TRW Systems, Redondo Beach, California (Software on Family of Military Engineer Construction Equipment (FAMECE); Peat, Marwick and Mitchell, Washington, D.C. (Software on FAMECE); Pacific Car and Foundry Company, Renton, Washington (Ribbon Bridge); United Kingdom Ministry of Defense, Directorate of Sales, London, England (Medium Girder Bridge); Garrett Airesearch Corporation, Phoenix, Arizona, Medical Unit Self-contained Transportable (MUST); Stanford University, Palo Alto, Cali-

fornia (Analygesic Compound); Solar Division, International Harvester Corporation, San Diego, California (10KW turbo-alternator); ONAN Division of Studebaker Corporation, Minneapolis, Minnesota (5KW and 10KW diesel engine generator sets); AAI Corporation, Cockeysville, Maryland (Supply Handling Conveyor); UniRoyal, Mishawaka, Indiana (Collapsible Tanks and Synthetic Camouflage Nets); Atomics International, Conoga Park, California (Fuel Decontaminants); Wiggins Incorporated, Los Angeles, California (Nozzles); FRAM, Incorporated, Tulsa, Oklahoma (Filter Separators).

Fiscal year 1972 program.—FAMECE continues in engineering development with competitive prototype validation. The Ribbon Bridge and United Kingdom Medium Girder Bridge continue in testing and development being initiated on a cable reinforcing kit for the Medium Girder Bridge. Engineering and service testing were completed on the XW–18 heavy duty membrane. Engineer design tests of the dust control system were conducted and engineering and service test initiated. Commercial container handling equipment is being evaluated to determine its suitability for military usage. Engineer design of the Supply Handling Conveyor System is being continued. A contract to optimize container design through use of new materials and fabrication technology is being awarded, and testing of panel material is underway. Evaluation of commercially available internal cargo restraint systems for use in the 8'x8'x20' container is being completed Engineer design testing of the multi-leg tanker mooring system and work on collapsible fuel tanks are continuing. The family of filter separators was completed. Work on the batch interface detector is continuing. Engineering development of the 10KW Turbo-Alternator is being continued. The Synethetic Camouflage Screening System will continue in development.

Fiscal year 1973 planned program.—Family of Military Engineer Construction Equipment (FAMECE) will be continued in prototype validation. The Medium Girder Bridge will undergo engineering and service tests. The XM–19 medium duty landing mat will be completed and the heavy duty landing mat will begin engineering and service testing. Results of the evaluation of commercially available container handling equipment will be used to determine optimum equipment required. Engineering design testing will be initiated on the Supply Handling Conveyor System. Containers of new lightweight materials will be evaluated. Testing of collapsible tanks will be continued. Development will continue on the 10KW Turbo-Alternator. The Woodland version of the Synthetic Camouflage Screening system will be completed. Engineering and service tests of the Dust Control System, the Medium Girder Bridge and the Cable Reinforcing Kit will be completed. A family of rough terrain forklift trucks will be developed.

Program to completion.—This is a continuing program.

Resources (In million of dollars:)

R.D.T. & E. funds for fiscal year 1971 and prior, $41.9; fiscal year 1972, $13.4; fiscal year 1973, $11.4; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman Ellender. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

Mr. Johnson. Yes, sir.

(The tabulation follows:)

[In millions of dollars]

Projects	Fiscal year—		
	1971	1972	1973
1G664717DH01—Combat Engineer equipment	4.779	2.765	2.085
1G664717DH08—Family of military engineer construction equipment	0	.900	.915
1G664717DH14—Bulk materiel handling equipment	.575	.740	1.500
1G664717DL39—General support equipment	.880	.760	.760
1G664717DL41—POL distribution systems	.963	1.135	.710
1P664717D470—Vietnam laboratory assistance program	1.000	.205	0
1S664717D511—Meteorological equipment systems	.900	1.000	.940
1G664717D589—Powerplants portable	3.400	3.660	2.850
3A664717D832—Field medical support equipment	1.461	1.460	.630
4A664717D895—Military construction systems development	.600	.810	1.000
Total	14.558	13.435	11.390

Chairman ELLENDER. Please describe the family of military construction engineer equipment project.

Mr. JOHNSON. The family of military engineer construction equipment (FAMECE) is a new mobility concept for combat engineer construction equipment. A common power module can be quickly coupled to any of eight work tool attachments to doze, scrape, grade, carry, place, and compact earth. Combining the power module with any one work module minimizes the amount of equipment needed to meet the many varied requirements of military construction. Each member of the family will have a balanced weight-to-horsepower ratio to achieve high-production capacity, high reliability, operational simplicity, and minimum maintenance. Individual power and work modules will be transportable by medium lift helicopters and be air-droppable from Air Force assault aircraft.

FAMECE is designed to operate in a combat environment. It will replace a large part of the current combat inventory of 70 makes and 92 models. Unlike the assortment of existing equipment, FAMECE emphasizes standardization, simplicity, mobility, and air portability.

Famece is currently in the validation prototyping phase to select the most cost-effective alternative from among several candidate systems. After selection of the primary systems, Famece will proceed into full-scale development.

Senator YOUNG. $2.1 million is requested for the program entitled "Combat Engineer Equipment." Please describe this project and your planned program for fiscal year 1973.

Mr. JOHNSON. The objective of this project is to develop equipment for field use by combat engineers. The planned program for fiscal year 1973 includes funds for testing of the medium girder bridge developed by the United Kingdom for potential Army use, testing, and evaluation of commercial and foreign candidates for an improved bridge erection boat, and continued engineering development of medium- and heavy-duty airfield landing mats, prefabricated airfield membranes, and a distributor and materiel to control dust.

Chairman ELLENDER. For the project entitled "Bulk Materiel Handling Equipment," you are requesting $1.5 million. What are the objectives of this project?

General GRIBBLE. The objectives of this project are to develop economical, efficient, and reliable materials handling methods, techniques, and equipment to make possible the mechanized handling of Army supplies under all types of operating conditions, and thereby promote rapid deployment, mobility, and conservation of manpower.

Senator YOUNG. Why do you need the increase of $760,000 you are requesting?

General GRIBBLE. Prior to the Vietnam conflict, the majority of the cargo shipped by the Army was in break bulk. During the Vietnam era the increased use of trailer and van-size containers for moving unit equipment, prebined stocks, and resupply of materiel demonstrated that significant advantages could be realized through containerization. In addition, economic factors have compelled the civilian maritime industry to convert merchant ships from break bulk to a container fleet, and subsequent to 1972, forecasts show that the availability of break bulk dry cargo ships will be insufficient to meet DOD requirements for the movement of cargo. Since the Army must rely upon the civilian maritime industry to transport the bulk of the cargo, it is

imperative that the Army logistics system be compatible with those of the civilian maritime industry.

The Army has implemented the use of containers on a limited basis as a transportation envelope. Experience and studies of Vietnam revealed that containerization offers a possible area for reducing logistical cost and at the same time improve the responsiveness of the logistical system in both peace and wartime. However, military facilities, equipment, concepts, and doctrine are inadequate and incompatible with the newly developed commercial container system, and the Army's logistical capability for the 1972–82 time frame will be impaired unless the potential of the commercial industry is capitalized upon and adapted to the Army in the field.

The increased funds will enable the Army to carry out the requisite research, development, test and evaluation of commercial and/or modified commercial containers and container/cargo handling hardware.

Chairman ELLENDER. $2.9 million is requested for the project "Power Plants—Portable." Please comment on the objectives of this project.

Mr. JOHNSON. The objective of this project is to develop new portable electric power sources and components through application of technological advances in this field. It provides the Army with electric power generation equipment with increased reliability, improved maintainability, longer operating life, less pollution (air and noise), lower fuel consumption, and increased power density (ratio of output to fuel) characteristics than current power equipment.

Senator YOUNG. What will you do with the $1 million you are requesting for the project entitled "Military Construction and Supporting Development."

Mr. JOHNSON. The funds requested for this project are required to support the engineering development of military construction systems for both permanent facilities construction and troop construction in all potential theaters of operation. Based on studies and evaluations of techniques, materials, and methods conducted under exploratory development projects, engineering development will be conducted in the following task areas: The Army functional components system, advanced ABM facilities, military housing, advanced airfield and heliport systems, construction expedients, combat engineering methods and techniques, port harbor and near shore engineering, and construction effort analysis.

SURVEILLANCE, TARGET ACQUISITION, AND NIGHT OBSERVATION (STANO)

Chairman ELLENDER. $22 million is for the program entitled "Surveillance, Target Acquisition, and Night Observation," or STANO. Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

ENGINEERING DEVELOPMENT

Description.—The objective of this Program Element is to conduct the engineering development of surveillance, target acquisition and night observation devices. The program presently is concentrating on night vision devices, special purpose and aural detectors, unattended ground sensors, and surveillance and target acquisition radars to detect and locate personnel, vehicles, and weapons. The objective of the program is to provide the Army with a badly needed capability to locate and engage targets during all conditions of weather and visibility.

Work performed by.—In-house work is performed by the US Army Electronics Command, Ft Monmouth, New Jersey; Mobility Equipment Research & Development Center, Ft Belvoir, Virginia; and US Army Night Vision Laboratory, Ft Belvoir, Virginia. Major contractors are: ITT Gilfillan, Van Nuys, California; Farrand Optical Company, New York, New York; Electro-Optical System, Pasadena, California; International Telephone and Telegraph Federal Laboratories, San Fernando, California; Hughes Aircraft, Culver City, California. Anticipated bidders for radar production contracts include: General Dynamics, San Diego, California; RCA, Moorestown, New Jersey; ITT Gilfillan, Van Nuys, California; General Electric, Syracuse, New York; Sperry Rand, Great Neck, New York. There are approximately 15 additional contractors involved in this program element with about $2 million being spent on these smaller contracts.

PROGRAM ACCOMPLISHMENTS AND FUTURE PLANS

Fiscal Year 1972 program.—Engineering and Service Tests commence on second generation image intensification night vision devices. Two models of the Thermal Night Observation Device, Long Range are being procured for testing. The AN/PPS–15 development continued and contracting for engineering development models will be accomplished in FY 72. Delivery was made of the AN/TPS–58 radars to meet urgent Vietnam requirements. Production of engineering test models is continuing with approval of the Coordinated Test Program expected in FY 72. Engineering development was started on a task to improve the Army's present sound ranging system (GR–8). Development of a countermortar radar was begun in FY 72. A Coordinated Test Program was approved and contracting for engineering development models is expected in late FY 72. Contract for development of the Laser Designator Tracker System will be initiated in Fourth Quarter, FY 72.

Fiscal Year 1973 planned program.—Complete engineering and service tests of the second generation image intensification individual and crew served weapons sights. Complete engineering designs tests of the Thermal Night Observation Device, Long Range. Procurement of engineering design models of the Handheld Thermal Viewer, perimeter surveillance low light level set, and an improved general purpose searchlight. Fabrication of engineering models of the AN/PPS–15 with engineering and service tests to begin in late FY 73. Final assembly and delivery of the engineering test models of the AN/TPS–58. Fabrication of engineering development models of the Mobile Mortar Radar will begin in FY 73. Development of a radio data link to update the GR–8 Sound Ranging System will continue. Continue development work for the engineering development models of the Laser Target Designation System. Engineering development will be started on elements of the Remotely Monitored Battlefield Sensor System (REMBASS), an unattended ground sensor system.

Program to completion.—This is a continuing program.

Resources (In millions of dollars:)

R.D.T. & E. funds for fiscal year 1971 and prior, $17.9; fiscal year 1972, $13.3; fiscal year 1973, $22.2; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

General GRIBBLE. Yes, sir.

(The information follows:)

[In millions of dollars]

Projects	Fiscal year—		
	1971	1972	1973
1X664723DL59—Aerial-information-identification position devices	3.5	1.5	0
1S664723DL70—Night vision devices	4.0	4.0	5.1
1S664723DL71—Special-purpose detectors	.4	1.8	4.0
1S664723DL72—Radars	4.9	4.7	6.9
1S664723DL73—Unattended ground sensors	.09	0	6.3
1S664723DL76—Aural	.17	1.4	0
Total[1]	13.1	13.3	22.2

[1] May not add due to rounding

Senator YOUNG. Please comment on the need for the very large increase of $8.9 million you are requesting for fiscal year 1973.

Mr. JOHNSON. I would be glad to; $6.3 million of the increase is in the area of unattended ground sensors. Of this sum $4.7 million is for the remotely monitored battlefield surveillance system (Rembass) and the remaining $1.6 million is for physical security. The funds for Rembass starts engineering development by providing for the procurement of 12 small unit packages, a basic subsystem of Rembass. These systems will be used for engineering tests and expanded service tests. Physical security is a new start for the Army. Responsibility for this program was transferred to the Army incident to the disestablishment of defense special project group (DSPG). The funds provide for completing the R.D.T. & E. of the joint service intrusion detection system.

The remainder of the increase ($2.6 million) is spread over three projects: night vision observation devices, special purpose detectors, and radars. The increase in night vision is for accelerating the development of the long-range night observation device (NOD/LR). This device is the only long-range thermal imaging device of proven potential. Additional funds for the special purpose detector are for contract of engineering design models for the laser designator tracking system (LDTS). The increase in radars is for first year incremental funding of an engineering design model contract for the countermortar radar (AN/TPQ–36).

Chairman ELLENDER. Of the total requested for STANO, $5.1 million is for the project entitled "Night Vision Devices". Give us some specific examples of the items you are working on under this project, and tell us what you will do with the $5.1 million you are requesting for fiscal year 1973.

Mr. JOHNSON. Specific examples of image intensification items are the individual weapon sight (AN/PVS–4) and the crew served weapon sight (AN/TVS–5). An example of a thermal device is the handheld thermal viewer (AN/PAS–7). The $5.1 million will continue the engineering and service tests of the image intensification devices and permit initiation of engineering development of thermal night vision devices.

Senator YOUNG. $3.9 million is for the project entitled "Special Purpose Detectors". Give some examples of the equipment you are working on under this subelement and tell us why you need the increase of $2.2 million you are requesting.

Mr. JOHNSON. The equipments being worked on under the title "Special Purpose Detectors" are:

(*a*) A lightweight laser designator to be used by a mortar forward observer to designate stationary point targets out to a range of [deleted] meters and area targets out to a range of [deleted] meters. This piece of equipment weighs approximately 10 pounds.

(*b*) A laser locator designator to be used by an artillery forward observer to designate stationary point targets to [deleted] meters and area targets out to [deleted] meters. It will also have the capability of providing range information to the forward observer out to [deleted] meters.

(*c*) An airborne laser tracker to be installed in attack helicopters to provide steering information to the aircraft crew to guide the air-

craft to the target being designated by a laser. An increase of $2.2 million is needed in fiscal year 1973 in order to meet total contractual obligations.

Chairman ELLENDER. $6.9 million is for the project entitled "Radars." Give some specific examples of the types of radars you will be working on with these funds.

Mr. JOHNSON. Radar developments in this project area: a very short range lightweight ground surveillance radar, the AN/PPS–15, to detect and locate personnel and vehicular targets; a moving target locating radar, the AN/TPS–58, to detect, locate, and automatically track personnel and vehicular targets at medium ranges; and a mobile mortar locating radar to automatically locate hostile mortar and rocket launch sites.

Chairman ELLENDER. $6.3 million is for the project entitled "Unattended ground sensors"; $86,000 was provided for this project in fiscal year 1971, and no funds were provided in fiscal year 1972. Please comment on this project, and tell us why you are requesting such a large sum of money for fiscal year 1973 in view of past funding history.

General GRIBBLE. The objective of this project is to conduct engineering development for a ground-based battlefield surveillance system capable of remote operation anywhere by the Army in the field and in any level of conflict. The system is called the remotely monitored battlefield sensor system (Rembass). Remote sensors may be emplaced by hand, aircraft, and [deleted]. The Rembass may be configured for a variety of operations. [Deleted]. This system must be compatible with the tactical communications system of the Army. Equipment will be compatible with other military services to include common frequencies, modulation and sensor communication language. The elimination of funds in fiscal year 1972 for this project resulted from a delay in the initiation of Rembass advanced development efforts and a restructuring of funds required for the Rembass development program. The materiel need (engineering development) (MN(ED)) and the associated concept formulation package and an appropriate system development plan are scheduled to be available at the end of fiscal year 1972. The above documentation defines the remotely monitored battlefield sensor system (Rembass). Competitive procurement will then be initiated for [deleted] $1.6 million is programed to take over defense special projects group initiated joint interior physical security program in July 1972.

DEFENSIVE CHEMICAL-BIOLOGICAL MATERIEL

Chairman ELLENDER. $2.3 million is requested for the program entitled "Defensive chemical-biological materiel". Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

ENGINEERING DEVELOPMENT

Description.—The objective of this element is to develop rapid detection and warning systems, and protective materials and equipment to warn of the presence of and to protect against chemical or biological attack. This element covers engineering development and type classification of defensive systems and equipment to protect individuals from chemical and biological agents. This requires

protection of the respiratory system and all body surfaces; manual and automatic detection and warning devices that respond to toxic agents on all surfaces, in the atmosphere, and in food and water; and means to decontaminate skin, clothing, equipment, terrain, food, and water. Collective protection shelters for certain headquarters and communications functions, for rest and relief, and for certain vehicle crews are required to relieve the stresses and restrictions inherent in individual protective equipment.

Work performed by.—U.S. Army Edgewood Arsenal, Md. Major contractors are: Bendix Corp., Towson, Md.; American Air Filter Co., Inc., St. Louis, Mo.; Donaldson Co., Inc., Minneapolis, Minn.

Fiscal year 1972 program.—The following major items are now in Engineering Development or will enter in FY 1972: The modular collective protective equipment for a tracked vehicle command post, the modular collective protection system, M8 vehicular-mounted alarm, and multipurpose detector kits.

Fiscal year 1973 planned program.—The modular collective protection system will continue in Engineering Development. The multipurpose detector kits will continue in ED.

Program to completion.—The modular collective protection system will reach type classification in FY 1975. Multipurpose chemical agent detector kits, the multipurpose mask, automatic liquid agent detector, area scanning alarm, and incapacitating agent alarm remain to be completed.

Resources (in millions of dollars):

R.D.T. & E. funds for fiscal year 1971 and prior, $2.6; fiscal year 1972, $1.7; fiscal year 1973, $2.3; additional funds to completion are continuing; total estimated cost is not available.

Chairman ELLENDER. I note that three projects are funded under this program element for fiscal year 1973. Please comment briefly on each of them. Comment especially on the project entitled "Chemical Detection and Sampling Development" which appears to be a new effort.

Mr. JOHNSON. Yes, sir. Project D018, Collective Protection for Vehicles, Vans, and Missile Complexes, provides for the development of a modular collective protection systems, adaptable to the improved Hawk, the TSQ73, and Tacfire, as well as other vehicles and vans. Project D020, Chemical Detection and Warning Systems, is to adapt the M8 chemical alarm for use on combat vehicles. Project D022, Chemical Detection and Sampling Development, is a fiscal year 1973 new start on the multipurpose chemical agent detection kit which will replace four items in the current inventory.

CHEMICAL COMBAT SUPPORT

Chairman ELLENDER. $430,000 is for the program entitled "Chemical Combat Support." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

ENGINEERING DEVELOPMENT

Description.—This program consists of five projects which provide for the development of new and more effective riot control agents (RCA) and munitions for both tactical use and for controlling civil disturbances; the development of man-portable and mechanized flame weapon systems; and for personnel detection, marking, identification and tracking systems.

Work performed by.—U.S. Army Edgewood Arsenal, Edgewood, Md.; Honeywell, Inc., Minneapolis, Minn.; Aerojet Ordnance and Manufacturing Co., Downey, Calif.; American Aluminum Co., Mountainside, N.J.

Fiscal year 1972 program.—[Deleted].

Fiscal year 1973 planned program: [deleted].

Program to completion.—This is a continuing program with an objective of providing rapid acting and non-hazardous riot control munitions as well as effective and accurate systems; improved flame weapons and equipment; and improved marking and detection systems. As new riot control agents and flame fuels are introduced, appropriate delivery systems will be developed.

Resources (in Millions of dollars:)

R.D.T. & E. funds for fiscal year 1963 through fiscal year 1971, $7.1; fiscal year 1972, $0.9; fiscal year 1973, $0.4; additional funds to completion are continuing; and the total estimated cost is not available.

Senator YOUNG. Are you requesting funds for any new projects in fiscal year 1973?

Mr. JOHNSON. No, sir.

Chairman ELLENDER. Please comment briefly on each of the projects to be funded under this program element.

Mr. JOHNSON. This program supports two projects in fiscal year 1973. Project DF96, Tactical Riot Control Agent Munitions, supports engineering development of new and more effective air and ground employed tactical munitions for dissemination of riot control agent CS. The objective of project D638, Civil Disturbance Control Systems, is to develop new and more effective riot control agent devices and dissemination systems for controlling riots and civil disorders.

Senator YOUNG. Are the riot control aspects of this program mostly for the use of the National Guard?

Mr. JOHNSON. No, sir. The systems developed for civil disturbance are for use by all components of the Army who might become involved in the control of riots or civil disturbances. Although primary support is for Active Army forces, it does include the National Guard and the Reserve forces as well.

COMMAND AND CONTROL

Chairman ELLENDER. $3.3 million is for the program entitled "Command and Control." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

ENGINEERING DEVELOPMENT

Description.—There are two projects in the Command and Control Program Element. These projects are for engineering development efforts common to tactical command and control and tactical automatic data processing. The Air Defense Control and Coordination System Project is to develop and test an air defense control and coordination system, the AN/TSQ–73, which will employ to the maximum proven electronic microminiaturized TACFIRE components. It will be used by field army air defense commanders to control and coordinate the fires of NIKE HERCULES and HAWK Surface-to-Air Missiles, for protection of friendly aircraft, for dissemination of long range radar data to fire units and for transmittal of air battle data to the joint level control facility. The system will replace the [deleted] AN/MSG–4. The obsolescent AN/MSG–4 [deleted] is expensive to operate and maintain, and is not compatible with other Services' new command and control systems. The NIKE HERCULES and HAWK command and control capability overseas is [deleted] in the automatic transfer of data from weapon control centers to the firing batteries by the AN/MSG–4. The AN/TSQ–73 will provide reduced maintenance costs, the [deleted] will be greatly increased and this system will be compatible with the new command and control systems of other services. The Identification, Friend or Foe (IFF) Equipment Project is to perform engineering development of equipment to obtain rapid and positive identification of elements which have been detected on the battlefield. The current main effort is the [deleted]. This program element also covers the

engineering development of equipment for the Battlefield Identification System (BIS) which will provide identification of ground elements on the battlefield.

Work performed by.—U.S. Army Electronics Command, Fort Monmouth, New Jersey directs this work and directs the Air Defense Control and Coordination System through its Project Manager for Army Tactical Data Systems. The contractors are Data Systems Division, Litton Industries, Van Nuys, California (AN/TSQ–73) and Hazeltine Corporation, Little Neck, New York (AN/TPX–46). Contractor for AN/APM–305 and AN/TPM–25 will be Teledyne Electronics, Newbury, California.

Fiscal year 1972 program.—Engineering development continues with delivery of the first AN/TSQ–73 prototype in [deleted] Research and Development acceptance tests on the first prototype begin [deleted] Complete service testing of The Ground Interrogator AN/TPX–50 with the Forward Area Alerting Radar and type classify Standard A. Begin Initial Production Testing of the Ground Interrogator AN/TPX–46. Begin engineering development of the AN/APM–305 Transponder Test Set and the AN/TPM–25 Interrogator Test Set.

Fiscal year 1973 planned program.—The second AN/TSQ–73 prototype will be delivered [deleted] and Research and Development acceptance tests will be completed [deleted] Engineering Tests/Expanded Service Tests will begin [deleted] Engineering development of a ground interrogator for use with [deleted] will begin. Development and testing of the AN/APM–305 and AN/TPM–25 will continue.

Program to completion.—Engineering Tests/Expanded Service Tests for the AN/TSQ–73 are scheduled to be completed [deleted]. The target date for the Initial Operating Capability (IOC) of the AN/TSQ–73 is [deleted]. This is a continuing program.

Resources (in millions of dollars:)

R.D.T. & E. funds for fiscal year 1963 through fiscal year 1971, $15.2; fiscal year 1972, $3.5; fiscal year 1973, $3.3; additional funds to completion, are continuing; total estimated cost is not available.

Chairman Ellender. Please comment briefly on the two projects funded under this program element for fiscal year 1973.

General Gribble. The two projects in the command and control program element are for engineering development efforts common to tactical command and control and tactical automatic data processing. The air defense control and coordination system project is to develop and test an air defense control and coordination system, the AN/TSQ–73, which will employ to the maximum proven electronic microminiaturized Tacfire components. It will be used by field army air defense commanders to control and coordinate the fires of Nike Hercules and Hawk surface-to-air missiles, for protection of friendly aircraft, for dissemination of long range radar data to fire units, and for transmittal of air battle data to the joint level control facility. The system will replace the [deleted] AN/MSG–4. The obsolescent AN/MSG–4 has [deleted] is expensive to operate and maintain, and is not compatible with other services' new command and control systems. The Nike Hercules and Hawk command and control capability overseas is [deleted] in the automatic transfer of data from weapon control centers to the firing batteries by the AN/MSG–4. The AN/TSQ–73 will provide reduced maintenance costs, the [deleted] will be greatly increased and this system will be compatible with the new command and control systems of other services. The identification, friend or foe (IFF) equipment project is to perform engineering development of equipment to obtain rapid and positive identification of elements which have been detected on the battlefield. The current main effort is the [deleted]. This program element also covers the engineering development of equipment for the battlefield identification system (BIS) which will provide identification of ground elements on the battlefield.

Senator YOUNG. What is the relationship between this program element and the one entitled "Command and control" which we discussed a short time ago?

Mr. JOHNSON. This program element contains those command and control projects that are in engineering development. The other program element contains those command and control projects that are in advanced development.

COMMUNICATION—ELECTRONIC TESTING ACTIVITIES

Chairman ELLENDER. $10.7 million is for the program entitled "Communication—electronic testing activities". Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

MANAGEMENT AND SUPPORT

Description.—The objective of this program is to provide for electromagnetic environmental compatibility (EMC) and engineering test (ET) of Army communications and electronic (C–E) equipment and concepts and for service test (ST) and Initial Production Test (IPT) of Army Security Agency (ASA) and non-division C–E equipment. There are five projects in this program element:

1. Joint Advanced Tactical Command and Control Communications. This project supports two joint interoperability programs: Tactical Air Control Systems/Tactical Air Defense Systems (TACS/TADS) and Ground and Amphibious Military Operations (GAMO). The Chief of Naval Operations is the Executive Agent for TACS/TADS and Chief of Staff, U.S. Army for the GAMO program. (Project 1S664712D321)

2. Communications-Electronic Equipment Testing. Provides funds for ET and IPT of C–E equipment and also for ST of non-division C–E equipment. (Project 1U665701D326)

3. Communications and Electronic Intelligence Equipment. Evaluates and tests C–E equipment assigned to signal units, communications-electronic intelligence equipment for support of the DA counter-intelligence mission. (Project 1S665701D571)

4. U.S. Army Electronic Proving Ground (USAEPG) Field Test Facility. Provides funds for operation of the USAEPG and Army's electromagnetic compatibility analysis and EMC testing program. (Project 1U665701D615)

5. ASA Testing Activities. Provides funds for all testing (except electromagnetic compatibility) of all C–E equipment operated by ASA. (Project 5A665701 D918)

Title Communication Electronic Testing Activities

Work performed by.—The program is executed by the Test Directorate, U.S. Army Electronic Proving Ground, Fort Huachuca, Arizona, Bell Aerospace, Tucson, Arizona, and Lockheed Electronics Company, Plainfield, New Jersey. Lockheed has established a Tucson, Arizona field office for this operation. The Joint Advanced Tactical Command and Control Communications is conducted by the U.S. Army Electronics Command, Fort Monmouth, New Jersey, through its Project Manager for Army Tactical Data Systems. The only contract presently let for TACS/TADS is with Data Systems Division, Litton Industries, Van Nuys, California. ASA Test Facility at Fort Huachuca, Arizona, conducts the work under project 5A665701D918.

Additional contractors involved in communications electronic testing include: Bunker-Ramo, Westlake Village, California; Resalab, Dallas, Texas; Watkins Johnson, Palo Alto, California; R. F. Communications Incorporated, Rochester, New York; Hughes Aircraft Incorporated, Tucson, Arizona; University of Arizona, Tucson, Arizona; Institute of Telecommunications Sciences, Boulder, Colorado; National Bureau of Standards, Boulder, Colorado.

PROGRAM ACCOMPLISHMENTS AND FUTURE PLANS

Fiscal Year 1972 program.—Feasibility testing is being conducted on [deleted] will be initiated. Fiscal year 1972 funds will be used to test: the AB–864 MAST; AN/TRC–112/121 (Secure Mode) 00–1D MOHAWK Phase I and II; AN/GSA–124 Converter Group; PP–6224 Power Supply, and BA–527 and 536 batteries. Testing will continue on projects carried over from fiscal year 1971.

Fiscal year 1973 planned program.—Continue testing of various electronic equipment as required. Representative items include the [deleted]. Additional capabilities for the range facilities will be developed as funds permit. New C–E equipment evaluated as it becomes available. The Army TACS/TADS test site (Fort McArthur, California) will be prepared, the TACS/TADS test team will be activated. One TSQ–73 will be refurbished to participate in the joint test.

Program to completion.—This is a continuing program to support research and development of C–E equipment. As new equipment, equipment design or concepts of deployment becomes available, the facility to evaluate its impact on other C–E equipment in the same operational environment must be available. TACS/TADS testing is scheduled for [deleted] with operational effectiveness test to be conducted in [deleted] GAMO testing is scheduled for [deleted].

RESOURCES

[Dollars in millions]

	Fiscal year—			Additional to completion	Total estimated cost
	1971	1972	1973		
R.D.T. & E.:					
Funds	$9.7	$11.8	$10.7	Continuing	Not available.
Man-years	627	587	559	Not available	Do.

Chairman ELLENDER. Please provide a tabulation for the record listing the project to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

Mr. JOHNSON. I will be glad to.

(The information follows:)

[In thousands of dollars]

Projects	Fiscal year—		
	1971	1972	1973
1S665701D321—Joint advanced tactical command-control and communications programs	[Deleted].		
1U665701D326—Communications-electronic equipment			
1S665701D571—Communications-electronic intelligence equipment testing			
1U665701D615—U.S. Army electronic proving ground field test facility			
5A665701D918—Army Security Agency testing activities			
Total			

Senator YOUNG. Comment on your planned program for fiscal year 1973.

General GRIBBLE. Mr. Chairman, in the fiscal year 1973 planned program we will continue testing of various electronic equipment as required. Representative items include the AN/ALQ–80, 67, AN/APR–39, AN/TLQ–15, Cefirm Leader, and Quick Fix. Additional capabilities for the range facilities will be developed as funds permit. New C–E equipment will be evaluated as it becomes available. The Army TACS/TADS test site (Fort McArthur, Calif.) will be prepared and the TACS/TADS test team will be activated. One TSQ–73 will be refurbished to participate in the joint test.

COMMUNICATION ELECTRONICS EQUIPMENT

Chairman ELLENDER. Of the total requested for communication—electronic testing activities, $3.4 million is for the project entitled "Communications electronics equipment." Describe this project briefly and comment on your planned program for fiscal year 1973.

Mr. JOHNSON. This program, communications electronic equipment testing, conducts tests and evaluations of communications and electronic equipment and systems to determine engineering adequacy, tactical performance, safety characteristics and to determine to what degree the equipment/systems and associated tools/tests equipment perform assigned missions. These evaluations also include determination of the suitability of the maintenance packages. In fiscal year 1973 major tests include the following: AN/PPS–15, ground surveillance radar; a portable automatic weather observation station; the AN/ARC–135 radio; the AN/ALQ–67 antiaircraft artillery fuse jammer; AN/PRC–70 radio set; AN/GRA–73 radio terminal; AN/UPR–1 radiac monitor and the AN/TSQ–83 communications control system.

Chairman ELLENDER. This project would seem to be continuing at roughly the same level as in fiscal year 1972. Am I correct about this?

Mr. JOHNSON. Communication and electronic equipment testing is a level of effort and remains at approximately the same level in fiscal year 1973 as it was in fiscal year 1972.

ELECTRONIC PROVING GROUND FIELD TEST FACILITY

Senator YOUNG. $3.5 million is for the management and support of the U.S. Army Electronic Proving Ground field test facility. Where is this facility located?

Mr. JOHNSON. The U.S. Army Electronic Proving Ground field test facility is located at Fort Huachuca, Ariz., with the contractor (Lockheed Electronics Co.) facility associated with the test facility being located in Tucson, Ariz.

Chairman ELLENDER. What agencies use this test facility other than the Army?

Mr. JOHNSON. Agencies using the U.S. Army Electronic Proving Ground other than the Army include the Air Force, Navy, National Aeronautics and Space Administration, and the U.S. Department of Transportation.

Senator YOUNG. Do these agencies reimburse the Army for use of the facility?

Mr. JOHNSON. Use of the U.S. Army Electronic Proving Ground by agencies other than the Army is done on a reimbursable basis. Fiscal year 1973 estimates for reimbursements is $330,000.

Chairman ELLENDER. How many civilian employees work at this facility, and how much of the $3.5 million requested is for their compensation and benefits?

Mr. JOHNSON. A total of 54 civilian employees work at the U.S. Army Electronic Proving Ground Field Test Facility, program element 6.57.01A D615. $1.013 million of the $3.5 million in this project is for civilian employees compensation and benefits.

Senator YOUNG. How many military personnel are assigned to the facility?

Mr. JOHNSON. A total of 39 military personnel work at the U.S. Army Electronic Proving Ground Field Test Facility.

Chairman ELLENDER. Comment on some of the major systems tested here.

Mr. JOHNSON. Major systems to be tested at the U.S. Army Electronic Proving Ground Field Test Facility in fiscal year 1973, include the electromagnetic compatibility of the following systems: Tactical fire direction system; tactical satellite communications system; and the SAM–D, Lance, and Dragon missile system. These tests are to determine the system operability in the sophisticated electromagnetic environment into which they will be employed.

ARMY SECURITY AGENCY TESTING FACILITIES

Chairman ELLENDER. $2.7 million is for the Army Security Agency testing facilities. Tell us where these facilities are located and comment on their use.

Mr. JOHNSON. This facility, the U.S. Army Security Agency Test Center, is located at Fort Huachuca, Ariz. The U.S. Army Security Agency has a special mission in the Army. The U.S. Army Security Agency Test Center is a relatively small facility which performs testing only on that unique, sensitive electronic warfare and cryptologic intelligence systems and equipment designed exclusively for use by the U.S. Army Security Agency and cryptologic services in support of national and Department of the Army programs. The facility has the capability to perform about 20 major tests annually that require specialized knowledge, instrumentation, and use of specialized U.S. Army Security Agency equipment. Most testing performed is special purpose wherein development and concept matters are considered concurrently. This is made necessary by the continuing requirement for quick reaction to new and ever changing electronic threats.

Senator YOUNG. What kind of equipment is tested at these facilities that cannot be tested at the Electronic Proving Ground field test facility?

Mr. JOHNSON. Due to the U.S. Army Security Agency's (USASA) special mission in the Army, there is a requirement for unique, sensitive, electronic warfare and cryptologic intelligence systems and equipment to accomplish this mission. The USASA is constantly aware of the new threats emerging from intelligence collection and must utilize the latest research discoveries to meet that threat. Testing USASA-developed equipment requires especially trained USASA personnel who must have special clearances and who must be familiar with USASA operations, concepts, doctrines, and systems as well as be available for participation in on-site tests in overseas locations. Much of the test instrumentation, although not individually classified, must be configured from test to test in an environment which is unique to USASA and requires knowledge of special intelligence information to properly establish test design and to operate a realistic test environment. Because of the special USASA mission, much of the testing is compressed on a quick reaction basis. There is no duplication of resources and facilities between the USASA Test Center and the U.S. Amy Electronic Proving Ground (USAEPG). The USASA Test Center shares the USAEPG facilities wherever possible and procures only unique instrumentation which is not available through other

sources. Conversely, the USASA Test Center provides some resources and test assistance to the USAEPG and performs special tests for other agencies and services.

TESTING COMBAT EQUIPMENT

Chairman ELLENDER. $57.2 million is requested for the management and support program entitled "Testing combat equipment." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

MANAGEMENT AND SUPPORT

Descriptions.—The object of this program is to conduct tests to confirm the acceptability of developmental systems or items to fulfill their intended military purpose. Tests conducted are Engineering Tests and Expanded Service Tests. These tests are the final tests of research and development prototypes prior to entering production. Environmental tests in the tropics and arctic are conducted during this phase. Three projects within the program element directly support the above testing. These are: Tests Boards; Instrumentation, Test and Evaluation Command; and Methodology, Test and Evaluation Command. Other testing related projects are also financed by this program element. Three of these projects, described in the following descriptive summaries, are as follows: Meteorological Support to R&D Activities, Joint Munitions Effectiveness Testing, and support of Operational Test and Evaluation (OTE) of Combat Equipment. Four other, smaller projects also supported are as follows: Simulation Testing of Vehicles, the Army Aviation Systems Test Activity, Evaluation of Foreign Materiel, and Development of an Automated Calibration System.

Resources (In millions of dollars):

R.D.T. & E. funds for fiscal year 1971, $42.7; fiscal year 1972, $52.8[1]; fiscal year 1973, $57.2; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

General GRIBBLE. Yes, sir.

(The information follows:)

[In millions of dollars]

Projects	Fiscal year— 1971	1972	1973
1G665702D063—Vehicle engineering audit		1.000	1.000
1F665702D066—Aviation system testing activity		2.613	5.110
1T665702D127—Meteorological support to R.D.T. & E. activities	4.000	4.000	4.000
1Y665702D537—Project MEXPO	.700		
1U665702D618—Test boards	19.336	19.350	18.640
1T665702D620—Munitions effectiveness testing	5.000	5.000	5.000
1U665702D623—Instrumentation test and evaluation command	5.622	[1] 11.300	5.800
1U665702D625—Test methodology, test and evaluation command	6.237	7.722	5.930
1Y665702D650—Evaluation of foreign materiel	1.670	1.635	1.550
1T665702D651—Automated calibration system	.100	.210	.210
6A665702D986—Support of OTE of combat equipment			10.000
Total	42.665	52.830	57.240

[1] Includes supplemental of $4,000,000.

[1] Includes supplemental of $4,000,000.

Senator YOUNG. Are you requesting funds for any projects not previously funded?

General GRIBBLE. Yes. Project D986, Support of Operational Test and Evaluation (OTE) of Combat Equipment, was established as a separate project in fiscal year 1973 in order to purchase relocatable instrumentation to provide an expanded capability to conduct OTE of air defense, air defense suppression, attack helicopter, antitank missile, and electronic warfare systems.

Chairman ELLENDER. $5.1 million is for the project entitled "Aviation Systems Test Activity." Comment on the objectives of this project, and tell us why you need the very large increase of $2.5 million you are requesting.

General GRIBBLE. The primary objective of the aviation systems test activity is to accomplish engineer design tests, engineer flight tests, contractor compliance tests, and airworthiness and performance tests on all Army aircraft and components being considered by the Army for a specific Army aviation application. This test activity also monitors contractor flight testing and publishes test results in order to determine contractor performance, suitability, and acceptance or rejection of test items. The increase in funding between fiscal year 1972 and fiscal year 1973 is primarily attributable to costs associated with the evaluation of prototype advanced aerial fire support systems (AAFSS).

Senator YOUNG. Where are these tests performed?

General GRIBBLE. The U.S. Army aviation systems test activity is located at Edwards Air Force Base, Calif. Most of the testing is performed at or near the Edwards Air Force Base facility.

Chairman ELLENDER. $4 million is for the project entitled "Meteorological Support to Research, Development, Test, and Evaluation Activities." Comment on the objectives of this project.

Mr. JOHNSON. The objectives of this project are to provide meteorological support to Army R.D.T. & E. activities; provide specialized meteorological support to users of White Sands Missile Range; and the operation of three sites in the cooperative meteorological rocket network. This network consists of 14 stations (operated by U.S. Air Force, U.S. Army, U.S. Navy, Atomic Energy Commission, National Aeronautics and Space Administration, and Canada) to make measurements of wind, pressure, density, temperature, and ozone in the upper atmosphere from 30 to 100 kilometers aloft. Data are used for: (1) The design, test, and operation of aerospace vehicles, including their ground support systems, such as radar, (2) scientific studies relating to both the meteorology and aeronomy of the atmosphere, and (3) moitoring the state of the upper atmosphere for identification of pollution and possible changes in global weather and climate. The support to Army activities is provided by meteorological teams at 11 Army installations. These teams are composed entirely of military personnel. The support to White Sands Missile Range consists of user-oriented meteorological services, including impact prediction and ballistic support specified in national range documents. The three sites of the cooperative meteorological rocket network are operated by the meteorological teams in the Canal Zone and Alaska, and the personnel at White Sands Missile Range.

Chairman ELLENDER. $18.6 million is for the management and support of the various Army Test Boards. Would you provide for the record a listing of these boards, their locations, their primary responsibilities, and the amount requested for each for fiscal year 1973?

General GRIBBLE. Yes, sir; I will be glad to.

(The information follows:)

US Army Air Defense Board, Fort Bliss, Texas ($2,690,000) participates in planning and conducts tests of all Army Air Defense equipment and tests equipment against countermeasures.

US Army Armor and Engineer Board, Fort Knox, Kentucky ($2,185,000) participates in planning and conducts tests of all Armor and Engineer equipment and ground vehicles that have a combat application.

US Army Airborne and Communications-Electronics Board, Fort Bragg, North Carolina ($1,082,000) participates in planning and conducts tests of airborne, electronic and special warfare equipment.

US Army Infantry Board, Fort Benning, Georgia ($1,130,000) participates in planning and conducts tests of Infantry equipment for use in Army units.

US Army Field Artillery Board, Fort Sill, Oklahoma ($1,035,000) participates in planning and conducts tests of Army Field Artillery and associated equipment.

US Army Tropic Test Center, Fort Clayton, Canal Zone ($1,892,000) conducts tropic environmental tests on all materiel expected to be used in the tropic environments.

US Army Arctic Test Center, Fort Greely, Alaska ($2,511,000) conducts arctic environmental tests of all materiel expected to be used in the arctic environments.

US Army Aviation Test Board, Fort Rucker, Alabama ($6,115,000) participates in planning and conducts tests of aircraft and other aviation materiel.

Senator YOUNG. $5 million is for the project entitled "Munitions Effectiveness Testing." Please comment on the objectives of this project and tell us what you will do with the funds you are requesting.

Mr. JOHNSON. The objectives of this triservice project are: The definition of and recommendation for corrective action to the services of problem areas and/or knowledge gaps related to munitions and weapons effeectiveness; the provision of a focal point for joint-service efforts to improve the data base and analytical methodology used in the determination and prediction of nonnuclear munitions and weapons effectiveness in a real-world environment; and the development, publishing, and updating of joint munitions effectiveness manuals on a continuing basis. These manuals provide to the services a uniform basis for munitions and weapons employment and use, the determination of munitions and weapons requirements, and the evaluation of new munitions and weapon concepts. In fiscal year 1973, efforts will continue on publishing and updating air-to-surface and surface-to-surface manuals; development of methodologies for air-defense systems and aircraft attrition; assessments of combat materiel system vulnerability; and combat, damage data collection, collation, storage, analysis, and dissemination.

Chairman ELLENDER. $5.8 million is for the management and support of the Instrumentation, Test and Evaluation Command. Describe exactly what these funds support and tell us what you will do with the $5.8 million you are requesting for fiscal year 1973.

General GRIBBLE. This project funds for the development and acquisition of up-to-date test instrumentation for the U.S. Army Test and Evaluation Command's range and test facilities. The funding budgeted for fiscal year 1973 will provide for improvements needed to keep pace with new and sophisticated weapon systems being tested. Major improvements are planned in measuring electronic countermeasures vul-

nerability, improved target scoring systems, and improved centralized data control and automation.

Chairman ELLENDER. $5.9 million is for the support of the "Test Methodology, Test and Evaluation Command." Describe what these funds will be used for.

General GRIBBLE. The objective of this project is to improve test methodology and methods of handling test data in support of an overall program to improve reliability and timeliness of test results. The increasing complexity of equipment, the high cost of prototype models and the desire to shorten leadtime all combine to require that more information be obtained from tests in a shorter period of time. This can be accomplished by improvements in methodology, instrumentation, and automatic processing of associated data. Fiscal year 1973 funds will be used to substantially improve materiel test procedures and provide for an increased automatic data processing capability.

Chairman ELLENDER. $10 million is for the new effort entitled "Support of Operational Test and Evaluation of Combat Equipment." What are the objectives of this project?

General GRIBBLE. The objectives of the newly established project, "Support of operational test and evaluation of combat equipment" are:

(1) Conduct studies and analysis to improve test methodology for realistic operational testing.

(2) Develop and procure items to create a more realistic operational environment to include simulators to be utilized in lieu of actual hardware/systems.

(3) Develop, design, purchase, and install specialized equipment, instrumentation, and data collection/processing systems which are required to support OTE.

Senator YOUNG. What will you do with the $10 million you are requesting for fiscal year 1973?

General GRIBBLE. The $10 million will be utilized for the procurement of test instrumentation to be used in operational test and evaluation (OTE). This equipment will assist in the precise location and control of maneuver elements that comprise the simulated combat environments necessary for OTE. Increased instrumentation capabilities are needed for the OTE of air defense, air defense suppression, attack helicopter, antitank missile, and electronic warfare systems testing. The relocatability of this equipment will increase the number of areas at which OTE can be conducted.

DESERET TEST CENTER

Chairman ELLENDER. $9.6 million is requested for the management and support of the Deseret Test Center. Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

TESTING

Description.—The Deseret Test Center (DTC) test program consists of two major efforts. The Joint Operational Chemical Warfare and Biological Defense Test Program is developed in response to requirements from the unified and specified commands and the Services. The Services Development Test Program is developed to satisfy service requirements for testing CW agents, hardware proto-

types or systems in any phase of R&D and the testing and challenge of chemical and biological defense items in R&D. The DTC testing provides technical data on meteorological, ecological and other environmental effects on the systems and items tested. In addition, operational and logistical data essential to development of operational planning factors, doctrinal and use concepts for chemical warfare and chemical-biological defensive systems are provided to the user. The testing also provides data for service evaluation and acceptance of the developmental items.

Work performed by.—Desert Test Center, Fort Douglas, Utah and its subordinate Class II installation, Dugway Proving Ground, Utah.

FY 1972 Program.—The FY 1972 test program consisted primarily of carryover efforts from the FY 1971 program and included [deleted] Field Safety and Technology Studies initiated in FY 1970 were continued. No open-air tests of lethal chemical agents were conducted.

Fiscal year 1973 planned program.—The FY 1973 program continues to place emphasis on small-scale non-toxic field tests, analytical studies and laboratory testing in lieu of open-air toxic agent testing. The planned FY 1973 program contains [deleted]. No lethal open-air tests are planned for FY 1973.

Program to completion.—This is a continuing program.

Resources. (In million of dollars) :

R.D.T. & E. funds for fiscal year 1971, $11.7 ; fiscal year 1972, $10.9 ; fiscal year 1973, $9.6 ; additional funds to completion are continuing ; and the total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded under this program, the amounts for each fiscal years 1971 and 1972, and the request for fiscal year 1973.

Mr. JOHNSON. Yes, sir.

(The information follows:)

[In millions of dollars]

Projects	Fiscal year—		
	1971	1972	1973
1X665704DL01—Incapacitating chemical agent/materiel testing	0.031	0.033	0.020
1X665704DL02—Lethal chemical agent/materiel testing	3.493	2.710	2.250
1X665704DL03—Chemical defense materiel testing	1.057	.750	.500
1X665704DL06—Biological defense materiel testing	.110	.050	.080
1X665704DL09—Riot control agent/materiel testing	.931	1.100	.500
1X665704DL10—Other combat support materiel testing	.056	.140	.040
1X665704DL11—Simulant agent/materiel testing	2.274	2.140	2.310
1X665704DL12—Range safety and research and development	3.295	3.550	3.590
1X665704DL13—Range instrumentation	.418	.463	.300
Totals	11.665	10.936	9.590

Chairman ELLENDER. Is the Deseret Test Center the only facility to be supported with these funds?

Mr. JOHNSON. Yes.

Senator YOUNG. Comment generally on the kinds of testing carried out at this center.

Mr. JOHNSON. Deseret Test Center conducts chemical warfare and chemical-biological defense testing for the Department of Defense. This includes testing in support of the Army's chemical warfare/CB defense research and development program; developmental testing for the Air Force, Navy, and Marine Corps upon request; and testing necessary to answer operational chemical warfare/CB defense requirements of the commanders of the unified and specified command.

Chairman ELLENDER. Of the total requested for the Deseret Test Center, $3.6 million is for a project entitled "Range Safety and Research and Development." Please comment on this project and describe its objectives.

Mr. JOHNSON. The major objectives of this project are to establish impeccable safety criteria for selection of operational test sites and for field operations; to provide data in support of safety objectives pertinent to the mission objectives; to evaluate, develop, and improve meteorological technology, laboratory techniques, and test methods for chemical and biological simulants and tracers, and chemical warfare agents and munitions to insure safe and valid field evaluations of these materials. All of these objectives are in support of other projects in this program element and respond to recommendations of the Secretary of the Army's Ad Hoc Committee for Review of Testing Safety at Dugway Proving Ground.

MODERN ARMY SELECTED SYSTEMS, TEST, EVALUATION, AND REVIEW (MASSTER)

Chairman ELLENDER. $4 million is for the program entitled "Modern Army Selected Systems, Test, Evaluation, and Review." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

MANAGEMENT AND SUPPORT

Description.—Project Modern Army Selected Systems, Test, Evaluation, and Review (MASSTER) is the testing organization that will provide for field testing and evaluation of materiel developments. This effort provides a new dimension in the Army's ability to determine the impact a materiel item or system has on tactics, organizations, logistical support systems, and training programs. Three types of tests are conducted: Materiel Field Tests, Materiel Systems Field Tests, and Systems Field Tests. This testing does not duplicate existing tests. Primary initial effort was directed to Surveillance, Target Acquisition, and Night Observation (STANO) programs. Emphasis is shifting to give primary emphasis to the elements of the Army's Integrated Battlefield Control System (IBCS). Systems integration and engineering efforts will be augmented by test assessments, studies, and modeling to provide maximum utility of test results.

Work performed by.—Project MASSTER (CG III Corps, Fort Hood, Tex.).

Fiscal year 1972 programs.—Testing of new systems proposed for entry into the STANO inventory is accomplished. The two major systems tests conducted are: Mechanized Battalion in a Mid-Intensity Conflict and follow-up test of Battalion/Brigade in a Low Intensity Conflict. Testing includes elements of the Integrated Battlefield Control System (IBCS). Supporting studies and analyses will continue.

Fiscal year 1973 planned program.—The 1973 program will include testing new developmental prototypes. Testing will include elements of the Mid-Intensity and Integrated Battlefield Control System (IBCS) tests. Supporting studies and analyses will be continued.

Program to completion.—This is a continuing program.

Resources (In millions of dollars):

R.D.T. & E. funds for fiscal year 1971, $5.4; fiscal year 1972, $5.6; fiscal year 1973, $4.0; additional to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

General GRIBBLE. Yes, sir.

(The information follows:)

[In millions of dollars]

Projects	Fiscal year— 1971	1972	1973
RX665705DY01—Modern Army selected systems, test, evaluation, and review (MASSTER)	3.5	4.0	3.0
1U665705D575—Modern Army selected systems, test, evaluation, and review/Army Materiel Command support activities	0	.05	.05
6A665705M984—Modern Army selected systems, test, evaluation, and review support	1.9	1.5	.95
Total[1]	5.4	5.5	4.0

[1] May not add due to rounding.

Chairman ELLENDER. I note in the descriptive summary that three types of tests are carried out under this program element. Would you describe these types of tests and give us some examples of materiel tested under each type?

General GRIBBLE. Yes, sir. The materiel field test is conducted to evaluate basic capabilities and military potential. This type of test is proposed by a materiel developer or the Department of the Army staff, and is intended to provide additional guidance to the developer as a basis for development, deployment or production decisions. This type is normally R.D.T. & E. funded. Examples of materiel test are the: helicopter multifunction system, track while scan radar, and the AN/PPS-5 radar improvement kit.

The systems field test has as its basic purpose the evaluation of organizations and unit effectiveness. The impact of new materiel items, new organizations and new concepts are evaluated simultaneously to determine optimum solutions for specific units. Systems tests are normally proposed by the U.S. Army Combat Developments Command and are funded primarily by OMA. Examples of this type of testing are the electronic concepts and organization evaluation and the intelligence concepts test.

The materiel systems field test has both materiel and systems objectives and may be funded from both programs. In rare cases, developmental items may be evaluated concurrently in a systems test and that portion of the test is then funded by R.D.T. & E. An example of this was the test of the foliage penetration radar, and the evaluation of the utility of daylight television mounted in rotary wing aircraft.

Senator YOUNG. Of the total for this program, $3 million is for the project entitled "Modern Army Selected Systems, Test, Evaluation and Review", also known as MASSTER. Are there any funds in the operation and maintenance appropriation for this project?

General GRIBBLE. Yes, sir. For 1973, $8,391,000 is requested for this project under the operation and maintenance appropriation.

Chairman ELLENDER. Please describe the objectives of Project MASSTER and comment on the program for fiscal year 1973.

General GRIBBLE. Yes, sir. The objective of this project is to conduct necessary tests to improve the Army's ability to determine the impact a materiel item or system has on tactics, organization, logistical support systems, and training programs. This testing does not duplicate existing tests. Primary initial effort was directed to surveillance, target acquisition, and night observation (STANO) programs. Emphasis is shifting to give primary emphasis to the elements of the Army's integrated battlefield control system (IBCS).

The 1973 program will include testing new developmental prototypes. Testing will include elements of the midintensity and integrated battlefield control system (IBCS) tests.

MANAGEMENT AND SUPPORT

Chairman ELLENDER. The next budget activity to be considered is entitled "Management and support" for which you are requesting $58.9 million. How much was provided for this budget activity in fiscal years 1971 and 1972?

General GRIBBLE. The management and support budget activity was provided $57.9 million in fiscal year 1971 and $62.3 million in fiscal year 1972.

PROGRAMWIDE ACTIVITIES

Chairman ELLENDER. Of the total requested for management and support, $56.2 million is for the program element entitled "Programwide activities". Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

MANAGEMENT AND SUPPORT

Description.—This program element is a continuing program providing resources for that portion of the Army research and development in-house effort that cannot practically be identified to specific RDTE projects financed under other program elements. These resources finance the general and administrative RDTE expenses at major command headquarters (except Department of the Army headquarters); operation and maintenance of selected general purpose research and development activities; and procurement of minor construction and special purpose equipment. These funds also support effort within the free world to establish and conduct cooperative research and development with allies in order to reduce net costs to each, enhance standardization of defense equipment through such cooperative efforts and to exchange research and development technological information to reduce duplicative efforts and increase the technological base available to all participating nations. Funds are also provided for the operation of the Armed Services Explosive Safety Board. The Army is the executive agent for this Board to develop explosive safety criteria for Department of Defense wide use.

Resources (In millions of dollars):

R.D.T. & E. funds for fiscal year 1971, $55.2; fiscal year 1972, $59.0; fiscal year 1973, $56.2; additional funds to completion are continuing; and the total estimated cost is not available.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

General GRIBBLE. I will be happy to.

(The information follows:)

[In thousands of dollars]

Projects	Fiscal year—		
	1971	1972	1973
MM88—Programwide activities	54,434	58,235	55,476
M798—International cooperative research and development	256	300	250
M857—Armed Services Explosives Safety Board	500	500	500
Total	55,190	59,035	56,226

Chairman ELLENDER. Of the total requested, $55.5 million is for the project which is also entitled "Programwide activities". Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

PROGRAMWIDE ACTIVITIES

MANAGEMENT AND SUPPORT

Description.—This project provides the resources to support:

(1) General and administrative expenses such as personnel cost, travel, and other applicable expenses for the performance of research, development, test, and evaluation functions at command headquarters level above installations/activity level except for Department of the Army Headquarters.

(2) Costs for operating and maintaining selected general purpose type administrative activities/installations funded by RDTE whose effort is not logically distributable to a specific project being conducted in one of the other budget activities.

(3) Special purpose equipment cost benefiting more than one research and development project. Special purpose equipment is primarily those technical and scientific items peculiar to the RDTE program.

(4) RDTE costs for minor construction projects not identifiable with specific RDTE projects under other budget activities and not included under the Military Construction Appropriation. Minor construction comprises construction, modification, and additions required in the execution of the RDTE program costing less than $50,000 and benefiting more than one research and development project.

PROGRAM ACCOMPLISHMENTS AND FUTURE PLANS

Fiscal 1972 program.—Provide essential management, maintenance and operation support required for the accomplishment of the RDTE program.

Fiscal 1973 planned program.—Continuation of support for accomplishment of the Army's program as outlined in "Description" above.

Program to completion.—This is a continuing program.

Resources (In million of dollars):

R.D.T. & E. funds for fiscal year 1971; $54.4; fiscal year 1972, $58.2; fiscal year 1973, $55.5; additional to completion are continuing; and the total estimated cost is not available.

Senator YOUNG. I note in the descriptive summary the names of a number of organizations which are supported under this project. Would you please provide for the record a list of these organizations, the location of each, its principal function, and the amount which it will receive during fiscal year 1973.

General GRIBBLE. I will be glad to do so.

(The information follows:)

1. U.S. Army Materiel Command, Washington, D.C.—$6,300,000

The US Army Materiel Command headquarters performs assigned materiel functions for the Department of the Army. In performing these functions, the Army Materiel Command maintains commands and operates a complex of research labortories, arsenals, development and production facilities, proving grounds, and extensive laboratory and field test facilities for testing the entire spectrum of Army weapons and equipment.

2. U.S. Army Electronics Command, Fort Monmouth, N.J.—$850,000

The Headquarters Electronics Command is responsible for integrated commodity management of tactical communications, avionics, radar, automatic data processing, meteorology, night vision, combat surveillance, target acquisition, navigation and electronic warfare equipments and systems, as well as test equipment and tactical power sources.

3. U.S. Army Munitions Command, Dover, N.J.—$4,773,000

The Munitions Command, headquarters located at Picatinny Arsenal, is responsible for integrated commodity management of conventional, nuclear, and chemical munitions.

4. U.S. Army Test and Evaluation Command, Aberdeen, Md.—$8,027,000

Headquarters, Test and Evaluation Command, is responsible for engineering and service tests of Army materiel, test and evaluation support for the seven Army Materiel Command commodity-type subordinate commands, and participation in preparation for troop tests conducted by the US Continental Army Command.

5. U.S. Army Weapons Command, Rock Island, Ill.—$1,400,000

The Headquarters of the Weapons Command is responsible for integrated commodity management of artillery and infantry weapons, gun-type armament for aircraft, fire control equipment for weapons, and vehicles for which the predominant requirement is firepower, that is, self-propelled artillery, tanks and tank like vehicles to include combat engineer vehicles and recovery vehicles.

6. U.S. Army Aviation Systems Command, St. Louis, Mo.—$700,000

This command headquarters is responsible for integrated commodity management of Army aircraft, and aerial delivery equipment.

7. U.S. Army Medical Research and Development Command, Washington, D.C.—$1,560,000

The Medical Research and Development Command provides policy direction for the Command's research and development operations and is responsible for the management and the performance of medical research and development in the fields of medicine, veterinarian medicine, and the allied medical sciences.

8. U.S. Army Topographic Command, Washington, D.C.—$409,000

This Command provides policy direction for research and development operations in accomplishing research and development of equipment procedures, and techniques applicable to the topographic services including mapping, geodesy, and military geographic information.

9. U.S. Army Research Office, Arlington, Va.—$2,790,000

This activity coordinates, monitors, supervises basic and applied research and exploratory development programs asigned to the Department of the Army.

10. U.S. Army Missile Test and Evaluation Activity, Las Cruces, N. Mex.—$6,002,000

This activity establishes test criteria; plans, conducts, and evaluates reliability and development test programs. Conducts studies to advance reliability testing technology.

11. Yuma Proving Ground, Yuma, Ariz.—$3 million

The Yuma Proving Ground is a Test and Evaluation Command facility responsible for (1) planning, conducting and supporting desert environmental tests of Army materiel; (2) planning and conducting engineer design, production and postproduction tests and supporting research and development activity; (3) providing technical resources and support for Arctic environmental tests, as directed. Facilities of Yuma Proving Ground include test and evaluation areas and equipment for proving munitions, weapons, vehicles, techniques of air delivery, and various other type of Army materiel and procedures.

12. U.S. Army Advanced Materiel Concepts Agency, Alexandria, Va.—$2,725,000

This agency provides descriptions of alternative materiel systems and concepts of materiel with which future forces could be equipped. It conducts necessary design work and serves as a contact point for concepts originating in Army Materiel Command elements and industry during the concept formulation phase, complementing the Institute of Land Combat's conceptual design studies.

13. U.S. Army Systems Studies and Analysis Center, Aberdeen, Md.—$4,100,000

This center conducts systems analyses of Army weapons systems, communications, electronic systems, and vehicles. Develops methodologies and analytical techniques for conducting materiel systems analysis and provides cost and economic inputs to systems analyses activities. Performs reliability and maintainability studies of materiel systems and investigation of systems reliability models.

Senator YOUNG. How much of the $55.5 million requested is for the compensation and benefits of civilian employees, and how many civilian employees are paid under this project?

General GRIBBLE. Of the total requested, $36.1 million is for the compensation and benefits of 2,419 civilian employees paid under this project.

Chairman ELLENDER. Please comment on the project entitled "International Cooperative Research and Development" for which you are requesting $250,000.

General GRIBBLE. These funds are used in support of the objectives of this program which are to seek out and encourage cooperative research and development projects with allies in order to reduce net costs to each, enhance standardization of defense equipment through such cooperative efforts, and exchange research and development technological information to reduce duplicative efforts and increase the technological base available to all particiapting nations. These objectives are sought through data exchange agreements, bilateral and multilateral cooperative research and development agreements, participation in NATO cooperative research and development agencies, and the technical cooperation program.

Chairman ELLENDER. I note in the descriptive summary a reference to the basic standardization agreement between the Armies of the United States, the United Kingdom, Canada, and Australia. Please comment on this agreement.

General GRIBBLE. The Basic Standardization Agreement among the Armies of the United States-United Kingdom, Canada, and Australia 1964 came into effect October 1, 1964, and is commonly referred to as the BSA 64. The BSA 64 supersedes the BSA 1960 and was ratified to allow the entrance of Australia into what was then known as the American-British-Canadian Armies standardization program. The aims of the BSA 64 are: (1) to insure the fullest cooperation and collaboration among the American-British-Canadian-Australian (ABCA) Armies; (2) to achieve the highest possible degree of interoperability among the signatory armies through materiel and nonmateriel (concepts and doctrine) standardization; (3) to obtain the greatest possible economy by the use of combined resources and effort. The original program began in 1948 between the United Kingdom and the United States to assure continuation of efforts which began during World War II.

Senator YOUNG. What will you do with the $500,000 you are requesting for the Armed Services Explosive Safety Board?

General GRIBBLE. These funds will be used by the board to carry out a number of projects in support of all the services. These projects are generally directed toward the safe storage of explosives within buildings and other storage facilities, determination of the blast, and fragmentation effects of explosives and means of minimizing these effects. The fiscal year 1973 program is specifically directed toward characterizing the fragments emitted from explosives of stacked ammunition, developing designs for doors to earth-covered magazines which are as effective as the headwalls in which they are mounted, developing standard procedures for testing ammunition and in-process constituents to determine their hazard in an accidental explosion, and extension and refinement of data and design to explosives and configurations not yet investigated.

TECHNICAL INFORMATION ACTIVITIES

Chairman ELLENDER. $2.2 million is for the program entitled "Technical Information Activities." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

MANAGEMENT AND SUPPORT

Description.—Benefits to the Army obtained from this program element include: reduction of information search time on the part of bench level scientists, engineers and managers; improvement of accuracy of information; improvement of relevancy of information; and improvement in delivery of information in proper form at the right time and place. As a direct result of this effort, the program has and will continue to result in shortening of materiel development cycle time, elimination of undesirable duplication of RDT&E effort, reduction of false starts in RDT&E programs, reduction of RDT&E costs, improved information support to related non-RDT&E programs, and overall improvement of RDT&E management. Specific accomplishments include the ability to transmit drawings between installations for immediate review, approval or modification; search and retrieval of chemical compounds to include all pertinent references; computer-aided design of information systems; and correlation of work-in-progress with RDT&E requirements for more effective management control. This program element supports the effort for continued improvement of those technical information activities that are required for the general support of the Army RDT&E Program. Continued improvements will be made in the collection, storage, retrieval and dissemination of engineering, chemical, management and other specialized classes of information needed by Army scientists, engineers and managers.

Work performed by.—Approximately 45% of the work will be conducted in-house at Picatinny Arsenal, Dover, N.J.; Edgewood Arsenal, Edgewood, Md.; Computer Systems Command, Fort Belvoir, Va.; Walter Reed Army Institute of Research, Washington, D.C.; Savannah Engineer District, Savannah, Ga.; and Waterways Experiment Station, Vicksburg, Miss. The balance of the program will be conducted under contract. Major contractors (25K or more) are: Data Flow, Inc., Bethesda, Md.; Beeman Engineering, Inc., Boonton, N.J.; Cryptoanalytic Computer Science, Inc., Cherry Hill, N.J.; EG&G Co., Bedford, Mass.; Fein-Marquart Associates, Baltimore, Md.; Franklin Institute, Philadelphia, Pa.; Computer Learning and Systems Corporation, Rockville, Md.; Marquette Electronics, Milwaukee, Wis.; Carson Laboratories, Bristol, Conn., and Applied Data Research, Inc., Princeton, N.J. Additional contractors total 10 in number with an estimated dollar value of 185K. Responsible organizations are: U.S. Army Munitions Command, Dover, N.J.; U.S. Army Missile Command, Huntsville, Ala.; U.S. Army Computer Systems Command, Fort Belvoir, Va.; U.S. Army Medical R&D Command, Washington, D.C.; and U.S. Army R&D Information Systems Office, Arlington, Va.

Fiscal year 1972 programs.—Work on an advanced microfilm-oriented nuclear engineering data system; pilot operation of a computerized system for storing and retrieving chemical data; the automated design and optimization of technical information systems; the development of an operational logging and evaluation recorder for computer system evaluation; the development of medical information systems; the application of holography to computer memory storage and optical processing systems; continued operations and development of the Army Research and Development Information System; and improved operating effectiveness of Army technical libraries, information centers, and other data exchange techniques.

Fiscal year 1973 planned program.—Development of new and improved techniques in such areas as microforms and remote terminals for timely processing of the large volumes of information required for RDT&E program management and execution that is essential to the conduct of an effective Army RDT&E program. This effort is designed to insure maximum Army exploitation of the most recent technological advances in all RDT&E areas by insuring optimum

application of latest techniques to the handling of essential scientific, technical and management information. This effort will include: the implementation of engineering data handling problem solutions; experimental operation of a chemical information system, the automated design and optimization of information systems, new initiatives in computer and information science research; the application of holography to computer memory storage and optical processing systems, an expansion of medical information system techniques, the testing of improved procedures for Army technical libraries and information centers, and continued operation and development of the Army Research and Development Information System.

Program to completion.—This is a continuing program.

RESOURCES

[Dollars in millions]

	Fiscal year—			Additional to completion	Total estimated cost
	1971	1972	1973		
R.D.T. & E.:					
Funds	1.9	2.3	2.2	Continuing	Not available.
Man-years	26	26	26	Not available	Do.

Chairman ELLENDER. Are you requesting funds for any projects not previously funded?

General GRIBBLE. No.

Chairman ELLENDER. Please provide a tabulation for the record listing the projects to be funded, the amounts for each for fiscal years 1971 and 1972, and the request for fiscal year 1973.

General GRIBBLE. Yes, sir.

(The information follows:)

[In thousands of dollars]

Projects	Fiscal year—		
	1971	1972	1973
SX765803MY10—Multicommand data system	58	225	300
2P765803M720—Technical information functions and activities	661	643	720
2P765803M726—Engineering data storage and retrieval	300	310	260
2P765803M727—Chemical information and data system	305	100	100
2P765803M728—Technical information support activities	158	250	100
2P765803M729—Conferences and symposia	167	187	200
2P765803M730—Improved data effectiveness and availability	293	350	300
2P765803M761—Technical information analysis centers	0	250	240
Total	1,942	2,315	2,220

Senator YOUNG. How is the work under this program divided between Army in-house facilities, industrial organizations, and academic institutions?

General GRIBBLE. Approximately 50 percent of the effort will be conducted in-house at the U.S. Army Computer Systems Command, Redstone Arsenal, the U.S. Army R. & D. Information Systems Office, Picatinny Arsenal, Edgewood Arsenal, the U.S. Army Electronics Command, the U.S. Army Medical R. & D. Command, and the U.S. Army Materiel Command; 46 percent of the program will be conducted by industrial firms, and 4 percent will be conducted by academic institutions.

CIVILIAN TRAINING POOL

Chairman ELLENDER. The last program element to be considered under management and support is entitled "Civilian training pool". Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

MANAGEMENT AND SUPPORT

Description.—The Civilian Training Pool program provides for long-term training and education of Research, Development, Test and Evaluation civilian employees on a full-time basis for 120 consecutive training days (approximately six calendar months) or more. The objective of this program is to enhance Army internal skill development by providing educational opportunities for selected RDTE civilian employees. This program enables the participants to keep abreast of management, technical, and scientific advancements both within and outside the Federal Government. This training and education is related to the employee's present assignment or to his preparation for a planned career advancement. The establishment of this central pool of funds and limited manpower spaces enables organizations at lower levels to participate without diverting their current operating funds. These central funds cover tuition, salary, travel and related expenses during the training period. The provision of manpower spaces furnishes the staffing support necessary for achievement of organizational objectives during the absence of an employee for long-term education and training.

Program to Completion.—This is a continuing program.

Resources (In millions of dollars):

R.D.T. & E. funds for fiscal year 1971, 0.8; fiscal year 1972, 0.9; fiscal year 1973, 0.5; additional to completion, continuing; and the total estimated cost is not available.

Senator YOUNG. Are all of the personnel taking part in this training program employees of the Department of the Army?

General GRIBBLE. Yes.

Chairman ELLENDER. What sort of contractual agreement exists between the Department and the participants in these training programs?

General GRIBBLE. The Department of the Army personnel taking part in these training programs are required to sign a statement that they agree to continue in the service of the Department of the Army or another component of the Department of Defense unless involuntarily separated. This service obligation period is usually three times the length of the training period.

Senator YOUNG. Give us some examples of the types of training these individuals receive and the institutions they attend.

General GRIBBLE. The areas of study include such scientific and engineering subjects as aerospace engineering, electrical and electronic engineering, environmental engineering, mechanical engineering, heat transfer, servo control, soil mechanics, explosives, theoretical nuclear physics, biochemistry, bacterial metabolism, advanced physical chemistry, microbiology, quantum mechanics, civil engineering, mathematics, statistics, metallury, nutrition, research management and public administration. Some examples of courses pursued at various institutions are: application of mass spectrometry to organic chemistry, Stanford University; food stability and acceptability, University of Massachusetts; environmental engineering, Dartmouth

College; inertial guidance and control, University of Florida; electromagnetic waves, University of Alabama.

Chairman ELLENDER. There has been a substantial decrease in the funds requested for this program—from $900,000 provided in fiscal year 1972 to $500,000 requested for fiscal year 1973. What caused this decrease?

General GRIBBLE. During preparation of the fiscal year 1973 budget several very high priority R.D.T. & E. requirements developed. To assist in funding these requirements, a thorough examination of the fiscal year 1973 program was conducted. As part of this examination, funds for the civilian training pool were reduced to $500,000.

There were two primary reasons for taking some funds from this program element. One was the fact that unobligated fiscal year 1971 funds remained in the element. Another was the fact that civilian training is also funded by our development commands so the apparent 45-percent reduction from $900,000 in fiscal year 1972 does not represent the true impact on civilian training.

The Army recognizes the importance of civilian training, but the fiscal year 1973 budget level was judged to be adequate in light of other R.D.T. & E. priorities.

FEDERAL CONTRACT RESEARCH CENTERS

Chairman ELLENDER. A total of $23,798,000 is requested for support of the various Federal Contract Research Centers under the Army R.D.T. & E. appropriation, and $2,670,000 is requested under the Operation and Maintenance appropriation. How much was provided for these centers in both of these appropriations in fiscal years 1971 and 1972?

General GRIBBLE. A total of $21,667,000 fiscal year 1971 and $22,288,000 fiscal year 1972 R.D.T. & E. funds were used in support of Army programs at Federal Contract Research Centers. These centers also received Operation and Maintenance funds for $2,753,000 during fiscal year 1971 and $2,920,000 during fiscal year 1972 for programs at these centers.

Chairman ELLENDER. On page 94 of the justifications, I note a statement to the effect that the total of $26,468,000 requested for fiscal year 1973 for Army support of these centers does not include $8,955,000 for subcontract effort. Please comment on this statement. What are these subcontract efforts?

General GRIBBLE. The $8,955,000 shown in the justification for subcontract effort will be processed through Lincoln Laboratory and the Applied Physics Laboratory. This effort could be contracted directly by the Army rather than through Lincoln Laboratory and the Applied Physics Laboratory. Because this subcontract effort is directly in support of laboratory projects, it is more advantageous to let them do the contracting. The laboratories contract for this work using the procedures and facilities of local government contracting officers. Lincoln Laboratory subcontracts for data reduction, hardware, and equipment modifications to modernize and update the sensors located at Kiernan reentry measurement site, Kwajalein, in support of the Advanced Ballistic Missile Defense Agency's radar discrimination and designation programs. The Pershing subcontract effort through the Applied Physics Laboratory, Johns Hopkins University is for tech-

nicians deployed with operating forces in Europe to obtain operational data for analysis by Applied Physics Laboratory to build a data bank to evaluate Pershing systems. Additional Applied Physics Laboratory subcontracts are for operation and maintenance of the Pershing ground instrumentation program and for software associated with computer programs.

Senator YOUNG. What specific efforts is the Army making to develop more inhouse facilities to enable the gradual phaseout of use of the Federal contract research centers?

General GRIBBLE. The Federal Contract Research Centers (FCRC's) presently sponsored by the Army are Research Analysis Corp. (RAC) and the Human Resources Research Organization (HUMPRO). Both RAC and HUMPRO are to be phased out of their present modeof operation as soon as practical and will then cease to be FCRC's.

The Army has offered to bring a part of the RAC staff in-house, and RAC is exploring its sale to another corporation. While the Army does not intend to continue support of RAC as an entity, it may purchase some studies and analyses from RAC's successor organization on a competitive basis.

The Army is now staffing a new laboratory which will perform some of the work formerly done by HUMRRO. Since HUMRRO has severed ties with George Washington University it has diversified its program, in fact, it has greatly increased its amount of nondefense business. Therefore, HUMRRO has requested the FCRC relationship with the Army be terminated and that any new work be awarded on a straight competitive contractual basis.

HUMAN RESOURCES RESEARCH ORGANIZATION

Chairman ELLENDER. $3.7 million is requested for Army support of the Human Resources Research Organization, one of the Federal contract research centers. The tabulation appearing on page 89 of the justifications setting out the sources of funding of this organization will be included in the record at this point.

(The information follows:)

	Fiscal year—		
	1971 actual	1972 estimate	1973 estimate
Human Resources Research Organization (HumRRO):			
Research, development, test, and evaluation, Army:			
1.25.14.A—Safeguard defense systems	41	0	0
6.11.02.A—Defense research sciences	389	380	300
6.21.06.A—Military manpower resources technology	2,295	2,400	2,400
6.31.01.A—Manpower resources development	695	750	1,000
Total, R.D.T. & E., Army	3,420	3,530	3,700
Total, Human Resources Research Organization	3,420	3,530	3,700

Senator YOUNG. Where is HUMRRO located?

General GRIBBLE. HUMRRO is located at 300 North Washington Street, Alexandria, Va.

Chairman ELLENDER. Of the $3.7 million requested, $300,000 is in the defense research sciences category. Describe the projects for which this $300,000 will be used.

Mr. JOHNSON. HumRRO performs work on four work units in this project. The first of these seeks to develop specific knowledge on the human factors involved in command and control activities, and their contribution to organizational effectiveness. The second work unit effort is research to provide an assessment of fundamental factors which influence visual perception. An objective of this effort will be to develop a model of detection and recognition performance and to determine which of the human factors involved may be influenced by training. The third work unit is intended to develop a method for improving racial attitudes among military personnel through an investigation of vicarious attitudes. The fourth work unit in this area of research is to determine the range and scope of the learning capability of low-ability personnel, to observe the longitudinal effects of long-term learning strategies on Army trainees, and to determine the proficiency levels that can be reached under sustained, intensive training.

Senator YOUNG. $2.4 million is for research under the military manpower resources technology category. What will you do with these funds?

Mr. JOHNSON. The funds requested in this category will be used for research efforts which include an analysis of the specific skill which Army officers must possess to effectively lead and manage their units. This analysis will be aimed at a level appropriate for providing input to career-level courses in the Army educational system. Training exercises will be developed that incorporate these skills, but in simulated leadership positions so that the consequence of mistakes will not seriously inhibit learning. Specific commander activities in command decisionmaking will be investigated to provide a basis for the development of a tactical training simulator which will simulate various combat situations. Additionally, prototype instructional materials embodying newly developed functions and tasks for Army classroom instructors will be prepared and evaluated. Major emphasis will be placed on developing performance-oriented, individualized training methods for use both in schools and within units and on managing training conducted with these new methods. Advisory services will be provided to the Military Assistance Command Vietnam on training research and development. Research will continue on basic and advanced individual training techniques and course management.

Chairman ELLENDER. Comment on the $1 million requested for research in manpower resources development, and tell us why you need the increase of $250,000 you are requesting.

Mr. JOHNSON. The funding level requested is required for research in computer-administered instruction (CAI) with additional interest in simulation, gaming, and miniaturization techniques. There is evidence to indicate that this type of instruction will lead to more efficient training in terms of both time and money. The products of these efforts will be the development of a prototype CAI system that will be refined into a system usable in Army training. The $250,000 increase requested is required to perform explorations into the learning process that might lead to marked improvements in training both of units and of individuals within the unit. We are constantly seeking means to reduce training costs, shorten training time, and increase training effectiveness, and this is more effort in that direction.

RESEARCH ANALYSIS CORPORATION

Chairman ELLENDER. $6.2 million is for the Army support of the Research Analysis Corp. The tabulation appearing on the bottom of page 89 and the top of page 90 setting out the sources of funding for this center will be included in the record at this point.

(The information follows:)

FEDERAL CONTRACT RESEARCH CENTERS, SUMMARY BY APPROPRIATION/PROJECT

[In thousands of dollars]

	Fiscal year—		
	1971 actual	1972 estimate	1973 estimate
RESEARCH ANALYSIS CORPORATION (RAC)			
Research, development, test, and evaluation, Army:			
6.11.02.A—Defense research sciences	140	0	0
6.21.20.A—Combat development investigation	84	250	500
6.47.17.A—General combat support	95	0	0
6.51.01.A—Studies and analyses	5,981	5,350	5,660
6.58.01.A—Programwide management and support	400	0	0
Total R.D.T. & E. Army	6,700	5,600	6,160
Operations and maintenance, Army			
203198—Command, Europe	11	0	0
305120—Combat development activities and headquarters	200	200	200
721112—Supply management operations	1,204	1,400	1,200
722898—Headquarters, Army materiel command	4	0	0
871412—Recruiting and examining	100	0	0
950000—Administration and associated activities	9	0	0
Total O. & M. Army	1,528	1,600	1,400
Total Research Analysis Corp	8,228	7,200	7,560

Senator YOUNG. Tell us where this organization is located and describe the general nature of the work performed there.

General GRIBBLE. The Research Analysis Corp. (RAC) is headquartered in the Research Park in McLean, Va. The general nature of the work is in the operations research/systems analysis applied to military and non-military problem situations. The Research Analysis Corp. performs scientific and engineering studies and research to support top-level planners and decisionmakers in a wide range of problem areas. Army is its principal client. Work, however, of significant scope is also conducted under separate contracts with defense and nondefense organizations including the Arms Control and Disarmament Agency, Department of Defense, Federal Aviation Agency, Weather Bureau, and National Science Foundation. RAC's analyses extend beyond the purely military field to cover technical, economic, and political considerations as well. Particular emphasis, for example is on systems integration and systems analysis combining and applying techniques of operations research, cost effectiveness, and systems engineering.

For the Army, RAC performs scientific analyses and develops methodologies to solve problems in force structure, logistics, combat simulations and resource analysis. In summary the results of RAC's studies are used as inputs to decisions that could ultimately become Army policy, major hardware procurements, or Army positions.

Chairman ELLENDER. The $6.2 million requested is for research in two categories; $500,000 is for combat development investigation. Describe this effort and tell us what the $500,000 will be used for.

General GRIBBLE. The combat development investigation program element is planned tentatively to support one project at Research Analysis Corp. The objective of this investigation is to identify alterative concepts for the Army's development and employment of helicopters during the 1976–82 time frame.

Chairman ELLENDER. $5.7 million is for studies and analyses. Give us some specific examples of the studies and analyses to be performed with these funds, and comment on why it is impossible for the Army to perform them in Army in-house facilities.

General GRIBBLE. At this point in time we only have candidate studies and analyses. The cost of the candidates exceeds the amount we are requesting. The Army Study Advisory Committee has begun its annual series of meetings to determine the final content of the fiscal year 1973 program. This committee, chaired by the Assistant Vice Chief of Staff of the Army, will finish its work by late May. Six examples of some of the candidate efforts are as follows.

Assistant Secretary of the Army (Manpower and Reserve Affairs) is to sponsor a study called Analytical Techniques for Examination of Manpower Policy Alternatives. This study will complete, refine, extend, and apply computer models such as computation of manpower programs using linear programing (COMPLIP), chance-constrained adaptive manpower planning (CHAMP), and enlisted loss inventory model (ELIM) in order to examine the Army manpower policy alternatives. The resultant products should allow for a better evaluation of policy and operational constraints on manpower programs. These evaluations will become very important during the critical period of transition into operation of the "no draft" environment.

The special assistant to the Chief of Staff of the Army for Modern Volunteer Army will continue to evaluate the effectiveness of the Modern Volunteer Army program. This study is to be called Evaluation of the Modern Volunteer Army (MVA) Program (phase III).

The study called Models for Manpower and Personnel Distribution (Phase II), sponsored by Deputy Chief of Staff for Personnel, will be directed toward implementation of the prototype system developed during fiscal year 1972.

Deputy Chief of Staff for Logistics is to complete the development, programing, and validation of a study called Models of the U.S. Army Worldwide Logistic System (MAWLOGS).

The U.S. Army Combat Developments Command will continue to improve the computer simulation of land combat in a study called Conceptual Design for the Army in the Field Alternative Force Evaluation (CONAF/RACAFE III).

The results of a study called NATO Combat Capabilities Analysis II (COMCAP II) will continue to expand and refine the estimates for general purpose theater force needs or capabilities. These estimates also constitute the Army input to Office Secretary of Defense.

As you well know, Research Analysis Corp. (RAC) was established to perform studies and analyses for the Army. It was deemed essential that these studies and analyses be devoid of Army-oriented parochialism, yet considerate of the Army's roles, missions, needs, and general operating environment. The research organization was required to be large enough to offer a broad interdisciplinary capability. RAC, since 1961, has fulfilled that need. During the same time, the Army has increased its in-house capability, as has private industry, and has reduced its reliance on RAC. This increasing in-house capability coupled

with the pressure of inflation and dollar ceilings has made corporate existence difficult for RAC and has resulted in plans that would have RAC lose its special status as a Federal contract research center.

Yet, even with the increased in-house capability, there is a continuing need to rely on outside contractors. The in-house capability will be constrained by manpower considerations, and could tend toward parochialism. In addition, as the problems facing the Army change, the particular skills required to attack a specific problem might not be available in-house. In summary, the Army's reliance on RAC for studies and analyses has reduced, and will continue to reduce. At the same time, there will be a continuing need for some contractor-performed studies and analyses.

Chairman ELLENDER. In addition to the $6.2 million requested in the R. & D. appropriation, you are also requesting $1.4 million under the "Operation and Maintenance" appropriation for work to be performed by the Research Analysis Corp.; is this correct?

General GRIBBLE. That is correct, Mr. Chairman.

Chairman ELLENDER. Of the total requested under Operation and Maintenance, $200,000 is for the support of combat development activities and headquarters. What will these funds be used for?

General GRIBBLE. That amount represents the reservation of a level of effort for the U.S. Army Combat Developments Command for work that could not be properly charged to the RDTE appropriation. It is expected that this amount will be used to provide analytical advice and assistance to in-house efforts.

Senator YOUNG. $1.2 million is for supply management operations. Comment on this project.

General GRIBBLE. That amount represents that portion of the RAC work year 1973 program that is earmarked for the U.S. Army Materiel Command. The specific studies will not be identified until the Army Study Advisory Committee finishes its deliberations in late May, but will address particular problems encountered by this command in its operating missions of supply and maintenance for the Army.

AEROSPACE CORP.

Chairman ELLENDER. Of the total for Federal Contract Research Centers, $3.3 million is requested under the R. & D. appropriation for Army support of the Aerospace Corp. The tabulation appearing on the bottom of page 90 of the justifications setting out the source of funds for this center will be included in the record at this point.

(The information follows:)

	Fiscal year—		
	1971 actual	1972 estimate	1973 estimate
Research, Development, Test, and Evaluation, Army:			
1.25.14.A—Safeguard defense systems	2,000	2,220	2,350
6.21.05.A—Materials	0	100	100
6.27.07.A—Topographic and geographic investigations	30	45	50
6.33.04.A—Advanced ballistic missile defense program	347	385	780
Total, R.D.T. & E., Army	2,377	2,750	3,280
Total, Aerospace Corp.	2,377	2,750	3,280

Chairman ELLENDER. Of the total R. & D. funds requested for the Aerospace Corp., $2.4 million is for work on the Safeguard defense system. Describe the work to be performed by Aerospace on Safeguard.

General GRIBBLE. The Aerospace Corp. supports the space and missile systems organization (SAMSO), of the Air Force in the accomplishment of the ICBM portion of the Safeguard system test target program (SSTTP) in the role of general systems engineering and technical direction. The SSTTP provides targets for functional evaluation of the Safeguard systems components located at Meck Island in the Kwajalein Atoll. The Army, therefore, is funding its share of the costs of the target missile flight program being executed by the Aerospace Corp. under contract to the Air Force.

The functions planned for fiscal year 1973 are essentially the same as performed in fiscal year 1972, namely that of systems engineering/technical direction of the Air Force's efforts in providing ICBM targets to be used in Safeguard system test.

Senator YOUNG. Is this $2.4 million included in the $340.5 million requested for Safeguard under the budget activity "Missiles and Related Equipment?"

General GRIBBLE. Yes, the $2.4 million is included in the $340.5 million Safeguard request.

Chairman ELLENDER. Comment on the need for the increase of $130,000 you are requesting.

General GRIBBLE. This increase is to cover an anticipated price escalation. It will permit the functions planned for fiscal year 1973 to remain at essentially the fiscal year 1972 level.

Senator YOUNG. $100,000 is for research on materials. Describe this effort.

General GRIBBLE. The materials requirement is for a complete evaluation of the properties of metal versus fiber reinforced composites before the end of fiscal year 1975 in order to meet advanced interceptor commitments. [Deleted.] The Aerospace Corp. has developed a proprietory process for making a particular composite which is the leading metal matrix, fiber-reinforced composite material in one class of materials which has the potential to meet advanced interceptor substructure materials requirements.

Chairman ELLENDER. $50,000 is for Topographic and Geographic Investigations. Comment on this project.

General GRIBBLE. Aerospace Corp. will provide technical assistance in transferring, updating and maintaining the trace program on the Mobility Engineering Research Development Command (MERDC) CDC 6600 computer. TRACE is a comprehensive program for precision orbital determination of geodetic satellites. USA Topographic Command (TOPOCOM) has a version of the trace program (Space 8) on the Univac 1108 computer which is to be used extensively in lunar and geodetic applications. The trace program, which is continuing to undergo revision and updating, is on a CDC 6600 computer; so maintaining the current version on the MERDC computer enables Engineer Topographic Laboratories to participate in the analysis of the Doppler study and provide TOPOCOM, locally, with the current trace program which can be converted to the 1108 if desired.

Also support is required for the development of subroutines and modification to the Space 8 program in support of lunar and geodetic effort.

Chairman ELLENDER. $780,000 is for the Advanced Ballistic Missile Defense Program. Comment on this effort, and tell us why you need the rather large increase of $395,000 you are requesting.

General GRIBBLE. The Aerospace Corp. provides interface and planning support for joint Army/Air Force research and development efforts mutually beneficial to ballistic missile defense and strategic offensive force missions. During fiscal years 1973 through 1977 a spectrum of special targets will be flown into Kwajalein missile range to generate the data base for the development and verification of discrimination techniques in support of ABMDA and Safeguard Hardsite terminal defense programs.

APPLIED PHYSICS LABORATORY—JOHNS HOPKINS UNIVERSITY

Chairman ELLENDER. $100,000 is requested under the R. & D. appropriation for Army support of the Applied Physics Laboratory at Johns Hopkins University. The tabulation appearing on the bottom of page 91 and the top of page 92 of the justifications will be included in the record at this point.

(The information follows:)

	Fiscal year—		
	1971 actual	1972 estimate	1973 estimate
Research, development, test, and evaluation, Army:			
6.23.03.A—Missile technology	388	300	
6.37.12.A—Mapping and geodesy	30	50	100
Total, R.D.T. & E., Army	418	350	100
Operations and maintenance, Army:			
202254—General purpose forces—Pershing	1,050	1,020	1,020
Total, O. & M., Army	1,050	1,020	1,020
Total, Applied Physics Laboratory, Johns Hopkins University	1,468	1,370	1,120
Subcontract effort excluded from this amount	(610)	(828)	(500)

Chairman ELLENDER. This entire $100,000 is for mapping and geodesy. Describe this effort, and tell us why you need the increase of $50,000 you are requesting.

General GRIBBLE. The facilities and expertise of the Applied Physics Laboratory (APL), as the prime developer of the Doppler backpack system, are required to assist in the systems integration, maintenance and test support of the advanced development of a Doppler translocation system. This system is being evaluated as a potential means of extending survey control over long distances for the field Army. The increased funds are required for a study by APL aimed at reducing the positioning error in the Doppler backpack system to provide a broader application for Army tactical use.

Senator YOUNG. Under the "Operation and Maintenance" appropriation, $1 million is requested for the program entitled "General Purpose Forces—Pershing." Please comment on this program and the need for the $1 million you are requesting.

General GRIBBLE. The Applied Physics Laboratory provides an independent evaluation of the Pershing weapon system's capability to

perform its assigned mission in Europe. A military-civilian team provides complete coverage of the operational test program, and analyzes the effect of the product improvement program on system reliability. Applied Physics Laboratory has the expertise, experience and data bank accumulated during the past few years which justifies continuation of this work by this contractor. Their studies and recommendations have been extremely useful in improving operational readiness of the system.

Chairman ELLENDER. There is a notation that $500,000 subcontract effort is excluded from the total $1,120,000 being provided for the Applied Physics Laboratory. What are these subcontract efforts?

General GRIBBLE. The subcontract effort through the Applied Physics Laboratory, Johns Hopkins University is in support of the Pershing program. Through these subcontracts Applied Physics Laboratory obtains data technicians who are deployed with the operational forces in Europe. Additional subcontracts are for operation and maintenance of the Pershing ground instrumentation program and for software associated with computer programs.

LINCOLN LABORATORY—MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Chairman ELLENDER. Under the research and development, $9.1 million is for Army support of the Lincoln Laboratory of the Massachusetts Institute of Technology. The tabulation appearing on the bottom of page 92 will appear in the record at this point.

(The information follows:)

	Fiscal year—		
	1971 actual	1972 estimate	1973 estimate
Research, development, test, and evaluation, Army:			
6.33.04.A—Advanced ballistic missile defense program	4,740	6,082	6,188
6.53.01.A—Kwajalein missile range (KMR)	2,380	2,550	2,920
Total, R.D.T. & E., Army	7,120	8,632	9,108
Total, Lincoln Laboratory, Massachusetts Institute of Technology	7,120	8,632	9,108
Subcontract effort excluded from this amount	(19,100)	(9,155)	(8,455)

Chairman ELLENDER. Of the total requested, $6.2 million is for the Advanced Ballistic Missile Defense program. Comment on this project and tell us why the increase of $106,000 is needed.

General GRIBBLE. The Advanced Ballistic Missile Defense Agency contracts with the Lincoln Laboratory for support in four fundamental areas. These include radar technology, field system development and integration, designation and discrimination engineering, and radar data analysis and interpretation. In the category of radar technology, radar development studies will concentrate on array antenna and RF power sources. Also included are studies in surface wave technology designed to provide a means for major improvements in signal processing. Another important work in this category is that of radar propagation—to determine the impact of tropospheric and ionospheric effects on the performance of precision tracking radars. Field system development and integration efforts provide support to

ABMDA in fielding a solid state phased array radar and associated control computer in the Kwajalein Atoll. The designation and discrimination engineering program, which during fiscal year 1972 has been focused on installation and checkout of both hardware and software at the Kiernan Reentry Measurement Site radar (Krems), is aimed at developing discriminants and classifying the observables which occur in a ballistic missile defense environment. This category also includes the continuation of work on the simulation of the perimeter acquisition radar (Simpar), which is essential to future Safeguard systems tests in the Kwajalein Missile Range.

The radar data annalysis and interpretation effort entails careful examination of all data from the Krems radars with appropriate analysis to permit full understanding of the results. The increase reported in the program for fiscal year 1973 is to cover an estimated price escalation to permit required levels of effort to be maintained.

Senator YOUNG. What is the difference in the work being done by the Lincoln Laboratory and that of the Aerospace Corp. on the Advanced Ballistic Missile Defense program?

General GRIBBLE. The Lincoln Laboratory provides support based on expertise in the broad areas of radar, space communications, and missile defense. This Laboratory collects and analyzes reentry radar data using the Kiernan Reentry Measurement Site (Krems) radars at the Kwajalein Missile Range. Lincoln technicians also develop specialized radar techniques and components, and provide consultation and technical assistance in the management of radar developments. The Aerospace Corp., on the other hand, is the agency which provides overall system integration of targets, sensors, and missile boosters or aircraft which are to be used in support of ballistic missile defense flight test programs. These services are provided for both Army and joint Army/Air Force use.

Chairman ELLENDER. $2.9 million is for the Kwajalein Missile Range. What connection has the Lincoln Laboratory with the Kwajalein Missile Range, and how will these funds be used?

General GRIBBLE. Since the inception of the Advanced Research Projects Agency (ARPA) sponsored Pacific Range Electromagnetic Signature Studies (PRESS) program at Kwajalein in 1961, Lincoln Laboratory has served as scientific director for the sensor development and field measurement effort of the program. The sensor complex is now identified as the Kiernan Reentry Measurement Site (Krems). It has been in a continual state of technological evolution since the beginning. When the Press program started the Target Resolution and Discrimination Experiments (Tradex) radar was a major sensor. That radar has been joined by the ARPA long-range tracking instrumentation radar (Altair) and ARPA/Lincoln Laboratory C-band Observable Radar (ALCOR) radars developed under the direction of Lincoln Laboratory. The Tradex radar has just been completely modified under Lincoln Laboratory cognizance. Major modifications under way or planned for Altair and ALCOR include the capability to simulate the perimeter acquisition radar (PAR) and the Safeguard system with Altair and the enhancement of ALCOR's extremely high resolution measurements capability for satellite and other space flight surveillance efforts. A new capability of real-time target acquisition, tracking, and identification called the Designation and Discrimination

Engineering (D. & D.E.) program involves all three radars and is in support of BMD technical objectives. Lincoln Laboratory with their unique experience and capabilities has provided and continues to provide the overall system coordination and technical management necessary for successful accomplishment of the total field measurements program conducted by the Krems complex at KMR. The $2.9 million in fiscal year 1973 will provide for 48 Lincoln Laboratory personnel to perform system coordination and the technical management of the Krems complex.

Senator YOUNG. Why do you need the increase of $370,000 you are requesting?

General GRIBBLE. The increase is almost entirely the result of the Designation and Discrimination Engineering (D. & D.E.) program at Kwajalein. The D. & D.E. facility will become operational in fiscal year 1973 and requires a manning increase of five additional Lincoln Laboratory personnel.

MITRE CORP.

Chairman ELLENDER. $1.5 million is requested under the R. & D. appropriation for Army support of the Mitre Corp. The tabulation appearing on the bottom of page 93 and the top of page 94 of the justifications setting out the source of funding of the Mitre Corp. will be included in the record at this point.

(The information follows:)

	Fiscal year—		
	1971 actual	1972 estimate	1973 estimate
Research, development, test, and evaluation, Army:			
1.25.14.A—Safeguard defense systems	965	900	900
6.33.04.A—Advanced ballistic missile defense program	571	476	450
6.37.12.A—Mapping and geodesy	0	50	100
6.57.05.A—Modern army selected systems, test, evaluation, and review (MASSTER)	96	0	0
Total, R.D.T. & E., Army	1,632	1,426	1,450
Operations and maintenance, Army:			
1.25.16.A—Safeguard defense system	175	300	250
Total, O. & M., Army	175	300	250
Total, Mitre Corp	1,807	1,726	1,700

Senator YOUNG. Of the total requested under the R. & D. appropriation for Mitre Corp., $900,000 is for the Safeguard defense system. Comment on the work Mitre Corp. performs on the Safeguard system, and tell us how it differs from the work performed by Aerospace Corp. on this system.

General GRIBBLE. Safeguard contracts with Mitre for essential support in two R.D.T. & E. areas: Coordination and integration of the conduct of the actual tests on Safeguard communications, including commercial carriers communications equipment under a simulated nuclear environment and Safeguard data processing software evaluation. The work Mitre Corp. performs on the Safeguard systems is in the field of communications support and of Safeguard data processing, whereas the Aerospace Corp. provides support in the accomplishment

of the ICBM portion of the Safeguard system test target program (SSTTP) in the role of general systems engineering and technical direction.

Chairman ELLENDER. $450,000 is for the advanced ballistic missile defense program. Describe the Mitre Corp.'s efforts on this program and tell us what the difference is between the efforts of Mitre and those of the Aerospace Corp. and the Lincoln Laboratory on this program.

General GRIBBLE. The basic contribution of the Mitre Corp. to our advanced ballistic missile defense program efforts is in providing data processing technical support. This support relates to the monitoring of various data processing contracts; to assistance in planning computer simulation and analysis; and in both technical and consultative efforts by the Mitre Corp. to the terminal defense and light area defense programs. Two further activities of the Mitre Corp. relate to evaluation of candidate computer associated software for use in ballistic missile defense systems, and to the continuing evaluation of requirements for data processing as it applies to command, control, and communications. These functions contrast clearly with those of the Aerospace Corp. which handles the overall system integration of flight test programs, and the work of the Lincoln Laboratory in evaluating radar techniques, components, and data obtained from advanced ballistic missile defense radar sources.

Chairman ELLENDER. $100,000 is for work in mapping and geodesy. Tell us how these funds will be used, and comment on the need for the increase of $50,000 you are requesting.

General GRIBBLE. The U.S. Army Topographic Command (USA TOPOCOM) has a requirement to have an operational program in support of the worldwide topographic readiness capability by fiscal year 1975. To meet this requirement, the U.S. Army Engineer Topographic Laboratories (USAETL) will have to evaluate the suitability of the candidate generalized data management systems currently available, rather than develop a separate system. Mitre Corp. will be utilized to assist in the evaluation and application of these programs to management of the data base problem. In fiscal year 1973, USAETL will utilize Mitre to evaluate system 2000 and other selected data management systems available at the Mitre/Bedford computer facility as applied to topographic test files. Studies of alternative data management systems are required to provide USAETL with information on which to base selection of the best system for performing topographic data storage, manipulation, and retrieval. This data handling system is the very core of the topographic data bank being developed by the Army.

Senator YOUNG. $250,000 is requested under the Army operation and maintenance appropriation for work by the Mitre Corp. on the Safeguard defense system. What will these funds be used for?

General GRIBBLE. Utilizing OMA funds, Mitre provides scientific and technical assistance to the Safeguard Communications Agency's system analysis, systems engineering, and test and evaluation efforts. During fiscal year 1973 Mitre will compile, review, and analyze all facets relating to shock and vibration effects on communication equipment planned for use in the Safeguard communications program; provide scientific, engineering, and technical assistance for the intersite and intrasite communications system; and provide scientific and technical assistance for the nonnuclear test and evaluation program.

QUESTIONS BY SENATOR THURMOND

Chairman ELLENDER. Senator Thurmond was unable to be here today but has asked that questions submitted by him be answered for the record. The questions and the responses will appear at this point.

(The information follows:)

SAM–D PROGRAM

Senator THURMOND. Secretary Johnson, the Army has expended nearly $350 million in the research and development phase of the SAM–D (surface to air missile) program and over $600 million remains to complete development. Have any of the findings to date raised any serious questions as to the technical problems faced in this program?

Secretary JOHNSON. There are no indications of high risk technical problems in the program to date.

Senator THURMOND. Briefly, how far will the $171 million R and D requested in fiscal year 1973 take us?

Secretary JOHNSON. The R&D funding request for fiscal year 1973 will allow us to continue Engineering Development (ED). It will be the first year of ED and we will begin the fabrication of the tactical prototypes. Fabrication on all ED guidance sections will begin and testing of the first three will be initiated. We will retrofit the Advanced Development model radar in preparation to support some early firings in [deleted] and begin work on the ED model radar. We will continue effort on those items (Launcher Group, Battalion Control Group, Support Equipment) which were not addressed during Advanced Development but which are now required for the complete tactical system.

Senator THURMOND. Briefly, how will the remaining $450 million in R and D be expended in fiscal year 1974 and beyond?

Secretary JOHNSON. In FY 1974 and beyond we will complete fabrication of the tactical prototypes. Extensive testing of components and subsystems will begin and be completed. Firings of tactical missiles with the Advanced Development Model Control Group will begin in [deleted]. Once the tactical prototype system has been fabricated we will conduct numerous firings to insure the system will satisfy its design requirements.

Senator THURMOND. Mr. Secretary, kindly place in the record the justification for the SAM–D program from a threat standpoint?

Secretary JOHNSON. The threat to SAM–D is an air supported threat. It consists of [deleted.] Current systems such as the NIKE HERCULES and HAWK are extremely limited in fire power as their fire sections can only engage one threat at a time and are [deleted.] These systems are using the technology of the 1950s and will not be able to combat the threat in the 1980s. SAM–D will replace both HERCULES and HAWK. SAM–D will have a multiple target engagement capability and be able to successfully [deleted.]

Senator THURMOND. Where would the SAM–D batteries be deployed? (Europe, US?)

Secretary JOHNSON. SAM–D will be deployed to support the field army. Currently, this would mean that it would be in Europe. We have factored in the number of batteries required for use in CONUS for long range planning purposes.

Senator THURMOND. Where would the $95 million in military construction funds be expended?

Secretary JOHNSON. The military construction funds would be used for CONUS site preparation in the 1980 time frame. They would be used on the eastern and western coasts and along the northern border in similar areas where we now have our NIKE HERCULES deployed.

Senator THURMOND. How would the SAM–D compare with the Soviet SAM missiles in South Vietnam, Egypt and elsewhere?

Secretary JOHNSON. [Deleted.] SAM–D is a modern system using the latest technology. It is being designed to be effective on the battlefield of the 1980s and will have a multiple target engagement capability in a [deleted.] SAM–D will be [deleted.]

Senator THURMOND. In what way is the SAM–D different from the Site Defense System for our Minuteman missiles?

Secretary JOHNSON. SAM–D is a modern air defense system being designed for the field army to counter the air supported threat. It could be used in CONUS to complement SAFEGUARD. A study is now being conducted to determine the

[deleted] capability of SAM–D. The Site Defense System for our Minuteman missiles is a terminal ballistic missile defense system. It has no capability against the air supported threat and is to be used in CONUS only.

Senator THURMOND. Secretary Johnson, does the SAM–D program depend on present state-of-the-art radar?

Secretary JOHNSON. Yes sir.

Senator THURMOND. What are the chief technical risks in this program?

Secretary JOHNSON. There are no chief technical risks in this program. The advanced development program over the past years has allowed us to begin engineering development with no high technical risks.

INFLATION FACTOR

Senator THURMOND. Has the Army's total program costs taken into account an inflation factor? If so, what factor was used?

Secretary JOHNSON. Yes sir. The Army's total program costs have taken into account an inflation factor. The factors used are the standard Department of Defense indexes specified by the Office of the Secretary of Defense (Comptroller).

Senator THURMOND. Are all Army R&D programs using the same factor?

Secretary JOHNSON. No sir. A different index is specified for the non-compensation developments and the weapons systems. In addition, weapons systems indexes vary from year to year.

UTILITY TACTICAL TRANSPORT AIRCRAFT SYSTEM

Senator THURMOND. General Gribble, are you in agreement with the General Accounting Office report on the Utility Tactical Transport Aircraft System (UTTAS)?

General GRIBBLE. The Army provided specific comments on a draft of the GAO report and pointed out where the Army differs in viewpoint and provided supporting rationale. The GAO changed its report in all instances with one major and several minor exceptions. I agree with the final GAO report with the exception of the remaining deviations provided in the Army comments. The one major difference is that the GAO feels it would be difficult to justify having a competitive prototype fly off if only three manufacturers compete to participate in the prototype phase of the program. Informal discussions with industry lead me to believe that at least three major helicopter manufacturers will compete. If only these companies participate an adequate spread of professional aircraft designs will result. I believe that the current Army plan to select two manufacturers will be worthwhile. After all, the competitive aspects of such a selection will result in overall savings to the government offsetting the costs of a two manufacturer competition.

Senator THURMOND. Why does the Army feel it is necessary to go for a dual prototype development of the airframe on this helicopter?

General GRIBBLE. Use of the competitive prototype approach in development of the UTTAS should result in the lowest life cycle costs. This is true because the total R&D costs required for any of the considered R&D approaches are dwarfed by the subsequent acquisition and 10 year operational costs. A conservative savings of only 7 percent in acquisition costs alone will more than compensate for the costs for R&D competition. Not only will total costs be lower, but the UTTAS product should be better.

Senator THURMOND. General, the R and D costs for this program seem high. Do you attribute this to the dual airframe development?

General GRIBBLE. It is estimated that the added cost for a competitive prototype fly off or "dual airframe" development will cost nearly $90 million; however, the amount should be easily recouped by savings in follow on acquisition costs alone resulting from the competition. The Army has conducted extensive R&D on reliability and maintainability for utility helicopters. The basic objective of developing a reliable and maintainable UTTAS does require detailed design analysis and does require extensive testing to derive adequate statistical sampling to insure the design will be successful. This testing of components and prototype end items does, of course, add to the R&D cost.

Senator THURMOND. General, in coordinating this program with the Navy and Air Force so that the utility helo needs of these services might also be met with the UTTAS program, have any significant disagreements resulted to date?

General GRIBBLE. On 13 May 1971 at the UTTAS Defense Systems Acquisition Review Council the UTTAS program was described in detail to include alterna-

tives, to all services. The current program was unanimously selected by all services. Coordination with the other services continues. Examples of this coordination are: we have a Navy Department representative sitting on the Source Selection Advisory Council. The engine development specification was informally reviewed by the US Navy for special sea operational requirements.

Senator THURMOND. When does the Army expect to award the contract and when will the fly off take place?

General GRIBBLE. The engine development contract was awarded to General Electric on 6 March 1972. The airframe development contracts will be awarded in September 1972. The competitive fly off will start in September 1975.

Senator THURMOND. After the fly off how long will it take before production begins?

General GRIBBLE. The competitive fly off will be completed in September 1976. The first production contract, which is considered an LP (Limited Production) buy, will be awarded within a few months after the fly off, in the 1st Quarter Fiscal Year 1977. The first LP aircraft will be delivered to the Army in the 4th Quarter Fiscal Year 1978. Full production contract award is scheduled for April 1978.

Senator THURMOND. General, what is the justification for the [deleted] utility helicopters the Army wants? Has the Air Force or Navy given any number estimates?

General GRIBBLE. The quantity of UTTAS requested by the Army is based on planned force levels. Current plans call for, essentially a [deleted] division force in the UTTAS time frame. UTTAS will replace the UH–1 in assault helicopter companies, air cavalry units and aeromedical evacuation units in this force. In addition to equipping these units, maintenance float requirements, training requirements and normal attrition were considered when determining the quantity of UTTAS required. The USAF and the USN have not provided estimates to the Army concerning the numbers of utiilty helicopters required in the future.

Senator THURMOND. General Gribble, what do you feel are the chief technical risks in this program?

General GRIBBLE. Assuming that we may proceed with the current planned R&D program to include a competitive fly off and extensive component and prototype testing, the UTTAS development will be a low risk program. However, a number of new technical features are being incorporated into the UTTAS design such as: elastomeric bearings, composite materials, improved metals, improved design features, improved crash survivability, reduced vulnerability and others. Within that generally low risk spectrum however, the highest risk facet is being able to meet the reliability and maintainability objectives.

LASER SEEKER FLIGHT TESTS

Senator THURMOND. General Gribble, turning to the Hellfire program, what has been learned from current state-of-the-art laser seeker flight tests?

General GRIBBLE. The purpose of the flight tests was to demonstrate the terminal homing accuracy which can be achieved with a laser seeker missile. These tests were conducted with exploratory dollars. There were 15 flights, one of which was a missile failure. The 14 remaining flights have demonstrated the technical feasibiiity of using a helicopter launched laser guided missile to hit tank sized targets. We have learned the following specific items from the tests. The tests demonstrated:

1. Launch from a helicopter in an attack mode to include low level launch (60 feet) and pop-up tactics.
2. A [deleted] missile launch from a helicopter.
3. A capability to designate targets from a ground designator at a range of [deleted].
4. A [deleted] circular error probable (CEP) for the 14 shots. (These 14 shots included firing one seeker which we knew from pre-fire tests was marginal in performance and which missed the center of the laser spot by [deleted] feet. If this shot were declared no test, the demonstrated CEP would be [deleted].
5. The capability of tracking moving targets with the laser designator and achieving target hits. Such hits were made against a target board [deleted).

Additionally we have collated this test data and some simulations conducted with a missile [deleted] laser seeker with the Combat Developments Command Experimental Command tests on helicopter survivability. This data shows us that

when the laser guided missile is launched from a helicopter and designated from the ground, helicopter survivability is considerably enhanced. For instance, the mean exposure time of the helicopter is [deleted] when the position of the target is generally known. Further, when the missile is launched from ranges of greater than [deleted] from the tank type targets protected by the [deleted] there is a negligible antiaircraft threat to the helicopter.

Senator THURMOND. General, when will prototype missile testing begin?

General GRIBBLE. The firing portion of the HORNET Military Potential Test will begin in August of 1973. The HORNET Military Potential Test will be initiated in July of 1972. The first two phases of this test will consist of simulations in an operational environment. These simulations will start with one-on-one tactics and progress to more complex scenarios where a team or teams of the attack helicopter would attack multiple targets in an operational environment. The firing phase of this test will verify the simulation. The firings will use the HORNET missile which we have demonstrated in our terminal accuracy program. These efforts will also verify the utility of our laser designators. The test will provide an in-depth knowledge of the technical and operational effectiveness of this system. The HORNET missile is being used as representative of the capabilities that can be obtained with a helicopter launched laser guided system.

Senator THURMOND. What are the main unanswered questions the Army will have to resolve before proceeding with the Hellfire program?

General GRIBBLE. There are two major questions for which the Army needs answers. These are:

1. What are the mission and performance envelopes of the system?

2. Is the system cost effective in comparison to existing systems? Since we are dealing with new technology and we have a prototype missile which can verify some of our theory, the Army is planning to conduct a military potential test to assist in answering the two stated questions. The objectives of the test are:

[Deleted].

3. To examine tactics and doctrines for employment of laser guided weapons.

[Deleted].

5. To develop an insight for the logistical requirements of the Hellfire missile system.

The information gained from the military potential test should provide the basis for establishing credible mission and performance envelopes and the cost effectiveness of the Hellfire missile system.

Senator THURMOND. Would a successful Hellfire program result in the elimination of the TOW missile as a helicopter anti-tank weapon?

General GRIBBLE. [Deleted]. The Hellfire cost-effectiveness study which is scheduled for completion in April 1974, will indicate [deleted].

Senator THURMOND. When will the cost-effectiveness study on this program be available?

General GRIBBLE. The cost-effectiveness study for Hellfire should be available in April of 1974. This schedule provides for the information resulting from the HORNET Military Potential Test to be incorporated into the study. If the Military Potential Test slips in schedule, the cost-effectiveness study schedule will also be delayed.

SUBCOMMITTEE RECESS

Chairman ELLENDER. Is there anything else?

We will recess until tomorrow morning at 10 o'clock.

(Whereupon, at 12:35 p.m., Monday, March 13, the subcommittee was recessed, to reconvene at 10 a.m., Tuesday, March 14.)

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1973

WEDNESDAY, MARCH 15, 1972

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 10 a.m., in room S–126, the Capitol, Hon. Allen J. Ellender (chairman) presiding.

Present: Senators Ellender, Young, Allott, and Symington.

DEPARTMENT OF DEFENSE

DEPARTMENT OF THE ARMY

SAFEGUARD SYSTEM

STATEMENT OF LT. GEN. W. P. LEBER, SAFEGUARD SYSTEM MANAGER, OFFICE, CHIEF OF STAFF OF THE ARMY

ACCOMPANIED BY:

MAJ. GEN. J. A. KJELLSTROM, DIRECTOR OF ARMY BUDGET, OFFICE OF THE COMPTROLLER OF THE ARMY

COL. HARRIS H. WOODS, CHIEF, PROGRAM AND BUDGET DIVISION, BUDGET AND MANPOWER DIRECTORATE, U.S. ARMY SAFEGUARD SYSTEM OFFICE

BUDGET REQUEST

Chairman ELLENDER. The subcommittee will come to order.

Today, we shall consider the fiscal year 1973 request for the Army's Safeguard antiballistic missile system.

The total request of $1,595,400,000 is contained in six appropriations:

	Millions
Research, development, test and evaluation	$340.5
Missile procurement, Army	753.0
Other procurement, Army	1.4
Military construction, Army	390.0
Operation and maintenance, Army	92.7
Military personnel, Army	17.8

All but one of these requests—that for military construction—will be considered in this appropriation bill.

Lt. Gen. Walter P. Leber, the Safeguard system manager, will be the principal witness. General Leber will also discuss site defense of Minuteman.

You may proceed.

INTRODUCTION OF ASSOCIATES

General LEBER. Mr. Chairman and members of the committee, I appreciate the opportunity to present in some detail the proposed Safeguard program for fiscal year 1973, to review the status of the Safeguard deployment, including the presentation of a short film, and explain the fund requirements. I have with me today Col. Harris H. Woods of my staff.

PROGRAM OBJECTIVES

On March 14, 1969, President Nixon announced the following objectives for Safeguard:

Protection of our land-based retaliatory force against a direct attack by the Soviet Union.

Defense of the American people against the kind of nuclear attack which the People's Republic of China is likely to be able to mount within the decade.

Protection against the possibility of accidental attack from any source.

He further elaborated:

We will provide for local defense of selected Minuteman missile sites and an area defense designed to protect our bomber bases and our commnad and control authorities.

By approving this system, it is possible to reduce US fatalities to the minimal level in the event of a Chinese nuclear attack in the 1970's, or in an accidental attack from any source.

GRAND FORKS SITE PROTECTION

Senator YOUNG. Would the ABM site at Grand Forks provide protection for Minot, AFB, and the Minuteman wing there?

General LEBER. Yes, it would give some protection to that base, with the Spartan.

Senator YOUNG. I returned from Minot yesterday morning, and the people there are very interested in the Safeguard because we have [deleted] Minutemen at those two big military bases. They are interested in protection.

General LEBER. It would not give the same degree of protection at Minot as it would at Grand Forks, because it is not as close to the Minot Minuteman wing. But the long-range radar, the PAR, would reach out and pick up targets coming to Minot and it would be using our long-range Spartan with the [deleted] warhead against those targets.

PROGRAM OBJECTIVE AND SITING CHANGES

Chairman ELLENDER. You will recall that Secretary McNamara presented the Sentinel plan, which is now the Safeguard, and the objectives he had were, first, to protect against a Communist Chinese attack. The second objective was to provide an option to defend some Minuteman intercontinental ballistic missile sites.

The third objective was to provide limited protection against possible accidental launch of an intercontinental missile by any nuclear power. Generally speaking, how does Safeguard differ from Sentinel?

General LEBER. The objectives were changed, and the siting was changed. Most of the Sentinel locations were near large cities. If

you remember, the first one started was near Boston. There was quite an objection raised to that by some people in that area.

The second site was to be near Chicago, and again there was quite an objection raised. There were a total of 17 sites altogether in the Sentinel program.

The primary objective of the Sentinel program was the one you mentioned, of protecting the American people against an attack from the Chinese People's Republic.

Chairman ELLENDER. But it is so remote. I would protect myself against Russia, if I had to, rather than China. I don't think China is even thinking of attacking the United States. It is just a figment of the imagination. That is all it is.

To protect the sites themselves is a drastic change from the original purpose of the Sentinel. You had to have it some way or another. The Army got its way.

Proceed.

General LEBER. Thus, rather than focusing on a single purpose, Safeguard has been and continues to be designed to achieve several objectives against a combination of Soviet and Chinese threats.

ANNUAL REVIEWS

The President also stated—

. . . this program will be reviewed annually from the point of view of (a) technical developments, (b) the threat, (c) the diplomatic context including any talks on arms limitation.

He further stated that—

Each phase of the deployment will be reviewed to insure that we are doing as much as necessary but no more than required by the threat existing at that time.

1970 DEPLOYMENT PHASE

A Department of Defense review, in 1969, led to the initial deployment phase of the Safeguard program in fiscal year 1970, consisting of starting deployment at two Minuteman sites, one near Grand Forks AFB in North Dakota and one near Malmstrom AFB in Montana. Specifically, the facilities and equipments to be authorized at each were as shown on chart 1.

(The chart follows:)

CHART 1

CONGRESSIONAL AUTHORIZATIONS—FISCAL YEAR 1970

Grand Forks: 1 PAR; 1 MSR; [Deleted.] SPARTAN; [Deleted.] SPRINT; 2 remote launch sites.

Malmstrom: 1 PAR; 1 MSR; [Deleted.] SPARTAN; [Deleted.] SPRINT; 2 remote launch sites.

SITE FACILITIES

General LEBER. At each site there was to be a Perimeter Acquisition Radar (PAR), a Missile Site Radar (MSR), the necessary support facilities for each, collocated Spartan and Sprint missiles, and two remote Sprint launch sites.

In November and December 1969, Congress completed authorization and appropriation action for this initial phase of the deployment.

1971 PHASE

The first annual review led to the proposal of the second phase of the Safeguard program for fiscal year 1971. This proposal was to: continue work at Grand Forks and Malmstrom; commence deployment at one additional site in the Minuteman field near Whiteman Air Force Base, Mo.; provide for additional Sprints at the Grand Forks and Malmstrom complexes (as shown on chart 2); and undertake advanced preparation for deployment at five other sites.

(The chart follows:)

CHART 2

CONGRESSIONAL AUTHORIZATIONS

Grand Forks:
- Fiscal year 1970:
  - 1 PAR; 1 MSR; [Deleted.] SPARTAN; [Deleted.] SPRINT; 2 remote launch sites.
- Fiscal year 1971:
  - [Deleted.] SPRINT; 2 more remote launch sites.

Malmstrom:
- Fiscal year 1970:
  - 1 PAR; 1 MSR; [Deleted.] SPARTAN; [Deleted.] SPRINT; 2 remote launch sites.
- Fiscal year 1971:
  - [Deleted.] SPRINT; 2 more remote launch sites.

Whiteman[1]:
- Fiscal year 1971:
  - 1 MSR; [Deleted.] SPARTAN; [Deleted.] SPRINT; 4 remote launch sites.

Warren:
- Fiscal year 1971:
  - Advanced preparation.

GRAND FORKS SITE DIFFERENCES: RADARS AND SPRINT INTERCEPTORS

Senator YOUNG. There is a difference between the Grand Forks site and some of the others. Do they have additional capability there or a double system of radar?

General LEBER. There are really two differences. One is in the radars at the two northern sites, the Grand Forks and Malmstrom. We have the Perimeter Acquisition Radar (PAR) and the Missile Site Radar (MSR) at each of these sites. The PAR has a very long range, out to about [deleted] miles. It can pick up incoming targets, incoming Russian missiles, at [deleted] miles out and start tracking them and finding out where they are going to land.

Senator YOUNG. In all kinds of weather?

General LEBER. Yes, sir; night or day and in all kinds of weather. It can then pass that information over to the Missile Site Radar and tell it to start getting ready to send up something and intercept the attacking warhead. That PAR at Grand Forks can also pass that kind of information to the proposed Missouri site.

Senator YOUNG. There will not be a PAR at the Missouri site?

General LEBER. There will not. The other difference is that, the number of Sprint interceptors at each site vary. At Grand Forks there

[1] Fiscal year 1972 legislation withdrew this construction authorization and restricted Whiteman to advanced preparation only (site selection, land acquisition, site survey and the procurement of long leadtime items).

will be a total of [deleted]. At Malmstrom, only [deleted]. At Whiteman we plan to put in [deleted], and at Warren, [deleted].

Now, the number of Sprints depends on the layout of the Minuteman field. Some of those fields, you know, are long and strung out, and you can't defend them as well from a noncircular site as you can one that is laid out in a circle.

So you have to look at each location, see where the Minuteman silos are located, and then plan your defense. From that you determine how many Sprints are needed.

As I said, at Grand Forks there will be [deleted] and at Malmstrom [deleted]. There will be the same number of Spartans at each site, [deleted] at Grand Forks, [deleted] at Malmstrom, and [deleted] at Whiteman.

Senator YOUNG. Thank you. I was not clear on that.

ORIGINAL AND PRESENT COST ESTIMATE VARIANCE

Chairman ELLENDER. During the course of your presentation can you give us what the original estimate to construct the various sites was and how it differed from the estimates you gave?

General LEBER. Yes, sir; I will do that.

(The information follows:)

The current MCA estimate to construct the four sites in the Minuteman fields is $1,206 million. This contrasts with the original Safeguard four-site estimate developed in the spring of 1970 for the same construction, which totaled $805 million. Estimated costs for construction of the individual sites, other MCA program requirements, and changes leading to the current estimate are summarized in the following chart.

[In millions of dollars]

Site/purpose	Budget hearings, fiscal year— 1971 (spring 1970)	1972 (spring 1971)	1973 (spring 1972)
			3
Grand Forks	233	263	28
Malmstrom	199	236	309
Whiteman	130	155	211
Warren	108	151	208
Other program requirements	135	151	195
Total	805	956	1,206
	Fiscal years 1971–72		Fiscal years 1972–73
Changes:			
Inflation		101	111
Program stretchout		4	4
Program change/revised estimate		46	135
Total change		151	250

1971 PHASE

General LEBER. Continuing now with the fiscal 1971 request, it asked for a continuation of the deployment at Grand Forks and Malmstrom, the addition of a third site at Whiteman Air Force Base in Missouri, and providing for additional Sprints at Grand Forks and Malmstrom and undertaking advanced preparation at five other sites.

ADVANCED PREPARATION SITES

The five sites for which advanced preparation was proposed were: Warren AFB in Wyoming; a site in the vicinity of Washington, D.C.; and Northern border sites in the Upper Northwest; the Michigan/Ohio area; and New England.

On October 1, 1970, the Congress authorized proceeding with all elements of the fiscal year 1971 request except for the advanced preparation on four of the five sites. Thus, Sprint augmentation of the Grand Forks and Malmstrom sites was authorized as well as initiation of deployment at the Whiteman site with the equipments shown on the second chart. Also authorized was advanced preparation for a fourth site located in the Minuteman field near Warren AFB, Wyoming.

WASHINGTON, D.C., SITE

Senator YOUNG. I understand there is a possibility that we may reach an agreement with Russia [deleted]. Russia has been interested in protecting Moscow.

How high on your priority list is Washington, D.C.? There may be some difference of opinion about defending the capital.

General LEBER. The full Safeguard program has had in it a site at Washington, D.C., right from the start. It would be one of the 12 sites. As one of the 12 it would provide area protection for this part of the country and would also provide protection for our National Command Authority, which we abbreviate to NCA.

[Deleted.]

ACQUISITION OF SITE PRIORITY: CONGRESSIONAL DENIAL

Senator YOUNG. But in your priorities of acquisition of land, Washington is not high, is it?

General LEBER. Each year, starting with the request for fiscal year 1971, we have asked the Congress for an authorization to do some advanced preparation at the Washington site. The Congress has not seen fit to grant that. All they did last year was to give us authority to spend about $3 million for some studies. That did not include going out on the grounds and picking any sites.

AUTHORIZED STUDY FOR NATIONAL COMMAND AUTHORITY DEFENSE SYSTEM

So up to this point, we have no authority for anything other than a little bit of study for the National Command Authority defensive system.

[Deleted.]

Senator YOUNG. That is all. Thank you.

Chairman ELLENDER. You have spent or will spend $3 million?

General LEBER. We have not spent it; no, sir. The Congress just gave us that authority last November. We have started the studies, but we have not spent that.

Chairman ELLENDER. What kind of studies are these?

General LEBER. Sir, the question here is: What kind of radars and what kind of interceptors should we put in to protect the National Command Authority if this were an isolated site, not one of 12, but sitting here by itself, such as Moscow, for instance. Would we put in a PAR? If we did, how many faces would it have? We would not just want to be able to face north, because then we couldn't pick up the missiles coming in from the ocean. How many Missile Site Radars should we have; how many Spartan; how many Sprint?

This is a special problem, assuming this is an isolated site. Before spending the money that would be involved, we would want to carefully look at what are the choices and how can we get the most for our money. That is the kind of study that is necessary.

Chairman ELLENDER. Proceed.

1972 PHASE

General LEBER. After the second annual Safeguard review, the President proposed the next phase of the Safeguard program for fiscal year 1972. This recommendation consisted of continuing the deployment at the Grand Forks and Malmstrom sites; starting construction at the Whiteman site, which was authorized in the fiscal year 1971 budget; and taking steps toward deployment of a fourth site either near Warren Air Force Base, Wyo., or in the Washington D.C., area.

In November 1971, Congress authorized continuance of the deployment at Grand Forks and Malmstrom. Also authorized was advanced preparation at the third site, Whiteman, and the fourth site, Warren, for 1972. No authorization beyond study of component configuration for a National Command Authority (NCA) defense system was given.

THIRD ANNUAL REVIEW

Principal findings of the third annual review previously presented to you by Secretary Laird are summarized below.

THREAT

The Soviet threat has continued to evolve both numerically and technologically over the past year. The Soviets have initiated construction of new silo designs which imply that new missiles may be deployed. The Y class missile launching submarine production continues at a high rate. The estimated time when the Soviets could achieve parity with us in Polaris-type submarines is now 1973. Development of new long-range SLBM continues.

U.S. ECONOMY AND CAPABILITY

Senator SYMINGTON. General Leber, let us get all cards on the table about danger from the Soviets. They have no MIRV now, separately targeted units. We in turn are running out of money. The more we put into this system, the less we will have for other essential systems for the services—Air Force, Navy, Marine Corps, and Army.

What I don't understand, you talk of the threat. We have 31 Polaris submarines currently going into Poseidons. Each of the 16

missiles will have a minimum of [deleted] separately targeted weapons. That makes [deleted] dead cities as the possibility.

In addition, we have 10 more Polaris submarines where each tube of their 16 tubes is over [deleted].

Under those circumstances, it would be incredible anyone would want to attack the United States; [deleted] cities dead if anybody did attack.

We have not yet talked about the Minuteman potential, nor the strategic bomber potential.

So what do you mean, insofar as we have no idea that there is any MIRV in the Soviet Union when, you say, "The Soviet threat has continued to evolve numerically and technologically over the past year"?

I have been following the SALT talks carefully, have been to Vienna twice over the past few months. We are the ones far ahead in the submarine field, because of the development of the Poseidon.

[Deleted.]

I just don't see why you base so much of your case on the Soviet threat, why this threat is such that we have to go to all of these new weapons systems.

As was testified to by a former director of research and engineering before the Armed Services Committee, there was a time when we didn't know whether the Polaris system would work, or whether the Minuteman would work. We did feel the bombers would work, because they worked in World War II. So we developed all three systems, called them the TRIAD.

Now, even though everybody says all the systems work, we continue to saddle the taxpayers with all these offensive systems, and now want to add on his back this defensive system.

What are your comments about that, as long as you bring up this so-called Russian threat?

Russian Antiballistic Submarine Increase Vis-a-Vis United States

General Leber. I have simply summarized what the Russians have done. I think the information indicates that the threat has grown. With regard to the degree to which it has grown, of course, some people differ on the exact numbers. But I don't think there can be any doubt that the Soviets now have more submarines that are capable of launching missiles than they had last year.

Senator Symington. But we still have more launchers.

General Leber. But we are not growing as fast as they are in that field. At the rate they are growing, they are going to have as many submarines as we have by next year.

MIRV Missiles

Now, it is true that our Poseidon has a multiwarhead. They do not as yet, as far as we know, have that kind of missile for their submarines. We think if they continue to work on it—and there is indication that they are working on MIRV—they will eventually arrive at it. They have done everything else.

We have started with the atomic bomb and they have gotten it. We have the hydrogen bomb and they have that.

OVERKILL

Senator SYMINGTON. I am a believer in the theory of overkill. What difference does it make if they can kill us 4,000 times and we them only 2,000; or we can kill them 4,000 times and they us only 2,000 times? Why do we have to have every service with a complete strategic picture to answer any attack against this country, especially when all these duplicate systems are breaking the back of the U.S. economy?

I mention it at this point because we hear again and again and again about the great new Soviet threats. Every country is a threat, no doubt. But I don't think we can assume at this point there is any first-strike capability in the Soviet Union. If you can show that, it would be appreciated because, if not, then we should not continue to waste billions of dollars of the taxpayers money.

Thank you, Mr. Chairman.

CHINESE ACTIVITIES TO OBTAIN ICBM CAPABILITY

General LEBER. The Peoples Republic of China (PRC) has continued to develop its nuclear capabilities. There is recent evidence that PRC is continuing activities to obtain an ICBM capability. This capability would become operational as early as 1975, but it will more likely be about 1976–77.

Chairman ELLENDER. Why do you assume that represents a threat to the United States?

General LEBER. We are not trying to deal in assumptions here. I am strictly talking of capability. The information we have is that they are talking about getting an ICBM capability.

Chairman ELLENDER. How do you know it is not to protect China against Russia?

General LEBER. I don't know.

Chairman ELLENDER. But you are building against it. You have a fear that causes you to come before this committee and present the possibility that China may strike, so we must be prepared.

MINUTEMAN DEFENSE

General LEBER. That is right. However, we are not yet building against the Chinese threat, because to deal with that we need 12 sites spread all over the country. What we are building now are sites for Minuteman defense.

Senator SYMINGTON. One reason we are not building against the Chinese threat is that the Congress has limited, by law, what we can build against. When you all came up here with the idea we had to protect this country against China, but didn't have to worry too much about the Soviet Union, that is when I got off the bandwagon. Then we shifted from area defense, the Sentinel system, to Safeguard. But we didn't change the design in order to take care of the changed mission.

SAFEGUARD TECHNICAL PROGRESS

General LEBER. Progress on the research and development portion of the Safeguard program over the past year has been outstanding and there are no technical problems which would affect a decision to proceed with the Safeguard deployment in 1973. The prototype Missile Site Radar (MSR) located at Meck Island in the Kwajalein Atoll has been operating since September 1968. It has met or bettered all of its design objectives. In December 1969, two ICBM's launched from Vandenberg Air Force Base, Calif., were successfully tracked.

Test Programs

The Safeguard system test program began at Meck Island in the spring of 1970 and 23 tests have been conducted to date. Of these, 19 have been successful, two partially successful, and two unsuccessful.

The first phase of the system test program contained 16 tests and was completed in the fall of 1971. This phase verified basic system design concepts and demonstrated system level integration of hardware subsystems while evaluating software programs to be used in later testing. Test results during this phase were 12 successful, two partially successful, and two unsuccessful.

The second phase of the Safeguard system test program which contains about 40 planned missions began in the fall of 1971. This series of tests is being conducted using advanced data processing programs which contain more tactical elements than the previous ones. Tests in this series are designed to evaluate the integrated system using more complex intercept geometries which stress specific system functions. Seven tests, all of which were successful, have been conducted thus far in the series. These tests have included both Spartan and Sprint intercepts of target reentry vehicles launched by ICBM and SLBM type boosters.

Perimeter Acquisition Radars (PAR)

The Perimeter Acquisition Radars (PAR) are under fabrication and the first installation will be at Grand Forks (the first Safeguard operational site). The Air Force's AN/FPS-85 radar, which is based on similar technology and same frequency, has been operational since late 1968, at Eglin AFB, Fla. A limited engineering development model (LEDM) of the PAR was constructed at the Syracuse, N.Y., General Electric plant during 1969 and has completed test. The presently scheduled date for deployment of the first PAR site is October 1974.

Assembling of Components Without Test

Senator Young. We have never really had a prototype test approach. have we?

General Leber. No, sir. We have not put together the full PAR as it will be at North Dakota and tested it as a prototype. As I said, the reasons we did not is that we observed the Air Force's experience with their radar in Florida, which is the same frequency and same type radar. We had the contractor, General Electric, put together the components of the PAR without the building.

Senator Young. General Electric or Western Electric?

General Leber. General Electric is on the PAR. Western Electric is the contractor over the whole system.

Contractor Profits

Senator Symington. Is General Electric making a profit?

General Leber. Yes, sir.

Senator Symington. Is Western Electric making a profit on the G.E. units?

General Leber. Western Electric makes a profit on the subcontracts.

Senator SYMINGTON. They do make a profit?
General LEBER. Yes, sir.
Senator SYMINGTON. Western is owned by A.T. & T.; correct?
General LEBER. Yes, sir.
Senator SYMINGTON. Is that figure in the rate structure of A.T. & T.?
General LEBER. No, sir.
Senator SYMINGTON. Is this icing on the cake? It is a cost-plus contract; is it not?
General LEBER. Yes, sir.

DECISION NOT TO TEST SPRINT AND SPARTAN INTERCEPTORS AT GRAND FORKS

Senator YOUNG. Would it be possible to use a site like Grand Forks as a prototype to test the Sprint and Spartan?
General LEBER. We have looked into that, sir, and feel it is not feasible to launch those interceptors from that site even if they had dummy warheads. For one thing, we would be flying over Canada, and that is not going to be very popular. So we have decided not to try firing interceptors from the North Dakota site.
We will do everything short of firing the interceptor in the way of testing the system to see that it will work. But we are not planning to launch the Spartan or Sprint from the North Dakota site.
Senator SYMINGTON. Mr. Chairman, I would ask, you are not prepared to launch them even without a nuclear warhead?
General LEBER. No, sir; we don't think we could do that feasibly. Of course, Vandenberg is right on the coast. The Air Force launches their missile over the Pacific and there are no people or cities involved.

TESTING AT KWAJALEIN

Senator YOUNG. Will you take the Sprint and Spartan out of their silos to test them?
General LEBER. Yes, sir; we will. We have a program for that to selectively take an interceptor out of its silo, take it out to Kwajalein and test it. This will be done over the years to be sure that our system is still reliable.

1972 ACHIEVEMENTS

Command and control requirements for the interface with the Air Force Minuteman equipment have been defined, and a study of the integration of Safeguard with Continental Air Defense Command has been completed. At this point I would like to show a short film which highlights the progress achieved over the past year.
Senator YOUNG. I think we should wait to show the film when the chairman returns.
General LEBER. Let us continue and we will come back to it.

CONSTRUCTION PROGRESS

The construction depicted in the film was as of early October 1971. Of course, since that time additional work has been completed. A summary of the construction status and equipment readiness dates (ERD) of the first two Safeguard sites at Grand Forks and Malmstrom is shown in the following chart:

SAFEGUARD CONSTRUCTION STATUS

Site, ERD and components	Percent completion Feb. 29, 1972	Construction completion date
Grand Forks, October 1974:		
PAR buildings	82	August 1972.
MSR buildings	82	January 1973.
Collocated Spartan field	95	Do.
Collocated Sprint field	78	Do.
Remote Sprint fields 2 and 3	47	Do.
Remote Sprint fields 1 and 4	3	July 1973.
Malmstrom, April 1976:		
PAR and MSR buildings	5–10	April to July 1974.
Collocated Spartan and Sprint fields	(1)	July 1974.

[1] Starting.

Grand Forks and Malmstrom Sites

All of the ground equipment for Grand Forks and Malmstrom is under procurement contract. Production for the operational Spartan and Sprint missiles to be deployed at the first two sites is underway. Procurement has been initiated for the Whiteman site.

Senator Young. Have you resolved the labor problems at the Malmstrom site?

General Leber. Yes, sir; we have.

Construction of the first two Safeguard sites at Grand Forks and Malmstrom Air Force Bases is now proceeding. Construction for Grand Forks is currently about 80 percent complete overall and Malmstrom construction is about 5–10 percent complete. A labor contract problem caused a slip in the Malmstrom site schedule of about 11 months. A letter contract to complete construction of the technical facilities at the PAR and MSR was signed December 2, 1971. The contract provided for proceeding with construction mobilization, and was definitized as a fixed-price contract on February 24, 1972.

Private Construction for Housing of Construction Workers at Grand Forks

Senator Young. I would like to ask questions about the Grand Forks site. I have received complaints from some of the small towns near Grand Forks. People there built housing to provide for construction workers. They feel now that the Government will be building too much housing at the ABM site and their facilities will be unused.

General Leber. I really don't think that is a danger. If anything out there, we are still very short of housing. As a practical matter, I don't think there will ever be too much. The construction contractor is now in the last phases of his work. He is 80 percent complete. This coming summer and fall he will be phasing out.

At the same time, the weapons system contractor is going to move into this site with on the order of 1,000 people, all of whom need housing. Following that will come the ARADCOM, or the Army Air Defense Command, and other people. So our surveys indicate there is just no surplus housing, and we don't predict there will be any.

Operational Personnel

Senator Young. After the site becomes operational, about how many people will be housed at or near the ABM site and about how many will require housing in the local communities?

General LEBER. There will be a total at Grand Forks of about 1,500 people to operate that site complex. For those, we are scheduling now about 600 units of family housing to be built on site. Those are the people who have to live near the radars to be available in time of an emergency.

So there are still about 900 of them that we expect—some of them will be bachelors—but we expect a portion of them will be looking for housing in the surrounding community.

We continue to make surveys out there and there has not been much construction of new housing out there for this project.

The little towns are pretty conservative, and they have not gone into any speculation for housing. They have had trailer housing, but we expect that when the construction is over the trailers will not be needed. I am talking about the kind of housing people will be willing to live in over a period of a year. If they would build it, we would use it. It is just that simple.

SEWERS AND WATER MAINS

Senator YOUNG. That is a good answer. They, of course, have built other facilities, such as sewers and water mains.

General LEBER. Yes, sir; and we have helped with that.

IMPROVEMENT OF AIRPORT AT LANGDON

Senator YOUNG. One program they needed badly, which you have not really been able to accomplish because there is no authorization, is the airport in Langdon. The nearest airport to the ABM site is Grand Forks. Most of the personnel now use helicopters to go from Grand Forks to the Langdon area.

General LEBER. I realize that.

Senator YOUNG. If that small airport at Langdon were improved, the personnel going to the ABM site could use small planes rather than helicopters.

What they need is snow removal equipment and parking facilities for planes. Neither one of those is eligible for funds under the Mansfield-Young amendment or the Federal Aviation funding. Is there any way in which they could be helped?

General LEBER. We have no authority to help it now. Part of the problem is that when it gets into the operational phase, we cannot justify an airport. The amount of traffic coming in there will be so small. Most of it can be handled by vehicle. We cannot justify the expenditure involved for an airport.

Senator YOUNG. Wouldn't a considerable number of service personnel utilize an expanded airport?

General LEBER. Some, but not many. You can do it by vehicle, and the weather during part of the year is such that you cannot fly anyway. They are planning on bringing in their repair parts, for example, by truck. It would be just an occasional flight for some visitor, for example. You cannot justify an airport just for this.

Senator YOUNG. If you continue to use helicopters the way you are now using them, it could be much cheaper.

General LEBER. The Air Force already uses them in that area to serve for the Minuteman field; we have used the same helicopter.

Senator YOUNG. But if you are going to have a substantial number of military personnel going back and forth, it would be cheaper to spend a little money on the airport and use fixed-wing planes.

General LEBER. We will look into this problem.

Senator YOUNG. Thank you.

(The following additional information was subsequently supplied:)

The Army has previously responded to queries from the Langdon airport authorities regarding the types of aircraft used by agencies associated with SAFEGUARD and the use they might make of the Langdon airport. Several agencies have indicated use of the facility if commercial services were available on adequate schedules. In general, available aviation capability at Langdon airport would be used in those cases where it proves cost effective. However, it should be noted that Army plans for support of military activities at the Grand Forks SAFEGUARD site do not require the use of local civilian airport facilities.

FILM SHOWING OF 1972 ACHIEVEMENTS

General LEBER. Senator Ellender, we deferred showing the short film we have until you got back to show the progress we have made. If it is agreeable with you, we will do that now.

(At this point in the record a film entitled "Safeguard System Progress Report" was shown.)

MORRISON-KNUDSON CONTRACT

Senator YOUNG. I have heard the reports, General Leber—whether they are accurate or not, I don't know—that Morrison-Knudson in North Dakota is losing money. What kind of a contract do they have? Is it one on which they could lose money?

General LEBER. It is a fixed-price contract advertised and awarded to the low bidder. So it is possible that they could lose money. They have bid and given us a price. I have not heard that they are losing money.

Senator YOUNG. How many bidders were there?

General LEBER. I would have to look that up for the Grand Forks site.

But I would think there were not more than three or four. At Malmstrom, the Montana site, there were only two. These projects are so large it is difficult to get construction firms with the capability to handle them.

(The information follows:)

Three joint ventures, sponsored by Morrison-Knudsen Co., Inc.; Dravo Corp.; and Martin K. Eby Construction Co., Inc. submitted bids for construction of the Grand Forks major technical facilities.

SPRINT-SPARTAN SPEED COMPARISON

Senator YOUNG. The Sprint appeared to travel very rapidly. How much faster is that than the Spartan?

General LEBER. Much faster. The Sprint gets out [deleted].

[Deleted.] So that will give you an idea. It is pretty fast. Of course, it is designed to operate in the atmosphere closer in. The Spartan does its work [deleted].

Senator YOUNG. Thank you.

SYSTEM OPERATION

Chairman ELLENDER. I would like to ask a few questions about the movie you have just shown. The experiments involved a lot of people. As I understand it, when Safeguard is completed, it will be self-operational.

General LEBER. Yes, sir; you have to turn it on.

RADARS

Chairman ELLENDER. I understand that. Will this radar be operational at all times?

General LEBER. Yes, sir; the radars would be on all the time, tracking, searching, and particularly the Perimeter Acquisition Radar, to see if there would be any targets coming in. Of course, we would hope to get some warning from our BMEW's so we would have [deleted] warning. But we would be essentially operational all of the time.

ANNUAL COST OF OPERATION

Chairman ELLENDER. General, could you give us an estimate of the annual cost of the Safeguard system?

General LEBER. Well, I have it for the four-site program. It would run about $210 million a year for O. & M., A. and MPA after the system is completed.

OPERATION PERSONNEL

Chairman ELLENDER. That covers what?

General LEBER. That covers the manning of the sites.

Chairman ELLENDER. How many people are required?

General LEBER. As I said, at the Grand Forks site there would be a total of about 1,500 and the same at the Malmstrom site. At the Whiteman site there would be about 1,000.

The difference there is because we don't have the Perimeter Acquisition Radar at Whiteman. So the total for four sites would be about 5,000 people. That is at the tactical sites. Then you would have the depot and the training facilities to train replacements and other support personnel.

Senator YOUNG. Does this 1,500 personnel figure include Western Electric personnel and servicemen?

General LEBER. The few that will be there. We are talking about after the site becomes operational, the contractor, we feel, will still have a few highly specialized technical advisers there to advise the Army people, but there will be very few of them. Most of these people I am talking about will be Army, either military or civilian.

Senator YOUNG. But the Army will have to pay for the personnel from General Electric and Western Electric?

General LEBER. And that is included in the figure I have given you.

Senator YOUNG. Thank you.

COMPUTER OPERATIONS AND TESTING

Chairman ELLENDER. As I said, and I understood you to agree, after the sites are completed, the whole system would be operated through computers.

General LEBER. Yes, sir; when the battle is on you have to have the computer, because it is so fast you could not do it with human beings alone.

Chairman ELLENDER. Have you ever tested this complete system insofar as it is to be handled through electronics?

General LEBER. The films you saw there of the tests at Kwajalein used the computer, used software, used the Missile Site Radar, which you saw a picture of, and you saw both the Spartan and Sprint interceptors. The facility out in the Pacific does not have the PAR. We are using one of the other radars out there to simulate the PAR; in other words, to do the work the PAR will do at Grand Forks. So we have put together the Missile Site Radar, the two interceptors, and have a simulated PAR at the Pacific. We are carrying on all of these tests essentially under the control of the computer.

Chairman ELLENDER. All of that is done with the knowledge of what——

General LEBER. Yes, sir; we know when it is going to happen and where it is coming from.

Chairman ELLENDER. You can regulate the distance and other factors?

General LEBER. Yes, sir.

COMPUTER OPERATIONS UNDER AUTHORITY OF MAN

Chairman ELLENDER. When this system is completed, it will be left to a computer as to when to shoot the Sprint or Spartan?

General LEBER. When man enables it to. You see, you still depend on man to say you can fire nuclear weapons. The computer doesn't have that authority. But once we enable the system, then the computer is essentially running the battle.

Chairman ELLENDER. Then, once the battle starts, personnel have very little to do.

General LEBER. Only to start or stop it, is what it amounts to. Man can modify, however, the computer's response to the attack.

SIGNALING OF INTERCEPTORS

Chairman ELLENDER. How near must a missile approach its target before the signal is given to intercept it?

General LEBER. The miss distance varies with the type of interceptor.

Chairman ELLENDER. I am asking about Spartan and Sprint.

General LEBER. I am saying with the Spartan it would come within [deleted]. With the Sprint, which is the smaller one, it would come within [deleted]. That would be close enough to kill the target because we are using a nuclear warhead.

Chairman ELLENDER. Do I understand you would have two shots at an incoming missile?

General LEBER. You can, yes, sir. The system will fire, look at the results and fire again if necessary. [Deleted.] You have time to do that.

Chairman ELLENDER. That would be over our own territory?

General LEBER. Yes, sir, or Canada.

Chairman ELLENDER. This second shot is also guided or fired through electronics?

General LEBER. Yes, sir.

Chairman ELLENDER. And man will have not a thing to do with it, except to see that the computers are working?

General LEBER. Yes, sir.

Chairman ELLENDER. Will these computers be in operation at all times?

General LEBER. Yes, sir.

Chairman ELLENDER. Without interruption?

General LEBER. Yes, sir.

Chairman ELLENDER. Earlier you referred to annual operation cost of approximately $210 million. What is included in that estimate?

General LEBER. That is the estimated annual operation and maintenance and military personnel cost.

Chairman ELLENDER. After the system becomes operational, do you anticipate there will be other substantial costs, such as modifications?

General LEBER. Here you have to make some estimates on what is going to happen to the system after it becomes operational. You can consider other systems that have been built and operated, and I would say it is probable you are going to want to improve it. I have not yet seen a system that was built and then was perfect. So I would think there will be a continuing requirement for development and some requirement for procurement of new parts or replacement of part of the system. We have tried to estimate this. The total of the research and procurement and whatever little bit of construction would be involved, we think, might run into the order of $100 million a year for four sites.

Chairman ELLENDER. For R. & D.?

General LEBER. And procurement. This is on the assumption you are going to want to improve your system. As I say, everything leads us to believe you want to improve.

Chairman ELLENDER. If it is not yet operational, how can you determine improvement requirements?

General LEBER. They are going to be operational. The radars are going to be searching. We are going to have exercises that we can run with the computer to test the system continuously. The one thing we are not going to do is to fire interceptors from sites in the States. But we will have tracking satellites, and we will have many opportunities to test the system.

In addition, we feel this program at the Kwajalein Missile Range will probably continue under the general research and development program for antiballistic missiles into the future. And as it continues, they will develop better ways of doing some of these things. Some of those might be applicable to the Safeguard system.

Chairman ELLENDER. So this is a continuous process?

General LEBER. Well, sir, we always try to improve. I think that the program, the research and development program, will continue.

Chairman ELLENDER. Well, I am glad I voted against it.

SPARTAN AND SPRINT INVENTORIES

Senator SYMINGTON. Mr. Chairman, I ask a question in the context of your question. Do you have [deleted] Spartans and [deleted] Sprints, General, that you plan to house?

General LEBER. Yes, sir.

Senator SYMINGTON. If those are shot in defense, our positions are helpless, aren't they?

General LEBER. [Deleted.]

Senator SYMINGTON. If the danger is serious, the offense can saturate the system, can he not?

General LEBER. I think it is a question of how many weapons he has. If he goes on increasing the number of ICBM's and SLBM's that he has available to him, this system will not handle it. Of course, we recognized that from the start.

As one plan for handling it, we have started bringing along the system which we call Site Defense of Minuteman to augment the Safeguard and put more interceptors in and mount them.

Senator SYMINGTON. If your analysis of Soviet missile capacity is correct, it won't handle it today, so you are building something you know is ineffective if they are serious in their attack, using your own figures.

General LEBER. Of course, it is not available today, but we think it would handle, if it were available, today's threat. But if the threat grows and continues to grow, it will go beyond the capability for which it was designed.

Senator SYMINGTON. Thank you, Mr. Chairman.

PROTECTION OF MINUTEMAN SITES

Chairman ELLENDER. This entire system is constructed and conceived primarily to protect our own missile sites?

General LEBER. The Safeguard system has several objectives. The only one of those objectives we are implementing now is the protection of the Minuteman sites, because those are the only sites the Congress has authorized.

Chairman ELLENDER. But that is the basis of your presentation to us—that it was necessary for us to protect our present sites in order to be able to retaliate?

General LEBER. Yes, sir.

Chairman ELLENDER. And that is the primary purpose, as I understand it.

General LEBER. Of the presently approved program.

POSSIBLE SYSTEM EXPANSION

Chairman ELLENDER. I presume that in time we are going to ask that it be expanded, not only to protect the sites but the surrounding area. Probably more of these would be requested to protect other areas.

General LEBER. That would depend on the threat, yes, sir.

Chairman ELLENDER. Proceed.

1973 PROGRAM

General LEBER. The annual review of the threat, technical progress and diplomatic considerations, has led the Secretary of Defense to propose the following Safeguard program for fiscal year 1973.

1. Proceed with the planned deployment at the four Minuteman sites.

2. Initiate advanced preparation for defense of the NCA at Washington, D.C.
3. Plan for the longer term to continue the deployment leading to full 12-site Safeguard.
4. Continue with the prototype demonstration program for Site Defense of Minuteman.
5. Continue with area defense research and development.

MINUTEMAN AND AREA PROTECTION: SITE DEPLOYMENT AUTHORIZATION

Chairman ELLENDER. When you talk about the planned 12-site Safeguard deployment, how many of those sites are located at our Minuteman ICBM complexes?

General LEBER. Only four of the 12 are in Minuteman fields. The rest of the eight sites are spread around the country to accomplish the objective of giving area protection to the American people against the kind of an attack which may come from the Chinese.

Senator YOUNG. Your report states: "Continue with the prototype demonstration program for the Site Defense of Minuteman.

General LEBER. I will explain that in a little more detail.

SITE COST DECREASE: RESEARCH AND DEVELOPMENT COSTS

Senator SYMINGTON. May I ask a question. In 1970, the cost of the four bases was estimated at $6.5 billion. In 1971, it was estimated at $7.1 billion. Now, for the four sites alone, exclusive of Atomic Energy Commission costs, it is estimated at $8.0 billion.

In addition to that, I know, as a member of the Joint Committee, the atomic aspect of it will cost about another billion. That is up to about $9 billion for these four sites.

In your opinion, assuming a steady dollar, does that mean that the 12 sites will cost $27 billion?

General LEBER. No, sir. I can give you the figures for the 12 sites, the same ones you have given.

Going back to the fiscal year 1971 hearings, the acquisition cost estimate for 12 sites was $10.7 billion. Last year it was $13.7 billion. This year it is $16.3 billion.

Senator SYMINGTON. How can you have four sites costing roughly $9 billion, counting your atomic warheads? What was the total figure for the 12 sites?

General LEBER. $16.3 billion.

Senator SYMINGTON. So you could put eight more ABM sites up for less than the original price of the first four sites?

General LEBER. Yes, sir; because the research and development would have been done. We would not have to do that over for the 12. And with the increase in volume, product unit price would go down on interceptors and radars, and so on.

Senator SYMINGTON. You mean the learning curve?

General LEBER. Yes, sir.

Senator SYMINGTON. Would you supply for the record a more detailed breakdown as to how that would develop from the standpoint of four sites costing some $9 billion, 12 sites $16 billion?

General LEBER. Yes, sir.

(The information follows:)

There are certain SAFEGUARD costs which are relatively fixed and independent of the size of the deployment. These include the costs for such effort as the RDTE program, management activity, the depot and the Central Training Facility. Under current deployment schedules, SAFEGUARD fixed costs are estimated to be approximately $4.1 billion. To this amount, a variable cost averaging roughly $1 billion per site must be added to obtain the DOD acquisition cost (RDTE, procurement and MCA cost through last site completion) for any given deployment. The average cost of $1 billion per site assumes the same configuration for each added site, so that the cost could normally be expected to decrease as the number of sites increases. This decrease, however, is offset by the extension of overhead costs over longer periods required for the larger deployments and by the increased rates of inflation allowed for the later years.

Using the rough relationship of fixed and variable costs described above, the DOD acquisition cost of a 4-site deployment is currently estimated to be about $8 billion whereas the 12-site acquisition cost estimate comes to a little over $16 billion. This is exclusive of AEC costs of about $1.04 billion for a 4-site deployment and $1.24 billion for the full 12-site deployment.

FUTURE SITES PROTECTION OF AREAS

Chairman ELLENDER. I have one more question. As I understand it, you have been limited by the Congress to full deployment at only two sites—Grand Forks and Malmstrom.

General LEBER. That is correct.

Chairman ELLENDER. Proceed.

1973 PROGRAM

General LEBER. The program I have just outlined will do these things:

One. Provide a level of protection, depending on the nature and severity of the attack, for Minuteman and command and control centers in the Central United States (Omaha and Colorado Springs) at the earliest possible time, and a base for defense of inland bomber bases with improved area defense components.

NORAD AND OMAHA PROTECTION

Senator ALLOTT. Mr. Chairman, may I ask a question. In the case of Norad you would have only a general area defense for both Norad and Omaha?

General LEBER. Yes, sir, with Spartan.

Senator ALLOTT. Do we have a map of where these bases are proposed to be located?

Go ahead, General. I will look at that while you are talking.

1973 PROGRAM

General LEBER. Two. Provide defense of the NCA against small attacks or accidental launches, and the means of affording added valuable time for decisionmaking in the event of a mass attack on Washington, D.C.

Three. Provide the base for augmented Safeguard defense of Minuteman if future threat developments warrant. The Site Defense of

Minuteman is a separate program for augmentation of Safeguard and will be discussed later in this presentation.

Four. Provide the means of introducing advanced nationwide area defense at a later time.

Five. Enhance probability for success of SALT.

Chairman ELLENDER. All right.

DEPLOYMENT SCHEDULE

General LEBER. The scheduled equipment readiness dates (ERD) for the deployment are as follows:

October 1974, Grand Forks; April 1976, Malmstrom; early 1977, Whiteman [1]; late 1977, Warren [1]; early 1979, initial defense of NCA.[2]

WHITEMAN SITE

Senator SYMINGTON. How much money are you requesting for Whiteman?

General LEBER. Total for Whiteman is $289.5 million. That includes the Whiteman share of procurement, as well as construction.

Senator SYMINGTON. Thank you.

NATIONAL COMMAND AUTHORITY

General LEBER. Early 1979, the initial defense of the National Command Authority, would be the same kind of defense we would provide as part of the 12-site deployment [deleted].

Chairman ELLENDER. This is a part of the 12-site program?

General LEBER. It is a modification of the 12 sites.

PROGRAM COST AND SCHEDULE

The total DOD funding requirements (new obligational authority) for Safeguard are those indicated on chart 3.

(The chart follows:)

CHART 3

SAFEGUARD FISCAL YEAR 1973 BUDGET REQUEST

[In millions of dollars]

Appropriation	Continuation of previously authorized program	Whiteman and Warren	Advanced preparation, Washington, D.C.	Total
R.D.T. & E.	330.5		10.0	340.5
PEMA	497.5	238.2	18.7	754.4
MCA	[1] 41.0	349.0	[2]	390.0
OMA	92.7			92.7
MPA	17.8			17.8
NOA total	979.5	587.2	28.7	1,595.4
Estimated expenditures, fiscal year 1973				(1,458.9)

[1] Includes $26,000,000 community impact assistance and $15,000,000 standard miscellaneous design.
[2] $6,000,000 MCA appropriated in fiscal year 1972 will be used for site survey and design of NCA.

[1] Based on initiation of construction in early calendar year 1973.
[2] The initial defense of the NCA is the same as would be provided in the 12-site Safeguard deployment and consists of a single Missile Site Radar (MSR) and interceptors. A Safeguard site at Washington under an arms control agreement permitting ABM defenses of national capitals might need to provide for a [deleted] deployment of [deleted] deployed by late [deleted]. The current program calls for initiating the multifaced PAR design required by the [deleted] deployment.

WHITEMAN, WARREN, AND WASHINGTON, D.C. SITES

General LEBER. As you can see from that chart, $979.5 million will be required for continuation of the previously authorized program. In other words, the first two sites; $587.2 million is intended to initiate deployment at the Whiteman and Warren sites. A much smaller amount, $28.7 million, would be employed for advanced preparation for the Washington, D.C., site.

Senator YOUNG. Does that include any money for acquisition of land?

General LEBER. No, sir; it does not. It is for research and procurement. It is not expected to include any acquisition of land. As a matter of fact, what we would try to do in the case of the National Command Authority defense is to use Government land to the maximum extent possible to avoid having to acquire any more land in this area.

Senator SYMINGTON. You say construction and production. There was not even a prototype of the computer; there was only a mockup.

General LEBER. That was the PAR.

Senator SYMINGTON. I understand. Are you producing missiles for Whiteman?

General LEBER. No, sir.

Senator SYMINGTON. Does any of this money involve the purchase of missiles for Whiteman?

General LEBER. We have not ordered any missiles for Whiteman.

Senator SYMINGTON. You have $150 million for construction. What is the $113 million for production at Whiteman?

General LEBER. If the deployment at Whiteman is authorized as we propose here in the 1973 program, we would start the procurement of missiles for Whiteman in fiscal 1973.

Senator SYMINGTON. That is all I asked.

1973 FUNDING REQUIREMENT BY APPROPRIATION

General LEBER. With that background, I would like to take each of the appropriation categories for Safeguard and explain in some detail the requirement for the funds. I believe it would be easier to follow if a more detailed chart were used (chart 4), which gives for each appropriation and in total the amount made available to date, obligations and expenditures through January 31, 1972, and the amount requested for fiscal year 1973.

As you can see in summary, approximately $5 billion has been appropriated and made available to date with $4.3 billion obligated and $2.9 billion expended through January 31, 1972. The amount requested for fiscal year 1973, $1,595.4 million, is the same as shown on the preceding chart.

RESEARCH, DEVELOPMENT, TEST, AND EVALUATION

Chairman ELLENDER. General, before you proceed with your discussion of the request for $340.5 million for research, development, test, and evaluation, I want to include in the record selected paragraphs from the descriptive summary.

(The information follows:)

FISCAL YEAR 1973 R.D.T. & E. DESCRIPTIVE SUMMARY—SAFEGUARD DEFENSE SYSTEM

CATEGORY: OPERATIONAL SYSTEMS DEVELOPMENT

Budget Activity No. 3—Missiles and Related Equipment

Background.—President Nixon, on March 14, 1969 announced the following defense objectives for SAFEGUARD: (a) "Protection of our land-based retaliatory forces against a direct attack by the Soviet Union," (b) "Defense of the American people against the kind of nuclear attack which Communist China is likely to be able to mount within the decade," (c) "Protection against the possibility of accidental attacks from any source." He further elaborated that: (a) "We will provide for local defense of selected MINUTEMAN missiles sites and an area defense designed to protect our bomber bases and our command and control authorities," (b) "By approving this system, it is possible to reduce U.S. fatalities to a minimal level in the event of a Chinese nuclear attack in the 1970's or in the event of an accidental attack from any source." Rather than focusing on a single purpose, SAFEGUARD has been and continues to be designed to achieve several objectives against a combination of Soviet and Chinese threats. The President also stated on March 14, 1969 that "This program will be reviewed annually from the point of view of (a) technical developments, (b) the threat, and (c) the diplomatic context including any talks on arms limitations." He further stated that, "each phase will be reviewed to insure that we are doing as much as necessary but no more than required by the threat existing at that time." Soviet tests of modifications of the SS–9, SS–11, and SS–13 have continued. Even if the Soviets add no more Intercontinental Ballistic Missiles (ICBM) to their forces, qualitative improvements, to include Multiple Independent Re-entry Vehicles for the existing force levels could pose a threat to the survivability for U.S. land-based ICBM's unless defensive measures are taken. There has been no slowdown in the deployment of Soviet Y-class submarines and a new long-range Sea-Launched Ballistic Missile is being tested. These could threaten the survivability of our strategic bomber force. The Chinese have continued to make progress towards the development of an ICBM system. Estimated earliest possible initial ICBM capability is 1973 with the more likely time being the mid-1970s. The President discussed developments in the Strategic Arms Limitations Talks (SALT) in his Foreign Policy Report to Congress on February 25, 1971. Although there has been progress in SALT, the necessary results have not been obtained from the negotiations to allow change in basic plans for SAFEGUARD. This year a complete and comprehensive review was conducted in accordance with the President's commitment of March 14, 1969 for a measured and orderly deployment of SAFEGUARD, taking only the minimum steps necessary to preserve our ability to meet the threat as it evolves.

The OSD budget decision is to request authorization to implement the following SAFEGUARD program through FY 73: (a) Continue construction at the sites at Grand Forks Air Forks Air Force Base, North Dakota and Malmstrom Air Force Base, Montana, (b) In FY 73, start construction at the site at Whiteman Air Force Base, Missouri and Warren Air Force Base, Wyoming. (c) Take steps toward deployment of a site in the Washington, D.C. area. (d) Continue prototype demonstration development on the dedicated Hardsite Defense (HSD) system for protection of MINUTEMAN.[1]

This decision reflects the following considerations: (a) To be responsive to the evolving threat, orderly progress on the SAFEGUARD defense of MINUTEMAN and those research and development activities for improving future MINUTEMAN survivability should continue. Deployment of the Whiteman and Warren sites would allow the completion of the required four-site MINUTEMAN defense and a light defense of some inland strategic bomber bases and command and control centers. (b) The National Command Authorities (NCA) in the Washington, D.C. area are vulnerable to attack by Soviet Intercontinental Ballistic Missiles (ICBM) and Sea-Launched Ballistic Missiles (SLBM). The defense of our NCA would add to the credibility of our deterrent. At the same time, the NCA defense is part of one option of a U.S. Strategic Arms Limitation proposal and is of interest to the Soviet negotiators. Proceeding now with advanced preparation activities for the NCA defense site will provide the option to complete this

[1] Subject to revision based on Presidential review.

defense at the earliest date. (c) Steps toward a full light area defense deployment covering the contiguous U.S. continues to be a desirable objective because of the continuing efforts of the Chinese to produce an ICBM. Therefore, we should retain the option for proceeding with the full 12-site SAFEGUARD. (d) Because the deployment of Soviet strategic offensive forces continues, it is prudent to retain the option to reinforce the defense of U.S. Strategic Forces with a dedicated Hardsite Defense (HSD) of MINUTEMAN. Thus, continuing the prototype demonstration of the HSD system is part of the FY 73 program. (e) The proposed program for SAFEGUARD requests funds and authorization for construction of two additional MINUTEMAN defense sites, advanced preparation for an NCA defense and provides the President flexibility with regard to SALT developments and in combating the offensive threat.

Description.—The development program for the SAFEGUARD Ballistic Missile Defense System is being conducted to support the Equipment Readiness Dates. The SAFEGUARD Ballistic Missile Defense System will consist of two types of phased array radars: The Missile Site Radar (MSR), the Perimeter Acquisition Radar (PAR) and their associated data processors, and of two types of missiles: The SPRINT and the SPARTAN. The SAFEGUARD components serve the following basic functions: The PAR is the long-range radar which first acquiries and tracks the target; the MSR is the shorter-range radar which continues to track the target and also guides the interceptor missiles; the SPARTAN is the long-range defense missile; and the SPRINT is the high acceleration terminal defense missile. The data processors provide the necessary calculations for the entire intercept operation.

Work performed by.—Management: The SAFEGUARD System Manager, Office of Chief of Staff, U.S. Army, Washington, D.C.; with subordinate elements including the SAFEGUARD System Command, Huntsville, Alabama, and the SAFEGUARD System Evaluation Agency, White Sands Missile Range (WSMR), New Mexico, and including staff supervision over Department of Army commands and agencies for SAFEGUARD activities. *Prime Contractor:* Western Electric Company, New York (Bell Telephone Laboratories, Whippany, N.J.). *Major Subcontractors:* Martin-Marietta Corporation, Orlando, Florida; General Electric Company, Syracuse, New York; McDonnell-Douglas Corporation, Santa Monica, California; Raytheon Company, Bedford, Massachusetts.

Program accomplishments and future plans:

Fiscal year 1972 program.—Integrated system tests using the MSR, its data processor and SPRINT and SPARTAN missiles will continue at KMR with [deleted] system tests scheduled for FY 72. Six of these tests, of which 5 were fully successful and 1 partially successful, were conducted in the first half of this fiscal year. These tests include SPRINT remote launch firings from Illeginni. PAR and Missile Site Radar (MSR) FY 72 efforts are being directed toward TSCS integration testing and software evaluation, site test, and site activation planning. Essentially all SAFEGUARD procurement items (over 99 percent) required for a four-site deployment are scheduled for release to production by the end of FY 1972. Software development is continuing. The software package in use at Meck Island will continue to be augmented to bring in additional tactical-like functions. Installation of the full-size TSCS will be completed at Madison, New Jersey. Design release of the MSR will be completed as will factory testing of the PAR. Engineering and design studies to determine building criteria, hardware requirements, equipment layout and interface requirements for a multiface PAR to support a National Command Authorities defense are to be initiated.

FY 1973 planned program.—The SAFEGUARD System Test Program will continue at KMR with [deleted] tests tentatively scheduled for FY 1973. Software development, testing and evaluation will continue. The primary effort in FY 1973 will be checkout and integration of the tactical software on the full-size TSCS and the design, testing and shipment to Grand Forks of major portions of the installation and test software as well as parts of the MSR and PAR weapons process. FY 1973 will see the completion of the [deleted] SPRINT missile R&D fabrication program, with delivery of the final 10 missiles. The last nine missiles of the 45 SPARTAN missile R&D fabrication program will also be delivered. FY 73 effort for the MSR includes continued operation of the MSR prototype at Meck Island and incorporation of changes to the tactical MSR dictated by results of Meck Island testing. FY 1973 PAR funds are for engineering effort associated with the installation, testing and interfacing of PAR equipment at the Grand

Forks site and associated design changes as necessary as well as for effort associated with the development of a multi-face PAR. In FY 1973 SPRINT and SPARTAN warhead section testing will be conducted as a joint effort (Atomic Energy Commission/Bell Telephone Laboratories/Picatinny Arsenal). Design release of the SPARTAN and SPRINT adaption kits will be in FY 1973. [Deleted.]

Program to completion.—Integrated system tests with SPARTAN, SPRINT, and the Missile Site Radar (MSR) at Meck Island will continue against live Intercontinental Ballistic Missile (ICBM) and Sea-Launched Ballistic Missile targets. [Deleted] additional system tests are tentatively scheduled at Kwajalein Missile Range (KMR) to complete the SAFEGUARD System Test Program. Joint Atomic Energy Commission/Army underground nuclear tests will be continued to study vulnerability of selected SAFEGUARD components. Software testing at the Tactical Software Control Site (TSCS) will continue. Perimeter Acquisition Radar (PAR) research and development tests will be conducted at the first tactical PAR site. This program is scheduled to support a late 1974 Equipment Readiness Date for the first site.

RESOURCES

[Dollars in millions]

	Fiscal year 1971 and prior	Fiscal year 1972	Fiscal year 1973	Additional to completion[1]	Total estimated cost[1]
RDTE: Funds	$1,460.9	$358.0[2]	$340.5[3]	$440.1	$2,599.5.
Sites being funded	1 and 2[2]	1 and 2[2]	1, 2, 3, and 4	1, 2, 3, and 4	4 sites.

[1] Assumes approval for 4-site Minuteman defense.
[2] An additional $42,400,000 from prior years is available and has been released as prior year funds for use against fiscal year 1972 RDTE program requirements.
[3] Subject to revision based on Presidential review.

(Chart 4 follows:)

SAFEGUARD FUNDS

[In millions of dollars]

Appropriation	Approved program fiscal year 68-71	Approved program fiscal year 1972	Requested NOA fiscal year 1973	Obligated as of Jan. 31, 1972	Expended as of Jan. 31, 1972
RDTE	1,460.9	[1] 358.0	340.5	1,708.5	1,406.4
Procurement	1,478.6	640.0	754.4	1,954.8	1,022.1
Missile procurement, Army		(639.0)	(753.0)		
Other procurement, Army		(1.0)	(1.4)		
MCA	685.8	119.0	390.0	427.6	290.2
OMA	101.5	75.4	92.7	132.0	112.5
MPA	37.7	14.3	17.8	46.1	46.1
Total	3,764.5	1,206.7	1,595.4	4,269.0	2,877.3

[1] Excludes $42,000,000 in prior year Safeguard RDTE funds released for use against fiscal year 1972 requirements.

General LEBER. At the beginning of fiscal year 1968, R.D.T. & E. components had been carried to a point where feasibility of these components had been demonstrated. Flight tests were being carried out on the Sprint missile and Spartan missile flights were soon to start. A major portion of the funds for a prototype MSR for Meck Island had been obligated.

1968–72 FUNDING

An R.D.T. & E. approved program totaling $1,818.9 million has been made available to the Army for Safeguard in the years 1968 through 1972. The progress being made in the development program covered by these funds has already been described to you, and you saw some of it in the film.

1973 NOA Requirement

In my discussion of fiscal year 1973 R.D.T. & E. requirements, I shall refer to chart 5.

(The chart follows:)

CHART 5

SAFEGUARD RDTE

[In millions of dollars]

	Fiscal year 1968-71	Fiscal year 1972 [1]	Fiscal year 1973 requested NOA
Weapon system contractor (WSC):			
Sprint	221.9	37.3	20.9
Spartan	234.3	38.3	31.5
Data processing	194.8	83.0	82.3
MSR	70.5	8.7	6.9
PAR	87.7	16.9	19.0
System engineering	84.6	25.4	23.3
Site operations, fee, overhead, documentation and training	200.3	56.4	49.3
WSC subtotal	1,094.1	266.0	233.2
Government system support	113.6	29.4	26.8
Test support	121.6	49.3	57.2
SAFSEA and SAFCA	30.7	14.7	13.3
Modified Spartan	11.8	38.0	
NCA defense		3.0	10.0
TACMAR and reentry measurements program (now in ABMDA)	46.7		
Total	1,418.5	400.4	340.5

[1] Fiscal year 1972 NOA is $358,000,000. The $400,000,000 shown includes $42,400,000 available from prior years ($42,000,000 from fiscal year 1971 and $400,000 from fiscal year 1970) for use against fiscal year 1972 requirements.

System Development Contract

General Leber. As you will remember, the Government employs the Western Electric Co. (Weco) as prime system contractor for the development and test of the BMD system. Weco is assisted by the Bell Telephone Laboratories with respect to engineering and design. R.D.T. & E. of the major components is accomplished by four subcontractors to Weco—General Electric for the PAR, Raytheon for the MSR, McDonnell-Douglas for the Spartan, and the Martin-Marietta for the Sprint. A major portion of our funding requirement ($233.2 million) is, therefore, in the system contract category. The major activities which must be carried out include:

(*a*) The $20.9 million for Sprint and $31.5 million for Spartan is primarily for planned system tests at Meck Island. These funds are for the Spartan and Sprint missiles to be used in the tests and posttest analysis of flight data, documentation and management, as well as for nuclear vulnerability testing.

Cost and Maintenance of Missiles

Chairman Ellender. Could you tell us what the cost of each of these missiles is?

General Leber. Today a Sprint is costing about [deleted] million and a Spartan is costing about [deleted] million.

Chairman Ellender. How many Sprints and Spartans will you have at each site?

General LEBER. In the case of Spartans we would have [deleted] at each of the four Minuteman sites. In the case of Sprint it varies. At Grand Forks there would be [deleted], at Malmstrom [deleted], at Whiteman [deleted], and at Warren [deleted].

SILO REUSE

Senator YOUNG. After a Sprint or Spartan is fired from the silo, can that silo be used again?

General LEBER. It could be. [Deleted.]

But you could. We have reused those out at the Pacific test range. We fire out of the same silos many times.

BALLISTIC MISSILE DEFENSE CENTER

Senator ALLOTT. Mr. Chairman, before we get too far away from this, may I ask a question. What is the purpose of the Ballistic Missile Defense Center?

General LEBER. This is the command center located in the mountain at Colorado Springs, which ties in with the North American Defense Command. This is our interface with the overall commander, the Air Force general who commands the overall defense for the United States.

Senator ALLOTT. Is this center now an existing facility?

General LEBER. No, sir. It is being built. The excavation has been done in the mountain to provide the space, and the building is now under construction. That is being done by the Air Force. What we will do is come into that building and put in the necessary computer with the software which will interface with the overall command system of the United States.

Senator ALLOTT. So that the Air Force will do the construction?

General LEBER. Yes, sir. Actually, the Corps of Engineers is doing it, but it is under the Air Force.

Senator ALLOTT. Then you will be installing the software?

General LEBER. Yes, sir.

Senator ALLOTT. When will that be completed?

General LEBER. The Ballistic Missile Defense Center will be completed by the time the first site is operational in the fall of 1974.

Chairman ELLENDER. Proceed.

SYSTEM DEVELOPMENT CONTRACT

General LEBER. (*b*) Data processing efforts continue at a high level with a total requirement in fiscal year 1973 of $82.3 million.

Development of data processing hardware is virtually complete. Software development is proceeding according to schedule, with about 58 percent of the tactical software for the first site coded and with installation and checkout of the Tactical Software Control Site (TSCS) underway. During fiscal year 1973, coding is scheduled to be completed, integration tests to be well underway, and software deliveries to the Grand Forks site started.

(*c*) Continued operation of the Meck Island prototype MSR including its integration with system tests and incorporation of changes

to the tactical MSR dictated by results of the Meck Island testing will cost about $6.9 million.

(*d*) Installation, testing, and interfacing of the complete PAR equipment will be done at Grand Forks in fiscal year 1973; however, a great deal of the PAR sensor equipment will have been tested previously at the TSCS. These costs are in the order of $19 million.

(*e*) Overall systems engineering and integration will require $23.3 million. This includes continued effort in the design of test and maintenance support equipment; coordination of the many activities associated with overall aspects of the Safeguard R. & D. program, updating and refinement of performance/design specifications, and system integration, and evaluation of all system parameters.

(*f*) The remainder, $49.3 million is for site operation, fee, contractor's overhead, and certain maintenance documentation as well as continued development of training aids and devices. Approximately half of this amount is attributable to our test program at Kwajalein Atoll and includes overall coordination of test operations at Kwajalein Missile Range, test planning, and data reduction by the weapon system contractor.

System Support

For system support, $26.8 million is required. Included in this requirement are funds for program management by the Government personnel concerned; R. & D. laboratory support, and support and development studies; work by the Army's Munition Command on warhead adaption kits; and certain special hardness testing of components.

Test Support

The major portion of this $57.2 million is for fabrication and launching of test targets fired into Kwajalein Atoll for system testing and the remainder is for special support rendered to us on a reimbursable basis by the Kwajalein Missile Range (KMR). Safeguard makes maximum use of surplus Minuteman and Polaris boosters, both of which require extensive modification. Air Force and Navy support of the Safeguard system test program is now totally funded by Safeguard, while prior to fiscal year 1972 the launch facilities and support portion was funded by the Air Force and Navy.

SAFSEA and SAFCA

The U.S. Army Safeguard System Evaluation Agency performs independent evaluation of the Safeguard system for the system manager. The Safeguard Communications Agency conducts tests, analysis, and evaluation of Safeguard communication. The two together will cost some $13.3 million.

Modified Spartan

No additional funds are required in this effort in fiscal year 1973 as sufficient funds remain from the fiscal year 1972 appropriation to complete the predevelopment verification work planned for fiscal year 1973.

NCA DEFENSE

The $10 million requested by fiscal year 1973 along with the $3 million provided in fiscal year 1972 will be utilized to initiate the multi-faced PAR design required by the currently planned site at the NCA in addition to any design modifications required for the current MSR for an NCA defense role.

PROCUREMENT

Chairman ELLENDER. If there are no further questions on R. & D., we will proceed with the consideration of the $754.4 million requested for procurement. Of this total, $753 million is included in "Missile procurement, Army," and $1.4 million for communications equipment is included in "Other procurement, Army." The Safeguard missile data sheet will be included in the record at this point.

(The information follows:)

FISCAL YEAR 1973 PRESIDENT'S BUDGET ESTIMATE—MISSILE DATA SHEET

Service: Army—Nomenclature: Anti-Ballistic Missile System (SAFEGUARD) P–1 Line Item Nos. 1–2–3–4–5–24; Popular Name: Safeguard

Description/Mission.—The SAFEGUARD Anti-Ballistic Missile System consists of two types of phased array radars, the Missile Site Radar (MSR), the Perimeter Acquisition Radar (PAR), and their associated data processors; and of two types of missiles, the SPRINT and the SPARTAN. The SAFEGUARD components serve the following basic functions: the PAR is the long-range radar which first acquires and tracks the target; the MSR is the shorter-range radar which continues to track the target and also guides the interceptor missiles; the SPARTAN is the long-range defense missile; and the SPRINT is the high acceleration terminal defense missile. The data processors provide the necessary calculations for the entire intercept operation.

The President, on March 14, 1969 announced the following defense objectives for SAFEGUARD: (a) "Protection of our land-based retaliatory forces against a direct attack by the Soviet Union," (b) "Defense of the American people against the kind of nuclear attack which Communist China is likely to be able to mount within the decade," (c) "Protection against the possibility of accidental attacks from any source." He further elaborated that: (a) "We will provide for local defense of selected MINUTEMAN missiles sites and an area defense designed to protect our bomber bases and our command and control authorities." (b) "By approving this system, it is possible to reduce U.S. fatalities to a minimum level in the event of a Chinese nuclear attack in the 1970's, or in the event of an accidental attack from any source."

COST DATA

[In millions of dollars]

	Fiscal year 1970 and prior	Fiscal year 1971	Fiscal year 1972	Fiscal year 1973[1]	Fiscal year 1974[1]	Fiscal year 1975[1]	Fiscal year 1976[1]	Fiscal year 1977[1]	Cost to complete[1]	Current estimate total program[1]
Missile procurement:										
Quantity[2]		[Deleted.]	[Deleted.]	[Deleted.]						
Cost	116.8	265.2	359.0	396.2						
Less: Advance procurement			17.2	5.0						
Net missile cost		265.2	341.8	391.2						
Plus: Advance procurement		17.2	[Deleted.]	[Deleted.]						
Total missile cost		282.4	346.8	398.6						
Missile program unit cost	N/A	N/A	N/A	N/A						
Ground equipment	647.5	352.6	[Deleted.]	[Deleted.]						
Weapons system cost	764.3	635.0	612.0	716.1						
Initial spares	.6	12.0	26.5	36.6						
R.D.T. & E	1,096.9	364.0	358.0	340.5						
MILCON	328.8	357.0	119.0	390.0						
Program acquisition cost	2,190.6	1,368.0	1,115.5	1,483.2						
Average program unit cost										
Total additional cost[2]	62.7	4.0	1.5	1.7						

[1] To be provided at a later date.
[2] Number of SPRINTS/Number of SPARTANS.

Basis for fiscal year 1973 budget request.—This budget request provides for the following SAFEGUARD program through fiscal year 1973: (a) continue construction at the sites of Grand Forks Air Force Base, North Dakota, and Malmstrom Air Force Base, Montana; (b) in fiscal year 1973, start construction at the site at Whiteman Air Force Base, Missouri and Warren Air Force Base, Wyoming; and (c) take steps toward deployment of a site in the Washington, D.C., area.

This request provides for continuing procurements for the two sites previously authorized (Grand Forks AFB and Malmstrom AFB) and for the third and fourth sites (Whiteman AFB and Warren AFB) being requested for authorization this year. It includes the procurement of SPARTAN missiles and a portion of the SPRINT missiles for the Whiteman AFB site, the Missile site Radar and the Missile Site Data Processor for the Warren AFB site, and other ground support equipment for the 4-site program; and initiates limited advanced procurement of ground equipment for the National Command Authority site.

This decision reflects the following considerations: (a) To be responsive to the evolving threat, orderly progress on the SAFEGUARD defense of MINUTEMAN and those research and development activities for improving future MINUTEMAN survivability should continue. Deployment of the Whiteman AFB and and Warren AFB sites would allow the completion of the required four-site MINUTEMAN defense and a light defense of some inland strategic bomber bases and command and control centers; (b) The National Command Authorities (NCA) in the Washington, D.C. area are vulnerable to attack by Soviet Intercontinental Ballistic Missiles (ICBM) and Sea-Launched Ballistic Missiles (SLBM). The defense of our NCA would add to the credibility of our deterrent. At the same time, the NCA defense is part of one option of a U.S. Strategic Arms Limitation proposal and is of interest to the Soviet negotiators. Proceeding now with advanced preparation activities for the NCA defense site will provide the option to complete this defense at the earliest date; (c) The proposed program for SAFEGUARD requests funds and authorization for construction of two additional MINUTEMAN defense sites, advanced preparation for an NCA defense and provides the President flexibility with regard to SALT developments and in combating the offensive threat.

Test Data

1. DEVELOPMENT TEST

(*a*) *Sprint*

(1) Development contract awarded Martin/Orlando in March 1963.

(2) Successful flight of first maneuverable SPRINT at White Sands Missile Range, NM in November 1965.

(3) Development flight tests completed 12 August 1970 with 42 missiles flown:

(a) Successful, 23

(b) Partially successful, 9

(c) Unsuccessful, 10

(*b*) *Spartan*

(1) Outgrowth of NIKE-ZEUS, DM 15C missiles.

(2) Being developed by McDonnell-Douglas which developed ZEUS, using as much technology from ZEUS as applicable to higher performance SPARTAN.

(3) First development test flight at Kwajalein on 30 March 1968.

(4) Development flight test completed on 15 December 1969 with 15 missiles flown:

(a) Successful, 11

(b) Partially successful, 2

(c) Unsuccessful, 2

2. SYSTEM TEST

(*a*) *Sprint*

(1) System tests with SPRINT commenced at Kwajalein Missile Range in October 1970.

(2) First successful intercept of a live target occurred during December 1970.

(3) Through December 1971, 9 system tests involving 10 missiles have been flown:

(a) Successful tests, 8

(b) Partially successful, 0

(c) Unsuccessful tests, 1

(b) *Spartan*

(1) System tests were started in March 1970 involving the Missile Site Radar, Data Processors and SPARTAN missiles.

(2) First fully successful space point intercept occurred in June 1970.

(3) First live target intercept test was successfully conducted in August 1970.

(4) Through December 1971, 10 system tests involving 11 missiles have been flown:

(a) Successful tests, 7

(b) Partially successful tests, 2

(c) Unsuccessful tests, 1

(c) *Radar tracking test*

There were also 2 tracking tests through December 1971 not involving missiles which were successful.

CONTRACT DATA

Contractor/subcontractor	Major subsystem	Type of last contract
Western Electric Co., New York, N.Y. Subcontractor is: Martin Marietta Corp., Orlando, Fla.	Sprint	CPFF
Western Electric Co., New York, N.Y. Subcontractor is: McDonnell-Douglas Corp., Santa Monica, Calif.	Spartan	CPFF
Western Electric Co., New York, N.Y. Subcontractor is: General Electric Co. Syracuse, N.Y.	PAR	CPFF
Western Electric Co., New York, N.Y. Subcontractor is: Raytheon Co., Bedford, Mass	MSR	CPFF

Characteristics	Class	Item model, series, class, etc.	
		Sprint	Spartan
Guidance	U	Command	Command.
Altitude (maximum)	S	[Deleted]	[Deleted].
Diameter (inches)	U	52.8	43.1.
Length (feet)	U	26.86	55.2.
Propulsion	U	Solid	Solid.
Weight (with warhead) (pounds)	C	[Deleted]	33,500.
Warhead type	U	Nuclear	Nuclear.

COST HISTORY COMPARISON

	Quantity missile/GSE	Amount in millions
Initial planning estimate:		
Procurement	2 sites	$1,622
R.D.T. & E	do	2,073
MILCON	do	490
Total program cost		4,185
Current estimate total program (fiscal year 1972 budget submission/March 31, 1971 SAR):		
Procurement	3 site MM defense	2,965
R.D.T. & E	do	2,403
MILCON	do	800
Total program cost		6,168
Current estimate total program (fiscal year 1973 budget submission):		
Procurement	(1)	(1)
R.D.T. & E	(1)	(1)
MILCON	(1)	(1)
Total program cost		

[1] To be provided at a later date.

General LEBER. The breakout I shall use in discussing procurement is that on chart 6.

(Chart 6 follows:)

CHART 6—SAFEGUARD PROCUREMENT

[In millions of dollars]

	Fiscal year 1968–71 approved	Fiscal year 1972 approved	Fiscal year 1973 requested NOA
Missile procurement, Army	1,475.8	639.0	753.0
Sprint	(146.0)	(176.9)	(181.7)
Spartan	(253.2)	(169.9)	(216.9)
Ground equipment	(1,000.1)	(265.2)	(317.5)
Production base support	(63.9)	(0.5)	(0.3)
Repair parts	(12.6)	(26.5)	(36.6)
Other procurement, Army	2.8	1.0	1.4
Communications	(2.8)	(1.0)	(1.4)
Total procurement	1,478.6	640.0	754.4

SPRINT MISSILE AND GROUND EQUIPMENT FOR SPARTAN MISSILE

General LEBER. It breaks the procurement into that for the Sprint, the Spartan, ground equipment (which is basically the radar and data processor for both the MSR and PAR), production base support, repair parts, and communications. This breakout is similar to that shown by line item on pages 5, 6, and 19 of your procurement supporting data for fiscal year 1973 budget estimate (P–1 exhibit).

1968–72 FUNDING

The funds shown on the chart for fiscal year 1972, and earlier for the Sprint and Spartan missiles were used to build up the production base and for the procurement of missiles for Grand Forks and Malmstrom, The fiscal year 1972 and earlier ground equipment program included funds to build up the production base and for the procurement of the radars and data processors and remote launch equipment for the first three sites (Grand Forks, Malmstrom, and Whiteman), for the ballistic missile defense center (BMDC), for the tactical software control site (TSCS) equipment at Madison, N.J., and for training equipment. Communication equipment for the first three sites was procured and repair parts procurement was initiated. The production base support included funds for rehabilitation, repair and modification, packing, crating, and transportation of Government-owned production and industrial plant equipment to be operated by contractors.

1973 REQUIREMENTS

The breakout of the requirement for fiscal year 1973 NOA is shown on chart 6.

SPRINT

Some $181.7 million is required for this subsystem. Included is procurement of the first increment of the Whiteman missiles, and launch and ground support equipment for the Whiteman site. Fewer missiles are funded in fiscal year 1973 than in fiscal year 1972 because the Sprint production rate has been reduced to match the current site completion dates. To support hardware procurement, including that contracted for in prior years, funds are required for production preparation, such as acquisition and rebuild of manufacturing tools and test equipment and for installation and test at the Grand Forks site.

Funds are also required to continue production services such as design support, production engineering, supervision of the manufacturing effort, and development of systems for operation and maintenance of equipment when deployed onsite. During fiscal year 1973 production facilities for assembly and checkout of the complete missile will be initially established at the plant of the major missile subcontractor, Martin-Marietta. Fabrication of missile components will continue at vendor plants.

SUGGESTED PROCUREMENT DELAY: LEADTIME AND PRODUCTION RATE

Senator SYMINGTON. If you don't intend to have any deployment at Whiteman, general, until 1977, why do you start procuring Sprint missiles for 1977 deployment, when we are so short of funds at this time?

General LEBER. It is because of two things: The leadtime and the rate of production.

Senator SYMINGTON. There is no leadtime involved in a 4-year program on a missile of this character.

KEEPING PRODUCTION LINE OPEN

General LEBER. It depends on the rate of production, sir. What we are trying to do here, once we start this production line, is to keep it hot and produce as many Sprints as we need and shut it down, but not shut it down and start it up and shut it down again. You know how expensive that would be.

Senator SYMINGTON. I do know, and am only asking if you have 4 years on an item on which the design is completed and is in production, why do you have to have the money now to produce it, if you don't need it for 4 years?

General LEBER. If we didn't, the production line would be shut down. In other words, we will finish the production on the missile for Malmstrom, and if we don't get money to continue with those at Whiteman, we will have to shut the line down.

Senator SYMINGTON. If you don't get money for additional bases [deleted] then all of this money is wasted.

General LEBER. If we know how many sites there would be and how many missiles, we could adjust the program.

Senator SYMINGTON. In all of the years I have been here, this is the first time I have seen a product of this type requested for a development at least 4 years away, especially since you have the tools, jigs, dies, and fixtures to make these missiles now.

Just one more point. The chairman asked you whether we have to overhaul these missiles periodically. The longer they are in stock, then the closer they are getting to the day they have to be overhauled because they have been so long in stock.

General LEBER. Exactly. For that reason we do not plan to have these missiles finished and delivered until the site is ready for them. We don't want to waste any of their life on the shelf.

Senator SYMINGTON. If you don't want to have them until you deploy them 4 years from now, why do you ask for the money now?

General LEBER. As I said, it is a matter of continuing the production line. We have cut back, as I have said here, the rate of production

of Sprint to the lowest that a line is worth keeping for it. We can't reduce that any more.

So we have now ordered all of the Sprint we need for the first two sites. If we don't place another order, that production line is going to go down. Then we would have to start it up again.

Senator SYMINGTON. When would it go down?

General LEBER. When they finish producing the missiles for Grand Forks and Malmstrom. Of course, the missiles for Malmstrom would be coming off the line in time to be on site in 1976. What we are saying is that we want to keep that line running.

EFFECT OF NONPROCUREMENT AT THIS TIME

Senator SYMINGTON. When would your line go down if you did not, at this time, ask for money to procure missiles you volunteer you will not need until 1977?

General LEBER. It would go down in 1976 when we finish the balance of the Malmstrom missiles.

Senator SYMINGTON. 1976. There is no long leadtime in 3 years involved on this missile.

General LEBER. As I said, we have a continuing contract here. We give the contractor orders ahead so he can order his material. You must realize some of the material for these things will be ordered next year. Fabrication of the many components will be going on. The completed missiles will be put together and delivered on the date I have mentioned.

Senator SYMINGTON. Would you supply for the record the detailed reason why, if you don't need the missiles until 1977, it is necessary to have the money to buy them now?

General LEBER. Yes, sir.

(The information follows:)

Missile production is calculated so as to provide the number of missiles indicated below for each site on the dates indicated.

Sprint Spartan:	
GF (October 1974)	[Deleted]
Malm (April 1976)	
Whiteman (Early 1977)	
Warren (Late 1977)	

To support this tactical requirement plus the non-tactical missiles required for production verification testing and stockpiling reliability testing, production rates were calculated on the basis of producing at the optimum rate permitted by programed tooling. However, production at this optimum rate would require that we fund production of more missiles than are now contemplated in the FY 73 budget request. The FY 73 missile buy has been reduced because, if optimum production rates were to be maintained without starting production of missiles any earlier than lead times would require, a production gap would occur between completion of the currently contracted missiles for Grand Forks and Malmstrom, and the initiation of production for Whiteman and Warren. During the gap, the government would be required to pay for retaining skilled manpower, manufacturing space and tooling not being effectively utilized. The approximate cost would be $40 million in the near term and in excess of $100 million in the total four-site program.

Instead, a minimum sustaining production rate has been adopted which keeps all lines operating, prevents expensive gaps and provides for final missile deliveries in fiscal year 1977. This procedure does entail costs for storing some of the missiles, but these are far less than shut-down and start-up costs. For those missiles to be stored, the effect of the storage on shelf-life is not expected to be significant.

SPARTAN

General LEBER. Some $216.9 million in procurement funding is required for this subsystem. Included is the procurement of all Whiteman missiles, and launch and ground support equipment. As with Sprint, factory delivery schedules for Spartan have been revised to match current site completion dates. Also as with Sprint, the hardware procurement requires engineering support. Production preparations are continued for the acquisition, rebuild, and maintenance of the unique manufacturing tools and test equipment. Installation and test planning and procurement, and production services such as design, manufacturing supervision, and the development of required operations and maintenance systems continue. Of particular importance in fiscal year 1973 will be the direct procurement of the Spartan hardware from MDAC by the Government rather than through the Western Electric Co., the prime contractor. This action reduces the fee paid to the prime contractor for managing the hardware procurement and, when partially offset by increased Government costs due to breakout, results in a cost avoidance in fiscal year 1973 of approximately $3.5 million.

Senator SYMINGTON. This is constructive and I congratulate you on it. But the logical question: Why don't you do the same for Sprint?

General LEBER. We are planning on it next year.

GROUND EQUIPMENT

The largest single line of the procurement requirement is $317.5 million for ground equipment.

These funds continue production already underway and provide for the Warren Missile Site Radar (MSR) and its data processor; site test equipment for the four sites and the BMDC; the maintenance data systems for Malmstrom and Whiteman; and Tactical Software Control Site (TSCS) equipment. Funds are required for continuing production services which include design support, product assurance, safety engineering, manufacturing supervision, and the development of operations and maintenance systems. Installation and test charges are included for the radars and data processors. Major new activity in this category will be the initiation of onsite installation and test at the Grand Forks site.

Senator YOUNG. Mr. Chairman, I don't understand this "onsite installation and test." What test will you conduct?

General LEBER. All of this equipment is being produced in the plant and being tested as individual components before it is ever released from the plant.

It will be taken out to Grand Forks and put together inside those radar buildings, and it will have to be tested then as a system to see that it works.

Senator YOUNG. How can you test it without firing it?

General LEBER. You do it with special test tools, with some systems computers that run tests for you. It is a very elaborate program of testing, because this equipment is very complex. But it has to be completely tested onsite before you can say it is operational.

Senator YOUNG. Do you have a better test system than the Air Force had for the Minuteman which had a malfunction?

General LEBER. We hope so.

PRODUCTION BASE SUPPORT

Some $0.3 million is required for the rehabilitation of Government-owned industrial plant equipment at contractors' plants and packing, crating, handling, and transportation of Government-owned industrial production equipment utilized at contractor locations.

REPAIR PARTS

The requirement of $36.6 million for repair parts continues the procurement of the initial stockage of parts for the sites, including joint usage items which will be used during the installation and test period and will remain onsite for later use as initial stockage.

COMMUNICATION

Some $1.4 million is required for the procurement of communications equipment necessary for the Warren site.

MILITARY CONSTRUCTION

Chairman ELLENDER. The next item is the request for $390 million for military construction. This request will not be considered by this subcommittee, but I think it is desirable for General Leber to explain this request in order to have a complete record. Please proceed, General.

General LEBER. Chart 7 indicates the MCA appropriations made to date for Safeguard along with the fiscal year 1973 request.

(Chart 7 follows:)

CHART 7

SAFEGUARD MCA

[In millions of dollars]

	Fiscal year 1972 and prior fiscal years	Fiscal year 1973 requested NOA
Planning and design	96.6	1
Tactical construction	644.4	361
R. & D. construction support	22.9	
Access roads	23.9	2
Community impact	17.0	26
Total	804.8	390

APPROVED PROGRAM

General LEBER. The approved fiscal years 1968–72 MCA program now totals $804.8 million. Construction underway includes major contracts for the Grand Forks and Malmstrom sites.

A summary of the construction status at these two sites is shown on chart 8.

(Chart 8 follows:)

CHART 8

SAFEGUARD CONSTRUCTION STATUS

Site and ERD	Components	Percent completion Feb. 29, 1972	Forecast completion date
Grand Forks	PAR buildings	82	August 1972.
October 1974	MSR buildings	82	January 1973.
	Collocated Spartan field	95	Do.
	Collocated Sprint field	78	Do.
	Remote Sprint fields 2 and 3	47	Do.
	Remote Sprint fields 1 and 4	3	Do.
Malmstrom	PAR and MSR buildings	5–10	April 1974/ July 1974.
April 1976	Collocated Spartan and Sprint fields	(1)	July 1974.
Whiteman Early 1977	Advanced preparation initiated; Construction not yet authorized. ERD is dependent on full deployment		
Warren Late 1977	Authorization in fiscal year 1973 and start of Construction early calendar year 1973		

[1] Starting.

CONSTRUCTION PROJECTS

General LEBER. Award of the major construction contract for Malmstrom was delayed from April 1971 to December 1971 by labor problems. Work is now proceeding at Malmstrom under a letter contract awarded in December 1971 and definitized as a fixed-price contract on February 24, 1972. Design and engineering for the Whiteman and Warren sites is underway.

In addition to funds authorized for tactical construction, prior year Safeguard MCA funds have been used for construction of a central training facility at Fort Bliss. Prior year funds are being utilized to provide a mission depot at Glasgow Air Force Base, Mont.; to support the R. & D. program at Kwajalein; and through the community impact assistance program, to offset the cost of providing additional services and facilities to communities in the vicinity of Grand Forks and Malmstrom sites.

1973 PROGRAM

The fiscal year 1973 MCA request includes $150 million to construct the MSR, remote sites and support facilities at the Whiteman site; $199 million to construct the MSR, remote sites and support facilities at Warren; $15 million for standard and miscellaneous design and engineering and design in support of construction; and $26 million to continue the community impact assistance program. In addition, $6 million appropriated in fiscal year 1972 is available for advanced preparation for NCA.

Senator YOUNG. That $26 million is for the two sites?

General LEBER. No, sir; that would contemplate there would be some community impact assistance at the third and fourth sites.

Senator YOUNG. That has to be authorized?

General LEBER. Yes, sir.

Senator YOUNG. How much of the authorization is left now?

General LEBER. The total amount appropriated to date is $17 million, limited to just the North Dakota and Montana sites. Of that we have approved $6.5 million. We anticipate that additional requests will come in that will require the remaining amount.

We have projected this requirement for 1973, assuming that there would still be some additional requirements for Montana and North Dakota, but there would also be requirements for Missouri and Wyoming if we build the sites there.

OPERATION AND MAINTENANCE

Chairman ELLENDER. General, before you proceed with your discussion of the request of $92,733,000 for "Operation and maintenance" I want to have included in the record the information appearing on pages 5, 6, and 7 of the justifications.

(The information follows:)

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APPROPRIATION	(In Thousands of Dollars)		
Operation and Maintenance, Army	ACTUAL FISCAL YEAR 1971	ESTIMATE FISCAL YEAR 19 72	ESTIMATE FISCAL YEAR 19 73
BUDGET PROGRAM, PROGRAM ELEMENT/ AGGREGATION, OR BUDGET PROJECT ACCOUNT			
1 - Strategic Forces - SAFEGUARD	$ 43,690	$ 75,391	$ 92,733

JUSTIFICATION

Section 1 - Purpose and Scope

This program provides for:

SAFEGUARD Defense System: These funds cover the cost of planning activities for deployment of the SAFEGUARD weapon system. These activities include the development and evaluation of doctrine, organizations, materiel objectives, and requirements for operational use of SAFEGUARD.

SAFEGUARD Communications: These funds support the SAFEGUARD System Management Communications Network. Included are funds for developing technical requirements, specifications, preliminary design and engineering, plans for integrating the communication system into the weapon system, and test plans for all intra and inter-site communication subsystem. These funds also provide Defense Communications Systems Resources necessary for the support of the SAFEGUARD program including the leased/government owned long haul point-to-point circuitry provided by DCS switched subsystems and dedicated circuitry.

SAFEGUARD Logistics Support: Logistics support is provided by the following commands:

1. US Army SAFEGUARD System Command which is the contracting and purchasing agency for SAFEGUARD. This command is also responsible for the development, acquisition and installation of SAFEGUARD.

2. US Army SAFEGUARD Logistics Command which is responsible for the development of a logistics system for the support of the deployed SAFEGUARD System. This command will provide mission essential logistics support to the tactical SAFEGUARD sites.

SAFEGUARD Training: This activity provides for the development of the SAFEGUARD Central Training Facility, the development of SAFEGUARD Military Occupational Specialty peculiar skills, the preparation of training aids and the development of an instructor training base at the SAFEGUARD Central Training Facility.

SAFEGUARD Base Operations: These funds provide for installation support at SAFEGUARD tactical locations, including support of the Weapons System Contractor.

Section 2 - Justification

Summary of Required Funds

	(In Thousands of Dollars) FY 71	FY 72	FY 73
SAFEGUARD Management These funds finance the SAFEGUARD System Office (SAFSO) and the direct costs of Headquarters, USARADCOM, which are involved in SAFEGUARD deployment.	3,429	5,250	5,557
SAFEGUARD Communications These funds finance the SAFEGUARD Communications Agency costs for management of communications and reimburse DCS for costs for leasing and installing tactical communications supporting the SAFEGUARD deployment.	13,726	19,938	23,826
SAFEGUARD Development, Deployment and Logistic Support These funds are required for costs of management and support of development and deployment of the SAFEGUARD System, new equipment training, and development of logistic support for the SAFEGUARD System.	24,017	45,876	52,620
SAFEGUARD Training These funds are required to continue the establishment of the SAFEGUARD Central Training Facility and to provide instructors and materials which will be used to train personnel who will operate with the SAFEGUARD System.	2,518	4,327	7,655
SAFEGUARD Base Operations These funds are required to provide for installation support at SAFEGUARD tactical locations including support of the Weapons System Contractor.	———	———	3,075
TOTAL	43,690	75,391	92,733

Section 3 - Summary of Budget Changes

		In Thousands of Dollars
FY 1972 estimate		$75,391
Decreases		
1. Reduction in purchased services and contracted training	$ 308	
2. Reduction in contracted studies and technical support	894	
Total Decreases		- 1,202
Increases		
1. Increase in civilian personnal to support the approved on-going deployment	$5,535	
2. Annualization of January 1972 classified civilian pay raise	925	
3. Communication construction costs, including intersite cabling installation and hardening to support the authorized deployment	2,820	
4. Increase in support for added SAFEGUARD staff and faculty, students, management personnel, and personnel of the SAFEGUARD Depot Glasgow AFB, Montana who are employed in the presently authorized deployment	1,924	
5. On-site SAFEGUARD support costs for authorized sites, to include support of the Weapons System Contractor, security, the operation and maintenance of Tactical Support Equipment, and base operations support	3,995	
6. Mission support costs for SAFEGUARD students at the Central Training Facility who will support the authorized deployment	2,225	
7. Increase of automatic data processing required to establish an operational SAFEGUARD logistical system	446	
8. Increase of travel, transportation, communications, rent, utilities, printing, supplies, and equipment related to the increased management and supervision required during a period of increased production, delivery and construction of the authorized deployment	674	
Total Increases		18,544
FY 1973 Estimate		$92,733

1953 REQUIREMENTS

General LEBER. The OMA requirement for fiscal year 1973 of $92.7 million is shown on this chart. Our requirements break into categories as shown by the line items on the chart. The major portion, $45.2 million, is, of course, for personnel costs which include salaries, travel, transportation, and office services.

(Chart 9 follows:)

CHART 9

SAFEGUARD OMA

[In millions of dollars]

	Fiscal year 1968–71 approved	Fiscal year 1972 approved	Fiscal year 1973 requested NOA
Personnel costs	59.4	37.4	45.2
Rent and communications (non-DCS)	3.4	2.8	5.5
Contracts	30.7	18.8	24.7
Communications (DCS)	8.0	12.4	15.3
Depot equipment		4.0	2.0
Total	101.5	75.4	92.7

CIVILIAN PERSONNEL

Chairman ELLENDER. General Leber, at this point we must go vote. We will take a short recess.

(Brief recess.)

Chairman ELLENDER. The subcommittee will come to order.

General LEBER. The personnel funding for fiscal year 1973 will support an authorized civilian personnel strength of 2,481. This OMA funded effort is required for planning, supervision, and management of the program. These are the personnel in the various headquarters and offices which include my own Safeguard System Office (SAFSO).

CONTRACTS

The $24.7 million included for contracts is primarily for analysis effort, new equipment training, preparation of trade-off studies on manning and equipment requirements, and base operations support.

DEFENSE COMMUNICATIONS SYSTEM

Defense Communications System (DCS) costs of $15.3 million reflect the expenses for operation of the present administrative communications and installation of new leased tactical communications furnished by common carrier.

Chairman ELLENDER. Is all of this being done at the two approved sites?

General LEBER. Yes, sir, only at the two sites now. We are not putting any communications in for more than the two sites. Now, some of the other work, the planning and so forth——

Chairman ELLENDER. This is funded under O. & M.?

General LEBER. Yes, sir. In the case of communications, we are leasing but not building. We are leasing it from the common carrier.

Chairman ELLENDER. Is it in use now?

General LEBER. Some of it for the administration, which is for management data links and telephones for our construction people out there on the site.

Chairman ELLENDER. But insofar as the complete operation of it is concerned, you have nothing requested for the communications system?

General LEBER. The people who operate the switchboards at the site are covered by this. But when the site becomes operational, of course, there is a more elaborate communication system.

Chairman ELLENDER. Then I suppose funds would be required for repairs?

General LEBER. As I said, we are leasing the service and it is up to the common carrier to make the repairs and keep it working.

Chairman ELLENDER. What is the length of the contract?

General LEBER. It is on an indefinite basis for the services. The services include both operation and maintenance and are provided under services which are approved by the FCC and State regulatory commissions.

Chairman ELLENDER. How is the amount for each year determined?

General LEBER. It depends on how many lines, how many telephones and what kind of service you are going to require.

Chairman ELLENDER. These lines are specially built for this purpose?

General LEBER. Some of them are. Wherever possible we are using the existing network of the country between sites. That is why we contract with the common carriers, such as Mountain Bell Telephone or the others. In some cases we have to put in new lines because we have to bury them and make them so they won't be knocked out in case of attack.

Chairman ELLENDER. At whose expense is that done?

General LEBER. That is done by the contractor. We pay a special construction charge and lease the services.

Chairman ELLENDER. Proceed.

DEPOT EQUIPMENT

General LEBER. Depot equipment purchases amounting to $2 million consist of general and special purpose equipment, oscilloscopes, multimeters, wrenches, torque devices, fixtures, casts and other equipment to be used at the Safeguard mission depot at Glasgow Air Force Base, Mont. The Glasgow depot is to be activated and have initial maintenance capability by the ERD of the first tactical site in October 1974.

Chairman ELLENDER. Was that installation closed at any time?

General LEBER. Yes, sir; it was an Air Force base that was inactivated by the Air Force a few years back and remained in an inactive status for sometime. It has now been partially reactivated by the Air Force and will be used as one of their satellite bases for dispersing their bombers.

We have worked out an arrangement whereby we can use some of the base and convert some of the hangers into warehouses so we can use part of it for a depot.

Chairman ELLENDER. Why was it closed at one time?

General LEBER. The Air Force just decided they did not need that as an active bomber base.

Chairman ELLENDER. What caused them to open it again?

General LEBER. They needed it to spread out their bombers. The idea is to have not so many bombers on one base so they will not be vulnerable to attack. They will be locating some bombers there as a satellite base.

RENT AND NON-DEFENSE COMMUNICATIONS SYSTEM COMMUNICATIONS

The remainder, $5.5 million is for rent and non-DCS communications.

MILITARY PERSONNEL

(Chart 10 follows:)

CHART 10

SAFEGUARD MPA

[In millions of dollars]

	Fiscal year 1968–1971 approved	Fiscal year 1972 approved	Fiscal year 1973 request
Program totals	37.7	14.3	17.8

Note: MPA is an open allotment appropriation centrally controlled and managed at HQ. DA. The approved program for Safeguard represents that portion of the total appropriation estimated to be required to cover pay and allowances of Safeguard military personnel based on Army-wide average cost factors.

1973 REQUIREMENTS

General LEBER. The requirements in MPA to support the Safeguard deployment are shown by this last chart. We plan a military end strength in fiscal year 1972 of 1,426 and in fiscal year 1973 of 1,641. The fiscal year 1973 programed total would include 50 military personnel in the Washington area, 140 in the U.S. Army Air Defense Command, 132 in the U.S. Army Strategic Communications Command, 661 in the Continental Army Command at the Central Training Facility at Fort Bliss, Tex., 75 in the Army Materiel Command, and 28 in the Huntsville Engineer Division. The figures for these commands or organizations are subject to internal adjustment within the total program of $17.8 million to meet changing requirements.

Chairman ELLENDER. This is all part of the appropriation for military personnel.

General KJELLSTROM. If I may, sir, this is a part of the military personnel, Army appropriation which you heard the other day. There are 1,641 military personnel within the total end strength of 841,000, working with the Safeguard system. To provide you with the most complete picture possible on Safeguard, we have provided the support for all appropriations in General Leber's presentation.

SITE DEFENSE OF MINUTEMAN

General LEBER. I would like to turn now to another program related to Safeguard which we call the "Site Defense of Minuteman."

Chairman ELLENDER. General, before you proceed with your discussion of the request of $80 million for the project entitled, "Site Defense for Minuteman" I want to include selected paragraphs from the descriptive summary in the record.

As I understand this project was formerly referred to as "Hardsite Defense Prototype Demonstration."

General LEBER. That is correct, Mr. Chairman.

(The information follows:)

FISCAL YEAR 1973 RDTE MAJOR PROGRAM DESCRIPTIVE SUMMARY—MISSILES AND RELATED EQUIPMENT, HARDSITE DEFENSE PROTOTYPE DEMONSTRATION

RDTE Category: *Advance Development.*

BACKGROUND: Should the Soviet threat to MINUTEMAN continue to increase, the current SAFEGUARD defense of MINUTEMAN could require augmentation with additional active defenses. Recognizing this possible future need, the Army in FY 1970 conducted studies to examine the feasibility of a range of Hardsite Defense systems including adaptation of air defense components, dedicated single silo defenses, and dedicated mobile and fixed base multiple defense systems. Another feasible option, that of proliferation of SAFEGUARD components, was also examined. These analyses have shown that a dedicated Hardsite Defense system using new and smaller radars and their associated commercial data processors, when increased defenses are needed, would be less expensive than adding SAFEGUARD Missile Site Radars. It would not be necessary for these new radars to cover areas as large as do the SAFEGUARD MSRs. Based on the possible future need, and having examined the feasibility of dedicated Hardsite Defense of MINUTEMAN, the Army requested and the Congress approved FY 71 funds for the development of Hardsite Defense components.

DESCRIPTION: The HSD prototype demonstration program is in the early stages of development. A state-of-the-art phased array radar will be developed. A third generation commercial data processor and the SAFEGUARD SPRINT interceptor missile will be adapted for HSD use. Software will be developed concurrently with the hardware items to permit demonstration of the prototype components.

WORK PERFORMED BY

Management: The SAFEGUARD System Manager, Office of Chief of Staff, US Army, Washington, DC, with subordinate elements including the SAFEGUARD System Command, Huntsville, Alabama, and the SAFEGUARD System Evaluation Agency, White Sands Missile Range, New Mexico, and including staff supervision over DA commands and agencies for SAFEGUARD activities.

Contractors: The Brown Engineering Company (subsidiary of Teledyne, Inc.) was competitively selected as the System Engineering and Technical Assistance Contractor (SETAC) during FY 1971. A prime contractor will be selected in the first half of CY 72 at the conclusion of the contract definition phase; competing contractor teams are: (1) McDonnell Douglas Astronautics Co., with major subcontractors, TRW, Inc., and General Electric Co.; (2) Hughes Aircraft Co., with major subcontractors, Boeing Co. and System Development Corp.; (3) Raytheon Co. with major subcontractors, Martin Marietta Corp. (Orlando Division), IBM Corp. and General Research Corp.

PROGRAM ACCOMPLISHMENTS AND FUTURE PLANS

FY 1972 Program: Selection of a prime contractor from the CD competitors will be made in the first half of CY 1972. The prime contractor will begin work on the radar, data processor and software development. The interceptor (SPRINT II) contract definition was completed, advanced design has been initiated and the prototype demonstration phase of advanced development will begin in late FY 1972. The SPRINT II interceptor will be provided to the prime contractor as Government Furnished Equipment (GFE). The SETAC will continue to provide system engineering, management and development support to the government.

FY 1973 Planned Program: The prime contractor will initiate software development on a non-tactical computer and continue design and development of system specifications which began in FY 1972 along with procurement of some long lead-time hardware for the Hardsite radar. Development of the interceptor design and specifications with principal effort on the autopilot and missile borne guidance unit will continue. The discrimination program to provide information for evaluation of discrimination and bulk filter design will continue. System engineering, trade-off and feasibility studies will continue to assure appropriate

interface of the Hardsite Defense (HSD) system components and interface of the HSD system design with the SAFEGUARD and MINUTEMAN systems.

Program to Completion: Prototype design, fabrication and testing in the Continental United States (CONUS) of the radar and data processor will continue into [deleted]. Flight tests of the SPRINT II interceptor will be conducted at the Kwajalein Missile Range (KMR) in [deleted] and will continue into [deleted]. System integration testing and evaluation will be conducted at KMR beginning in [deleted].

Budget activity title: Missiles and related equipment—resources

(Dollars in millions)

RDTE: Funds—	
Fiscal year 1971	25
Fiscal year 1972	60
Fiscal year 1973*	80
Additional to completion	[1] 600 to 700
Total estimated cost	[1] 700 to 800

[1] Cost to be refined subsequent to selection of prime contractor.
*Subject to revision based on Presidential review.

General LEBER. If the Soviet threat continues to grow, the Safeguard deployment in the Minuteman fields would provide a suitable base for augmentation during the last half of the 1970's. Accordingly, advanced development of prototype components for site defense of Minuteman (SDM) has been initiated by the Army with fiscal year 1971 funds appropriated for this purpose.

As the chairman stated, this program was formerly called "Hardsite Defense." We have renamed it to make it more descriptive of what it is.

Senator SYMINGTON. May I say in that connection, this was the radar we originally suggested if there had to be any ABM of any kind, as a logical Hardsite radar.

It seemed incredible, when you first designed something for area defense, as you did with the Sentinel, that the radar would not have to be changed if you went from area defense to point defense, which you did when you announced the Safeguard system.

We said in the hearings, when we were beaten down, it was the only kind of a radar that would successfully defend Minuteman. Therefore, I am skeptical with previous efforts made against some of us, because of the technical advice we received. We knew we would have to come to Hardsite radars if we were serious in our desire to defend the Minutemen.

I make that observation for the record.

Chairman ELLENDER. This is not a new program.

PROGRAM RENAMED BECAUSE OF CONFUSION RESULTING FROM AIR FORCE PROGRAM OF HARDENING SILOS

General LEBER. No, sir. It started in 1971. We renamed it in an attempt to make it more descriptive.

Senator SYMINGTON. It is a new radar program. It is the program Dr. Panofsky told us 2 years ago we would have to have to make the system work.

General LEBER. The problem we found in the name "Hardsite" is that it was confused with the Air Force program which is going on of increasing the hardness of their silos so that they could withstand about [deleted] pounds per square inch instead of [deleted].

This is an ongoing program of the Air Force where they are going into the Minuteman silos, and by putting in some more shock mounting

and different doors, they will make their silos harder. This is a passive thing. You do it and it is there. There is no active defense.

SINGLE MISSION OF DEFENDING MINUTEMAN FORCE

What we are talking about here is an antiballistic missile system of active defense for Minuteman. Therefore, we get the name "Site Defense of Minuteman."

Unlike Safeguard, the site defense of Minuteman program has a single mission; it is dedicated to provide defense of our Minuteman force. Thus we see since Safeguard has several missions to perform, site defense of Minuteman is not a replacement for Safeguard but is being designed as an augmentation. In addition, the site defense of Minuteman concept envisions maximum utilization of the Safeguard command and control system, maintenance facilities, progress in development and similar assets.

AUGMENTATION OF SAFEGUARD

Senator SYMINGTON. You say the site defense of Minuteman has a single mission to provide the defense of the Minuteman force. Was not Safeguard dedicated to provide the defense of the Minuteman force?

General LEBER. As one of its missions.

Should the decision be made to deploy site defense of Minuteman, the Safeguard components would be augmented by SDM modules. A typical module protects [deleted] Minuteman silos and contains [deleted] phased array radars with their associated data processors and modified Sprint interceptors located in [deleted] firing sites.

Senator YOUNG. This consists mostly of additional Sprints?

General LEBER. Sprint is the only interceptor in this system. There are no Spartans.

Senator YOUNG. You add additional Sprints?

General LEBER. Yes, sir. It is the modified Sprint or Sprint II, but it is a Sprint.

Senator SYMINGTON. Would you keep the Spartan on the basis there are more Sprints?

General LEBER. Yes, sir, we keep the ones that are there.

Senator SYMINGTON. What you are doing is adding additional missiles?

General LEBER. Yes, sir, interceptors.

1971 R.D.T.E. ($25 MILLION)

A system engineering and technical assistance contractor (SETAC) has been competitively selected and the contract definition competition was initiated.

1972 R.D.T.E. ($60 MILLION)

Three prototype demonstration program proposals were submitted on November 30, 1971. These proposals were evaluated by formal source selection procedures and a prime contract for the prototype demonstration program for site defense of Minuteman was awarded to the McDonnell Douglas Astronautics Co. on February 28, 1972.

1973 Proposed Program

Fiscal year 1972 R.D.T.E. funds will support the prime contract through December 1972. Our intent is to employ R.D.T.E. funds requested for fiscal year 1973 to support the prime contract through July 31, 1973. The Sprint and technical assistance contractor efforts with fiscal year 1973 funds will terminate on July 31, 1973, and September 30, 1973, respectively. Subsequent fiscal year funding requests will be for 12-month periods.

Augmentation of SAFEGUARD

Chairman Ellender. Is this an additional system?

General Leber. It would be a system to augment Safeguard if needed; that is, if the threat so indicated. The program now is to proceed toward a prototype demonstration of components of the system. There is no authority for deployment. None has been asked for and none will be asked for until the threat so indicates.

Authority to Demonstrate System Capability

What we have here is authority to demonstrate that this system can be put together, and we will do this out at the test range in the Pacific. We will test it and show that the concept will work. That is what we are talking about.

Chairman Ellender. What are the principal components of this new system?

General Leber. We would have a radar. We would have a modified Sprint and we would conduct tests with it out in the Pacific.

Chairman Ellender. What is the nature of this test program?

General Leber. This is similar to the Safeguard test program. There would be a prototype of the modified SPRINT, the radar and the data processor software. Of course in the Safeguard program we started the construction before we had conducted all of the tests that we have now conducted in the Pacific. The tests have gone very well. It was a matter of time, when you needed it.

Chairman Ellender. The need for this new system is certainly open to question. However, I must say that I approve of the way you are developing this new system by building the prototype. One of my objections to the deployment of the Safeguard system was that we started deployment before we had ever tested the system. While we had tested some of the components, we have not, even at this date, tested the system.

Chairman Ellender. Senator Young.

System Development

Senator Young. Will this site defense program in North Dakota just protect the Grand Forks wing of Minuteman?

General Leber. It could be put in Minot, Grand Forks, Whiteman—any of the Minuteman sites.

Senator Young. Will this be put in at the Minot wing?

General Leber. It could be if the threat indicated; yes.

Senator YOUNG. Are you proposing it now for the Grand Forks wing?

General LEBER. No; we are not, because the threat doesn't warrant it. What we are trying to do is develop and prove it will work and then, if needed, we will put it in as many places as we need it.

Senator YOUNG. You are speaking of the site defense program?

General LEBER. Yes, sir.

RUSSIAN THREAT

Senator SYMINGTON. You build up the threat. Secretary Laird comes down and talks about these hundreds upon hundreds of offensive weapons capability the Soviets have. You have very few of these defensive missiles at these bases, relatively, against the offensive missiles they have.

You can't have it both ways. You immediately run into the danger of saturation if they are serious in the attack, or somebody's figures are wrong.

General LEBER. We don't think they can increase their threat overnight.

Senator SYMINGTON. They have the threat now, submarines, ICBM's, SS–9's, and SS–11's. They have it now. Why do we kid ourselves in thinking we can prevent them from saturating the bases in which they know, just as we know the number. Unfortunately, we won't tell the American people.

The Soviets know the number of missiles we have on these sites. Dr. Foster remains rigid. He won't agree to release even the approximate number of Sprints or Spartans at our bases.

The engineers I find independent of the Pentagon say [deleted].

It is interesting you all go this different way now. For 2 years we have said, if you need this system at all, this is the way to do it.

Chairman ELLENDER. Proceed.

1973 R.D.T. & E. FUNDING

General LEBER. Let me now address our plan for R.D.T. & E. funds requested in fiscal year 1973 budget (chart 11).

(Chart 11 follows:)

Prototype demonstration program for site defense of Minuteman fiscal year 1973 RDTE funding requirements

Tasks	*Millions*
Government	12.7
Prime and technical assistance contractor	49.3
Missile development	18.1
Total	80.1

ALLOCATION OF FUNDS

General LEBER. The $80.1 million requested for fiscal year 1973, will permit the prime contractor to build his rate of development efficiently while preserving the option to either maintain the program at a modest level or to expand it as the threat and other considerations may war-

rant. The fiscal year 1973 request also includes $20.4 million in MCA funds required to plan and construct facilities for the prototype demonstration at the Kwajalein Missile Range which will be required.

The effort of the prime contractor in fiscal year 1973 will consist of a continuation of development work begun in fiscal year 1972. This will be continued design and development of system specifications along with procurement of some long leadtime components for the SDM radar. The discrimination program to provide information for evaluation of discrimination and [deleted] design will also continue as will system engineering, tradeoff, and feasibility studies to insure appropriate interface of the components for site defense of Minuteman with each other and overall compatibility of the design of the system with the Safeguard and Minuteman systems. The missile contractor will continue development of the interceptor design and specifications with principal effort on the [deleted] and missile borne guidance unit. Additionally, the prime contractor will initiate software development on a nontactical computer.

This completes my statement, Mr. Chairman.

Chairman ELLENDER. Any further questions?

Senator SYMINGTON. Mr. Chairman, I have some questions.

Chairman ELLENDER. Proceed.

SUGGESTED FUNDING DELAY PENDING RESULTS OF SCHEDULED SALT MEETING

Senator SYMINGTON. At a recent hearing at the Senate Armed Services Committee, I raised the possibility of that committee's consideration of not funding for Safeguard until after the results of the next round of the SALT talks scheduled to begin this next month are announced. It is anticipated that this round of talks may produce some agreement with respect to the limitation of ABM's and, therefore, it would seem reasonable for the Congress to withhold approval of the additional billions pending announcement of said agreement.

One argument against postponing the decision for several months would be that such action would delay the construction program and thus increase the overall cost of Safeguard, which is now estimated, counting the AEC, at some $9 billion for the four sites.

OBLIGATION AND EXPENDITURE OF FUNDS TO DATE

In this connection, how much of the funds authorized in prior years have been obligated and/or expended to date?

General LEBER. That was included in one of the charts I have here in my presentation.

Senator SYMINGTON. It is in the record?

General LEBER. Yes, sir.

Senator SYMINGTON. Would you make a continuing record and supply it at this point?

General LEBER. Surely.

(The information follows:)

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CHART 4—SAFEGUARD FUNDS

[In millions of dollars]

Appropriation	Approved program, fiscal year 1968–71	Approved program, fiscal year 1972	Requested NOA, fiscal year 1973	Obligated as of January 31, 1972	Expended as of January 31, 1972
R.D.T.E	1,460.9	[1] 358.0	340.5	1,708.5	1,406.4
Procurement	1,478.6	640.0	754.4	1,954.8	1,022.1
Missile procurement, Army		(639.0)	(753.0)		
Other procurement, Army		(1.0)	(1.4)		
MCA	685.8	119.0	390.0	427.6	290.2
OMA	101.5	75.4	92.7	132.0	112.5
MPA	37.7	14.3	17.8	46.1	46.1
Total	3,764.5	1,206.7	1,595.4	4,269.0	2,877.3

[1] Excludes $42,400,000 in prior year Safeguard R.D.T.E. funds released for use against fiscal year 1972 requirements.

COST INCREASE WHICH WOULD RESULT FROM 3-MONTH DELAY

Senator SYMINGTON. If authorization of funds for fiscal 1973 were postponed for 3 months, what would be the estimated additional cost for the four-site program as a result of that delay?

[Deleted.]

General LEBER. The stretchout cost, if that is what you are talking about, is running about $100 million per quarter.

Senator SYMINGTON. $100 million a quarter?

General LEBER. Yes.

Senator SYMINGTON. So it would cost us $100 million?

General LEBER. If you delay it a quarter.

SITE COMPLETION COST

Senator SYMINGTON. [Deleted] what additional funds, including the fiscal 1973 request, would be required to complete those two sites?

General LEBER. Well, for the two-site program, we would require some additional funds for procurement to continue to completion.

Senator SYMINGTON. Please supply that for the record.

General LEBER. We have the figures. Roughly, we have through 1972, about $5 billion. We would need a total of about $6.8 billion. That is including OMA and MPA.

WHITEMAN ACQUISITION FUNDING

Senator SYMINGTON. According to figures supplied by the Defense Department, to date $270 million in acquisition costs have been appropriated for Whiteman. Have all of these funds been expended and/or obligated?

General LEBER. No, sir; they have not. The amount obligated for Whiteman is approximately $175 million. Most of it is for the radar. The amount expended for Whiteman to date has been approximately $50 million, mostly for procurement.

WHITEMAN CONTRACTORS

Senator SYMINGTON. Could you supply for the record a list of the contractors you have at Whiteman, including any cost-plus contracts for design at this point?

General LEBER. Yes, sir.

(The information follows:)

Site adaptation at Whiteman has been accomplished under Architect-Engineer design contract with Sverdrup and Parcel and Associates, Incorporated, of St. Louis. There are no other design contracts and no construction contracts pertaining to the Whiteman site.

WHITEMAN 1973 FUNDING AND COMPLETION COST

Senator SYMINGTON. For the fiscal year 1973, you are requesting $289.5 million for Whiteman. What would be the total cost to complete Safeguard at this site?

General LEBER. The fiscal year 1973 request for Whiteman would complete the construction. We would need additional procurement funds for Whiteman to complete the procurement of the missiles, the interceptors, and I would get that for you.

(The information follows:)

The estimated cost, beyond FY 1973, directly attributable to completion of the Whiteman site is $310 million.

COMMUNITY IMPACT ASSISTANCE: POSSIBLE PROGRAM LIMITATION TO GRAND FORKS AND MALMSTROM

Senator SYMINGTON. Included in this year's request—and this refers to a question Senator Young asked—is $26 million for community impact assistance to provide communities near Grand Forks, Malmstrom, Whiteman, and Warren with assistance to meet the cost of providing increased services and facilities as a result of the deployment of Safeguard. In that there would appear a strong possibility that an agreement of SALT would limit Safeguard to two sites, Malmstrom or Grand Forks, or perhaps one of those, with a National Command Authority. Why do we need to authorize funds at this time for community impact assistance for the building of additional sewers and so forth at Whiteman and Warren?

General LEBER. Well, you certainly wouldn't need it if you get a limitation agreement that limits you to two sites. There is no question about that.

PRIORITY OF FACILITIES

Senator SYMINGTON. Wouldn't such facilities be low priority until the site itself is near completion?

General LEBER. No, sir. They become fairly high priority once we start construction, as we have experienced out in North Dakota. The local people immediately say you are bringing in a large force of construction workers and we want some help.

Senator YOUNG. If I may say so, Senator, I don't know what your situation is in Missouri. But in North Dakota, out in the rural areas, where the largest city has only about 2,500 population, these little towns are not able to take care of a large influx of workers. So they were assisted with schools, roads and even sewers and water, and many other facilities.

EFFECT ON COMMUNITIES OF STARTING AND ABANDONING SITES

Senator SYMINGTON. If I may say to the able Senator, I would like to see us—and have said all along—proceed with the one base where

we are furthest ahead, based on the pictures we have just seen; have that as a laboratory to consider the further development of this type of defense. The same thing will happen in my State which happens everywhere when plans are abandoned. These are generally small towns, told what all this will do, and they are abandoned.

If we go on with this situation without further tests, and then it is all stopped [deleted], these towns are left holding the bag. That is what I think you, in effect, are saying about what could happen in North Dakota and Missouri.

Senator YOUNG. We say, "If you go ahead with the program, the funds are helpful."

Senator SYMINGTON. If you don't go ahead with it, the reverse is true, because the local communities and local businesses figure they are going ahead with it and making their plans accordingly.

RESOLUTION OF MALMSTROM LABOR DIFFICULTIES

With respect to the long, drawn-out labor difficulties at Malmstrom, it is my understanding that the union representatives and the contractor are close to or have reached agreement; is this correct?

General LEBER. They have reached agreement.

TAXPAYER COST OF LABOR TROUBLE

Senator SYMINGTON. What is the estimated cost to the taxpayers of this labor trouble? Can you give a figure on that?

General LEBER. It is hard to say. It has meant 11 months of construction delay, which has stretched out the four-site program. I will try to get it for you.

Senator SYMINGTON. Is there any comparable problem like this at Grand Forks or Whiteman?

General LEBER. No, sir.

(The information follows:)

For the 4-site deployment, the 8-month stretchout to the last site completion date, attributable to the 11-month delay in the award of the Malmstrom major construction contract, has increased DOD acquisition costs by an estimated $240 million.

WHITEMAN SITE MISSILE PROTECTION

Senator SYMINGTON. At Whiteman a factsheet supplied by the Department of Defense to the Armed Services Committee contains the following sentence: "This site will provide protection for a portion of the Minuteman missiles in the Whiteman Air Force area."

What portion of the total number of missiles at Whiteman will be protected?

General LEBER. With Sprint, we would defend about [deleted] Minuteman. All [deleted] would be covered by Spartan.

Senator SYMINGTON. That would be [deleted] the ones there. [Deleted].

General LEBER. Again, it depends on how many weapons they have for attack.

Senator SYMINGTON. On the law of averages they would miss at least half, would they not?

General LEBER. No, I don't think they are that bad.

Senator SYMINGTON. What you are really doing, as you set this program up, is planning to defend [deleted] at Whiteman, [deleted]; correct?

General LEBER. It is not necessary to defend all Minuteman at any location. Our objective is to assure about [deleted] Minuteman survivors from among four sites.

GRAND FORKS SITE PROTECTION

Senator SYMINGTON. How many do you expect to protect at Grand Forks?

General LEBER. At Grand Forks, [deleted.]

Senator SYMINGTON. Out of how many?

General LEBER. I think Grand Forks has the same number as Whiteman, [deleted.]

Senator SYMINGTON. So all of this effort is being made [deleted] at Grand Forks?

General LEBER. Again, trying to assure that about [deleted] Minuteman survive. We have to protect only that fraction that will result in about [deleted] survivors against the design threat. We have over 1,000 Minuteman silos. There is no need to protect them all.

Senator SYMINGTON. Why don't you protect them all at one base, instead of having all of these other bases?

General LEBER. That was considered.

Senator SYMINGTON. Why don't you take Grand Forks and give us 100-percent defense; and not mess up all the other locations?

General LEBER. That, I believe, was considered in the original planning. Part of the reason for that, as I said to begin with, Safeguard is a multi-purpose program. The four sites fit in with the overall 12-site deployment. One site, of course, is only one of 12. Four is four of twelve.

TRIAD DEFENSE

Senator SYMINGTON. If you plan on only defending [deleted] and if you have some [deleted] on the Polaris submarines alone, why do you need this at all?

General LEBER. This gets around to the basic discussion of the TRIAD and why carry the ICBM's at all.

GRAND FORKS AND MALMSTROM SITE PROTECTION

Senator YOUNG. Are you actually planning to defend only [deleted] at Grand Forks?

General LEBER. That is correct for the number protected by Sprint.

Senator YOUNG. Or are you planning that [deleted] will survive?

General LEBER. That is what we are going to defend. We are figuring on about [deleted] silos surviving. That is what we are there to defend.

Senator YOUNG. That is a different story from what you are telling Senator Symington. I got the impression from your answer to him that you are trying to defend only [deleted].

General LEBER. We are going to defend only sufficient Minuteman to have about [deleted] survive.

Senator YOUNG. That is a different story.

Senator SYMINGTON. You are only defending [deleted].

General LEBER. Of course this is with our Sprint defense. Now, with Spartan we are defending [deleted].

Senator SYMINGTON. How many Spartan missiles do you have at Grand Forks?

General LEBER. I believe at Grand Forks they have [deleted] Minuteman.

Senator SYMINGTON. I am talking about the Spartans.

General LEBER. [Deleted.]

Senator SYMINGTON. How can [deleted] Spartans, if they go off, defend [deleted]——

General LEBER. You have to get the missiles coming in and the offense has no way of knowing which silos are being defended with the [deleted] Spartans.

Senator SYMINGTON. Do not let us kid ourselves.

General LEBER. We have got a different interceptor.

Senator SYMINGTON. I said what proportion of the total number of missiles at Whiteman will be protected, and you said [deleted]. Then I asked what would it be, Malmstrom and Grand Forks, and you said [deleted]. Presumably, that would be true also at Malmstrom, wouldn't it?

General LEBER. [Deleted] there. It is roughly about [deleted]. When I say defend, I mean we defend enough Minuteman to insure meeting our objective of about [deleted] survivors.

Senator SYMINGTON. You are protecting [deleted] at Whiteman, [deleted] at Grand Forks, and [deleted] at Malmstrom; right?

General LEBER. Insuring survival of about [deleted] Minuteman against the threat Safeguard is designed to counter.

Senator SYMINGTON. I don't see any difference.

General LEBER. If Senator Young wants to make a point of that, I think he is right.

Senator YOUNG. Going beyond that, the Safeguard at Grand Forks is supposed to give some defense to the Minuteman wing at Minot.

General LEBER. Exactly. And the Headquarters at Omaha. We are not insuring survival of all the Minuteman at Minot; we are giving them some defense.

Senator SYMINGTON. I am not trying to be contentious about it, but for the life of me can't see why, if you want a real defense, you don't defend every ICBM at one base, instead of spreading it around so you half defend all bases.

PROGRAM ELEMENTS

This fact sheet also says that two elements of the Safeguard program are: "The plan for the longer term to continue the deployment leading to a full 12-site Safeguard," and "to continue with area research and development. Does the latter mean we are contemplating an area defense system beyond 12 sites?

General LEBER. Not beyond 12 sites; no. If anything, with fewer than 12 sites. The objective of the research and development program regarding area defense is to see whether we can come up with a modified Safeguard defense of the whole country more efficiently than was planned with the basic 12-site Safeguard. In other words, perhaps do it with [deleted] sites. This is the objective—always trying to improve.

Now, we don't know how we could do that today, but with continued work there are some ideas that could turn out to be feasible. We might be able to provide area defense with fewer than 12 sites.

Senator SYMINGTON. Thank you, Mr. Chairman.

QUESTIONS BY SENATOR THURMOND

Chairman ELLENDER. Senator Thurmond was unable to be here today but has asked that responses to questions he has supplied will be answered for the record. The questions and answers will appear at this point in the record.

(The information follows:)

SOVIET SAM SITE POTENTIAL

Senator THURMOND. General Leber, what potential do the present Soviet SAM sites have for use as an anti-ballistic missile defense system? How do we stand vis-a-vis the Soviets in this area?

General LEBER. There is evidence that currently deployed Soviet SAMs have not been modified to provide them with a ballistic missile defense capability. Various technical analyses of the [deleted].

The ABM potential of U.S. SAM systems has been analyzed. As noted above these systems (like their Soviet counterparts) have an inherent ABM capability against certain threats. However, the Soviets have a much larger deployed SAM force so that upgrading of Soviets SAMs into an ABM role poses a much more significant problem than any upgrading of the U.S. SAM forces.

UPGRADING OF SOVIET ABM SYSTEM

Senator THURMOND. Can you measure the degree to which the Moscow ABM system has been upgraded?

General LEBER. Measurement of Soviet upgrading of their ABM system around Moscow is primarily based upon construction activities at launch complexes around the city and activities at the ABM R&D ranges. The Soviets appeared to have originally [deleted] TRY ADD/GALOSH launch complexes, [deleted]. Four launch complexes have achieved operation status. [Deleted.]

In addition there is evidence of continued testing of an improved missile.

WASHINGTON NATIONAL COMMAND AUTHORITY

Senator THURMOND. The Safeguard request this year includes advanced preparation activities for the National Command Authorities defense in the Washington area. Is this a bargaining chip for SALT or would we need an ABM site here since the Soviets have Moscow already protected?

General LEBER. [Deleted.]

WASHINGTON ANTI-ICBM ADEQUACY

Senator THURMOND. Soviet land based ICBM's or sea based missiles off U.S. coast could easily hit Washington. What size ABM site would be required to adequately guard against this threat?

General LEBER. The initial defense of the NCA would be the same configuration as the Washington site planned for in the 12-site SAFEGUARD deployment and would consist of a single Missile Site Radar (MSR) and interceptors. [Deleted.]

TECHNICAL PROBLEMS IN SAFEGUARD DEVELOPMENT

Senator THURMOND. General Leber, some $340 million in research and development on SAFEGUARD is included in the FY 1973 account. What major technical problems remain to be answered in this program?

General LEBER. Progress on the research and development portion of the SAFEGUARD program over the past year has been outstanding and there are no technical problems which would affect a decision to proceed with the SAFEGUARD deployment in 1973. Of the $340.5 in FY 1973 RDTE New Obligational Authority we are requesting, about 25% is for continuation of the system tests out at

Kwajalein Missile Range. Another 25% is for continuation of the development of software for the data processor. About 25% more is for completion of the development hardware associated with the SPRINT, SPARTAN, MSR, and PAR subsystems. The remaining 25%, is for a variety of items, including the overall system support, a small amount of preparatory work on NCA defense and other testing particularly having to do with nuclear hardening to insure that this equipment will function properly in a nuclear environment.

Variance in Construction Request

Senator Thurmond. General Leber, the military construction account for SAFEGUARD was $357 million in FY 1971, $119 million in FY 1972 and is $390 million in FY 1973. Explain the variance between these 3 years, what caused the increase from 1972 to 1973, what are the 1973 funds for and what construction costs remain to complete the presently planned program?

General Leber. The FY 1971 SAFEGUARD MCA program of $357 million contained funds estimated in late 1969 to be sufficient to complete construction of the Grand Forks, Malmstrom and Whiteman sites. However, increased program costs, in particular those experienced at Grand Forks and Malmstrom, necessitated an internal reprogramming of FY 1971 as well as FY 1972 MCA funds. Consequently, the present FY 1972 program of $119 million, which reflects the $74 million Congressional reduction from the $193 million budget request, now contains funds estimated to be sufficient to complete all construction at Grand Forks and Malmstrom, as well as advanced preparation effort at Whiteman and Warren. Also included in the FY 72 program are $5 million appropriated for access road construction at the Warren site and $6 million appropriated for advanced preparation effort at the NCA site. However, these funds cannot be used until Congress authorizes Warren construction and NCA advanced preparation. These authorizations as well as authorization to undertake construction at Whiteman were denied in FY 1972.

The FY 1973 request of $390 million contains additional funds estimated to be required to complete all construction at the Whiteman and Warren sites. This request takes into consideration increased costs anticipated at these two sites based on the revised deployment schedule and our experience at Grand Forks and Malmstrom. The request includes $150 million to construct the MSR, remote sites and support facilities at the Whiteman site; $199 million to construct the MSR, remote sites and support facilities at the Warren site; $15 million for Standard and Miscellaneous Design and Engineering and Design in support of construction; and $26 million to continue the Community Impact Assistance program.

It is currently estimated that approximately $11 million more will be needed in FY 1974 to complete MCA requirements for a four-site deployment.

First Safeguard Operational Date

Senator Thurmond. General, if this nation proceeds on the current ABM schedule when will the first site be operational?

General Leber. The planned Equipment Readiness Date (ERD) for the first SAFEGUARD site near Grand Forks Air Force Base, North Dakota is October 1974. The work at this site is on schedule and we expect to meet the planned ERD.

Relation of Safeguard Funding to SALT Position

Senator Thurmond. General Leber, if the Congress rejected any part of the $1.4 billion requested for Safeguard in the 1973 budget do you feel the U.S. position at SALT would be weakened?

General Leber. [Deleted.]

Soviet MRV Capability Effect on Safeguard System

Senator Thurmond. Would the SAFEGUARD system, as presently programmed, be able to withstand a Soviet attack if the Soviets have achieved a MRV capability as Secretary Laird recently announced?

General Leber. If the level of deployment of Soviet MRV capability significantly raises the threat beyond that which SAFEGUARD was designed to handle, the presently planned four-site defense of MINUTEMAN would require augmentation in order to meet our defense objective. The four-site SAFEGUARD deployment

has the objective of maintaining the survival of [deleted] MINUTEMAN missiles against a Soviet force of approximately [deleted] RVs on-launcher. If the Soviets deploy the MRVs which are within the payload potential of their expanding ICBM force, then the SAFEGUARD defense of MINUTEMAN would require augmentation. As a hedge against such an increase in the threat, the Site Defense of MINUTEMAN prototype demonstration program is being undertaken by the Army.

Senator THURMOND. What would be the status of the SAFEGUARD system if the Soviets achieve a MIRV capability?

General LEBER. Deployment by the Soviets of an operational MIRV capability throughout their ICBM force may require augmentation of the presently planned 4-site SAFEGUARD Defense of MINUTEMAN. The actual effect on SAFEGUARD, however, would be a function of not only MIRV existence, but their actual numbers, yield and accuracy. The four-site SAFEGUARD deployment has the objective of maintaining the survival of [deleted] MINUTEMAN missiles against a Soviet force of approximately [deleted] RVs on-launcher. If the Soviets deploy accurate MIRVs that are within the payload potential of their expanding ICBM force, then the SAFEGUARD defense of MINUTEMAN would require augmentation. As a hedge against such an increase in the threat, the Site Defense of MINUTEMAN prototype demonstration program is being undertaken by the Army.

OPERATIONAL DATE OF MISSILE SITE DEFENSE SYSTEM

Senator THURMOND. What is the hoped-for operational date for the proposed Hardsite or missile site defense system which would supplement SAFEGUARD?

General LEBER. Our current authority with regard to the Site Defense of MINUTEMAN program is limited to prototype demonstration only. This program is to demonstrate prototype versions of equipment and software suitable for further development and deployment as a system if required. The current prototype demonstration schedule calls for completion of system flight tests at Kwajalein Missile Range in the first half of CY 1977. The decision to deploy the Site Defense of Minuteman system will depend on the threat to our MINUTEMAN force. Assuming that a deployment decision were made at an appropriate time, the first Site Defense of MINUTEMAN module could be operational by about [deleted]. This would require FY 74 funds for full-scale development and pre-production planning, as well as production funds beginning in FY 75.

SUBCOMMITTEE RECESS

Chairman ELLENDER. Are there any further questions?

If not, we thank you, gentlemen.

The subcommittee will stand in recess until 10:15 tomorrow morning.

(Whereupon, at 12:40 p.m., Wednesday, March 15, the subcommittee was recessed, to reconvene at 10:15 a.m., Thursday, March 16.)

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DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1973

TUESDAY, MAY 2, 1972

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 10 a.m., in room S–126, the Capitol, Hon. Allen J. Ellender (chairman) presiding.

Present: Senators Ellender and Young.

DEPARTMENT OF DEFENSE

DEPARTMENT OF THE ARMY

RESEARCH, DEVELOPMENT, TEST AND EVALUATION, ARMY

STATEMENT OF CHARLES L. POOR, DEPUTY ASSISTANT SECRETARY OF THE ARMY (RESEARCH AND DEVELOPMENT)

ACCOMPANIED BY:

MAJ. GEN. J. A. KJELLSTROM, DIRECTOR OF ARMY BUDGET, OFFICE OF THE COMPTROLLER OF THE ARMY

CHARLES R. WOODSIDE, ASSISTANT FOR PROGRAMS, OFFICE, ASSISTANT SECRETARY OF THE ARMY (RESEARCH AND DEVELOPMENT)

MAJ. GEN. GEORGE SAMMET, JR., DEPUTY CHIEF OF RESEARCH AND DEVELOPMENT

HOUSE DOCUMENT 92–272: SUPPLEMENTAL REQUESTS

Chairman ELLENDER. The subcommittee will come to order.

On March 29, 1972, the President submitted to the Congress supplemental requests totaling $254.8 million for fiscal year 1973. These are contained in House Document 92–272 and are the same items as were originally requested for inclusion in the fiscal year 1972 supplemental.

The document referred to will appear in the record at this point.

(The information follows:)

92D CONGRESS, 2d Session } HOUSE OF REPRESENTATIVES { DOCUMENT No. 92-272

SUBMITTING AMENDMENTS TO THE REQUESTS FOR APPROPRIATIONS FOR FISCAL YEARS 1972 AND 1973

COMMUNICATION

FROM

THE PRESIDENT OF THE UNITED STATES

TRANSMITTING

AMENDMENTS TO THE REQUESTS FOR APPROPRIATIONS FOR FISCAL YEARS 1972 AND 1973

MARCH 29, 1972.—Referred to the Committee on Appropriations and ordered to be printed

THE WHITE HOUSE,
Washington, March 29, 1972.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

SIR: I ask the Congress to consider amendments to the requests for appropriations for the fiscal years 1972 and 1973 transmitted in the budget for fiscal year 1973 involving a decrease in the amount of $254,800,000 in requests for the fiscal year 1972, and increases in the amount of $254,800,000 for the fiscal year 1973, for the Department of Defense—Military.

The details of these proposals are set forth in the enclosed letter from the Director of the Office of Management and Budget with whose comments and recommendations I concur.

Respectfully yours,

RICHARD NIXON.

Enclosures.

EXECUTIVE OFFICE OF THE PRESIDENT,
OFFICE OF MANAGEMENT AND BUDGET,
Washington, D.C., March 29, 1972.

The PRESIDENT,
The White House.

SIR: I have the honor to submit for your consideration amendments to the requests for appropriations for the fiscal years 1972 and 1973

transmitted in the budget for fiscal year 1973 involving a decrease in the amount of $254,800,000 in requests for the fiscal year 1972, and increases in the amount of $254,800,000 for the fiscal year 1973, for the Department of Defense—Military. The details of these requests are as follows:

REOUCTION OF 1972 SUPPLEMENTAL REQUESTS

DEPARTMENT OF DEFENSE, MILITARY PROCUREMENT

Budget appendix page	Heading	January budget request	Amendments previously proposed (H. Doc. 92-267)	Proposed amendments	Revised request
1064	Aircraft procurement, Air Force	$113,800,000	0	−$113,800,000	0
1064	Research, development, test, and evaluation, Army	28,000,000	$11,135,000	−28,000,000	$11,135,000
1064	Research, development, test, and evaluation, Navy	68,800,000	9,528,000	−63,800,000	9,528,000
1064	Research, development, test, and evaluation, Air Force	39,000,000	8,484,000	−39,000,000	8,484,000
1064	Research, development, test, and evaluation, Defense agencies	10,200,000	1,458,000	−10,200,000	1,458,000

These amendments would cancel the supplemental requests for fiscal year 1972 that were transmitted in the budget for fiscal year 1973.

DEPARTMENT OF DEFENSE, MILITARY—1973 BUDGET AMENDMENTS (PROCUREMENT)

Budget appendix page	Heading	January budget request	Amendment previously proposed (H. Doc. 92-267)	Additional amendment proposed	Revised request
306	Aircraft procurement, Air Force	$2,612,700,000		$113,800,000	$2,726,500,000
312	Research, development, test, and evaluation, Army	2,051,100,000	17,616,000	28,000,000	2,096,716,000
314	Research, development, test, and evaluation, Navy	2,710,900,000	19,087,000	63,800,000	2,793,787,000
315	Research, development, test, and evaluation, Air Force	3,178,600,000	14,577,000	39,000,000	3,232,177,000
317	Research, development, test, and evaluation, Defense agencies	507,200,000	2,687,000	10,200,000	520,087,000

The additional requirement for "Aircraft procurement, Air Force" is for the purchase of four Boeing 747 aircraft for the Advanced Airborne Command Post. Because of space and weight limitations inherent in the present aircraft, a larger aircraft, such as the 747, must be acquired to provide space and payload capacity to accommodate the improved communications and automatic data processing equipment.

The amendments for the research and development appropriations will be utilized to accelerate near term programs aimed at responding to potential challenges, to improve the operational test and evaluation capability, to attack the problem of the high cost of weapons, and to strengthen the technology base by initiating exploratory development in particularly promising areas.

This amendment will not change the outlay estimates included in the 1973 budget.

I have carefully reviewed these requests and am satisfied that they are necessary at this time. I recommend, therefore, that they be transmitted to the Congress.

Respectfully yours,

GEORGE P. SHULTZ.

Chairman ELLENDER. The purpose of the subcommittee meetings beginning today is to hear testimony of Defense Department witnesses on these supplemental requests.

The first witness we shall hear is Mr. Charles L. Poor, Deputy Assistant Secretary of the Army for Research and Development, who will speak to the $28 million requested by the Army for Research and Development.

The summary information on pages 13 through 18 of the justifications will be included in the record at this point.

(The information follows:)

RESEARCH, DEVELOPMENT, TEST, AND EVALUATION, ARMY: PROGRAM AND FINANCING

[In thousands of dollars]

	1973					
	Request pending	Budget plan proposed amendment	Revised request	Request pending	Obligations proposed amendment	Revised request
PROGRAM BY ACTIVITIES						
Direct:						
2. Aircraft and related equipment	247,100	8,000	255,100	274,000	8,000	282,000
6. Ordnance, combat vehicles, and related equipment	189,070	8,000	197,070	202,270	8,000	210,270
7. Other equipment	384,980	12,000	396,980	376,880	12,000	388,880
Other budget activities	1,247,566	----------	1,247,566	1,215,566	----------	1,215,566
Total direct	2,068,716	28,000	2,096,716	2,068,716	28,000	2,096,716
Reimbursable (total)	115,770	----------	115,770	115,770	----------	115,770
Total	2,184,486	28,000	2,212,486	2,184,486	28,000	2,212,486
FINANCING						
Receipts and reimbursements from:						
Federal funds	−114,770	----------	−114,770	−114,770	----------	−114,770
Non-Federal sources	−1,000	----------	−1,000	−1,000	----------	−1,000
Unobligated balance available, start of year: For completion of prior year budget plans				−200,000	----------	−200,000
Unobligated balance available, end of year: For completion of prior year budget plans				200,000	----------	200,000
Budget authority	2,068,716	28,000	2,096,716	2,068,716	28,000	2,096,716
BUDGET AUTHORITY						
Appropriation	2,051,100	28,000	2,079,100	2,051,100	28,000	2,079,100
Transferred to other accounts						
Transferred from other accounts						
Appropriation (adjusted)	2,051,100	28,000	2,079,100	2,051,100	28,000	2,079,100
Jan 1972 pay increase supplemental/amendment	17,616	----------	17,616	17,616	----------	17,616
RELATION OF OBLIGATIONS TO OUTLAYS						
Obligations incurred, net				2,068,716	28,000	2,096,716
Obligated balance, start of year				941,321	----------	941,321
Obligated balance, end of year				−1,081,537	−14,000	−1,095,537
Outlays, excluding pay increase supplemental				1,926,365	14,000	1,940,365
Outlays from civilian pay act supplemental				2,135	----------	2,135

RESEARCH, DEVELOPMENT, TEST AND EVALUATION, ARMY JUSTIFICATION

The additional funds requested in this budget amendment will be used for the following purposes: (1) to improve our capability to conduct operational test and evaluation in response to the Blue Ribbon Defense Panel recommendations, (2) to improve the near-term combat effectiveness of our forces, and (3) to strengthen our technology base by initiating developments in particularly promising areas. The following paragraphs furnish additional information on individual tasks classified by the three purposes:

Purpose 1.—To improve our capability to conduct operational test and evaluation in response to the Blue Ribbon Defense Panel recommendations.

a. *Advanced Attack Helicopter Evaluation.* The Army has already received $5 million of FY 1972 Emergency Funds for the design analysis, flight preparation and technical data package of two prototype attack helicopters. This budget amendment will finance additional flight evaluation, minor aircraft configuration changes, and augment the data evaluation. This additional testing and evaluation will strengthen the total data base for advanced aerial fire support system requirements.

b. *Instrumentation for Operational Test and Evaluation (OT&E).* This program will develop and procure instrumentation and more realistic target simulators. The requirement is necessitated by the current program to collect test data in an operational environment more representative of realistic combat conditions.

c. *Laser Countermeasures, Simulators and Testing.* [Deleted.]

Purpose 2.—To reduce operations costs and improve the near-term combat effectiveness of our forces.

Product Improvements for the M60A1. This effort will allow the Army to expedite the development of the laser range finder, solid-state computer, and tube-over-bar suspension system. These improvements will increase the hit probability, cross country mobility, and ride characteristics of the current M60A1 tank.

Purpose 3.—To strengthen our technology base by initiating developments in particularly promising areas.

a. *TOW Thermal Night Sight.* This program will provide competitive development prototypes for common thermal night sights for application to the TOW and DRAGON anti-tank missiles. It will exploit technology advances in far infrared systems that will provide a full range night time capability for the TOW and additionally should be small and light enough to be used on the DRAGON.

b. *Multiple Target Electronic Warfare Systems—Radars.* This program will initiate the development of Multiple Tactical Electronic Warfare Equipment (MULTEW II), [deleted] for use by the tactical commander. [Deleted.]

c. *Cannon Launched Guided Projectiles (CLGP).* This effort will allow the Army to continue the development of a technical base that will eventually lead to the realization of an effective CLGP system.

d. *Advanced VTOL Technology.* The advanced VTOL Technology effort will initiate the first increment of a three year tilt rotor prop aircraft research program. This increment will fund the preparation of a request for quotation, the selection process, and the subsequent award of a contract to design, fabricate and flight test two tilt rotor prop aircraft.

Additional information is contained in the descriptive summaries.

Element Code	Project number	Title	Fiscal year 1971 actual	Fiscal year 1972 budget	Fiscal year 1973 Request pending	Fiscal year 1973 Proposed amendment	Fiscal year 1973 Revised estimate
3. Aircraft and related equipment:							
2.36.25.A		Advanced aerial fire support system	52,600	9,370	53,610	5,000	58,610
	D242	Advanced attack helicopter evaluation				5,000	5,000
6.32.04.A		Advanced helicopter development	15,462	11,769	11,500	3,000	14,500
	D157	Advanced VTOL technology	9,636	8,677	8,000	3,000	11,000
		(Tilt rotor prop aircraft)				(3,000)	
6. Ordance, combat vehicles and related equipment:							
6.26.03.A		Firepower other than missiles	10,904	14,568	13,800	4,000	17,800
	A024	Cannon launched guided projectile				4,000	4,000
6.46.04.A		Mobility	11,404	16,330	40,980	4,000	44,980
	DE01	M60A1 product improvement program		3,000	6,400	4,000	10,400
7. Other equipment:							
6.37.11.A		Electronic warfare	10,198	[Deleted.]			
	D251	Protective electronic warfare equipment	6,257				
		(Multiple target electronic warfare systems, radars)					
		(Laser countermeasures, simulators and testing)					
6.37.19.A		Surveillance, Target Acquisition and Night Observation (STANO)	22,364	24,476	34,850	4,000	38,850
	DK70	Night vision devices	8,803	9,290	9,250	4,000	13,250
6.57.02.A		Testing combat equipment	42,665	48,390	57,240	4,000	61,240
	D623	Instrumentation for operational test and evaluation	5,622	7,300	5,800	4,000	9,800
		Total supplemental estimate				28,000	

PRESENTATION FORMAT

Chairman ELLENDER. Mr. Poor, you may proceed.

Mr. POOR. Thank you, Mr. Chairman.

Mr. Chairman and members of the committee: I am here today to discuss in some detail the Army R.D.T. & E. $28 million portion of the amendment to the President's budget for fiscal year 1973.

For each of the several items on our list I will tell you why we regard the project important enough for inclusion in this special category, how it came about that we did not request the funds earlier, and why we feel that we should not wait for future fund availability.

Chairman ELLENDER. The items in this $28 million are the same ones that were included in the fiscal 1972 supplemental request of $28 million, that has been withdrawn.

Mr. POOR. That is correct. The history is that this was originally requested as a supplemental to the fiscal year 1972 budget and with the passage of time it now has been changed to an amendment to the fiscal year 1973 budget.

TOTAL R. & D. REQUEST

Chairman ELLENDER. I want to provide in the record the fact that the original fiscal year 1973 budget request, including funds for the January 1 pay increase, for the total Department of Defense R. & D. program was $8,551,767,000, and this budget amendment totals $141 million for a revised total request of $8,692,767,000.

With respect to the Army's program, the original request was $2,068,716,000 and the additional $28 million being requested gives a revised request of $2,096,716,000.

Proceed.

Mr. POOR. We are requesting funds for eight programs. Each, for different reasons, is important; each, for different reasons, was not included in our earliest request; and each, again for different reasons, should not be delayed.

ADVANCED ATTACK HELICOPTER EVALUATION

Chairman ELLENDER. The first item is the request for $5 million for the project entitled, "Advanced Attack Helicopter Evaluation." The descriptive summary will be included in the record at this point.

(The information follows:)

FISCAL YEAR 1973 R.D.T.E. DESCRIPTIVE SUMMARY—BUDGET AMENDMENT

ADVANCED AERIAL FIRE SUPPORT SYSTEM (AAFSS) AND ADVANCED ATTACK HELICOPTER EVALUATION

Description.—For the past four years the Army has been conducting a series of experiments, tests and analyses relating to its aerial fire support system. The Advanced Attack Helicopter Evaluation will be a culmination of these efforts as well as an opportunity to take advantage of lessons learned in Vietnam, reexamine the attack helicopter role in mid-intensity warfare, exploit technological advances and recent industry initiatives. [Deleted.]

Related activities.—The DOD directed Close Air Support Study Phase I and II to resolve Close Air Support issues and materiel requirements. The CHEYENNE development program which is funded under the different project number D192 of the AAFSS Program Element (2.36.25.A).

Work performed by.—[Deleted.]
Program accomplishments and future plans.—
1. Fiscal year 1971 and prior accomplishments: Not applicable.
2. Fiscal year 1972 program: [Deleted.]
3. Fiscal year 1973 amendment: [Deleted.]
4. Program to completion: [Deleted.]
Resources.—(In millions of dollars):
R.D.T.E. funds for fiscal year 1971, 0; for fiscal year 1972, 0; for fiscal year 1973, 5.0; additional to completion [deleted]; for a total estimated cost of 10.0.

Mr. POOR. The advanced attack helicopter evaluation, for which we requested $5 million, constitutes a reevaluation of the requirements document for this system.

This evaluation includes a combination of engineering, cost and schedule analyses; analysis of older ongoing studies; analysis of field experiments; selected flight testing of industry-sponsored experimental attack helicopters, Bell Helicopter Co's King Cobra and Sikorsky's Blackhawk; and some special testing of the Cheyenne to fill identified data gaps.

Chairman ELLENDER. We have provided $53.6 million in the present 1973 budget for the Cheyenne. Is this amount in addition to that $53.6 million?

Mr. POOR. This amount is not included in the $53.6 million.

SELECTION DECISION BASIS

The purpose of this amount was to accelerate testing of the new machines that have become available in order to get a solid basis for a decision whether the Cheyenne as presently configured, or a Cheyenne modified to lower its cost, or the King Cobra, or the Blackhawk offers the most promising way to go for an early availability in an attack helicopter.

Chairman ELLENDER. As a substitute for the Cheyenne?

Mr. POOR. The possibility is that as a result of this testing we may decide one of the alternative systems is a better buy than the Cheyenne.

Major General SAMMET. The $53.6 million is for the Cheyenne, itself.

TEST DESCRIPTION

Chairman ELLENDER. I understand. Here you are asking for more money for the test program. Who is going to do the testing?

Mr. POOR. The Army agencies will do the testing. One of the tests is at Combat Development Centers which are Combat Environmental Tests. They are sort of war gaming experiments where you have tanks and other targets moving on the ground and the helicopter attempts to engage them. The test is instrumented so that you can determine who shot first, whether a shot hit the target or how far it missed. It is a war game used to obtain realistic field data for use in analyses.

Senator YOUNG. Mr. Chairman, may I ask a question for clarification?

EXISTENCE OF NEW INDUSTRY-DEVELOPED MACHINES

I thought the Army had made its decision to go ahead with the Cheyenne. Now you are talking about different choices. Is it true you haven't made the decision to go ahead with the Cheyenne?

Mr. POOR. I think that situation is something like this, sir. The Cheyenne, when designed, was thought to be the optimum ma-

chine for the Army. As a development program, while there were some very serious difficulties——

Senator YOUNG. I know all that. Have you made the decision or not to go ahead?

Mr. POOR. We made a decision to complete the development of Cheyenne. It is now conditional. The thing that is new is the existence of new machines, company-developed. We want to be sure we are not overlooking real advantages that may be available from the company sponsored experimental attack helicopter prototypes.

Chairman ELLENDER. Do you want the $53.6 million, too?

Mr. POOR. Yes, sir.

CHEYENNE COSTLY DEVELOPMENT AND POSSIBLE COMPARABLE PERFORMANCE BY CHEAPER INDUSTRY DEVELOPMENTS

Chairman ELLENDER. You have spent a lot of money on the Cheyenne, and as I recall the testimony we were advised that the major technical problems have been resolved. I have difficulty in seeing the need for this new effort.

Mr. POOR. We have developed a machine to our original specifications. It is very expensive but it does what we wanted it to do.

Chairman ELLENDER. You say you want to compare it with the King Cobra and the Blackhawk, and what else?

Mr. POOR. That is it. The reason we want to is that these are different machines and in one case smaller than the Cheyenne. The King Cobra is smaller; the Blackhawk is about the same size. They were developed by company private funds as flying machines to compete with the Cheyenne.

I think we would be imprudent not to learn all we can about those machines so as not to ignore the possibility that there may be a less expensive solution than the one we have achieved over the years. That is basically what the evaluation is about.

KING COBRA AND BLACKHAWK COMPETITION

Chairman ELLENDER. You say they were developed by company funds?

Mr. POOR. Yes. Both the King Cobra and the Blackhawk are private venture airplanes. They are not complete weapons systems. They are just flying machines that were developed with company funds. We feel we should test them to make sure that they do not offer an advantage over the Cheyenne by providing the minimum necessary capabilities at a substantially lower cost.

Chairman ELLENDER. Has the King Cobra ever been tested by the Army?

Mr. POOR. The King Cobra has not.

Chairman ELLENDER. And the Blackhawk?

Mr. POOR. The Blackhawk has had limited evaluation by the Army.

Chairman ELLENDER. At whose instigation were these two helicopters made?

Mr. POOR. They were made under the instigation of the companies, themselves, just part of the good old American competitive system.

Chairman ELLENDER. I wish more were done that way.

Mr. POOR. That is the way it was done.

Chairman ELLENDER. It would have saved money.

Mr. POOR. It may save money. We want to be sure, if there is money to be saved by sacrificing performance that we may not need, that we take advantage of it. I think I can shorten the discussion of this piece very considerably.

Chairman ELLENDER. I want you to read it all.

WITHDRAWAL OF REQUEST UPON APPROVAL OF ADDITIONAL REQUEST

Mr. POOR. If I may, subsequent to the submission of this item we have re-programmed $4.2 million. General Kjellstrom will address that later this morning. We did so in order to get started on this very rapidly. Given that reprograming, we won't need the $5 million addressed in this testimony. Not given that, of course, we would need it.

Chairman ELLENDER. You will address that matter, I presume, as you go along.

General SAMMET. Yes, sir; we will.

1972 EMERGENCY SUPPLEMENTAL FUNDING: SUPPORT OF CONTRACTOR'S DEMONSTRATION AND FOR COST DATA

Mr. POOR. I think I have covered the next sentence in the testimony.

In order to take advantage of the unique opportunity that has arisen since the earlier budget submission by the efforts of the helicopter industry in producing industry-sponsored experimental attack helicopters in a timely manner, the Army asked for funding in two increments: $5 million in emergency funds for fiscal year 1972 which has been approved, and this $5 million in the fiscal year 1973 budget amendment request.

The emergency funds have been used to support procurement of flight test hours necessary for the contractors' demonstration of the flight envelope, transition training for Army Aviators, and initial flight testing. In addition, the emergency funds will be used for any required instrumentation and data reduction, as well as to obtain preliminary contractor technical and cost data.

Chairman ELLENDER. You say the companies developed these themselves?

Mr. POOR. Yes; they have.

Chairman ELLENDER. What is meant by the expression: "to obtain preliminary contractor technical and cost data"?

Mr. POOR. It means this: The King Cobra, for example, is a real flying machine; it exists. We do not have from the contractor the kind of cost data that one would get if they were under contract to produce the machine. You know, the first estimates are likely to be pretty optimistic and the prices are likely to be fairly low until you get the names signed on the dotted line.

What we are doing is procuring from the contractors detailed specific proposals with firm prices associated with firm performance and actual flight data so that we will have a valid basis for comparison.

Chairman ELLENDER. You do not plan to go into production until this is done?

Mr. POOR. Oh, no. All this is testing the machine and getting very firm estimates from the contractors as to what it will cost to turn that machine into a complete fighting machine. The King Cobra does not have all the equipment on board although it has a lot of it.

INDUSTRY COMPETITION WITH CHEYENNE AIRCRAFT

Chairman ELLENDER. What was the manufacturer's purpose in building it?

Mr. POOR. It was built as a corporate venture to see if it could not beat the Cheyenne.

CHEYENNE EXPENDITURES

Senator YOUNG. How much money have we spent on the Cheyenne, including research and development and everything else?

Mr. POOR. I don't have that figure.

General KJELLSTROM. I have those figures. For research and development, $277 million has been spent on the Cheyenne to date. In addition to the $277 million for research and development, there was an expenditure of $135 million of procurement funds associated with the settlement of the cancellation of the procurement contract. You will recall we had a production contract with Lockheed that was cancelled. In settling that dispute and restructuring the development contract in April of 1971 there was an expenditure of $135 million for the funds appropriated for the production of Cheyenne helicopters.

Chairman ELLENDER. So we have spent a total of $412 million on the Cheyenne and we do not have an operational helicopter.

General KJELLSTROM. That is correct, Mr. Chairman.

Chairman ELLENDER. Of course that $412 million does not include any of the $53.6 million requested in the fiscal year 1973 budget for the continuation of the development of the Cheyenne.

General KJELLSTROM. That is correct.

Chairman ELLENDER. Proceed.

BUDGET REQUEST: ARMY PILOT TESTS AND ADDITIONAL DATA

Mr. POOR. The $5 million in this fiscal year 1973 budget amendment (the second increment) was requested to fund additional flight evaluation efforts primarily by Army pilots in nap of-the-earth flight, as necessary for adequate evaluation, and to expand other tests performed with hardware to obtain data that otherwise would be obtained through extrapolation.

Furthermore, with these additional funds, the Army will procure more detailed technical and cost data from the contractors.

FLIGHT HOUR EXPENSE

Chairman ELLENDER. Why does it cost $5 million to test it?

Mr. POOR. The contractors want to be reimbursed for the flight hours expense in flying their machine and associated instrumentation and data reductions. Pilots have to be trained, and the experiments are pretty complicated. Also, it is necessary to fund the companies efforts to provide the other technical cost and schedule data requested from them. All of this data will be used in the overall evaluation and in some cases will be used to up-date or verify data used in previous studies and analysis.

General SAMMET. It costs roughly $20,000 per flight test hour and we are running about 32 flight hours each on these aircraft.

Chairman ELLENDER. What, specifically, is the $20,000 spent for?

General SAMMET. To fly the aircraft, pay all the personnel involved in instrumentation and data reduction and maintenance.

Chairman ELLENDER. But the personnel are your regular pilots, are they not?

General SAMMET. Some of them. There are also technicans from the company who we must pay for the work they are doing in the evaluation.

Chairman ELLENDER. You utilize a combination of military and corporation aviators?

General SAMMET. We have a combination of test pilots from the different corporations plus our own Army pilots. They are working together. On some tests, the company pilots fly the aircraft. On other tests, the Army pilots fly the aircraft.

ARMY REQUEST FOR EVALUATION

Chairman ELLENDER. Why is it that we must pay the companies for this work? They are trying to demonstrate that their aircraft is better than the Cheyenne. It is to their advantage to prove this.

General SAMMET. It is the Army who has requested this evaluation. We have requested them to make available to us their aircraft, their personnel, the spare parts and support that go along with that, the test materiel and test equipment that is required to conduct these tests. This is an Army request to these companies now.

CHEYENNE FUNDING REQUEST: R. & D. COMPLETION AND NONEXPENDITURE OF BALANCE IN EVENT INDUSTRY AIRCRAFT IS SELECTED

Chairman ELLENDER. That is notwithstanding the fact that you are asking for $53.6 million to continue testing the Cheyenne?

General SAMMET. That $53.6 million has to do only with the Cheyenne and not with this evaluation.

Chairman ELLENDER. What will the $53 million for the Cheyenne be spent for?

General SAMMET. The first $17.1 million of the $53.6 million is to complete the R. & D. work on Cheyenne. That finishes Cheyenne R. & D., the $17.1 million. The additional $35.6 million is to be used to obtain three production prototypes of Cheyenne if we make the decision this fall to go Cheyenne or it will not be used for that purpose if the decision is to go to some other aircraft. At that point, we will come back to the Congress and request your permission to use that $35.6 million to apply to one of the other aircraft if that is the decision.

CHEYENNE CONTROL SYSTEM MODIFICATION AND PERFORMANCE

Mr. POOR. Mr. Chairman, I think the situation can be summarized like this: The Cheyenne as it is flying today is a well-understood machine. The weapon systems work in an absolutely spectacular fashion. It has a control system on the rotor which has in the past given some trouble. We now are flying it, limited very slightly in its maneuver capability.

The $17.1 million is primarily to fix that control system with a modification which has been recommended to us by a review committee made up of Dr. Flax, who was former Assistant Secretary of the Air Force for R. & D., and a number of experts from NASA and other Government laboratories. With that fix, the Cheyenne will have no limita-

tions; it will perform completely to our original specifications. That is what the $17.1 million is for so that we have the best Cheyenne airframe we can have available to us should we choose it this fall.

POSSIBLE NONAUTHORIZATION OF CHEYENNE

Senator YOUNG. Of course, we will have to await a decision of the Congress on this matter in connection with the procurement authorization. I understand that there is some question as to whether the Senate Armed Services Committee will recommend additional funds for the further development of the Cheyenne.

Mr. POOR. I hope they won't do that because I think in the interest of getting the right thing for the country we ought to have careful test data on the several candidates and make up our minds collectively.

Senator YOUNG. I understand that, but the bigger decision will be made in the authorizing committees. If they don't authorize the Cheyenne, you won't have it.

Mr. POOR. I recognize the authority of the committee to do that. As I say, I hope it won't happen. I hope they are able to make a carefully considered judgment using military test data as a basis for that decision.

Chairman ELLENDER. The Senate Armed Services Committee has already denied the funding authorization. Proceed.

REQUEST TIMING

Mr. POOR. This amended request for $5 million would allow the Army to complete the data base upon which the entire evaluation is built. We could not have included these funds in an earlier request because sufficiently promising industry designs had not yet been offered for our consideration.

REPROGRAMING REQUEST WHICH UPON APPROVAL OBVIATES REQUIREMENT OF INSTANT REQUEST

The effort to be funded by this request would allow the Army and the Congress to address promptly the important production decisions with the evaluation data in hand. In view of the delay in getting this request approved, we have reprogramed $4.2 million for the advanced attack helicopter evaluation in order to meet our program schedule. Notification of the reprogramming action was provided to Congress on April 21, 1972. It is our best estimate at this time that the $4.2 million will provide sufficient funding to complete the evaluation.

Provided the $4.2 is approved we won't need the $5 million.

Chairman ELLENDER. You are still talking about the Cheyenne?

Mr. POOR. I am talking about the Cheyenne, Blackhawk and King Cobra.

Chairman ELLENDER. The three of them?

Mr. POOR. The three of them. To get a data base to make the right decision.

PROCUREMENT FUNDING

Chairman ELLENDER. What did we get for the $135 million expended from production funds on the Cheyenne?

Mr. POOR. I think, if you will remember, this was a total package procurement with a production option. We exercised the production

option on the Cheyenne some years ago. Some start was made on tooling and building production prototype machines. That was stopped when the R. & D. program got in trouble because of the accident in flight. The production contract was canceled. That money bought us some tooling and some parts which are still there and in the Government's hands to use should we decide to go into production. I think that is about it.

REPROGRAMING PROCEDURES

Senator YOUNG. With respect to the $4.2 million reprograming increase you mentioned, is this a notification or prior approval action?

Mr. POOR. This is a notification type of action.

General KJELLSTROM. This is one of the reprograming actions that we will be discussing later today.

Senator YOUNG. It is not reasonable to expect a decision on this matter in one day.

Chairman ELLENDER. We will have a hearing on these reprograming requests today. We will not make any decision one way or the other. We will await the action of the other interested committees.

COST OF RESEARCH AND DEVELOPMENT

I am deeply concerned over the methods and cost of research in the Department of Defense. The costs are far too high, and in my judgment, there are too many layers of personnel involved. As I recall there are about 74,000 civilian employees engaged in R. & D. activities, and as I stated previously, about 35,000 military personnel, and there are close to 12,000 contractor personnel engaged in the operation of DOD facilities, for a total of about 121,000. These are engaged in the overall DOD $8.7 billion R. & D. program managed by Dr. Foster.

I am convinced that there is a lot of duplication and other wasteful practices in this R. & D. program—that is why it takes 121,000 people and $8.7 billion.

How many of the 35,000 military personnel assigned to R. & D. activities are Army personnel?

General SAMMET. We have a total of 9,000 involved in Army R. & D.

Chairman ELLENDER. That is a large number.

General SAMMET. Yes, sir; we will be glad to provide for the breakdown of where they are.

Chairman ELLENDER. I have requested that information for all services from the Department of Defense.

My point is this: all of the services are using military personnel to perform duties that should be performed by civilians.

Mr. POOR. I think that is true. We are employing officers where we could employ civilians, because the officers have special skills so they can do a better job.

Senator, I would like to suggest that there are a few places where a good officer can do a job where it is very difficult to find a civilian to do it.

Chairman ELLENDER. I can see that, in a few instances. But we have spent millions on educating and training military personnel to serve in assignments that cannot be filled by civilians, and I think we should

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use our military personnel for these type assignments—not those assignments that can be filled by civilians.

If we are ever going to make any real savings in the cost of defense, we are going to have to make a better use of our personnel—especially our military personnel.

Mr. POOR. I agree.

COST OF MANPOWER

Chairman ELLENDER. I recall, Secretary Moot stated that on an outlay basis 56 percent of the defense budget is for manpower-related costs. This leaves less than half for the development, procurement, and other costs of operation of weapon systems. We are going to have to make substantial reductions in personnel.

Mr. POOR. I can assure you we are doing that; we are cutting. I think General Sammet has some data on the cuts on Army R. & D. civilian-military manpower.

RECENT PERSONNEL REDUCTIONS

General SAMMET. In the last 5 years, we have reduced 6,000 personnel in R. & D. This is before it was brought to our attention. We are reducing continually.

We really control our own people and the numbers of people that we have. We have reduced from 41,000 down to 35,000 in the last 5 years.

CIVILIAN RESEARCH PERSONNEL

Chairman ELLENDER. Of the total of almost $8.7 billion requested for research and development for the Department of Defense, the Army's portion is approximately $2.1 billion. Just what personnel are paid from that amount?

General KJELLSTROM. All of the civilian personnel are paid out of that. It is the military personnel that are paid out of the military personnel appropriation. That is the disconnect between the $8 billion you referred to and the total cost of R. & D.

Chairman ELLENDER. I believe you stated a minute or two ago that of the 35,000 military personnel engaged in research activties, about 9,000 of them are Army personnel, and they work under your direction.

General SAMMET. They are working under us. Over the past few years we have reduced our military personnel by approximately 900 to the current level of 9,000.

Chairman ELLENDER. By 900?

General SAMMET. That is correct; speaking specifically to military.

Chairman ELLENDER. In addition, I believe the Army has about 17,000 civilians paid from R. &. D. funds. Is that correct?

General KJELLSTROM. 17,581 are included in the R.D.T. & E. appropriation request.

Chairman ELLENDER. How are they paid?

General KJELLSTROM. Sir, those are paid through the normal civil service procedures and paid out of part of the $2,068,000 request that is before the Congress.

Chairman ELLENDER. And contractors and then personnel are paid from this $2.1 billion also, I believe.

General KJELLSTROM. The contractors are paid out of the same appropriation, sir; only the civilian personnel are paid out of an element of expense entitled "Civilian Personnel," and the contractual personnel come out of an element of expense with the appropriation entitled "Contractual Services."

RELATIONSHIP WITH DR. FOSTER

Chairman ELLENDER. What supervision does Dr. Foster exercise over your operation?

Mr. POOR. Dr. Foster has program policy supervision. He reviews and approves our major programs. We discuss with him the Army submission to the Congress for the R.D.T. & E. budget. He has periodic program reviews. Furthermore, on major program initiation, we submit to the Defense Department, not just to Dr. Foster, detailed concept papers which are then reviewed at critical milestones, like initiation of engineering development on a new program, which usually involves Dr. Foster and several other Assistant Secretaries of Defense, who consider whether or not they think it is prudent to go forward with the major programs. The review is general on the supporting research program and detailed on the major programs. In a practical sense, Secretary Johnson and I generally meet with Dr. Foster on the average of once every week to talk about program status and how the thing goes.

As far as execution of our programs, we feel free to do what we think wise and the program is carried out through General Gribble's office, the Chief of Research and Development of the Army, and executed by the Army Materiel Command and its various commodity commands.

TESTING ORGANIZATION DESCRIPTION

Chairman ELLENDER. How is the testing done?

Mr. POOR. The testing is done in two ways. In the early phases of development, it is done directly by the developing agency, Army Materiel Command, through a separate piece of the Materiel Command called Test and Evaluation Command.

Chairman ELLENDER. Those costs are also included in the R.D.T. & E. appropriation for the Army, are they not?

Mr. POOR. The major fraction of the testing cost is paid out of the R.D.T. & E. appropriation.

Chairman ELLENDER. Do you know how many contractor personnel are paid from this appropriation?

Mr. POOR. There are a large number of contractor's civilians. I don't know the number of them, sir.

Chairman ELLENDER. Consider for a moment the tank which you have been developing. Are the costs of that development, together with the costs of personnel used in its development, paid from the R.D.T. & E. appropriation?

Mr. POOR. Absolutely all of the R. & D. people.

USE OF NONTESTING PERSONNEL

Chairman ELLENDER. Then how are these 17,000 Army civilians employed?

Mr. POOR. The major fraction of the civilians is in the commodity

commands and the laboratories of the Army. We have, for example, the Missile Command at Huntsville, which is charged with developing and procuring all our guided missiles. They have a fairly large staff.

Chairman ELLENDER. They are charged with the responsibility of both development and procurement.

Mr. POOR. Both development and procurement. They manage the development, which is mostly done under contract, although they do some small-scale experimental demonstration of prototype systems with their own hands, on the ground, in their own laboratories.

For example, the LITTLE JOHN rocket which was one of the first reasonably precise artillery rockets, was developed at Huntsville by those people. They invented and developed the guidance system that is used in the Lance missile, put into practice by the contractor, but invented and demonstrated for the first time by the people at the Missile Command. They do one class of things; they innovate new ideas themselves.

They have research equipment which will allow them to make measurements, wind tunnels, test stands, and things of this sort, to determine whether the contractor in the course of his development is doing what we asked him to do. So, they supervise the contractor. They are the taxpayers' technical representatives, if you like, and they have been doing a great job for us.

General SAMMET. Mr. Chairman, you mentioned, for example, who does our testing. The Test and Evaluation Command is essentially an independent test agency. The majority of the military who are in R.D.T. & E. belong to that command. It has soldiers belonging to that command stationed at Fort Sill, Fort Bliss, Fort Benning, Fort Knox, who do the actual testing. There are a few technical civilians with them but the majority of them are soldiers. They take the equipment in the field and try it out. About 50 percent of the military in R.D.T. & E. are involved in testing.

MILITARY TESTING PERSONNEL

Chairman ELLENDER. Of the 9,000 military personnel engaged by the Army in research, how many of those are employed for testing purposes?

General SAMMET. About 50 percent of those; that is all they do.

Chairman ELLENDER. What do the other 50 percent do?

USES OF OTHER MILITARY PERSONNEL IN RESEARCH

General SAMMET. The people in my office, General Gribble's office in the Pentagon, there are roughly 105 officers there. They do the staff work involving presentations before Congress and coordinating the entire program. Each project manager's office, for example, is headed—

Chairman ELLENDER. You mean it requires that many to work out the details necessary to do R.D.T. & E. work?

General SAMMET. That is right. You remember, we have the Army Materiel Command doing R.D.T. & E.; you have the Surgeon General doing R.D.T. & E., the Army Security Agency, and the Corps of Engineers doing R.D.T. & E. To coordinate those programs involving $2.1 billion, we have what is essentially a corporate headquarters in the Army. It is like a major company, General Motors, a corporate

headquarters which oversees Chevrolet, Cadillac, Pontiac, Buick, and Oldsmobile. That is exactly what we do. The same comparison.

LACK OF PRODUCTIVITY

Chairman ELLENDER. I wish you were as successful. I suspect that the large numbers of layers of personnel inhibit your productivity. The main battle tank that you spent so much time and money on is an indication that there is something wrong in your research procedures.

General SAMMET. This is no time to argue the tank program, sir.

LANCE MISSILE PROGRAM SUCCESS

But we have a new Lance missile just completing test. Right now, we have in our hands letters of offers from four countries totaling $430 million and three other countries are interested in it. That is how good it is.

Chairman ELLENDER. You plan to sell it to them?

General SAMMET. That is not up to us to say.

The countries are Great Britain, the Netherlands, Germany, and Italy. Letters of offer totaling $430 million.

Senator YOUNG. On the Lance missile?

General SAMMET. On the Lance missile. This tells me it is a pretty good item.

Senator YOUNG. It must be.

Chairman ELLENDER. It must be, no doubt. I presume permission to sell will have to come through the Congress.

General SAMMET. I cannot address that, sir.

General KJELLSTROM. It is monitored by the Office of the Secretary of Defense, Assistant Secretary of Defense for International Security Affairs. I am not familiar with the detailed procedure on this. We will be glad to provide it for the record.

NATIONAL OBJECTIVES

Chairman ELLENDER. This is my second year as chairman of this committee and I am devoting my energies to strengthening, not weakening, our national security. But our national security depends not only on our fighting men and their weapons, but also on our national economy, which is needed to support defense efforts. As of next June 30, interest charges on our national debt of about $429 billion will run to about $25 billion alone. My concern includes a fear that such a burden may well blunt our economy and affect our ability to pay for urgent requirements.

Mr. POOR. I share your concern.

INSTRUMENTATION FOR OPERATIONAL TEST

Chairman ELLENDER. The next item included in the budget amendment is the request for an additional $4 million for the project entitled, "Instrumentation, Test and Evaluation Command," making a revised request of $9.8 million. A discussion of the original request of $5.8 million will be found on page 956 of the hearings. The revised descriptive summary will be included in the record.

(The information follows:)

FY 1973 RDTE DESCRIPTIVE SUMMARY - BUDGET AMENDMENT

Date: March 1972

Program Element #6.57.02.A Title Testing Combat Equipment

Project #D623 Title Instrumentation, Test & Evaluation Command (TECOM)

Category Management and Support Budget Activity 7 - Other Equipment

DESCRIPTION: This project funds for the development and acquisition of up-to-date test instrumentation. The increasing complexity of equipment and the desire to shorten lead time combine to require that more information be obtained from testing in a shorter period of time. This can only be accomplished by improvements in instrumentation, range facilities and test methodology. Major funding efforts are directed toward improving the instrumentation capabilities at the White Sands Missile Range, New Mexico; the Air Defense Board, Ft. Bliss, Texas; Dugway Proving Ground, Utah; Aberdeen Proving Ground, Maryland; Electronic Proving Ground, Arizona; and the Aviation Test Board, Ft. Rucker, Alabama.

RELATED ACTIVITIES: Efforts to improve test procedures and methodology within US Army Test and Evaluation Command (USATECOM) are related to efforts to improve test instrumentation. Improvements in methodology lead to specifications for instrumentation and also lead to the development of new testing and analysis procedures associated with new instrumentation.

WORK PERFORMED BY: Personnel assigned to US Army Test and Evaluation Command. New instrumentation is procured from many different sources. Major anticipated acquisitions and potential contractors are:

Helicopter Test Instrumentation - EMR Telemetry Div., Sarasota, Fla.
Data Control Systems, Inc., Danbury, Conn.

Miss-distance Instrumentation - Westinghouse Defense Center, Baltimore, Md.

Altitude Test Instrumentation - Motorola Instrument Control, Inc., Phoenix, Ariz.
Honeywell Test Instrumentation Division, Denver, Colo.
Sanders Associates Instrumentation, Manchester, NH.

Highly Sensitive Real Time Samplers - Melpar, Inc., Falls Church, Va.

White Sands Missile Range Instrumentation Improvement - Emerson - Cummings, Canton, Mass.
BF Goodrich, Shelton, Conn.
Hewlett - Packard, Palo Alto, Calif.
Data General Corp., South Borrough, Mass.

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Budget Activity 7 - Other Equipment

Program Element #6.57.02.A Title Testing Combat Equipment

Project #D623 Title Instrumentation, Test & Evaluation Command (TECOM)

White Sands Missile Range Instrumentation Improvement - Systems Development, Inc., Dallas, Texas
Bell and Howell CEC Division, Pasadena, Calif.
Honeywell Instrumentation Division, Denver, Colo.

Observation Recording Instrumentation - Keuffel - Esser, Morristown, NJ.
Gurley Instrumentation Company, Troy, NJ.
American Optical Co., Buffalo, NY.

Tape Recorders - Ampex Corporation, Redwood City, Calif.
Sangamo Electric Corporation, Springfield, Ill.
Bell & Howell CEC Division, Pasadena, Calif.

PROGRAM ACCOMPLISHMENTS AND FUTURE PLANS:

1. FY 1971 and Prior Accomplishments: Preparation (1968) and update (1969, 1970 and 1971) of TECOM's Five Year Master Instrumentation Plan. The plan coordinates and integrates the individual Instrumentation Master Plan of all TECOM test agencies. Initiated studies for improved instrumentation. Purchased selected items. 1971 acquisitions of improved instrumentation spread over thirteen TECOM installations with bulk of funds for White Sands Missile Range.

2. FY 1972 Program: Continue to improve and replace test instrumentation in accordance with updated five year plan. Major acquisitions in following areas: miss-distance indicator radar, improved real-time chemical samplers, flight data acquisition/recording system, measuring electronic countermeasure vulnerability, data reduction and handling systems, and scoring systems. FY 1972 planned program is approximately $2.0 million more than the FY 1971 program due to the procurement of a miss-distance indicator radar for the US Army Air Defense Board.

3. FY 1973 Planned Program:

a. Continue to modernize and improve instrumentation in accordance with updated five year plan. Major expenditures at following installations: White Sands Missile Range, Deseret Test Center, Electronic Proving Ground, Aberdeen Proving Ground and the Aviation Test Board. Major improvements in instrumentation planned in following areas: measuring electronic countermeasures vulnerability, improved target scoring systems, and improved centralized data control and automation.

Budget Activity 7 - Other Equipment

Program Element #6.57.02.A Title Testing Combat Equipment

Project #D623 Title Instrumentation, Test & Evaluation Command (TECOM)

b. FY 1973 Budget Amendment: $4.0 Million. The inclusion of operational testing as a basis for determining suitability of materiel requires TECOM to develop new test and analysis techniques. The requirement is necessitated by emphasis on both testing under dynamic conditions representative of realistic combat conditions and the use of small tactical units. Dynamic testing requires a greater data collection and analysis capability. Present collection and analysis techniques generally are applicable to single systems tested under homogeneous or well defined conditions. To collect and analyze the more complicated Expanded Service Test (EST) data will require the development of new methodologies and new instrumentation procurements. The instrumentation effort will emphasize more realistic testing environments and use of improved target simulators.

4. Program to Completion: This is a continuing program.

RESOURCES: ($ in Millions)

	FY 1971	FY 1972	FY 1973	Additional to Completion	Total Estimated Cost
RDTE Funds	5.6	7.3	9.8*	Continuing	N/A

*Budget amendment is $4.0 million

TEST AND EVALUATION INSTRUMENTATION

Mr. POOR. The next item for which we are requesting money is "Operational Test and Evaluation." It ties in very much, I think, with your concern. This is the way we find out whether we have done a good job in developing a system.

The $4 million requested for test and evaluation instrumentation is important to us because it will improve our ability to conduct operational tests and evaluations.

General Starbird, who has been charged with overall DOD responsibility for implementing the Blue Ribbon Defense Panel recommendations that we test in a real operational environment in time to make informed production decisions, has identified the two components of the $4 million request as the most urgently needed improvements to the Army's testing capability. We agree.

Chairman ELLENDER. When do these tests take place?

Mr. POOR. Before production. They are an important step to the production decision.

Chairman ELLENDER. Is that an innovation?

Mr. POOR. What we are doing is expanding what we have done before. I think it is a legitimate criticism that we had not done thorough enough operational testing in all cases. The Blue Ribbon Defense Panel recognized this and urged us to do better and we are trying to do this. This money will allow us to.

Chairman ELLENDER. This is not a new item? You have done it in the past?

Mr. POOR. That is right. It increases the emphasis on that kind of testing and gives us the tools to do it properly.

INSTRUMENTATION PROCUREMENT

Of the $4 million requested for the procurement of instrumentation for operational testing and evaluation, $2.6 million will be used to develop and procure instrumentation for Yuma Proving Ground and the Aviation Test Board to support aircraft and aircraft weapons testing.

On-board aircraft sensing and recording systems will collect critical performance and operational effectiveness data. Representative multiple moving and fixed targets will be fabricated and located to simulate tactical situations. Zone scoring miss-distance will be measured at each target and transmitted to a central point for display during the test.

An integrated trajectory system will continuously provide the relative position of aircraft to each other and to targets. Data will be transmitted to a central point during the test. A collection and recording system for maintenance logistics, training, and reliability data will provide a central record for later analysis.

YUMA INSTRUMENTATION CAPABILITY

Chairman ELLENDER. With respect to the $2.6 million you are requesting for instrumentation at the Yuma Proving Ground, what capability will this give you that you do not now have for aircraft weapons testing?

Mr. POOR. Yuma has marvelous geography for testing performance of items like attack helicopters. It has adequate airport facilities and

the ground is great for it because you can shoot at it safely; the population density is very low. What it lacks is enough instrumentation so that you can keep track continuously of where the airplanes go during the maneuvers and how accurately the weapon delivery is carried out during the firing.

It also lacks a multiple moving target system. You know, you put targets out, an old tank or an old automobile. To test the field capability of a thing like a Cheyenne helicopter, you want to shoot against a moving target. You also would like to have miss-distance indicators. In case you don't hit the target, it is very useful to know by how much you missed.

So, this means that we need radar instumentation to keep track of the flying machine's location, on-board data, transponders in the aircraft to tell what the accelerations were, what control motions were carried out; that kind of thing. So, the components needed at Yuma are on on-board real time recording systems for the aircraft, multiple moving target system, a miss-distance indicator and a multitrack radar to keep track of the whole thing.

Chairman ELLENDER. You don't have any such instrumentation at the present time?

Mr. POOR. At the moment, we do not. We are doing it by sort of a cobbled-up early instrumentation.

Chairman ELLENDER. Is the sum that you are asking for the total cost for this?

FORT BENNING SYNTHETIC TARGET

Mr. POOR. I believe it is. At For Benning, there is a similar thing, a moving man, a synthetic target, moving tank, scoring system. All this is responding to the Blue Ribbon Panel suggestion that we do better operational testing in the field. I think this will be very helpful.

Chairman ELLENDER. With respect to the $1.25 million that you are asking for instrumentation of the U.S. Army Infantry Board, where will this equipment be installed?

Mr. POOR. At Fort Benning.

TOTAL INSTRUMENTATION COST

Chairman ELLENDER. What is the total estimated cost of the development and procurement of this equipment?

Mr. POOR. I believe it is $1.6 million.

Chairman ELLENDER. That is in addition to the $1.4 million?

Mr. POOR. No, sir.

General SAMMET. I have a little different breakdown than you have. That is $1.6 million. We have refined our figures. It is $1.6 million.

Mr. POOR. You have $1.25 million.

Chairman ELLENDER. $1.4 million is the figure provided to the committee.

Mr. POOR. It is essentially that amount.

INSTRUMENTATION CAPABILITY

Chairman ELLENDER. Generally speaking, what capability will this new equipment give you that you do not have for testing infantry weapons systems?

Mr. POOR. It will allow us to measure all the things that go on in an engagement; to keep track not just of a single weapon but of many

weapons in the field of experiment. Up to now, we could really do only a one at a time test, one weapon against one other. You know, real war does not go like that. There are many things going on and they react on each other. This will allow us to get complete data on a much larger scale, recorded there in permanent form for later analysis.

Chairman ELLENDER. We are still speaking of testing?

Mr. POOR. Yes, sir; in a combat environment as distinct from just the engineering test to see if the specifications are right.

Chairman ELLENDER. Proceed.

Mr. POOR. The balance of the $4 million will initiate development and procurement of instrumentation for the U.S. Army Infantry Board to support infantry weapons systems testing. Instrumentation will consist of the following:

DESCRIPTION OF INSTRUMENTATION EQUIPMENT

Programmed and remote controlled fixed and moving man and tank target systems for engagement by small arms and other man-launched weapons fire; ground-to-ground automated scoring systems for both direct and indirect fire for use with target systems to score hits and measure miss distances; multiposition location information on all test participants and target systems during a test exercise; and an automatic data collection and control system to control and coordinate the exercise, and collect data from all range systems.

With the availability of the equipment described, I believe we can come to you in later years with the hard data on weapon performance in the field necessary to convince you, and us, that our design choices are correct.

General Starbird's review is very new; consequently, we were unable to include this program in our earlier budget request. The promise of improvement in our weapon system acquisition process is great enough that we feel it is not prudent to wait any longer.

PROTECTIVE ELECTRONIC WARFARE EQUIPMENT

Chairman ELLENDER. If there are no further questions or comments on the request for an additional funds for testing, we will proceed with the next item which is a request for an additional [deleted] for the project entitled "Protective Electronic Warfare Equipment," to make a revised request of [deleted]. A discussion of the original request of [deleted] million will be found on page 935 of the hearings.

I note that the descriptive summary is for the most part classified, and cannot be included in the record.

Please proceed.

LASER COUNTERMEASURES, SIMULATORS AND TESTING

Mr. POOR. With the greatly increased dependence of the Army weapon systems on the use of lasers as target designators, as range-finders, and for quidance of missiles, [deleted]. We know that our [deleted]; therefore, our concern has been deepened.

Chairman ELLENDER. Is this the first request you have made?

Mr. POOR. The first request for this class of activity; that is correct.

Chairman ELLENDER. Are other countries engaged in this activity?

Mr. POOR. [Deleted.]

DESCRIPTION OF LASER OPERATION

Senator YOUNG. I am greatly interested in this laser possibility. Will you explain a little further how the laser operates on these weapons systems?

Mr. POOR. I will try to do it simply.

The laser, as you know, is a relatively new kind of light generator which makes very narrow, very high intensity light. You can make a beam of light which is much smaller in angle than a beam you can make from an electric light bulb, for example.

Because it is very nearly monochromatic, which means a very narrow frequency range, the beam impinging on the ground, looked at just in the wavelength region around the laser frequency, is very much brighter than the sun. You can paint a cross on a target at, say, 3 or 10 kilometers which can be recognized by a missile seeker looking at the ground; the fact that that light is on there makes it look enough different from the rest of the terrain so that the seeker can go seek it out.

Put that seeker on a missile or on a shell [deleted].

General SAMMET. It is invisible to your eye; you cannot see it.

Mr. POOR. But with a proper detector, it shows that it is different from the rest of the world.

Senator YOUNG. According to testimony the other day, we have even bounced signals off materiel we have left on the moon.

LIGHT MEASUREMENT ACCURACY

Mr. POOR. That is right. It is a very exciting technical possibility. We are using it now for rangefinders where you send a little packet of light out to a tank and it comes back and there is a device that measures the time that it receives the bounce back from the target. Knowing the speed of light, that gives you a very accurate measurement.

The apparatus is perhaps so big (indicating). That is infinitely better than our older way of doing it with a longer based rangefinder such as you see on our Navy ships and tanks.

Senator YOUNG. Is this in use now?

Mr. POOR. Yes. We use them for rangefinders; we use them for target designators for various homing systems and we think they are very important indeed. Our concern about [deleted].

USES OF FINDER

Chairman ELLENDER. In using this kind of finder, must you seek out the target or must you know it is there?

Mr. POOR. Somebody must know it is there. This somebody, for example, could be [deleted]. In a moment, I am going to talk about the cannon launched guided projectile program which will perhaps make it a little clearer. Somebody has to know it is there.

General SAMMET. Or point to a place where you think the target is. It may be on the edge of the woods. Maybe you can't see it but because of smoke emission or something you have reason to know it is there. You can point the laser at it for the range to that spot or actually help to deliver weapon fire to that spot.

Chairman ELLENDER. Who would be the one to detect it?
Mr. POOR. [Deleted.]
General SAMMET. [Deleted.]
Chairman ELLENDER. We will observe it visually?
Mr. POOR. That is correct.
General SAMMET. Infrared at night time, for example. He can't see with his eyes but the IR camera will show it is there.
Senator YOUNG. How is it that Dick Tracy was ahead of us on that development?
General SAMMET. Buck Rogers was, too.
Mr. POOR. Buck Rogers was using such weapons before they were invented.
General SAMMET. And Jules Verne, also.

LASER COUNTER-MEASURES

Mr. POOR. Additionally, efforts will also be conducted to develop means to [deleted]. Based on the findings of these tests, appropriate countermeasures will be developed and tested.
This [deleted].
It was not included in our 1973 request, although it should have been, because we did not at that time properly appreciate the importance of the effort. Nevertheless, it is, in our collective view, important enough to start promptly—we are already later than we should be.

INITIAL WORK PLANNED FOR WHITE SANDS MISSILE RANGE

Chairman ELLENDER. Will this be an in-house job or do you expect to contract it out?
Mr. POOR. The major initial effort, I believe will be at the Missile Electronic Warfare Test Agency at White Sands, which has unique capability.
Chairman ELLENDER. Who will conduct this test?
Mr. POOR. It is in-house. They are terribly good at this kind of work and they have done very well by us in the past. There will obviously have to be some contract support. We will seek that as the program goes forward.
Chairman ELLENDER. Does the Army operate this?
Mr. POOR. Yes.
Chairman ELLENDER. Will the money you are requesting complete the job?
Mr. POOR. No; I think this will be a continuing job for as far forward as I can see it. As long as the countermeasure game goes on, we have to keep abreast of the possibilities.
Chairman ELLENDER. So there will be no end to it.
Mr. POOR. People are too ingenious inventing new countermeasures to new systems. We have to keep track of them. This is a very significant start, and I look for very good results.

CANNON LAUNCHED GUIDED PROJECTILE TECHNOLOGY

Chairman ELLENDER. The next item is the request for $4 million for the initiation of a new effort entitled, "Cannon Launched Guided Projectile Technology." The descriptive summary will be included in the record.
(The information follows:)

FY 1973 RDTE DESCRIPTIVE SUMMARY - BUDGET AMENDMENT

Date: March 1972

Program Element #6.26.03.A Title Firepower Other Than Missiles

Project #A024 Title Cannon Launched Guided Projectile Technology

Category Exploratory Development Budget Activity 6 - Ordnance, Combat Vehicles and Related Equipment

DESCRIPTION: The objective of this project is to develop a technical base that will lead to the realization of an effective Cannon Launched Guided Projectile (CLGP). An integrated system approach will be used to investigate the following technical areas: Passive and active terminal homing based on inherent target signatures in the infrared and millimeter wave regions; fuzing peculiar to CLGP; pursuit and various options of proportional navigation; aerodynamic free-flight and control; systems synthesis; modeling and evaluation; fire control; and overall systems analysis and cost effectiveness.

RELATED ACTIVITIES: This project supports the work being done under Program Element 6.33.06.A, Terminal Homing and Warhead Advanced Development, Project D073, Cannon Launched Guided Projectile. That project is an FY 72 new initiative and part of the Air Defense Program. Coordination with the Navy is being performed to avoid duplication.

WORK PERFORMED BY: The bulk of the FY 73 funds requested in this budget amendment will be spent on contract to various US Corporations yet to be determined. Minor in-house efforts will be performed by the United States Army Materiel Command.

PROGRAM ACCOMPLISHMENTS AND FUTURE PLANS:

1. FY 1971 and Prior Accomplishments: None - This project is a new start in FY 73.

2. FY 1972 Program: None - This project is a new start in FY 73.

3. FY 1973 Budget Amendment:

a. Several studies will be made of operational problems in the area of laser semiactive homing. These include atmospheric limitations, forward observer limitations, beam wander statistics, environmental reflectivity, and countermeasures.

b. Infrared will be considered in two studies and a number of investigations in support of system engineering will be initiated.

c. A two phase homing concept will be evaluated. This concept involves acquiring the target from long ranges by homing on laser illumination and using infrared for the terminal phase.

(Desc Summ page - none)

Budget Activity 6 - Ordnance, Combat Vehicles and Related Equipment

Program Element #6.26.03.A Title Firepower Other Than Missiles

Project #A024 Title Cannon Launched Guided Projectile Technology

d. A program will be conducted to develop aerodynamic design information and prediction methods for stabilizing configurations with launch constraints.

e. Digital computer models will be used for calculating the detailed interior ballistic performance of each of the cannons with associated propellant loading conditions considered for the CLGP.

f. Warhead damage mechanisms will be evaluated and fuzing concepts for the CLGP will be investigated.

g. Analytical work will be performed on the factors which contribute to observer and target location errors as defined by pertinent studies.

4. Program to Completion: This will be a continuing program.

RESOURCES: ($ in Millions)

	FY 1971	FY 1972	FY 1973	Additional to Completion	Total Estimated Cost
RDTE Funds	0	0	4.0	Continuing	N/A

CANNON-LAUNCHED GUIDED PROJECTILE

Mr. POOR. Related to the [deleted] is the exciting breakthrough called the cannon-launched guided projectile.

Recent successful firings of shells using laser homing to direct the shell to a target marked with a laser designator have convinced us that it is possible, for the first time, to hit small targets, even moving tanks, with a single round of artillery. The promise is so great that we feel we must substantially accelerate the development in all the critical technology areas.

About half of the $4 million will be used to speed up work started by the Navy——

Chairman ELLENDER. You did not ask for that portion of the funds required?

Mr. POOR. This was, as you remember, a 1972 budget supplemental and now is an add-on.

And half to accelerate Army efforts on a somewhat different, competitive technical approach which offers promise of even better accuracy than has already been demonstrated.

The cannon launched guided projectile program is important because we are exploiting a real technical breakthrough. Against stationary point targets, one round can be expected to kill the target, where 10's or 100's might be required with the conventional unguided shells.

PLANNED TRANSFER OF FUNDS TO NAVY

Chairman ELLENDER. You indicate about half of the $4 million requested for this project will be used to speed up work started by the Navy.

Mr. POOR. That is correct.

Chairman ELLENDER. Do you plan to transfer these funds to the Navy?

Mr. POOR. Yes, sir.

Chairman ELLENDER. You will use the Navy facilities?

Mr. POOR. We will use the Navy facilities and give them money to help speed up their work. The two programs are clearly and importantly related to each other. It seems sensible to do it as a joint venture.

DIFFERENCES BETWEEN SERVICE PROGRAMS

Chairman ELLENDER. Are there any differences between the programs?

Mr. POOR. Yes; there are significant differences. The Navy technical approach uses a guidance scheme that is different from the Army's guidance scheme.

General SAMMET. The Navy uses what is called a pursuit guidance. Pursuit guidance does not give as high a degree of accuracy as does the Army's approach to it.

There are two types of targets. Some don't require the high accuracy and therefore there is no point in building into the system a very expensive seeker when you don't need it. That is the Navy's approach.

There is another category of target which is the moving tank which is of extreme concern to the Army, where we have to have high accuracy to hit that particular tank which is moving.

VIETNAM UTILIZATION

Senator YOUNG. May I interrupt to ask this question?

This would not be effective in targeting on a tank in the jungles in Vietnam, would it?

Mr. POOR. It would be difficult.

General SAMMET. If we can put a laser beam on that tank [deleted] the answer is yes, sir; it would be most valuable.

Senator YOUNG. It would work even though the tank were in the jungle?

General SAMMET. That is correct.

Mr. POOR. It has to be visible. You have to have a clear line of sight [deleted] to the tank and from the shell in flight to the tank. If it is under a jungle canopy, I don't see how you do it.

General SAMMET. If we don't know it is there, then we could not put the laser beam on it, of course. We have to be able to determine there is a target out there.

Senator YOUNG. It must be seen?

General SAMMET. Yes. It could be in the jungle if we could see it through the canopy. Radars and infrared may also be used to look through the canopy.

Senator YOUNG. Will infrared penetrate a jungle?

General SAMMET. To some extent it will. Our hand-held thermal viewer we are using today will penetrate as far as 600 feet through brush.

Mr. POOR. I think it is a chancy business. But the possibility of shooting a tank in the open with one round of artillery is a very exciting thing.

Senator YOUNG. They could use some of them in Vietnam now.

Mr. POOR. It would be very helpful. The successes in the past year, and the evidence from the Air Force experience in Vietnam with bombs similarly guided, have convinced us that our previously planned funding was simply inadequate to exploit the promise.

We believe, and believe you will agree, that the vast increase in artillery effectiveness, against fixed targets, and the even more exciting prospect of at last successfully engaging moving targets, like single tanks with a cannon, justifies maximum prudent acceleration of this new technology. If we accelerate now, we can expect to see prototype systems under test in fiscal year 1974.

1972 FUNDING INADEQUATE

Chairman ELLENDER. You say the funds were inadequate. When were those funds provided?

Mr. POOR. They were given to us in fiscal year 1972, I assume. The funds that we asked for were inadequate. It was not a matter of lack of responsiveness on the part of Congress. We feel we have been supported in this. We did not ask for it.

General SAMMET. The Navy came to us after we went to Congress and suggested we join them in their approach. So, we agreed this made sense. It saved money for both the Army and the Navy. The Navy would work on the 8-inch caliber; we would work on the 155 mm. caliber. When we complete our developments they can be used interchangeably with Army and Navy shells. This makes sense, to save money.

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NIGHT VISION DEVICES

Chairman ELLENDER. The next item is the request for an additional $4 million for the project "Night Vision Devices," to make a revised request of $13.1 million. A discussion of the original request of $9.1 million will be found on page 709 of the hearings. The revised descriptive summary will be included in the record.

(The information follows:)

FY 1973 RDTE DESCRIPTIVE SUMMARY - BUDGET AMENDMENT

Date: March 1972

Program Element #6.37.19.A Title Surveillance, Target Acquisition, and Night Observation (STANO)

Project #DK70 Title Night Vision Devices

Category Advance Development Budget Activity 7 - Other Equipment

DESCRIPTION: The purpose of this project is to conduct the advance development of components, devices, and accessories for providing the Army with a capability of carrying out its mission at night. Included within this project are direct and remote view image intensifier tubes, infrared detectors, miniature cryogenic devices, light sources, power supplies, optics and thermoelectric coolers to provide night operational capabilities to assist in the performance of combat vehicle operations, missile utilization, and tasks to support the individual soldier.

RELATED ACTIVITIES: The US Navy and US Air Force use image intensifier tubes in their night vision requirements. The US Army, US Air Force and US Navy programs are closely coordinated. Active international programs are conducted with NATO and Quadripartite countries. Prior to 1970 work in this project was previously accomplished under Program Element #6.37.04.A, Project 1Z663704D052, Engineering Night Vision Components.

WORK PERFORMED BY: Night Vision Laboratory, Fort Belvoir. Representative Contractors are: Bendix Research, Southfield, Michigan; Machlett Labs, Springdale, Connecticut; ITT, Fort Wayne, Indiana; Barnes Engineering, Stanford, Connecticut; Borg-Warner Corporation, Des Plains, Illinois; HRB Singer, State College, Pennsylvania; Kollsman, Elmhurst, New York; Crysler Corporation, Center Line, Michigan; Phillips Broadcast Corporation, Mahwah, New Jersey; Varo, Garland, Texas; and 10 additional contractors with an estimated $2.9 Million in contracts.

PROGRAM ACCOMPLISHMENTS AND FUTURE PLANS:

1. FY 1971 and Prior Accomplishments: In this project advanced development models of three devices for the Southeast Asia Night Operations (SEA NITEOPS) Program were procured. These were a handheld thermal viewer, a stabilizer sight for use on ground vehicles, and a driver's night periscope. Work continued on the development of second generation 25mm intensifier tubes for starlight scopes, crew served weapon sights, and night vision binoculars. A laboratory model of a far infrared pointer for use with night vision binoculars has been tested and modified. Most of the technical difficulties encountered in designing wafer tubes, providing bright source protection, and gating have been studies and solutions found in FY 71. Xenon high power and sealed beam lamps reached a plateau in development in 1970.

Budget Activity 7 - Other Equipment

Program Element #6.37.19.A Title Surveillance, Target Acquisition, and Night Observation (STANO)

Project #DK70 Title Night Vision Devices

2. FY 1972 Program: Technical and engineering support is being provided to finalize development of 18mm wafer tubes for goggle application. Field evaluations are continuing on a far infrared lightweight weapons sight. Advanced components to include coolers, detector arrays, and display for use in far infrared viewing are being placed in breadboard models and tested. A new task to investigate optical and electro-optical countermeasures has been undertaken. New developments are stressing commonality. Initial development has begun on a zoom capability.

3. FY 1973 Planned Program:

a. Initiate development of new image intensifier and far infrared tubes utilizing ternary materials. Continue development of far infrared detectors using materials with faster responses operating at higher temperature detectors. Continue development of light emitting diode displays for far infrared systems, a two watt laser illuminator, a monolithic semiconductor laser array and a Turret Integrated Night Thermal System (TINTS) for combat vehicles. Initiate development of a discreet sensor for confirming targets and a common TOW/DRAGON night sight.

b. FY 1973 Budget Amendment: $4.0 Million. This program provides competitive development prototypes for common thermal night sights for the TOW and DRAGON antitank missiles. This will exploit technology advances in far infrared systems that will provide a full range night time capability for the TOW and should be small and light enough to be used on the DRAGON. Delivery of the prototype night sights to the Army is expected 9 - 12 months after contract.

4. Program to Completion: This is a continuing program.

RESOURCES: ($ in Millions)

	FY 1971 and Prior	FY 1972	FY 1973	Additional to Completion	Total Estimated Cost
RDTE Funds	16.3	9.2	13.1*	Continuing	N/A

*Budget amendment is $4.0 million

Tow Thermal Night Sight

Mr. Poor. You have been hearing a lot over the past several years about things called FLIR's, forward looking infrared systems, devices that make possible seeing at night, without any illumination, either natural or artificial.

We have also discussed with you the importance of night vision, not only for tanks and helicopters, but also for infantry defense operations and antitank weapons like Tow and Dragon.

Passive thermal imaging systems, FLIR's of high quality, have, until very recently, been so heavy and so costly that they could not seriously be considered for infantry antitank system night sights.

Costing up to $250,000 apiece, and weighing about 100 pounds, they could be used on aircraft, or tanks, where the payoff in ability to see without being seen was great enough to justify the expense, but not for the infantry, who could afford neither the weight nor the cost.

With the passage of time, and pressure of competition, the state of the art has advanced to permit building a fully adequate infantry passive IR sight for Tow. The sight will see tanks out to the full 3,000 meter range of the Tow system.

The originally planned Tow sight, using laser illumination and a gated image intensifier is good only to about one-half the range of the Tow, and is five times heavier than the thermal sight.

The new thermal imaging sight can also be applied to the lighter, shorter range Dragon whose thermal sight is seriously range-limited, if used, as now planned for an interim Tow sight.

Laser Tow Sights

Chairman Ellender. You refer to the originally planned TOW sight. What is the currently planned status of development of the original laser TOW sights?

Mr. Poor. I think it is essentially complete. I think our plan is to put a data package on the shelf in case we need it for emergency procurement and to proceed with this newer development which we think is so much better.

Chairman Ellender. You haven't abandoned it?

General Sammet. No, sir.

Mr. Poor. No; but we will not procure it in any quantities because of its relative deficiencies measured against this newer technique.

Expenditure on TOW

Chairman Ellender. How much have you spent on it up to now?

Mr. Poor. I don't have that with me.

Chairman Ellender. Can you furnish it for the record?

Mr. Poor. Yes.

(The information follows:)

We have spent $9.7 million on the TOW Gated Night Sight.

Disadvantages of TOW

Chairman Ellender. You say you are going to set it aside and work on a new technique?

General SAMMET. We shall complete the testing which we are doing right now. We have no more dollars to spend on it. We will complete the testing, take the technical data package to enable us to produce it if an emergency should come up but not actually produce any at this time, for two reasons.

At the time we started that development, that was the best technology could offer. It is too heavy, for one thing; it weighs 58 pounds.

Second, it only goes out to a range of 1,250 meters, which is only about one-half as far as the TOW missile can fire.

So, it has these limitations. We knew that when we started but that was the best technology could offer us at that time.

Now, both Texas Instruments and Hughes have demonstrated to us that they can now produce a night sight that weighs only 10 to 12 pounds and will go out to the full 3,000 meters range of the TOW. This is what we want, and it actually cost less in production than the present TOW night sight.

Chairman ELLENDER. You know that at this time?

General SAMMET. We know this now.

CONTINUED TESTING

Chairman ELLENDER. Then why continue with the other?

Mr. POOR. We are not keeping on with it, sir.

Chairman ELLENDER. I know, but you are going to spend more money on it.

General SAMMET. We are going to finish the testing only, sir.

Chairman ELLENDER. How much will that cost?

General SAMMET. I don't recall what the number is to finish the testing. It means firing some missiles, that is what it really means, and using up those missiles. In an emergency, we could produce that this year if we had to but we see no point in procuring it when we have a better one here that gives us what we want. I think we would be imprudent to go ahead and produce that one and not do this work.

Chairman ELLENDER. Was this made by contract?

General SAMMET. Yes, sir.

Chairman ELLENDER. I presume that is why you are completing the testing.

Mr. POOR. I think the point is, Mr. Chairman, that the older sight is a very good device; it would be foolish not to complete the testing, which is a very small amount of money, so that we have it in hand in case we should need a substantial number of night sights in the next year or so, prior to the completion of this development. Once this is finished, then we would forget it.

OUTSIDE CONTRACTUAL WORK

Chairman ELLENDER. You state this is out-of-house work?

General SAMMET. Both of these are out-of-house; that is correct.

Chairman ELLENDER. In regard to the one you are going to complete testing before setting it aside, must you pay anything to break the contract?

General SAMMET. No, sir; we are at the point in the contract where we can put it on the shelf right now.

Mr. POOR. There is no termination charge because it is a development contract that will be completed. The $4 million is to initiate development of competitive prototypes to exploit the technological breakthrough of building small far-infrared devices with high resolution and high thermal sensitivity. Because there has been a real breakthrough, it is important that we start now—the capability is urgently needed in the field.

NIGHT VISION DEVICES DIFFERENTIATION

Chairman ELLENDER. I note this $4 million is in addition to the $9,250,000 included in the original 1973 request for the project entitled "Night Vision Devices, EK 70."

Just how does this project differ from the project designated "Night Vision Devices, DI 70," for which $5.1 million was requested in the original fiscal year 1973 budget request?

Mr. POOR. We have a very extensive program in night vision technology. It includes several night sights with the various systems like TOW and Dragon. It includes the night vision systems for tanks and helicopters. It is a large program with many, many things in it. This is a single add-on.

VIETNAM INFLUENCE ON RESEARCH

Chairman ELLENDER. What effect have our activities on Vietnam had on research?

Mr. POOR. I think it has been accelerated considerably by the Southeast Asia environment. The Army's night vision program has been around for a long time.

Chairman ELLENDER. I hope we will never again have to fight under such conditions.

Mr. POOR. I hope not, too, but the systems that we now have in hand are really the culmination of work that was started by the Army perhaps 15 years ago. It started inhouse under the direction of Dr. Wiseman, who is a very competent man in this business of low-level sensing radiation.

We have sponsored industry development by industry of new kinds of photo cathodes for things like television cameras, so that now there are television cameras that can see almost in the dark.

We have sponsored the development of image intensifiers, which I think perhaps you have seen, which are now reduced to the form of goggles that you can hold up in the dark and see with starlight. There is a whole family of devices that have grown out of fundamental work started by the Army many years ago. This line item I believe includes a number of systems exploiting that technology.

General SAMMET. This has worldwide applicability. It is not directly associated with Southeast Asia.

Chairman ELLENDER. I did not mean to ask a question limited to this particular program, but many of these innovations which you are now striving for, I presume, resulted from the conflict in Southeast Asia.

General SAMMET. Every requirement that the Army begins work on in R. & D. is to meet worldwide applicability. There are very, very few applicable solely to an area like Southeast Asia. Our malaria research would be for an area like that but the majority of our work has worldwide applicability.

MOBILITY

Chairman ELLENDER. We will now proceed with the additional request of $4 million for the project entitled "Mobility" which makes a revised request of $44.980 million. The original request of $40.980 million is discussed on page 882 of the hearings.

As I understand this request, the total of $4 million is for the M60A1 tank improvement program, and this is in addition to the $6.4 million included in the regular budget for this effort.

Mr. POOR. That is correct.

Chairman ELLENDER. The revised descriptive summary will be included in the record.

(The information follows:)

FY 1973 RDTE DESCRIPTIVE SUMMARY - BUDGET AMENDMENT

Date: March 1972

Program Element #6.46.04.A Title Mobility

Project #DE01 Title M60A1 Tank Product Improvement Program

Category Engineering Development Budget Activity 6 - Ordnance, Combat Vehicles and Related Equipment

DESCRIPTION: The M60A1 Tank Product Improvement Program provides for the development/engineering and application to M-60 series tanks of nine major product improvements. These are add-on stabilization, a solid-state ballistic computer, a laser rangefinder, a tube-over-bar suspension system, an improved reliability engine, a crew-served weapon sight mount, T142 track, an improved electrical system, and top-loading air cleaners. The application of these nine improvements will provide M-60 series tanks increased capabilities in the areas of reliability, mobility, and firepower. A principal feature of the M60A1 Tank Product Improvement Program is its provision for the application of the laser rangefinder, solid-state computer, improved reliability engine, tube-over-bar suspension, and improved electrical system improvements as a system, rather than as individual components. This provision, with its associated system analysis, reliability and maintainability assessment and system tests, will result in a high assurance of success prior to commitment to production. The development/engineering effort associated with the program is funded from both RDTE and PEMA resources. RDTE funds are required for the development of the solid-state computer, laser rangefinder, and tube-over-bar suspension improvements and for the support of engineering and expanded service tests of the resulting tank weapon system. The M60A1 Tank Product Improvement Program provides, in addition, for the fabrication and feasibility testing of a thermal sight for use in M60A1 tanks; RDTE funds are required also for the support of this thermal sight prototype program.

RELATED ACTIVITIES: The fabrication and feasibility testing of thermal sight prototypes is being carried out also by the Army's Night Vision Laboratory under P.E. 6.37.19.A. The thermal sight prototype work to be done under this project will be coordinated with that being carried out under P.E. 6.37.19.A, so as to insure that there is no duplication of effort.

WORK PERFORMED BY: The prime tank system contractor for the M60A1 Tank Product Improvement Program is the Chrysler Corporation, Centerline Michigan. The major contractor for the RDTE funded portion of the program is Hughes Aircraft Company, Culver City, California. Most of the in-house work in support of the RDTE funded portion of the program is being done by Frankford Arsenal, Philadelphia, Pennsylvania.

(Desc Summ p. 324)

Budget Activity 6 - Ordnance, Combat Vehicles and Related Equipment

Program Element #6.46.04.A Title Mobility

Project #DE01 Title M60A1 Tank Product Improvement Program

PROGRAM ACCOMPLISHMENTS AND FUTURE PLANS:

1. FY 1971 and Prior Accomplishments: Development of the solid-state computer, laser rangefinder, and tube-over-bar suspension was initiated in FY 1971. Development of the computer and rangefinder was initiated under P.E. 6.36.01.A; development of the tube-over-bar suspension was initiated under P.E. 6.26.01.A.

2. FY 1972 Program: Development of the solid-state computer, laser rangefinder, and tube-over-bar suspension is being continued. Six solid-state computers, six laser rangefinders, and three tube-over-bar suspension elements will be delivered. Engineering design tests and qualification and reliability tests will be initiated.

3. FY 1973 Planned Program:

a. FY 1973 Budget Amendment: The M60A1 Tank Product Improvement Program, as originally implemented, called for the application of the laser rangefinder, solid-state computer, and tube-over-bar suspension system improvements as individual components. Hence, the $3.3 million RDTE FY 1972 funds was required to support the continued development of these components. With revision of the program to provide for the application of these and other improvements as a system, additional funds are required. Specifically, the $4.0 million RDTE requested in this amendment is required to support the procurement of developmental component hardware for use in the expanded contractor tests and in the engineering and expanded service tests associated with the current (revised) program.

b. Development of the solid-state computer, laser rangefinder, and tube-over-bar suspension will be continued. Engineering design tests and qualification and reliability tests will be completed. An additional fourteen solid-state computers, fourteen laser rangefinders, and twelve tube-over-bar suspension systems including spares will be delivered. Engineering and expanded service tests will be initiated. Three thermal sight prototypes will be delivered for testing in FY 1974.

4. Program to Completion: With the completion in 1974 of engineering and expanded service tests, development of the solid-state computer, laser rangefinder, and tube-over-bar suspension will be completed. Military potential (feasibility) tests will be carried out on the three thermal sight prototypes.

Budget Activity 6 - Ordnance, Combat Vehicles and Related Equipment

Program Element #6.46.04.A Title Mobility

Project #DE01 Title M60A1 Tank Product Improvement Program

RESOURCES: ($ in Millions)

	FY 1971 and Prior	FY 1972	FY 1973	Additional to Completion	Total Estimated Cost
RDTE Funds	0	3.3	10.4 *	.4	14.1

* Includes FY 1973 Budget Amendment of $4.0 million.

M60A1 Tank Product Improvements

Mr. Poor. The Army and OSD are very concerned with the high unit costs and high maintenance costs of some of our systems, and the M60A1 tank program is an example of an effort to get simpler, cheaper systems.

With the cancellation of the XM803 program, the Army must start again to develop the high mobility, shoot-on-the-move, high accuracy first-round hit tank we feel is needed to face the Warsaw Pact threat. We are now developing a program to do just that.

In the original fiscal year 1973 budget justification, we reported on the plans we have made to meet the desires of the Congress to start again with a new prototype development.

It is, however, clear to us that this new start will take many years to fruition. We must develop the prototypes, and test them thoroughly, and take all the time-consuming steps to reach a reliable combat-test proven, mass production version of a new tank system.

Use of Previous Research

Chairman Ellender. How much of the work you did on the one you abandoned will be applicable to this new one?

Mr. Poor. I think a good deal. But there is still a long road, if it is a new design, to prove reliability.

Meanwhile, we still face the same threat. For the interim, the only available path to improved capability is to upgrade the present inventory M60 tank in those areas of its most critical weaknesses, namely, lack of mobility, and lack of accurate longrange firepower.

The $4 million request is to expedite on-going work on an improved suspension system, a laser range finder, and a solid state computer, and to start on systems integration so that we can apply these systems, adequately tested, to the tank as soon as possible.

Additional Funding Requirement

Chairman Ellender. This is in addition to the amount you requested in your 1973 budget?

Mr. Poor. That is correct.

Chairman Ellender. Have you any idea as to whether or not the cost estimates you have made will prove accurate?

Mr. Poor. I hope the cost estimate will come to pass. These are reasonably firm for the program as described. In this way, we hope the M60 will not be overmatched by new Russian tanks now coming into their inventory while we wait for the results of the new main battle tank program. Very simply, since we will have lost some time in the development of a new tank by a new start, we think it is very important to retrofit the inventory of M60s to make them more effective.

Cost of Refitting

Chairman Ellender. Have you made an estimate of the cost of refitting if you pursue that course?

General Sammet. The cost estimates have been made. I don't have them with me. They have been made. We are completely knowledgeable of those costs.

MULTIPLE TARGET ELECTRONIC WARFARE SYSTEMS

Mr. POOR. The [deleted] we are requesting for the Multiple Target Electronic Warfare System will be used to initiate the development of a [deleted] for use by the tactical commander.

Chairman ELLENDER. What is the total estimated cost of this?

Mr. POOR. The amount requested here is [deleted]. I don't know what the full program cost carried through to the end is. This is a start.

General SAMMET. The total is [deleted] over a 4-year period.

Chairman ELLENDER. That is the estimated length of the development period?

General SAMMET. That is correct.

PRODUCTION OF LIMITED CAPABILITY SYSTEM

Chairman ELLENDER. You indicate that you are apparently evaluating a system which has a limited capability. If you proceed to the development of this better system, do you have any plans to produce the current system you are now evaluating?

Mr. POOR. I believe we do not. We have built one system which already exists which we are evaluating. It would be foolish to proliferate that system since its capability is quite limited. As you know, the [deleted]. We project that a [deleted] of widely varying capabilities.

MULTEW I SYSTEM

We are currently evaluating a system called Multew I that has proven the technical feasibility to [deleted]. This new development, to be called Multew II, will permit us to [deleted]. The system will be capable of [deleted]. In addition, it will [deleted].

That breakthrough is the development of a [deleted].

It will also allow you to point [deleted] at once. We feel it is a quite important advance in technology.

ADVANCED HELICOPTER DEVELOPMENT

Chairman ELLENDER. The last item is the request for an additional $3 million for the project "Advanced Helicopter Development", to make a revised request of $14.5 million. The original request for $11.5 million is discussed on page 803 of the hearings.

The revised descriptive summary will be included in the record.

(The information follows:)

FY 1973 RDTE DESCRIPTIVE SUMMARY - BUDGET AMENDMENT

Date: March 1972

Program Element #6.32.04.A Title Advanced Helicopter Development

Project #D157/15 Title Rotary Wing Aircraft (Tilt Rotor Prop Aircraft)

Category Advanced Development Budget Activity 2 - Aircraft & Related Equipment

DESCRIPTION: The objective of this joint Army/NASA program is to demonstrate the concept of a tilt rotor aircraft through flight testing and verify that tilt rotor technology is in hand to initiate development of an operational tilt rotor aircraft. The program is considered an essential step in the evolution of a prototype tilt rotor aircraft, making possible research well beyond the level of "demonstration-of-feasibility". The research aircraft will be used for investigations throughout the flight envelop of tilt rotor aerodynamics, dynamics, structural and environmental characteristics, military mission compatibility, aircraft handling and control qualities, V/STOL avionics applications, and near terminal operational procedures. In addition, completion of the proof-of-concept flight testing will provide a proven VTOL aircraft with a wide transition corridor for general research and development of VTOL technical operations and traffic control, including the evaluation of automatic guidance systems. The tilt rotor aircraft combines the hover efficiency and maneuverability of the helicopter with the performance and productivity of a fixed wing aircraft to meet DA approved and anticipated future aviation requirements.

RELATED ACTIVITIES: The Department of the Army and the National Aeronautics and Space Administration initiated a joint research program to develop the technology for tilt rotor vehicles. In view of the need for technology and operational data to support development of civil and military vehicles with VTOL capability, the Army and NASA have agreed, by Memorandum of Agreement, that the combined objectives are best served by the conduct of a joint Army/NASA tilt rotor research aircraft program. The Department of Transportation and the Federal Aviation Agency are monitoring agencies to the program with interest displayed in the transportation/navigations/avionics area. Supporting tilt rotor technology parallels this program in exploratory development under Program Element 6.22.04, Aeronautical Technology.

WORK PERFORMED BY: US Army Air Mobility Research and Development Laboratory and the NASA/Ames Research Center, Moffett Field, Calif.; NASA/Langley Research Center, Langley, Va.; Vertol Division of the Boeing Company, Morton, Pa.; Bell Helicopter, Ft. Worth, Texas; Grumman Aerospace Corp., Bethpage, NY.

PROGRAM ACCOMPLISHMENTS AND FUTURE PLANS:

1. FY 1971 and Prior Accomplishments: A systematic approach for advancing tilt rotor technology has been pursued by the Army/NASA over the past five years. Several studies, beginning in the early 1950's and continuing through the mid-1960's were

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conducted to assess the potential of new vehicle concepts to enhance the Army's airmobile mission capability. These concepts included: tilt wings, tilt ducted fans, deflected slipstream, compound helicopters, and tilt rotor props. In considering the feasibility of these various vertical/short takeoff and landing (V/STOL) concepts, certain criteria were examined that emphasize essential characteristics common to Army air system. These criteria included: relatively long hover time with good hover efficiency and low downwash velocities; low noise levels, nap of the earth maneuverability and agility with sufficient dash speed for increased effectiveness. Based on these criteria, it was concluded by the Army and the NASA in the mid-1960's that the tilt rotor prop was the most advantageous V/STOL concept to meet future military and civilian air systems requirements. Accordingly, basic research and exploratory development efforts have refined the tilt rotor concept to the point where a flight demonstration is required for "proof of concept".

2. FY 1972 Program: Two parallel preliminary design and program plan studies are currently in progress to develop the "Request for Quotation" for the tilt rotor aircraft program. In addition, two efforts have been initiated in the tilt rotor supporting technology area. These include: a tilt rotor math model preliminary flight simulation study, and the structural and dynamic characteristics of composite materials in hingeless type tilt rotor blades.

3. FY 1973 Planned Program:

a. FY 1973 Budget Amendment: The $3.0 million will be used for the first increment of the tilt rotor "proof of concept" program. This increment will fund the evaluation of the on-going preliminary design studies, the preparation of a Request for Quotation to industry for parametric design studies, and the selection process for, and award of two parametric design contracts for the tilt rotor aircraft.

b. Source selection and contract award will be made by the beginning of the 3rd Quarter FY 1973 for the fabrication and test of two tilt rotor research aircraft. Refinement of the detail design will immediately commence and the fabrication of long lead time items will begin during the 4th Quarter of FY 73. Design and fabrication phases will continue throughout FY 74 and 1st Quarter of FY 75. Preflight tests will commence with ground runs followed by wind tunnel tests in mid-FY 75. Qualification test of the aircraft will be conducted during the second and third quarters of FY 75 with final flight configuration established by the last quarter along with first flight. Contractor flight test will continue into the 1st Quarter of FY 1976 followed by government flight tests. Advanced flight research will commence after the "proof of concept" flights. Application of state-of-the-art materials and fabrication techniques will be emphasized throughout the program to minimize risk. Existing government-furnished flight qualified engines and "off the shelf" components will be utilized when possible to maintain program costs or schedule advantages, providing their use causes no compromise of program objectives or scope. The government will provide both technical and reliability/quality assurance surveillance throughout the design activity.

Budget Activity 2 - Aircraft & Related Equipment

Program Element #6.32.04.A Title Advanced Helicopter Development

Project #D157/15 Title Rotary Wing Aircraft (Tilt Rotor Prop Aircraft)

4. Program to Completion: This is a continuing program.

RESOURCES: ($ in Millions)

	FY 1971	FY 1972	FY 1973	Additional to Completion	Total Estimated Cost
RDTE Funds	1.3*	0	6.0**	Continuing	N/A

*FY 1971 funds provided the supporting technology necessary to proceed with the proof of concept flight program contained herein. These funds were not separately identified in previous years.

**Includes FY 73 Budget Amendment of $3.0 million.

ADVANCED VTOL TECHNOLOGY

Mr. POOR. Finally, there are programs to advance technologies in areas vital to our security in the long run. In this category in the advanced VTOL technology item, $3 million to start on title rotor aircraft prototype demonstration.

ADVANCED VTOL TECHNOLOGY

Chairman ELLENDER. The original fiscal year 1973 request included $8 million for a project entitled "Advanced VTOL Technology." This budget amendment would increase that to $11 million. Why couldn't you use a portion of the $8 million included in the original fiscal year 1973 budget request for the development of this aircraft?

Mr. POOR. I would like to answer that for the record.

(The information follows:)

The $8 million requested in the fiscal year 1973 budget for the Advanced Development Rotary Wing Aircraft project includes $3 million for the tilt rotor program. The remaining $5 million are fund continuing efforts in new VTOL concepts which include the Advancing Blade Concept (ABC) demonstrator vehicle, the advanced rotor test vehicle, and the fan-in-fin tail rotor. In addition, several minimal funded efforts in helicopter control systems and new composite materials are being pursued in this project.

The additional $3 million in the budget amendment is required to balance our part of the tilt rotor program with NASA.

VTOL COSTS

Chairman ELLENDER. You have been working on the VTOL for a long time. How much have we spent to date on this program?

General SAMMET. I don't know, sir. I know what you are talking about. In 1960, we worked on VTOL aircraft, also, prematurely, unfortunately.

Chairman ELLENDER. I have $500 million as the cost.

General SAMMET. Not for the Army.

Chairman ELLENDER. That is total.

Mr. POOR. I wouldn't be surprised.

HARRIER DEVELOPMENT

Chairman ELLENDER. Yet we had to go to the British for the Harrier. Several countries seem to have stolen the march on us in some production breakthroughs.

Mr. POOR. We helped the British on the Harrier. The original test crews on the Harrier included Army test pilots.

Chairman ELLENDER. Knowledgeable pilots to fly it are not quite in the same category as know-how to develop it.

General SAMMET. Mr. Chairman, that particular aircraft cannot be used by the Army. The downwash from the jets is so great that we cannot live in the field with that type of VTOL.

Chairman ELLENDER. The A–X, I understand, is being developed.

DIFFICULTIES IN VERTICAL FLIGHT DEVELOPMENT

Mr. POOR. It will not fly vertically. Over the past dozen or so years, many projects have been started to build machines that take off and land vertically, like a helicopter, and fly efficiently in cruise flight, like

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an airplane. None of them if you except the Harrier VTOL jet fighter, have been able to survive through initial flight testing into production.

In every case, they were started too soon, with an inadequate technology base, and while all flew, they were simply too unreliable, too complex, too inefficient and too dangerous operationally to justify continuing their development for inventory.

VTOL Prototype Demonstration

Senator Young. Are we planning now to develop and produce VTOL planes?

Mr. Poor. This is a prototype demonstration program to determine whether we should, sir. Let me, if I may, follow through. We are planning to do a prototype demonstration to determine whether the thing is suitable for production.

Senator Young. We are initiating this kind of program?

Mr. Poor. Yes.

General Sammet. Development with no commitment to production at this time.

Senator Young. I realize that. I was interested in whether we planned to continue to buy from the British or whether we planned to build our own aircraft.

Tilt-Rotor Aircraft

Mr. Poor. This is a completely different category from the Harrier, Senator Young. The Harrier is a jet fighter airplane, a high-speed airplane, with jet lift. The tilt rotor machine is really a helicopter lift device, very low disloading, very low downwash, which, by rotating its rotors from the vertical to the horizontal plane, can fly like an airplane. So, at horizontal cruise it will go perhaps 300 miles an hour.

With its rotors rolled back it will fly exactly like a conventional helicopter. We tried to build such a machine some years ago and it was a failure. The technology base wasn't ready.

The reason this is important for the Army is that of all the convertible plane machines available today even the tilt wing concept flown on Canadair's CL–84, which is operational today, lacks the efficiency needed for an Army air system. Because of its characteristics, the CL–84 is highly unsatisfactory for the Army while operating in the vicinity of ground troops. This is due to the CL–84's high downwash velocity which is approximately four times stronger than a conventional helicopter or tilt rotor aircraft.

Now, why do we want to get started on this program this time when last time it didn't work? As a result of several years of basic technology work in wind tunnels with small- and full-scale models of the most critical components, the Army-NASA team of research scientists at Ames Laboratory, working together with the aircraft industry, have just recently demonstrated that we can, with high confidence, design a tilt rotor aircraft that can hover more efficiently than the best of our present-day pure helicopters, and fly like an airplane as well as our present-day medium-speed utility transports.

CIVIL TRANSPORT IMPLICATIONS

NASA and DOD agree that this breakthrough, with all its implications for radical improvements in military air mobility and important implications for civil transport, is ready for immediate research prototyping.

Chairman ELLENDER. Why are you engaged in civil transport implications?

Mr. POOR. We are engaged because we think it is important for air mobility applications. NASA is interested in civil applications of the same technique. It is a very appropriate thing for a joint venture for that reason.

Chairman ELLENDER. Can it have both civilian and military uses?

Mr. POOR. That is the point; it can. If the machines perform as expected, the top speed limitations of conventional helicopters, will be removed, giving us machines that will cruise efficiently at speeds of the order of 300 knots.

A conventional helicopter just does not like to go more than about 140 or 150 knots. So, it will essentially double the speed and with attendant increase in productivity. You don't have to use so much time to carry a given load for a given distance.

For the military, this new technology means more than halving the time for helicopter rescue missions; a great increase in productivity of transport helicopters; and exciting, as yet not fully appreciated, possibilities for new kinds of aerial weapons and reconnaissance systems.

JOINT NASA PROGRAM

Senator YOUNG. Who is doing the work on this?

Mr. POOR. It is a joint program with NASA and the Army, supervised out of Ames Laboratory of NASA where our air mobility laboratory center is. The two centers work together.

Senator YOUNG. What companies are involved?

Mr. POOR. The companies are Bell and Boeing Vertol, and Grumman is also interested. Bell and Boeing Vertol have done more experimental demonstration of components in the big 40-by-80-foot wind tunnel at NASA Ames.

Senator YOUNG. Eventually these would be competitive bidders.

General SAMMET. They are competing right now for this contract, if we get the money.

Mr. POOR. To start to exploit this new understanding, we have formulated a joint program with NASA, equally funded with NASA-DOD moneys, to build two small prototype aircraft to test and evaluate this concept in flight.

NASA sees the promise of a new class of quiet, efficient civil transports which can land and take off from city center locations, and we see a new class of military applications of perhaps even greater importance.

TOTAL PROGRAM COST

Chairman ELLENDER. What do you figure the entire cost of this program will be?

Mr. POOR. I believe it is about $40 million, including supporting technology efforts, over several years. The current situation is that we have requested proposals and if we have the money, we will evaluate them

competitively and build a couple of prototypes to prove the principle of this mode of flight.

The next step, then, if it turns out to be easy to control and can do all the things we believe it will do, will be to develop one particularly tailored to military application.

Because the positive results of the research were not clear to us a year ago, we did not program funds in the fiscal year 1972 budget to initiate the prototyping effort. We are now convinced of the reality of the breakthrough and ask you to help us start quickly.

Summary

In summary, I have presented eight important Army programs, totaling $28 million in this fiscal year budget amendment request. I hope it is clear why each is important now, and how it came about that we did not, and in many cases could not, reasonably request authorization a year ago.

Each request fits in one of the important categories of timeliness in meeting the threat, improving our technology base, increasing Operational Test and Evaluation and reducing the high cost of our weapons systems.

We have covered the reprograming of the $4.2 million for the Advanced Attack Helicopter Evaluation. If that is approved, we won't need the $5 million.

Senator Young. How much of the $28 million will need to be authorized before we can appropriate?

Mr. Poor. All of it. I hope you will agree with us that the remaining programs justify your full support.

Subcommittee Recess

Chairman Ellender. Are there any further questions?

Senator Young. No, Mr. Chairman.

Chairman Ellender. Thank you very much.

General Kjellstrom. Thank you, Mr. Chairman.

(Whereupon, at 12.30 p.m., Tuesday, May 2, the subcommittee was recessed, to reconvene at 10 a.m., Wednesday, May 3.)

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