

DEPARTMENT OF DEFENSE



ANNUAL REPORT

FOR FISCAL YEAR

1966

Including the Reports of the

SECRETARY OF DEFENSE

SECRETARY OF THE ARMY

SECRETARY OF THE NAVY

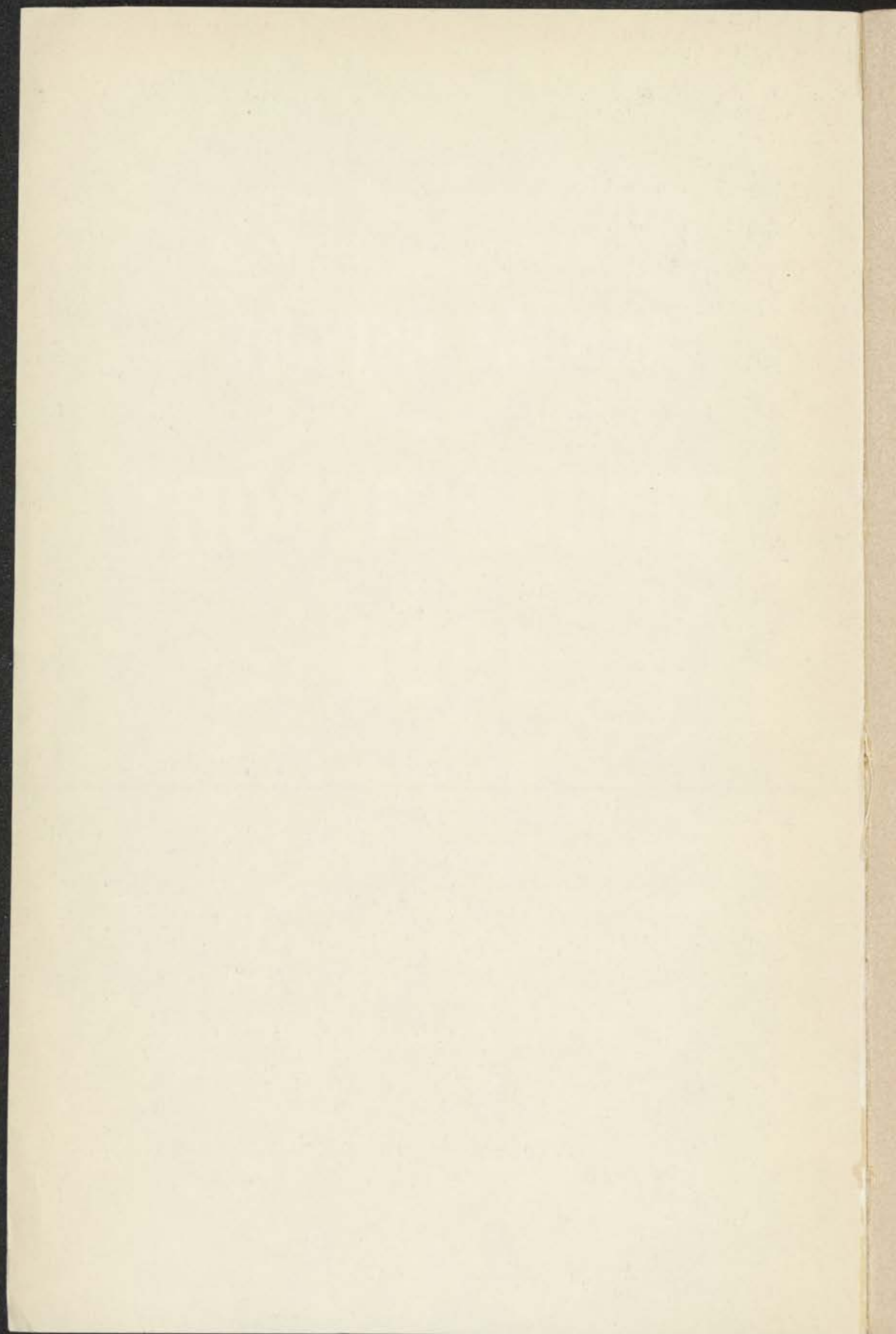
SECRETARY OF THE AIR FORCE

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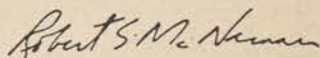
THE SECRETARY OF DEFENSE

WASHINGTON

DEAR MR. PRESIDENT:

In compliance with Section 202(d) of the National Security Act of 1947, as amended, I submit the annual report of the Secretary of Defense for fiscal year 1966, together with the reports of the Secretaries of the Army, Navy, and Air Force for the same period.

Yours sincerely,

A handwritten signature in dark ink, reading "Robert S. McNamara". The signature is written in a cursive style with a large, stylized "R" and "M".

ROBERT S. McNAMARA

THE PRESIDENT
THE WHITE HOUSE

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Annual Report
of the
SECRETARY OF DEFENSE

July 1, 1965, to June 30, 1966

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1. Operational Highlights of Fiscal Year 1966

The operational activities of the Department of Defense in fiscal year 1966 were dominated by the changing character of the conflict in Southeast Asia and its increasing demands on U.S. combat forces. As the year began, the Communists were increasing the momentum of their monsoon offensive in the central highlands of South Vietnam around Kontum and Pleiku. Several district capitals had been overrun, and many cities and towns, including Saigon, were being systematically cut off from the countryside. The Army of the Republic of Vietnam, stretched thin from having to defend thousands of cities, towns, and hamlets and troubled by continuing political turbulence in the nation, was unable to stem the Communist advance in the highlands. Hard fought battles with Communist forces, including regular North Vietnamese Army units, had seriously depleted the Army's already limited central reserve. By mid-July, it became apparent that the enemy had decided to make an all-out attempt to bring down the government of South Vietnam.

It was against this background that President Johnson on July 13, 1965, announced the dispatch of a special mission to Vietnam to determine what further measures might be taken to prevent the defeat of the Republic of Vietnam. He warned at the time that "increased aggression from the North may require an increased American response on the ground in South Vietnam." He also noted that "meanwhile, General Westmoreland has the authority to use the American forces that are now in Vietnam in the ways which he considers most effective to resist the Communist aggression and the terror that is taking place there."

On July 28, 1965, shortly after the return of the mission, President Johnson announced to the Nation: "I have today ordered to Vietnam the Airmobile Division and certain other forces, which will raise our fighting strength from 75,000 to 125,000 men almost immediately. Additional forces will be needed later, and they will be sent as requested. This will make it necessary to increase our active fighting forces by raising the monthly draft call from 17,000 over a period of time to 35,000 per month, and for us to step up our campaign for voluntary enlistments." The details of the increase in military forces were presented to the Congress on August 4. They included the ad-

dition of 340,000 men to the active forces in order to off-set the deployments then planned to Southeast Asia, provide additional forces for possible new deployments, and maintain our capabilities to deal with other crises elsewhere in the world.

The military personnel strength of the Army was to be increased by 235,000 to permit the activation of one division force, three brigade forces, a large number of helicopter companies, and their combat service support units as well as to provide for additional logistics support and the expansion of the Army training establishment.

For the Marine Corps, 30,000 additional military personnel were planned to augment existing units, activate certain new units—such as helicopter squadrons—and to meet increased training and manpower pipeline requirements.

The increase of 35,000 for the Navy was to be used for higher-than-normal personnel levels for naval vessels operating off the coast of Vietnam, for manning additional active ships, and for logistics support.

The 40,000 to be added to the Air Force would augment the crews of the B-52's to be utilized against targets in South Vietnam, support additional tactical fighter and troop carrier squadrons deployed to Southeast Asia and the higher utilization rates of airlift aircraft, and provide needed increases in the training establishment and other support activities.

Additional paid drill training spaces were authorized to raise the manning and readiness levels of selected reserve component units—including three Army divisions and six Army brigades, the Marine Corps Reserve Division/Aircraft Wing, and 24 Air Force flying squadrons (nine fighter, four tactical reconnaissance, and 11 airlift). It was decided, however, not to call up any reserves for active duty at this time.

Since the urgency of the force buildup did not allow sufficient time for the preparation of the normal budgetary detail, the additional requirements were financed on an interim basis, pending the request for a fiscal year 1966 supplemental appropriation the following January. Accordingly, the President transmitted to the Congress on August 4 a budget amendment providing for a Southeast Asia Emergency Fund of \$1.7 billion to gear up the production machine and initiate construction of the most urgent facilities at home and abroad. Military personnel and operation and maintenance costs were to be financed under the emergency authorities already included in the pending Defense appropriation bill for fiscal year 1966.

The Republic of Vietnam, for its part, undertook to increase still further the strength of its own armed forces, which had already been raised by about 100,000 men—from 525,000 to 625,000—during fiscal

year 1965. A particular effort was to be made to add new units to the regular Army and to build up the Regional Forces and the National Police. Other nations assisting the Republic of Vietnam in its struggle against Communist aggression, notably the Republic of Korea and Australia, also undertook to contribute combat forces or increase the units already there.

It was generally agreed among the allied nations that strike elements of the Vietnamese Regular Forces, together with U.S. and other free world forces, would concentrate on "search and destroy" operations—designed to destroy Communist forces and their base areas rather than to seize and hold territory permanently. Other Vietnamese forces, with some assistance from allied forces in areas contiguous to their own bases, would assume primary responsibility for "clear and secure" operations, which are undertaken when it is considered possible to conduct, on a continuing basis, the full range of pacification measures required to secure and hold an area.

The Vietnamese Regular Forces were also to continue to provide defense for government centers, including provincial capitals, district towns, and key governmental facilities and installations. They were to be assisted in this task by the Regional and Popular Forces, with the latter operating at the village and hamlet level. The reestablishment of normal governmental functions was to remain the responsibility of the civil authorities and National Police.

It was agreed that U.S. air units, in conjunction with the Vietnamese air forces, would conduct close support air strikes, suppressive fire, and airlift and reconnaissance operations in support of all friendly ground forces in South Vietnam. In addition, U.S. air units would undertake reconnaissance and strike missions against the lines of communications from North Vietnam and would assist U.S. and Vietnamese naval forces in patrolling and interdicting the sea approaches. U.S. naval forces were to provide gunfire support for friendly forces along the coast.

The United States, at the beginning of fiscal year 1966, had a total of about 60,000 military personnel in Vietnam, including nine maneuver battalions. The first major augmentation of U.S. combat forces in Vietnam began to arrive in July 1965, and included two Army brigades and two Marine Corps battalions. Four more Marine battalions reached Vietnam in August. In September the Army's 1st Air Cavalry (Airmobile) Division, with eight maneuver battalions and more than 400 helicopters, arrived in Vietnam. The 1st Air Cavalry Division, the only one of its kind, was activated on July 1, 1965, at Ft. Benning, Ga., using the resources of an infantry division and of the provisional test division that had been created in fiscal year 1963 to demonstrate the feasibility of the airmobile concept. Additional

U.S. units were deployed during October, along with the first Korean combat units—two-thirds of an Army division and a Marine brigade. By November the total U.S. strength in Vietnam had been increased to more than 153,000, including 34 maneuver battalions. These battalions were supported by combat and service support units and additional shore-based fighter and attack squadrons.

To house these units, and those yet to come, and to provide them with the needed operational and logistics facilities, a massive construction program was undertaken on a "crash" basis. An entire military infrastructure had to be built from the ground up, including ports, warehouses, roads, cantonments, airfields, maintenance facilities, and a new communications network. Immediate needs were met by the construction of temporary facilities to serve until more permanent structures would become available.

The first mission of these forces was to secure tactical base areas from which future operations could be launched and to clear major roads to these areas. The first major U.S. offensive, Operation STARLIGHT, was launched by U.S. Marines in August. In a highly successful amphibious-airmobile strike against enemy forces near Chu Lai, the Marines defeated the Viet Cong, inflicting heavy casualties. The operation demonstrated the effectiveness of U.S. firepower and mobility against Viet Cong main force units.

In the meantime, however, the number of regular North Vietnam Army units had also increased. As late as August 1965, North Vietnam had 14 infantry-type battalions in South Vietnam, but by the end of October the number had risen to 27. With this rapid buildup, significant combat operations doubled during October as Allied forces attempted to interdict Communist base areas and supply routes.

The greatest activity occurred in late October in the Central Highlands of the II Corps area, where two Viet Cong regiments, one of the largest concentrations of forces yet assembled by the enemy, tried to overrun the Plei Me Special Forces Camp and ambush friendly reaction forces. This engagement, running for a period of about 1 week, eventually involved two Special Forces companies, one infantry and two Ranger battalions, and an Armored Cavalry squadron of the Vietnamese forces and one brigade of the U.S. 1st Air Cavalry Division. The attack was defeated, and the Viet Cong left 317 dead on the battlefield, while the allies lost 113 in the action, including 11 U.S. soldiers.

This engagement proved to be the prelude to one of the most intense battles fought by U.S. forces in Vietnam during fiscal year 1966. Following the attack on Plei Me, elements of the 1st Air Cavalry Division continued mopping up operations in the Pleiku area—killing 216

Viet Cong and capturing 117, while losing 55 men of their own. On November 14, units of the division moved in pursuit of the Viet Cong into the Ia Drang valley, along the Vietnam-Cambodian border in the Chu Pong mountains. Here a Communist secret base area was uncovered, quartering two regular North Vietnam regiments and a number of Viet Cong units, all in well-entrenched positions. Four battalions and several support units of the 1st Air Cavalry eventually engaged the enemy. Repeated attempts by the Communist forces to overrun U.S. positions by human wave attacks were repulsed with the help of air and artillery support. Almost 400 strike sorties were flown by U.S. air units, including the first B-52 sorties in support of U.S. ground forces. (The first B-52 missions against targets in South Vietnam had been flown in June 1965.)

The battle of Ia Drang valley appears to have arisen from a deliberate and well-planned enemy effort to test the behavior and reaction time of U.S. forces. The enemy's tactics in the battle suggest a fanatic determination to inflict a serious defeat on these forces and a readiness to accept heavy losses to accomplish this end. In the first phase of the operation alone, the Communists lost 1,286 men compared to U.S. losses of 217 killed and 232 wounded. The final phase of the operation began on November 18 with three Vietnamese battalions conducting a search and destroy operation west of Pleiku. When this phase ended, 265 more Viet Cong had been killed and 10 captured, at a cost of 21 Vietnamese killed and 61 wounded.

All in all, November proved to be a disastrous month for the Communist forces. They lost more than 5,500 men killed in action, almost 600 prisoners were taken by Allied forces, and more than 1,100 Communists defected. In addition, 2,164 weapons, including 181 of the heavier types, were captured.

Allied pressure on the Communist forces continued to be applied in December. A combined operation in the I Corps area, involving Vietnamese and U.S. Marine units against a Viet Cong main force regiment, resulted in more than 400 known Viet Cong dead and possibly 600 others. Large quantities of Viet Cong supplies and equipment were captured or destroyed.

By the end of 1965, U.S. military strength in Vietnam had grown to 184,000, compared to less than 60,000 at the end of June. "Third nation" military strength had increased from 3,300 to 22,400 and the number of South Vietnamese under arms from 626,000 to 691,000. Despite the losses suffered by the enemy, estimates of the size of Communist forces continued to rise during the same 6-month period—from 212,000 to 231,000 for the Viet Cong and from 9,200 to more than 26,000 for the personnel in regular North Vietnamese units. Most significantly, however, the prompt movement of large U.S. combat

forces into Vietnam had blunted the Communist offensive aimed at the overthrow of the Republic of Vietnam, and inflicted heavy losses on the enemy.

While the immediate danger of a Communist takeover was being thwarted, the United States pursued its continuous effort to find a peaceful solution. Even as he announced the deployment of U.S. forces to South Vietnam on July 28, 1965, the President reiterated that:

"We are ready now, as we have always been, to move from the battlefield to the conference table. I have stated publicly and many times, again and again, America's willingness to begin unconditional discussions with any government, at any place, at any time. * * *

"We do not seek the destruction of any government, nor do we covet a foot of any territory. But we insist and we will always insist that the people of South Vietnam shall have the right of choice, the right to shape their own destiny in free elections in the South, or throughout all Vietnam under international supervision, and they shall not have any government imposed upon them by force and terror so long as we can prevent it."

Despite intensive worldwide diplomatic effort by the United States, third countries, and private individuals, seeking negotiations without conditions for a peaceful settlement, the Government of North Vietnam remained adamant behind its four-point program, involving:

1. Withdrawal of all U.S. troops and weapons;
2. No military alliances or foreign bases or troops;
3. Settlement of the internal affairs of South Vietnam by the South Vietnamese people in accordance with the program of the National Liberation Front of South Vietnam; and
4. Peaceful reunification of North and South Vietnam by the Vietnamese people in both zones.

The position of the United States at year end was summed up by the Secretary of State as follows:

1. The Geneva Agreements of 1954 and 1962 are an adequate basis for peace in Southeast Asia;
2. We would welcome a conference on Southeast Asia or on any part thereof;
3. We would welcome "negotiations without pre-conditions" as the 17 nations put it;
4. We would welcome unconditional discussions as President Johnson put it;
5. A cessation of hostilities could be the first order of business at a conference or could be the subject of preliminary discussions;

6. Hanoi's four points could be discussed along with other points which others might wish to propose;

7. We want no U.S. bases in Southeast Asia;

8. We do not desire to retain U.S. troops in South Vietnam after peace is assured;

9. We support free elections in South Vietnam to give the South Vietnamese a government of their own free choice;

10. The question of reunification of Vietnam should be determined by the Vietnamese through their own free decision;

11. The countries of Southeast Asia can be nonaligned or neutral if that be their option;

12. We would much prefer to use our resources for the economic reconstruction of Southeast Asia than in war. If there is peace, North Vietnam could participate in a regional effort to which we would be prepared to contribute at least one billion dollars;

13. The President has said "The Viet Cong would not have difficulty being represented and having their views represented if for a moment Hanoi decided she wanted to cease aggression. I don't think that would be an insurmountable problem";

14. We have said publicly and privately that we could stop the bombing of North Vietnam as a step toward peace although there has not been the slightest hint or suggestion from the other side as to what they would do if the bombing stopped.

While efforts to achieve unconditional discussions continued, the United States, in view of the diplomatic impasse, had no alternative but to continue the struggle against Communist aggression in Southeast Asia. Accordingly, the President sent to the Congress, in January, a fiscal year 1966 supplemental request for Southeast Asia totaling \$12.3 billion in new obligational authority and a regular fiscal year 1967 Defense budget request totaling \$59.9 billion. However, the President noted in his Budget Message that:

"No one can firmly predict the course of events in Southeast Asia. They depend not only upon our own actions but upon those of our adversaries. As a consequence, ultimate budgetary requirements could be either higher or lower than amounts I am now requesting. * * *

"Should our efforts to find peace in Vietnam prevail, we can rapidly adjust the budget to make even faster progress in * * * the solution of our domestic problems. If, on other hand, events in Southeast Asia so develop that additional funds are required, I will not hesitate to request the necessary sums."

In view of the continued enemy buildup, particularly of regular North Vietnamese units, it was considered prudent to provide in the

January 1966 budget requests for the deployment of additional U.S. combat forces in Southeast Asia, if required. This, in turn, necessitated some further increase in the overall force structure.

To round out the Army's strategic reserve and support the possible deployment of additional forces to Southeast Asia, as well as to provide additional training, logistics, and personnel pipelines, another 45,000 men were added to the Army, providing a fiscal year 1966 end-strength of 1,159,000. The Navy was authorized 8,000 additional men to augment its Southeast Asia operations, raising the fiscal year 1966 end-strength to about 724,000. Another 55,000 men were provided for the Marine Corps to man and support a new division and supporting units, thereby raising its fiscal year 1966 end-strength to about 250,000. The Air Force was authorized an increase of 4,200 men to support possible additional deployments to Southeast Asia and to provide for increased pipeline and training needs. This brought the Air Force authorized strength to about 854,000 for the end of fiscal year 1966. Actually, by June 30, 1966, all of the military Services had exceeded the strength goals planned in January. The Army had reached 1,200,000, the Navy 745,000, the Marine Corps almost 262,000, and the Air Force 887,000.

Combat operations in South Vietnam continued at a high level during the second half of fiscal year 1966. U.S. ground forces engaged in more than 350 battalion-size or larger operations during this period, compared to less than 200 in the first half. In addition, they participated in 98 combined operations with other friendly forces compared to 65 during the first 6-month period. During the entire year, U.S. aircraft flew a total of almost 300,000 sorties, compared to about 40,000 during fiscal year 1965.

Three operations conducted during the January-June period were particularly noteworthy. The first, a combined operation by units of the 1st Air Cavalry Division and Korean and Vietnamese forces, was designed to clear the II Corps coastal plain area. It began in late January and continued for 42 days. Nearly 2,400 enemy were killed and another 700 captured. One regular North Vietnamese Army regiment was neutralized, losing most of its crew-served weapons, and the capabilities of a Viet Cong main force regiment were seriously impaired. The enemy's fortified facilities in the area were destroyed.

In early March, Marine Corps and South Vietnamese troops trapped a North Vietnamese regiment in a valley northwest of Quang Ngai in the I Corps area. After a 4-day battle, 532 of the enemy were killed and 24 captured.

In early May, a brigade of the U.S. 25th Infantry Division moved to spoil a major monsoon offensive by North Vietnamese units in the

II Corps zone. After the enemy was engaged, units of the 1st Cavalry Division joined the battle, in which over 700 Communists were killed and nearly 100 captured. As a result the anticipated enemy offensive failed to materialize.

By June 30, 1966, U.S. military strength in South Vietnam had grown to 267,000, an increase of more than 207,000 during the fiscal year. Army forces increased from 27,300 to 160,000, Navy personnel ashore from 3,800 to 17,400, the Marine Corps from 18,100 to 53,700, and the Air Force from 10,700 to 36,400. Including U.S. military personnel in Thailand and aboard the ships of the Seventh Fleet offshore, the total U.S. military personnel strength in Southeast Asia had risen from about 103,000 to almost 322,000 during the year. At the same time, the number of Vietnamese under arms increased from 625,000 to 700,000 and the personnel of other free world units from 3,300 to almost 30,000. Korean forces rose from 2,100 to 25,200 and Australian military personnel from 1,100 to 4,400.

Translated into military units and equipment, the deployment was equally impressive. The United States added during the year 42 maneuver battalions to the 9 already in Vietnam on June 30, 1965. The number of combat support battalions increased from 4 to 38 and engineer and construction battalions from 6 to 30. Fighter-attack aircraft deployed in Southeast Asia, including those aboard carriers offshore, increased from about 600 to 850, and nonattack aircraft ashore from 400 to 830. The number of helicopters deployed to Southeast Asia more than tripled—from 500 to almost 1,700. The U.S. Navy's coastal patrol increased from 35 to 91 vessels and a force of 64 river control craft was operating by the end of the year. The Republic of Korea had deployed by June 30, 1966, two Army divisions and a Marine brigade, and the Australians increased their forces from one battalion to two, while New Zealand provided an artillery unit.

The intensification of military operations took its toll. A total of 3,664 American servicemen died as a result of hostile actions in fiscal year 1966, compared to 304 killed in 1965. The United States also lost 532 aircraft from hostile action and another 277 from operational accidents; losses in fiscal year 1965 had been 134 and 138 respectively. South Vietnamese forces suffered more than 10,600 combat deaths and other free world allies more than 300.

The Viet Cong and North Vietnamese forces, however, lost almost 50,000 killed in action during this period, and possibly more. Nevertheless, Communist strength in Vietnam continued to increase in fiscal year 1966, reaching a total of about 299,000 on June 30, 1966, compared to about 221,000 a year earlier.

As the year ended, it was evident that the Communists had lost the military initiative and that their hope for a quick victory had been

frustrated. U.S. forces had clearly demonstrated their superiority in large unit combat and on many occasions U.S. firepower and mobility had proved to be more than a match for the stealth and cunning of the enemy. Communist safe havens, which in some cases had not been challenged for a quarter of a century, were no longer inviolate. The free world forces had forcefully demonstrated that the Viet Cong and their North Vietnamese allies will continue to pay a heavy price as long as they persist in their aggression.

II. Operational Forces and Programs

Fiscal year 1966 witnessed a major expansion in the armed forces of the United States. Active duty military personnel increased from 2,655,389 to 3,094,058 during the year. Most of the increase took place in the general purpose forces, which are the forces primarily involved in our military effort in Southeast Asia. Notwithstanding the deployment of an additional 220,000 men to Southeast Asia during the year, other U.S. forces overseas were maintained at about the same level, the strategic deterrent was further strengthened, and the readiness of reserve components was raised to new premobilization levels.

Strategic Forces

These forces include the principal general nuclear war capabilities of the Nation, consisting of both offensive and defensive weapon systems. The civil defense effort is an integral part of this program.

Strategic Offensive Forces

The strategic offensive forces, because of their capability to destroy any attacker even after absorbing a surprise first strike, provide the major deterrent to a deliberate nuclear attack on the United States or its allies. While it is hoped that these forces will never have to be used, they are ready, if the need arises, to meet any challenge. During the year, continued improvements were achieved as new, more capable weapons became operational, and work was started to provide still greater effectiveness in the future, with particular stress being placed on increasing the capability of our weapons to penetrate any possible enemy missile defense.

Strategic Offensive Missiles

At the beginning of fiscal year 1966, all five wings of the MINUTEMAN I missiles were operational, and work was well under way on the construction of additional sites for the improved MINUTEMAN II missiles. This new missile provides longer range and/or larger payload, greater accuracy, and more operational versatility than its predecessor. By the end of the year, the first squadron of MINUTEMAN II's had become operational and a second was nearly ready. Work on upgrading the older MINUTEMAN I system to the im-

proved MINUTEMAN II system had also begun. By June 1966, a total of 880 MINUTEMAN missiles were operational.

While the goal of 1,000 operational MINUTEMAN still appeared appropriate in the context of the envisioned overall strategic force structure and in the light of the expected threat, further improvements in the MINUTEMAN'S performance became feasible. The new version, to be known as MINUTEMAN III, will include an improved third stage permitting an increased payload and an advanced reentry vehicle. Operational production of this missile will begin in fiscal year 1969. Ultimately all MINUTEMAN I silos will be usable by MINUTEMAN II or III missiles.

Since the ATLAS and TITAN I missiles were phased out of operation during fiscal year 1965, the 54 TITAN II's with storable liquid fuel remained as the only other land-based strategic offensive missiles. These missiles, deployed in hard silos, continued to be maintained on an operationally alert status throughout the year.

Eight more POLARIS submarines were commissioned during the year, raising the total to 37. The remaining 4 submarines in the currently authorized force of 41 were under construction and nearing completion, 3 having been launched by June 30, 1966. The entire force is scheduled to be fully operational by the first quarter of fiscal year 1968. Nineteen of the more recently launched submarines carry the long-range 2,500-mile POLARIS A-3 missile, as does one of the former A-1 ships retrofitted with the A-3. Thirteen submarines are equipped with the intermediate-range 1,500-mile A-2 missile. The remaining four of the five submarines originally deployed with the 1,200-mile A-1 missile were being converted to A-3's at the end of the year.

While the current force goal of 41 ballistic missile submarines continues to appear adequate, steps are underway to improve still further the capabilities of this force. Work was begun in fiscal year 1965 on the POSEIDON missile designed to have vastly greater accuracy, flexibility, and payload-carrying capability than any of current models. The increased payload will allow it to carry the sophisticated equipment needed to ensure penetration of heavily defended targets. During 1966, development work on the POSEIDON was accelerated in order to provide an earlier capability to begin production and deployment than was originally envisioned.

The stepped-up efforts to develop more capable and larger payload missiles (MINUTEMAN III and POSEIDON) are closely tied to the work being done in the area of penetration aids. In view of the possibility that our strategic forces may in the future face far more effective defenses, the incorporation of new penetration aids in our strategic missiles may become critically important to the success of

the nuclear deterrent. Although much work in this area had been done in recent years, a further acceleration was ordered during 1966.

The Post Attack Command and Control System (PACCS) provides an airborne launch control capability for the strategic retaliatory forces in the event that ground-based launch facilities do not survive the initial enemy attack. Several EC-135's were added to the PACCS force during the year, significantly improving the survivability of our command and control system.

Strategic Bombers

With the growth in the size and effectiveness of the strategic missile force during fiscal year 1966, the manned bomber force continued its long-planned phasedown. Starting the year with over 900 aircraft, the force had been reduced by June 30, 1966, to 680—600 long-range B-52's and 80 medium-range B-58's. Phased out during the year were the last five wings of B-47's, once the backbone of this country's strategic airpower superiority, and 30 of the oldest B-52's, whose high cost of modification and maintenance made their continued retention unjustified. In addition, the last of the old KC-97 refueling tankers were retired, being replaced by larger KC-135's.

During the year the size of the force on continuous airborne alert was reduced to the number that could be accommodated within the regular training program. This step was taken because of our much improved warning system, which virtually ensures that the ground alert aircraft can be launched in time to avoid destruction and because of the high survival capability of the hardened missiles which now represent such a large share of the total offensive force. About half of the B-52's were maintained on 15-minute ground alert throughout the period. In addition, a number of B-52's were modified to carry the considerably greater conventional bomb loads required for saturation bombing over South Vietnam.

The present force of B-52's and B-58's will ensure a manned bomber component in our strategic offensive forces until the early 1970's. In order to provide the option of having strategic bombers beyond that time, it was decided during the year to initiate the development and procurement of a strategic bomber version of the F-111. This aircraft, known as the FB-111, will possess dual-purpose performance characteristics so that it can be used for both strategic and tactical missions. For the more distant future, component development work was continued on an Advanced Manned Strategic Aircraft (AMSA). Current plans call for the phaseout of the older B-52's and the B-58's by fiscal year 1971, leaving only the 255 most recent B-52's and 210 FB-111's, or a total force of about 465 manned bombers.

To give the FB-111 a more effective stand-off attack capability, the short-range attack missile (SRAM), a smaller, more accurate low-altitude air-to-ground missile than HOUND DOG, was being developed. Particularly useful against advanced terminal defenses, the SRAM is expected to be available by 1969, when the first FB-111 squadron is scheduled to be operational.

Strategic reconnaissance capabilities were greatly improved during the year by the delivery of the new SR-71 into the operational forces. These new aircraft are capable of flying three times the speed of sound at altitudes of over 80,000 feet and carry a variety of photographic, radar, and infrared sensors.

On January 17, 1966, a B-52 collided with a KC-135 tanker during a high altitude refueling operation over Spain and both aircraft crashed. As a result, some nuclear material was released when a nuclear weapon was damaged, contaminating some Spanish soil and vegetation. Work began promptly and all of this contamination was successfully removed. Simultaneously, an intensive land and sea search was initiated to locate a nuclear weapon that had been lost. It was finally found on March 15 by Navy research submarines 5 miles offshore at a depth of about 2,500 feet. Following several unsuccessful retrieval operations, during which the bomb became dislodged and slipped still deeper to about 2,850 feet, it was recovered intact on April 7 during the fourth attempt.

On June 8, 1966, one of the two XB-70's that had been completed collided in midair with a NASA F-104 aircraft and was totally destroyed. Two test pilots lost their lives. The XB-70 program, a joint NASA and Defense test effort, had been accumulating experimental data on supersonic aircraft developments for both military and civilian use. The initial XB-70 test program had been completed prior to the accident, and the remaining aircraft will be able to carry out all the important follow-on tests planned.

Strategic Defensive Forces

In recent years, the shift in the basic nuclear threat to this country from manned bombers to ballistic missiles has required concomitant adjustments in our strategic defensive forces. This effort continued during 1966 while work was pressed forward on the development of an effective defense against ballistic missiles.

Antibomber Defenses

Our early warning radar systems were originally deployed to alert the continental defense forces to an approaching enemy manned-bomber attack. Since today an enemy's missiles would most likely

precede his bombers, our anti-aircraft defenses have become both relatively less important and more vulnerable. As a result, the anti-bomber warning systems of the 1950's have been reduced to bring their operating costs more into line with the actual bomber threat. A number of radar picket ships and DEW line extension aircraft and land-based radars were phased out during the 1961-65 period. In 1966, the remainder of the DEW line extension aircraft and the radar picket ships were retired. Offshore radar coverage was continued by early-warning aircraft, equipped with automatic transmitters that transfer data directly to the control centers.

Overall direction of the continental defense forces is performed by the North American Air Defense Command (NORAD), a combined U.S.-Canadian headquarters responsible for the entire continent north of Mexico. On January 1, 1966, NORAD's automated Combat Operations Center deep inside Colorado's Cheyenne Mountain achieved an initial operational capability. It is expected to be fully operational within a year. This vast complex of 11 underground buildings, which are mounted on springs to protect their sensitive electronic equipment against damage from shock waves, greatly reduces the vulnerability of NORAD to nuclear attack. Construction of an alternate hardened NORAD Combat Operations Center was in the planning stages. NORAD's component commands were also reorganized in fiscal year 1966 with the six geographic regions in the United States being merged into four areas, accompanied by a parallel realignment of the Army and Air Force Air Defense Command structures.

The Semi-Automatic Ground Environment (SAGE) system for control and direction of air defense against enemy bombers, which was vulnerable to missile attack and not susceptible of hardening, has been upgraded by a system of back-up interceptor controls (BUIC). An interim manual BUIC capability was provided beginning in 1961, and 31 of these manual stations were still in operation on June 30, 1966. In September 1965, the first semi-automatic BUIC II center became operational, and the originally planned system of 14 BUIC II centers was completed in April 1966. Current plans call for expanding the number of BUIC centers to 19 and providing them with the fully automated and improved BUIC III system. Although it cannot handle as many targets or interceptions as a SAGE center, the BUIC system is less vulnerable, less costly to operate, and more commensurate with today's manned bomber threat. Completion of the BUIC II system in 1966 permitted the deactivation of four more SAGE centers during the year. Under the revised plan, only 12 SAGE direction centers will eventually be retained and these will be fully integrated with the 19 BUIC III stations. Modification of the BUIC II stations to the BUIC III configuration is scheduled to begin in

fiscal year 1967. Finally, the program to "internet" the Defense Department's radar system with that of the FAA was carried forward with the development and initial procurement of a "digitizer" that makes FAA radar inputs compatible with the SAGE-BUIC III system.

The size of the active interceptor force was further reduced during the year as part of the planned phasedown program. The number of the active F-102's was reduced by more than half, as many of these aircraft were transferred to the Air National Guard units assigned to continental defense. Two F-102 squadrons were modified for inflight refueling and transferred to Southeast Asia to augment air defense capabilities in that area. The size of the Air National Guard's continental defense forces remained unchanged as the F-102's replaced the older subsonic F-89's. The last of these F-89's is scheduled to be retired by the end of the fiscal year 1967. The capabilities of the present interceptor force were substantially enhanced by radar, navigational, and electronic countermeasure improvements and by modifying some of the aircraft to permit inflight refueling. The survivability of the interceptor force was increased by further dispersal and by keeping one-third of the force on alert at all times.

Although a new manned interceptor would substantially increase the effectiveness of our antibomber defenses, there remained the question of whether its great cost could be justified in light of the current Soviet manned bomber threat. However, work was continued during the year on the YF-12A test program and on a fire control and missile system which could be used by either an F-12 type interceptor or a modified version of the F-111. These programs ensure that, if the need arises, the Department could proceed expeditiously with the production and deployment of either of these aircraft. Since in such circumstances a more effective and survivable system of warning and control would also seem to be desirable, the study of an Airborne Warning and Control System (AWACS) continued to be pursued, including the development of the overland radar technology to provide effective coverage at all altitudes.

The surface-to-air missile forces remained essentially the same throughout the fiscal year, except for the elimination of some NIKE-HERCULES batteries deployed in defense of soft SAC bases. The eight BOMARC sites—six in the United States and two in Canada—continued to be armed with the 400-mile BOMARC B missile. Further progress was made in the HAWK improvement program, which aims to achieve a faster reaction time for this low altitude defense missile, to increase its reliability, and to raise its target-handling capability.

Antimissile Defenses

Warning of a ballistic missile attack continued to be provided primarily by the Ballistic Missile Early Warning System (BMEWS). All three of the presently planned stations were operational during the year, and completion of the Clear, Alaska, tracking radar further increased the warning reliability of the system. Additional development work was done on the over-the-horizon (OTH) radar, which permits the near-instantaneous detection of extremely distant ballistic missile launchings by bouncing radar or radio waves off the ionosphere. The installation of oversea-based OTH radar complexes was begun. Steps were also taken to improve the sea-launched ballistic missile detection capabilities of selected SAGE and SPACETRACK radars.

Further substantial progress was made during the year in developing an effective antiballistic missile (ABM) defense system, a project which has had the highest priority for many years and in which about \$2.4 billion has been invested during the last years. As currently conceived, this system, known as NIKE-X, would consist of a family of radars, long-range ZEUS missiles, short-range SPRINT missiles, and the necessary control and data processing equipment. A powerful multifunction array radar would provide central control and battle management, a long-range acquisition radar would identify targets for the extended-range ZEUS missile, and a smaller missile site radar would control both the SPRINT and ZEUS missiles. The new extended-range ZEUS would intercept enemy warheads at high altitudes outside of the atmosphere, thereby providing, in effect, an area defense. The high acceleration SPRINT would attack enemy warheads that successfully penetrate the ZEUS defenses and enter the atmosphere.

The NIKE-X system was well advanced in development by the end of the year. Although certain technical problems remained, there was high confidence in the feasibility of the system as a whole. Early in the fiscal year the development contract was let for the extended-range ZEUS missile, while extensive testing was continued on the basic ZEUS missile, which had demonstrated its intercept capability earlier. Test firings of the SPRINT missile, which began in early 1965, were also continued throughout fiscal year 1966. After the successful test of an experimental version of the multifunction array radar at White Sands in fiscal year 1965, components for additional test radars were procured during 1966 and construction of another test facility was started at Kwajalein Atoll.

Antisatellite Defenses

Detection and tracking of foreign satellites continued to be performed by NORAD's Space Detection and Tracking System (SPADATS). SPADATS acquires information from three separate

sources: The Navy's SPASUR detection fence extending across the southern United States, the BMEWS screen across the northern approaches, and the Air Force's SPACETRACK, a worldwide network of radars and optical sensors. Active defense capabilities against satellites were provided by special NIKE-ZEUS and THOR systems, each suitably modified to give it a capability within certain ranges to intercept and destroy hostile satellites.

Civil Defense

The major concern of the civil defense program in recent years has been the development of a Nation-wide shelter system to provide protection to the population against the radioactive fallout that would accompany any nuclear attack on this country. Such a system promises the highest return in terms of "lives saved per dollar expended" of any damage-limiting measure yet devised. However, the proposed increase in the size and scope of the civil defense effort for 1966 failed to receive Congressional approval, and the principal area of effort during the year continued to be the identification, marking, and stocking of existing shelter space.

By July 1, 1965, public shelter spaces for 136 million people had been identified, and nearly 14 million more were added during the year, for a total of nearly 150 million. By June 30, 1966, more than 89 million of these spaces had been marked and nearly 69 million stocked with survival supplies. The effort to develop additional shelter spaces continued with the placing of contracts providing for community shelter planning and the survey of smaller structures. A detailed account of civil defense programs and progress during fiscal year 1966 can be found in the report of the Secretary of the Army.

General Purpose Forces

The General Purpose Forces include most Army, Navy, and Marine Corps units and the tactical elements of the Air Force. These are the forces designed to perform all military operations short of general nuclear war, i.e., limited war and counterinsurgency operations.

For the General Purpose Forces, fiscal year 1966 was a period of rapid expansion as the military departments strove to meet the rising demands of the Southeast Asia conflict without resorting to the mobilization of reserve units. It was also a year of testing—testing of the forces which were deployed to the combat zone, testing of new operational concepts and new weapon systems in the arena of battle, and testing of the strength and responsiveness of the support establishment.

Army

With the decision not to call reserve units to active duty, the Army was required to activate several new major units during fiscal year 1966 in order to offset the deployments to Southeast Asia. By doing this and by increasing the readiness of its reserve components, the Army was able throughout the period to maintain unimpaired its ability to meet the needs of other contingencies elsewhere in the world.

New major active Army units authorized for the Vietnam buildup included a temporary infantry division, three separate infantry brigades, and an armored cavalry regiment, together with a large number of artillery battalions, aviation units, and air defense batteries. Of the major units, the division and two of the three brigades had become operational by June 30, 1966. The activation of these temporary units brought the Army's authorized force structure to 17 divisions and four independent brigades, or the equivalent of $18\frac{1}{2}$ divisions. During the year, the total number of active combat maneuver battalions—the basic building blocks of the ground forces—increased from 174 to 191, artillery battalions from 115 to 124, and the number of aviation units from 110 to 160. Overall Army active duty military personnel strength rose from 969,066 to about 1,199,784.

Major Army units deployed to Vietnam during the year, joining the 173rd Airborne Brigade already there, included the 1st Air Cavalry Division, the 1st and 25th Infantry Divisions, and the 1st Brigade of the 101st Airborne Division. Unchanged were the deployments to South Korea of two infantry divisions and to Europe of three mechanized and two armored divisions. By the end of the year, withdrawal of the last units from the Dominican Republic had begun.

The flexibility and mobility of Army ground forces were further enhanced by the activation of the first airmobile division on July 1, 1965. This division—the 1st Cavalry (Airmobile)—was formed from the resources of the provisional 11th Air Assault Division and the 2nd Infantry Division after extensive experimentation, test, and evaluation. The airmobile division differs from a ROAD infantry division principally in that it has more than four times as many aircraft (primarily helicopters), thus permitting the simultaneous lift and deployment of about a third of the division. The 1st Cavalry (Airmobile) was deployed to Vietnam shortly after activation, where it amply demonstrated the efficacy of the airmobile concept.

The expansion of the Army's aircraft inventory accelerated during the year, with the number being increased by nearly 1,200—from 6,933 to 8,098. The entire increase was in the helicopter inventory which rose by over 1,250 to 5,494, while fixed-wing aircraft actually

declined by nearly 100 aircraft, to 2,604. More than half of the helicopter increase consisted of versions of the versatile UH-1B/D Iroquois utility helicopter, which not only provides tactical mobility for troops and supplies but can also be used for evacuation of wounded or as a weapons platform. Other major helicopter deliveries included the light observation Sioux and Raven and the medium transport CH-47 Chinook.

The Army's procurement program in fiscal year 1966 totaled about \$5.2 billion, two and a half times more than in the previous year. As might be expected, the largest increases were in those categories most closely related to the conflict in Southeast Asia, with the program for aircraft being nearly tripled, that for ammunition nearly quadrupled, and that for production base support nearly quintupled. In addition to supplying the combat needs of Southeast Asia, a number of new items were put into production, including the AH-1G Cobra armed helicopter, the CH-54-A heavy-lift cargo helicopter. The first procurement by the Army of the M-16 rifle was also made during the year.

Several significant developments occurred in the antiaircraft defense field. The development program for the MAULER, which was to have served as a mobile air defense system for the protection of front-line troops, was formally cancelled in July 1965 after a year of development setbacks. As part of this decision, approval was given to the eventual deployment of an interim system employing self-propelled automatic guns and the CHAPARRAL missile (a vehicle-mounted SIDEWINDER modified to the surface-to-air mission) and to the development of an improved and more mobile HAWK missile. During the year, the CHAPARRAL missile was successfully testfired and procurement was initiated. A development contract was let for a self-propelled version of HAWK with ready-to-fire missiles on launchers. The shoulder-fired antiaircraft missile REDEYE also began to enter the inventory in substantial numbers, giving even the smallest tactical units an effective capability to engage and destroy low-flying aircraft. The improvement program for the HAWK and the advanced development of the SAM-D surface-to-air missile were vigorously pursued. The latter might serve as the eventual replacement for the current HAWK and NIKE-HERCULES missile, which comprised the Army's prime antiaircraft defense capability during fiscal year 1966.

Other important Army research and development programs under way in fiscal year 1966 included the main battle tank (in conjunction with West Germany); the wire-guided TOW long-range antitank missile; a smaller shoulder-fired medium antitank assault weapon, MAW; and the LANCE mobile battlefield missile, which will replace

the HONEST JOHN and LITTLE JOHN. Work continued on the engineering development of an Advanced Aerial Fire Support System (AAFSS), which is being designed as a high-speed weapons platform having an all-weather operating capability and mounting such weapon systems as machineguns, grenade launchers, rockets, and antitank missiles.

Navy

On June 30, 1966, there were 909 Navy ships in commission—410 warships and 499 other combatant vessels and auxiliaries. During the year 51 ships were added to the Fleet, while 22 ships were retired, for a net increase of 29. The number of general purpose ships at the end of the fiscal year totaled 875, an increase of 24 during the period. Total active duty Navy personnel strength increased by almost 73,800 from 671,448 to 745,205.

With the expansion of U.S. involvement in the Southeast Asia conflict it became necessary to reactivate ships from the Reserve Fleet in order to support the larger naval forces deployed to the area. For example, four fire support ships, originally designed to provide dense ship-to-shore rocket fire coverage of amphibious landings, were reactivated and deployed to Vietnam, where their high intensity firepower was used to support land operations near the coast. To provide more shallow-draft shipping for Southeast Asia, a total of 23 LSTs had been reactivated by the end of the year and more reactivations were in process. Additional underway replenishment support ships were also taken out of the Reserve Fleet and others shifted to the Pacific from other areas to meet the expanding support requirements resulting from the higher tempo of naval operations, particularly by attack carriers and destroyers. Twelve minesweepers were deployed to assist in sweeping the Saigon harbor and river.

A large number of destroyers, minesweepers, and Coast Guard patrol craft, as well as patrol aircraft, were employed in the MARKET TIME Operation, an intensive surveillance of coastal shipping to prevent the infiltration of men and equipment from North Vietnam by sea. In order to provide a similar surveillance on inland waterways, a large fleet of small boats and river patrol craft was formed during the year. Construction of new high-speed shallow-draft boats and craft to supplement these operations was underway, and some deliveries had been received by June 30, 1966.

Naval airpower played a critical role in Southeast Asia combat operations during fiscal year 1966. In the early stages of the conflict, before even temporary facilities could be constructed to permit large-scale land-based air operations, the Navy's aircraft carriers were able to move into position and provide the required strike and

support capabilities. Five attack carriers were assigned to this mission with three maintained "on line" at all times. During the year some 69,000 attack sorties were flown, including about half of all U.S.-attack sorties against North Vietnam.

Naval gunfire support of U.S. and Vietnamese ground operations was provided by cruisers with 6- and 8-inch guns and destroyers with 5-inch guns as well as by the four fire support ships. An average of slightly more than 10,000 rounds of naval gun ammunition per month was expended until the last quarter of the fiscal year, when an increase in missions more than doubled the ammunition used. Naval guns provided extremely effective harassing, interdiction, and illumination fire as well as highly accurate destruction and neutralization.

At the end of the fiscal year, a total of about 200 Navy ships were deployed to Southeast Asia, and Navy personnel afloat and ashore in the area totaled over 47,000.

The Navy's three nuclear powered ships—the attack carrier *Enterprise*, the guided missile cruiser *Long Beach*, and the frigate *Bainbridge*—were transferred from the Atlantic to the Pacific during the year. Operating experience indicated that the nuclear task force's long endurance capability and flexibility could be best utilized in the vast reaches of the Pacific.

The attack carrier (CVA) force dropped to its normal strength of 15, compared with 16 at the beginning of the year, after work was started in February 1966 on an extensive modernization of the *Midway*. (In addition, a CVS, the *Intrepid*, was operating as an attack carrier.) As previously mentioned, five CVAs were continuously deployed with the Seventh Fleet in Southeast Asian waters during the year. Two other CVAs were operating in the Mediterranean, and eight were assigned to the home-based First and Second Fleets. On June 30, 1966, the CVA force consisted of the nuclear-powered *Enterprise*, seven modern *Forrestal*-class, two 20-year old *Midway*-class, and five of the older *Essex*-class carriers (plus the *Intrepid*). Three CVAs underwent regular overhauls and modernizations during the year. An eighth conventionally powered *Forrestal*-class carrier, the *John F. Kennedy*, was under construction and nearly half completed by June 30, 1966. Construction of a second nuclear-powered CVA was scheduled for fiscal year 1967, and two additional nuclear carriers are planned for later years, looking eventually toward a CVA force consisting of four nuclear, eight *Forrestal*, and three *Midway*-class carriers.

The number of carrier air groups at year end remained at 17, the same size as in the past 3 years. However, the striking power of these air groups had been greatly increased by the delivery of newer aircraft, such as A-6A Intruders, A-4E Skyhawks, and F-4B Phantoms. The conversion of A-5A attack aircraft to a reconnaissance configura-

tion proceeded on schedule, as did the modernization of the RF-8's. The E-2A was introduced into the force and two detachments deployed to Southeast Asia on CVAs, where they provided early warning and interceptor control capabilities.

Aircraft in the final stages of development or production during the fiscal year included the new version of the Phantom, the F-4J, which made its first test flight in May 1966. First production deliveries were scheduled for fiscal year 1967. The new attack A-7A Corsair II also was in production for deployment in 1967. The F-111B development program made further progress as additional flight tests were conducted. The two principal development problems involved the PHOENIX missile and control system and the excess weight of the aircraft; both problems appeared capable of solution.

The air campaign in Southeast Asia required very large increases in the procurement of air ordnance for fiscal years 1966 and 1967. Included were substantial quantities of bombs, air-to-air SPARROW III and SIDEWINDER missiles, air-to-surface BULLPUP missiles, and SHRIKE antiradiation missiles. The new TV-guided standoff glide bomb, the WALLEYE, became operational, and further large procurements were planned for fiscal year 1967. Development continued on another TV-guided air-to-surface missile, the CONDOR, and in April a contractor was selected to produce test models.

During the year the ASW aircraft carrier force was reduced from nine to eight, with one of the eight ships being used as an attack carrier in the Pacific. However, the overall capabilities of the ASW force were improved. More S-2E Tracker aircraft and SH-3A Sea King helicopters, both of which have new submarine detection systems, were delivered. The land-based ASW squadrons received new P-3A Orion patrol planes. At the end of the year, the attack submarine force—another major component of the ASW force—totaled 104 ships, 22 of which were nuclear-powered. The nuclear submarine (SSN) construction program was delayed somewhat, principally as a result of the submarine safety program. However, while only one new SSN was commissioned, four others were launched.

Major ASW weapon systems under development or entering the forces during the year included the new AN/SQS-26 sonar, which is being installed in all new destroyers. This sonar has both longer detection ranges and greater search area coverage than the current AN/SQS-23. A new variable depth sonar with increased detection capabilities is also being installed on all new destroyer escorts. The MK-46, a new, faster, lightweight torpedo with an improved detection range for use against the newer high-speed deep-diving nuclear submarines, began entering the operational inventory. This weapon can be delivered by

surface ships as well as aircraft. Also under development was an advanced sophisticated high-speed torpedo, the MK-48.

Fleet antiair warfare capabilities were significantly improved as the first of a new class of destroyer escorts equipped with TARTAR missiles and two new TERRIER-armed frigates joined the Fleet. The program to upgrade the existing TARTAR-TERRIER-TALOS missile systems was pressed forward as was the development of a new standardized missile that can be used on both TARTAR and TERRIER launchers. Tests indicated that a modified ship-based version of the SPARROW air-to-air missile may be able to provide the Fleet with an effective close-in air defense capability, and work on this Point Defense Surface Missile System was started. Development of an Advanced Surface Missile System (ASMS) designed to meet the Fleet's air defense needs in the next decade also continued during the year.

Early in fiscal year 1966 it was decided to transfer the five icebreakers remaining in the Navy to the Coast Guard and have only one Service conduct this type of operation in the future. The Coast Guard, will, of course, be responsive to Navy icebreaking requirements as well as to the needs of private sea commerce and national research programs.

With the Vietnam buildup, the strength of the Marine Corps increased during the year from 190,213 to 261,716, a gain of 71,500 men. The largest single portion of this increase resulted from the addition to the active force structure of a combat division, together with its necessary combat support units. By the end of the year, two of the new divisions' brigades had been activated and were combat ready. The Marine Corps also established additional communications, engineer, and military police units. Two special helicopter training squadrons were organized to train new pilots for Vietnam, temporarily using UH-34D helicopters borrowed from the Marine Corps Reserve. Other strength increases were authorized to bring units already deployed in Vietnam to full strength, to expand the training and support base, and to provide a rotation pipeline.

Marine Corps personnel in Southeast Asia nearly tripled during the year, increasing from 18,100 to 53,700. Major Marine Corps units deployed included the 1st and 3rd Divisions and the 1st Marine Air Wing, while the Marine Special Landing Force—part of the 9th Amphibious Brigade—operated as an integral part of the Seventh Fleet. Sixteen combined Navy-Marine Corps amphibious operations were conducted in Vietnam during the year and more than 100 Marine Corps land operations of battalion size or larger. Marine Corps aircraft flew over 43,000 attack or support sorties and 349,000 helicopter sorties.

At the end of 1966, the three active Marine aircraft wings had a total of about 1,200 active combat and combat support aircraft. Combat capabilities of these forces were increased during the year by the delivery of F-4 fighters, A-6 all-weather attack aircraft, and the first deliveries of the EA-6A electronic countermeasure aircraft. The Corps also received its first delivery of the CH-53 Sea Stallion heavy assault cargo helicopter. These helicopters proved invaluable in the movement of cargo, weapons, and other heavy loads over the rugged Vietnamese terrain.

Air Force

The Air Force's general purpose forces continued to grow in overall effectiveness during fiscal year 1966 as new, more sophisticated aircraft and missiles entered the operational inventory. However, the most significant development was the evolution of the Vietnam conflict into an air war of major proportions, rivaling in many respects the air campaigns of World War II and Korea.

The Air Force not only flew about half of all attack strikes against North Vietnam, but also more than 50,000 sorties in support of ground force operations in the South. Area-saturation bombing missions in the South were carried out by Guam-based B-52's, modified to carry conventional ordnance. These B-52 missions against suspected Viet Cong strongholds helped in preventing the enemy from massing his forces or finding sanctuary for rest and recuperation, destroyed valuable material, and contributed to the lowering of Communist morale. By the end of the year, there were over 1,000 Air Force aircraft in South Vietnam—double the number at the beginning of the year. The new units deployed to Vietnam included four tactical fighter, one reconnaissance, and two air commando wings. Total Air Force military personnel in Vietnam increased from 10,700 to more than 36,400.

The Air Force Special Air Warfare (SAW) forces received special emphasis with new squadrons being formed and deployed to South Vietnam. These forces provide important counterinsurgency, psychological warfare, and unconventional warfare capabilities and employ a great variety of aircraft, primarily propeller-driven. Important additions to the SAW forces during the year were a squadron of AC-47's equipped with three side-firing machine guns and a squadron of F-5C lightweight jet fighters. The F-5's were sent to South Vietnam for evaluation as close ground support aircraft for antiguerrilla operations, and were retained for eventual transfer to the Vietnamese Air Force. The AC-47's provided effective suppressive fire in support of ground operations in Vietnam. The Air Force will purchase OV-10 light armed reconnaissance aircraft in fiscal year 1967 to augment the SAW forces. A tri-Service development, the OV-10A made its first

flight in July 1965. The Air Force planned to use a version of the OV-10 for the tactical air control mission, which includes forward air control, reconnaissance, and surveillance. Training in special air warfare and counterinsurgency techniques was also provided during the year to allied air forces from Southeast Asia, Europe, and Latin America.

Other aircraft deployed to Southeast Asia included the F-4, F-100, and F-105. Two squadrons of B-57 tactical bombers, originally scheduled for transfer to the Air National Guard, were also deployed to Vietnam and continued in the active force.

Air Force general purpose aircraft procurement for fiscal year 1966 was more than doubled by the special Southeast Asia budget amendment and supplemental, with almost all the increase being F-4's.

In early calendar year 1966, the first F-4D model Phantoms with improved radar and weapons delivery, began to enter the force, while development continued on the F-4E, equipped with an internally mounted nose gun and a more powerful engine. The new reconnaissance version of this aircraft, the RF-4C, also became operational early in the fiscal year. Growing reconnaissance requirements in Southeast Asia resulted in increased procurement of the RF-4C, carrying a new forward-looking radar and special high-altitude cameras. Development work on the variable-wing F-111A fighter neared completion as flight tests demonstrated the outstanding performance capabilities of the new aircraft. A reconnaissance version of this aircraft was also under development. The Air Force will also procure a version of the Navy's A-7A Corsair II to provide a lower cost, close air support capability to complement the higher cost, more sophisticated F-4's and F-111's. Funds for this purpose were included in the fiscal year 1967 budget request.

The Air Force's nonnuclear ordnance procurement program for fiscal year 1966 was more than doubled by the supplemental request to meet the high rate of munitions expenditure being experienced in Southeast Asia. Principal items included a variety of "iron bombs," 2.75-inch rockets, 20-mm. ammunition, and BULLPUP missiles. Large quantities of the BULLPUP, SPARROW, and SHRIKE antiradar missiles were received into the inventory during the year, and action was taken to expand the production base for the iron bombs, rockets, and 20-mm. cartridges.

The tactical air forces in Europe included at the end of the year F-100, F-102, and F-4 fighters, RF-4C reconnaissance aircraft, and MACE-B nuclear surface-to-surface missiles. The older MACE-A squadrons in Europe, which had been scheduled to phase out during the year, were temporarily retained. The last F-101 fighters were replaced by F-4's.

Airlift and Sealift Forces

The initially planned fiscal year 1966 program for the airlift and sealift forces underwent drastic changes during the year as a result of expanded Vietnamese requirements and Congressional actions. With the first large-scale deliveries of the C-141, the long-range airlift capacity, which had already doubled between 1961 and 1965, had been scheduled to rise about 12 percent during 1966. For the more distant future, full-scale development of the large C-5A transport and construction of a new class of Fast Deployment Logistics ships (FDLs) had been scheduled to start during the year. The former would be able to do the work of four or five C-141's and the latter would offer a far more efficient method for pre-positioning bulky military equipment near potential oversea trouble spots than the converted Victory ships currently used for that purpose. To bridge the gap until the new FDLs could be delivered, 14 more Victory ships were scheduled to be added to the three already in use as forward floating depots.

The decision during the summer of 1965 to increase our Vietnam deployments called for important changes in the airlift program. In order to achieve an immediate increase in airlift capability, the manning levels of both active and reserve units were raised to permit more intensive use of available aircraft. For example, the peacetime daily utilization rate of the Military Aircraft Command's more modern aircraft—the C-130's, C-135's, and C-141's—were raised from 5 to 8 hours, and that of the C-130E troop carrier aircraft in the Tactical Air Command and in the Pacific from 1½ to 5 hours. In addition, the production of the C-141 was accelerated. As a result of all these measures, the overall long-range airlift capability to Southeast Asia was more than half again as great by the end of fiscal year 1966 as it was at the beginning and more than a fifth greater than originally planned.

In the case of sealift, the special requirements generated by the Vietnam conflict were met principally by reactivating ships from the National Defense Reserve Fleet and by using other available U.S. merchant shipping. In addition, a number of special purpose ships were reactivated for the regular military sealift forces. Thus, between January 1965, when the fiscal year 1966 program had originally been proposed, and June 1966 a total of 19 special purpose ships were added, including LSTs, aircraft transports, and a shallow-draft tanker. All of the 16 troop ships in the force were placed in the Pacific service during the initial troop buildup in Vietnam.

In August and September 1965, engine and airframe contractors for the C-5A were selected and in October definitive contracts were awarded for development, production, and support. This aircraft, scheduled to enter the operational inventory at the end of the decade,

will have a gross weight of about 769,000 pounds, a maximum payload of 265,000 pounds, and a range of 2,700 nautical miles. Capable of carrying nearly any type of equipment needed by the ground forces, it will be able to operate from relatively undeveloped airfields and a ton-mile cost far lower than ever achieved before. The initial contract called for 58 production aircraft, enough for a force of three squadrons, and included firm options and prices for additional quantities without further negotiation. As a result of the continuing reappraisal of future airlift needs, three more squadrons of C-5A's were added to the planned force structure in January 1966, bringing the total to six.

In acting on the fiscal year 1966 budget, the Congress approved only two of the four FDL ships that had been requested. The Department's reanalysis of future lift requirements, however, reinforced the previous conviction that the FDL would make a very significant and effective contribution to overall rapid deployment capabilities. As the FDL concept was further developed, the possibility emerged of employing for these ships the "total package" contracting that was used in the case of the C-5A aircraft. The decision to go ahead with the contract definition for the FDL was made in March 1966, and a request for proposals was issued to five qualified bidders on April 1. Since the competitive development phase was bound to delay the award of the initial construction contract, no additional FDLs were requested in the 1967 budget, although a substantial fleet of such ships remained in the long-range Defense program. The Victory ships which had originally been scheduled for conversion to the forward floating depot role were instead employed, together with those already on station, in point-to-point service in support of Southeast Asia operations.

Reserve Forces

The conflict in Vietnam also brought many changes to the reserve components in fiscal year 1966. In August 1965, it was decided that reserve units would not be used for the initial force buildup and that instead selected elements of the reserves would be brought up to and maintained at very high states of readiness. This decision rested on the belief that, inasmuch as the force buildup schedule could be met without recourse to mobilization, the reserves could serve a more useful function as a readily available backup capability for dealing with other crises or with possible future needs in Southeast Asia. In order to achieve the desired level of readiness for the units involved, they were given additional manning to bring them up to full strength, more paid training drills, priority with respect to equipment and spares, additional full-time civilian technicians, and first call on the available capacity for active duty training of reserve personnel. By

the end of the fiscal year, these measures had brought key reserve units to unprecedented levels of premobilization combat readiness.

In the Army, the Selected Reserve Force (SRF) was composed of three infantry divisions, five separate infantry brigades, one separate mechanized infantry brigade, an armored cavalry regiment, and the necessary supporting forces—a total of 977 units with an authorized strength of about 150,000. Formation of this force, which was drawn primarily from the National Guard, was begun in October 1965 and completed by the end of the calendar year. To provide more trained manpower for the SRF and to reduce reserve components demands on the active training establishment, it was decided to inactivate units of the Army Reserve that were no longer needed. This decision was carefully reconsidered by the Department after the Senate Armed Services Committee opposed this action, but was reaffirmed on November 13, and by the end of December 1965 approximately 750 Army Reserve units had been inactivated. Nearly half of the reserve personnel affected were reassigned to other Army Reserve units or transferred to the Army National Guard; most of the others were transferred to the Ready Reserve Mobilization Pool.

A major reorganization of the Army's reserve components had been proposed in connection with the original budget request for fiscal year 1966. It envisioned the transfer of all organized Army Reserve units to the National Guard, the elimination of all units not called for in the approved plans, and the manning and equipping of all remaining units at the levels required to meet their readiness goals. Following hearings on this plan by the Armed Services Committees, the Congress in acting on the Defense Department's 1966 Appropriation Bill in September included special provisions which effectively precluded implementation of the realignment during fiscal year 1966. After again reviewing the desirability of the proposed new reserve structure, the reorganization plan was once more presented to the Congress in connection with the fiscal year 1967 budget request. On June 30, 1966, action was still pending on the necessary legislation.

During fiscal year 1966, the Naval Reserve continued to maintain 50 destroyers, escorts, and mine warfare ships in a state of full operational readiness. Reservists receiving regular paid drill training included the personnel of 38 aviation squadrons and eight Sea Bee battalions and those selected for augmenting active fleet units. In the case of the Marine Corps Reserve, 2,500 additional spaces were authorized to raise the mobilization readiness of the 4th Division Wing Team. All the additional reservists had been recruited by October.

The Air Force's reserve components also received additional manning and training to raise the mobilization readiness of nine F-100 squadrons, four RF-84 squadrons, one tactical air control group, and

11 C-124 squadrons. By the end of fiscal year 1966, eight of these units had reached full combat readiness, and most of the others had only minor deficiencies to overcome. The airlift elements of the reserve components, in addition to improving their readiness, contributed directly to meeting the greatly increased transport requirements generated by the Vietnam conflict. Cargo aircraft of the Air Force Reserve and Air National Guard made nearly 5,500 oversea flights during fiscal year 1966, of which more than a thousand were to Southeast Asia. In total, they handled more than 9 percent of the cargo carried by the Military Airlift Command during the year. The Air National Guard's aeromedical evacuation aircraft transported nearly 6,400 patients and over 5,700 other passengers.

For the Defense Department as a whole, the number of reservists on paid status during fiscal year 1966 rose from 1,002,500 to 1,054,100 with all components except the Air Force and Naval Reserves sharing in the rise. Most of the increase was in the Army National Guard and Reserve, primarily as a result of the minimum strength levels established in the Appropriation Act, and the failure of the merger plan to obtain Congressional approval. Without the reorganization, it was necessary to raise the National Guard strength above that approved by the Congress when the Selected Reserve Force was formed. The remainder of the overall increase was directly related to the higher manning authorized for selected units of the Air National Guard and the Marine Corps Reserve.

Research and Development

Although the Defense research and development program is generally geared to the longer term needs of the military forces, special emphasis was placed in fiscal year 1966 on the immediate requirements of the conflict in Southeast Asia. A total of about \$370 million was earmarked for this purpose, including funds available in the regular 1966 Budget and the Supplemental.

The research and development program is divided into five major activity categories corresponding roughly to the evolutionary stages required to translate a theoretical concept into a new item of military hardware. For management purposes, work in these five stages—research, exploratory development, advanced development, engineering development, and operational systems development—is broken down into literally thousands of projects, subprojects, and research tasks. Supporting these efforts are not only private contractors but also many Government-owned facilities, including test ranges, laboratories, and information retrieval centers.

The research category includes all basic research and those applied research projects aimed at expanding knowledge in new scientific areas. In fiscal year 1966, about one-half of all Defense-sponsored basic and applied research was conducted at various universities and most of the remainder at the "in-house" laboratories.

In the exploratory development category, more than 700 projects were being pursued. These projects seek to advance new technology to a point promising that this technology is applicable to new military systems. An on-going historical analysis of the practical results of research and exploratory development, called Project HINDSIGHT, was initiated in July 1965. By the end of the year, 20 recent weapon systems developments had been analyzed, showing that more than 700 significant scientific or technical advances had been made as the direct result of Defense-supported research and that these advances were the ones that had made the new weapon systems significantly better than their predecessors.

The concentration of Federal research programs in a relatively small number of the large east and west coast universities has been a matter of widespread concern for some time. As part of a Government-wide effort, the Department instituted during the year Project THEMIS, designed to broaden the Nation's research base responsive to military needs. In order to develop centers of technical excellence at universities in all parts of the country, contracts will be provided to science and engineering departments at universities heretofore poorly supported. A gradual expansion of the program is foreseen for future years.

The category of advanced development includes those projects that have advanced to a point calling for experimental hardware to be used in the technical or operational testing needed for a determination on full-scale engineering development. Instead of employing design specifications as in engineering development, advanced development attempts to encourage innovation through the use of performance specifications. Operational systems development, the last of the five stages, comprises those projects that, regardless of the stage of their development, have been approved for production or deployment. Many of the more important weapon and equipment projects in the last three categories were mentioned in the foregoing discussion of the operational forces.

The fiscal year 1966 budget requests, including the Supplemental, for all Defense research, development, test, and evaluation totaled \$6.9 billion in new obligational authority; this was reduced to \$6.7 billion by Congressional action. Total expenditures for the year were \$6.3 billion, approximately the same as in fiscal year 1965.

R&D Support of Our Forces in Vietnam

In general, most military equipment is designed with a sufficient breadth of capabilities to meet the military needs of a wide range of combat and environmental conditions. However, almost any major conflict will tend to have its own unique operational problems and thereby create its own specialized requirements, calling for improving and tailoring weapon systems and equipment to the needs of specific situations. This has occurred in the case of the Vietnam conflict.

In order to seek out systematically just what was needed by our forces in Southeast Asia, the military departments expanded their research and development efforts in Vietnam in conjunction with the Joint Research and Test Activity (JRATA). This activity had been created in 1964 with the specific responsibility of obtaining statements from field commanders on their most urgent needs and translating these into formal development requirements, which were then given priority over all other "normal" requirements laid down by the military departments. Financing of this effort in 1966 was provided largely through the R&D Emergency Fund and from the special 1966 supplemental appropriations for Southeast Asia. Special technical teams went to Vietnam not only to acquaint the forces in the field with the performance characteristics of equipment potentially available to them but also to allow research specialists to learn first-hand what the needs of the operating forces were.

Another management device to speed the R&D response to Southeast Asia was established in August 1965, called Priority Research and Development Objectives for Vietnam Operations Support (Project PROVOST). This project involved a comprehensive review of current R&D efforts to identify those that could make a significant contribution to current operations and, with additional funds, could be developed relatively quickly.

In general, Vietnam related R&D projects fall into four categories: Those designed to improve the ability of our forces to fight at night; those designed to reduce aircraft losses; those designed to develop counterinfiltration systems and weapons; and those designed to reduce troop susceptibility to the particular health hazards of Southeast Asia. By the end of the year, many items resulting from these efforts were already in use in Vietnam, including the M-79 40-mm. grenade launcher, the new jungle boot, the new jungle fatigue uniform, survival kits, air-to-ground weapons for armed helicopters, and extended-range jungle UHF radios. Among the items placed in accelerated development and expected to reach Vietnam during the next year were helicopter-transportable armored vehicles, smoke-generating

equipment, jungle-penetrating bomblets, airburst fuses, and new drugs to counter the drug-resistant varieties of malaria being encountered in Southeast Asia.

Nuclear Tests and Test Detection

The Department of Defense, in conjunction with the Atomic Energy Commission, is committed to the maintenance of four specific safeguards with relation to the Test Ban Treaty: (1) To conduct essential underground testing; (2) to maintain laboratory facilities and programs in theoretical and exploratory nuclear technology; (3) to maintain a standby atmospheric test capability; and (4) to detect and monitor Sino-Soviet nuclear activities.

During fiscal year 1966, the Defense Department conducted six underground tests and participated in two prepared by the AEC. These tests were designed to provide data on the vulnerability of missile launching sites and ballistic missile reentry vehicles to the effects of nuclear explosives, on cratering effects, and on the verification of the decoupling factor in various types of soil. The decoupling tests are essential to determining the risks (i.e., the chances of undetected testing) involved in a comprehensive test ban treaty. At the close of the year, work was progressing at the Tatum Salt Dome near Hattiesburg, Miss., on a follow-on decoupling experiment in the large cavity formed by the October 1964 SALMON test. The AEC's tests during the year were primarily concerned with verifying new design concepts for nuclear weapons. In total, the Department devoted about \$38 million during the year to measures contributing to this first safeguard.

Nearly \$57 million was allocated to the laboratory effort in nuclear technology, the second safeguard, which is intended to ensure that scientific investigation in this area is not allowed to atrophy because of the test ban. This program includes research into the effects of nuclear detonations, development of laboratory simulation techniques and equipment to supplement nuclear test data, and computational programs to extend the useful range of nuclear test data. The program continued to be most productive and to attract highly qualified scientists.

In support of the third safeguard—maintenance of a standby atmospheric test capability—about \$34 million was provided in fiscal year 1966. The two readiness exercises conducted during the year confirmed that atmospheric testing of an operational weapon system could be performed on 3 months' notice and weapons proof testing on 2 months' notice. A standby test capability is maintained by Joint Task Force 8 on Johnston Atoll in the Pacific.

Most of the \$110 million provided for detecting and monitoring Soviet nuclear activities was used to support two programs—the Advanced Research Projects Agency's VELA program and the Atomic Energy Detection System (AEDS). The purpose of VELA is to improve our capability for detecting, identifying, and locating nuclear explosions and to provide the detailed data needed for a realistic analysis of the nuclear test aspects of disarmament and arms control proposals. The VELA program is divided into four parts—satellite detection systems, ground-based systems, underground (including underwater) detection systems, and on-site inspection.

With respect to the first, the last of the three satellite launches took place during July 1965, completing the original program for placing six satellites into 55,000-nautical-mile circular orbits. The last two satellites carried improved instruments to test the feasibility of detecting nuclear explosions in outer space. By the end of the year only one of the first satellites, launched in October 1963, was no longer capable of adequately performing its surveillance mission.

Our capabilities to detect underground explosions were improved as the construction of the large aperture (200 kilometers in diameter) seismic array (LASA) in Montana was completed early in fiscal year 1966. Analysis of the first data received indicated that LASA had met its design objective. Of special importance to the detection of underground explosions was Project LONG SHOT, which took place on October 29, 1965, involving the detonation of an 80-KT nuclear device at a depth of 2,300 feet on Amchitka Island in the Aleutians. A worldwide network of nearly 300 stations, plus all 525 detectors of the LASA, recorded the seismic waves of this test. In addition, three large underwater chemical explosions, part of Project CHASE, were detonated off the Atlantic coast. The seismic waves produced by these experiments were recorded across North America and at some stations in Europe and South America. The objective of both the underground and undersea tests was to obtain data for improving the identification and calibration of explosions affected by regional variations in the earth's surface.

With respect to surface-based detection techniques, the VELA Program continued to investigate a variety of approaches, including systems that rely on accoustical or optical sensors, on the generation of electromagnetic energy, and on the sampling of atmospheric debris. Two field exercises, Projects BRECCIA and ARKOSE, conducted in Alaska and Utah, respectively, tested potential on-site inspection techniques.

The Atomic Energy Detection System (AEDS) is the primary "operating portion" of the Department's program to monitor Sino-Soviet nuclear activities. During fiscal year 1966, as in each year since the

signing of the Test Ban Treaty, additional monitoring stations were established and modernized equipment improved the capabilities of the existing stations.

The Defense Space Program

The Defense space program is an integral and fully coordinated element of the overall national space program. Without duplicating the work of NASA and the other agencies engaged in the national program, the Defense effort develops military systems which utilize the space environment to further national security goals, to complement the work of NASA in those areas where Defense has already achieved a high degree of competence, and to explore the usefulness of manned space systems for military purposes. The high degree of integration achieved between the civilian and military portions of the program is exemplified by the fact that approximately 240 military officers were assigned full time to NASA in fiscal year 1966.

On August 25, 1965, the President announced approval of the Manned Orbiting Laboratory (MOL) development program, a sophisticated effort designed to learn more about what man is capable of doing in space and how that capability might contribute to the accomplishment of military space objectives. Contract definition for MOL was completed in June 1966, and detailed schedules, costs, and specifications were established. The laboratory is being designed to accommodate two men in orbit for about 30 days and to provide them with pressurized and unpressurized working space. The first manned launch was set for mid-calendar year 1969. Site preparation at the Western Test Range and design of the launch complex were well underway by the end of the year.

A major element of the Defense space program is the development of a family of efficient standardized boosters capable of supporting a broad range of advanced space missions. One such booster is the TITAN IIIA, which consists of the first and second stage of a modified TITAN II combined with a new restartable upper stage, and is designed to place a 5,800-pound payload in a 100-nautical-mile orbit. Another, the TITAN IIIC, created by attaching two 120-inch diameter five-segment solid propellant motors to the TITAN IIIA, has a 25,000-pound payload capability and will be used to boost the MOL into orbit.

On June 16, 1966, a TITAN IIIC booster, performing in near perfect fashion, placed eight satellites into an equatorial, near synchronous 18,000-nautical-mile orbit. Seven of these were to serve as part of the Initial Defense Communications Satellite System, while the eighth was an experimental device designed to explore the feasibility

of using the earth's gravitational field to stabilize a satellite in a high orbit. Another launch of eight communications satellite repeaters was scheduled for later in the summer. Studies for an advanced or follow-on satellite communications system, to meet the strategic communications requirements of the 1970's, continued to be carried forward. The development of more powerful boosters will make possible the launching of heavier communications satellites, thereby increasing their life span and also reducing requirements for ground terminal facilities.

Improvements in both satellite and booster technology have advanced to the point where the use of satellite repeaters for communication with and between tactical units has become feasible. As a result, the Services were directed in October 1965 to begin the joint development of a tactical communications satellite system designed to serve the numerous operating units of land, sea, and air forces in the field.

Other major space-related R&D programs underway during fiscal year 1966 included further work on the Navy's navigational satellite system, on large solid fuel rocket engines, and on large storable liquid fuel rockets, with particular emphasis on the development of engines capable of multiple restarts in space.

Collective Security

The purpose of the military assistance programs of the Department of Defense is outlined in the Foreign Assistance Act, which states:

"In enacting this legislation it is therefore the intention of the Congress to promote the peace of the world and the foreign policy, security, and general welfare of the United States * * * by improving the ability of friendly countries and international organizations to deter, or if necessary, defeat Communist or Communist-supported aggression, facilitating arrangements for individual and collective security, assisting friendly countries to maintain internal security, and creating an environment of security and stability in the developing friendly countries essential to their more rapid social, economic, and political progress."

In support of these goals, the Department of Defense, in close cooperation with the Department of State, participates in the development of plans and programs for allied cooperation, carries responsibility for the implementation of the Military Assistance Program (MAP), and facilitates military export sales that contribute to mutual security.

The framework for these activities is provided by security treaties that link the United States to more than 40 nations. These treaties are based on our conviction, successfully tested on many occasions over the last 20 years, that maximum security for the United States and the free world is best obtained by collective rather than unilateral effort. As a result, the United States is a member of four regional defense alliances—the North Atlantic Treaty Organization (NATO), the Southeast Asia Treaty Organization (SEATO), the Organization of the American States (OAS), and the Australia-New Zealand-United States Treaty (ANZUS)—and participates in many activities of the Central Treaty Organization (CENTO). In addition, bilateral defense treaties have been concluded with Japan and the Republics of China, Korea, and the Philippines.

While overshadowed by the collective security effort in Southeast Asia, discussed at the beginning of this report, these alliances continued during fiscal year 1966 to provide increased insurance against Communist aggression to all participants. Combat capabilities were improved by the delivery of weapons and equipment under the military grant aid and sales programs. Further standardization of material promised to reduce logistic support problems. Joint training courses contributed to the development of common doctrine and procedures, and frequent maneuvers tested the combat readiness of the allied forces.

The timely assistance of U.S. forces continued to be assured by the deployment of large portions of our armed forces abroad and by significant increases in their strategic mobility, particularly through the expansion of our airlift capabilities. Despite the demands of Vietnam all alliance commitments were maintained without any major changes. On June 30, 1966, nearly 43 percent of our military personnel—some 1,320,000 men—were assigned to oversea commands or to fleet and mobile naval activities. The oversea total included about 504,000 Army and 250,000 Air Force personnel, while sailors and marines stationed at oversea bases numbered 134,000 and those assigned to afloat and mobile naval activities totaled 432,000. Only a temporary fluctuation of about 15,000 men in the 225,000 Army personnel authorized for Europe took place toward the end of the fiscal year as the result of early reassignments of selected specialists to training or field duty in the United States or Vietnam. This transitory reduction did not impair the combat capabilities of Army units in any significant way and was scheduled to be completely eliminated by December 1966.

The fact that American and European freedom and security are mutually dependent continued to be the underlying reality of our NATO policy. This interdependence was reaffirmed by 14 NATO nations in their common declaration of March 18, 1966, issued in

response to the decision of the French Government to sever its ties with the integrated military organization of NATO. In line with this decision, France—while maintaining its membership in NATO—terminated the assignment of French forces and personnel to the NATO command structure as of July 1, 1966, and requested the removal of NATO and foreign military bases and installations from French soil by April 1, 1967. After a review of the probable consequences of the French action, the 14 nations concluded that NATO would nevertheless remain able to carry out its basic mission for common security.

By the end of the fiscal year, plans were being developed for moving the Supreme Headquarters, Allied Powers, Europe (SHAPE) and the one for the allied forces on the central front (AFCENT) to Belgium and the Netherlands and the headquarters for U.S. forces in Europe (EUCOM) to Germany. Alternate bases were being selected for U.S. fighter, reconnaissance, and transport squadrons in the United Kingdom and Germany, and the possibility of relocating some squadrons in the United States under the dual-basing concept was being investigated. The movement of supply stocks from French depots to Germany and the United Kingdom was being initiated and a new supply line through the Low Countries was under consideration. While these moves would inevitably involve considerable inconvenience, work, and expenditures, they were not expected to have any substantial effect upon the combat capability of U.S. forces in Europe.

Although the French decision overshadowed other NATO developments, the Alliance continued to make considerable progress during the year in improving its planning processes and adjusting to changing circumstances. Notable among these developments was the approval given at the NATO Council meeting in December 1965 to a new NATO force planning procedure designed to narrow the persistent gap between military plans and available resources and to remove imbalances in the military contributions of the allies. The new procedure calls for the closer involvement of nationally responsible government leaders in the military planning process and the development of military and budgetary plans for several years in advance in order to facilitate the allocations of funds to the most urgent requirements.

The lengthy discussion of NATO strategy and nuclear weapons also entered a new phase with the establishment in November 1965 of a Special Committee of 10 NATO defense ministers. Problems regarding intelligence and data exchange, emergency communications, and nuclear planning were assigned to separate Working Groups. The Nuclear Planning Group, composed of five defense ministers, examined the strategic nuclear resource of the Alliance, the tactical nuclear weapons available, and the potential circumstances and consequences of their use. These discussions made possible for the first time a prag-

matic, realistic, and detailed approach to the nuclear problem to the mutual benefit of all participants.

In the Western Hemisphere, a successful effort at regional cooperation neared completion as the Dominican presidential election on June 3, 1966, promised the early restoration of regular governmental processes. Much of the credit for this encouraging development belongs to the Inter-American Peace Force (IAPF), composed of military and police personnel from the United States, Brazil, Costa Rica, El Salvador, Honduras, Nicaragua, and Paraguay. While the major mission of the IAPF was accomplished during the summer of 1965, it was retained at the request of the Provisional Government formed in September to assist in the maintenance of law and order until free elections could be held. U.S. personnel in the IAPF numbered about 6,000 during most of the fiscal year. On June 24, 1966, the OAS Council voted to withdraw the force. The first contingents sailed for home by the end of the month and the evacuation was completed on September 21.

Military Assistance

The fiscal year 1966 Military Assistance Program (MAP) made available \$1,636 million for assisting other nations to defend themselves against aggression, including \$1,170 million in new obligational authority, \$166 million in reappropriations and recoupments, and \$300 million in the form of an authorization to draw on U.S. military stocks and services whenever the President determined that such use was vital to the security of the United States.

The allocation of these funds followed the pattern established in recent years. Nearly 86 percent was allocated to 56 countries and the remaining 14 percent to such other requirements as U.S. participation in NATO infrastructure programs, support of international military headquarters, credit financing, and MAP administration. The regional distribution of the MAP funds allocated to countries was as follows:

	<i>Percent</i>
Europe	3.6
Near East and South Asia.....	14.7
Africa	1.8
Far East.....	60.4
Latin America.....	5.2

Nearly three-quarters of these funds went to allied and friendly countries on the periphery of the great Communist powers. They helped those governments to maintain effective military establishments, and, to that extent, relieved the United States of the need to deploy or maintain additional forces in support of joint security interests.

Other military assistance programs were designed (1) to strengthen

the capabilities of selected Latin American countries to maintain the internal security prerequisite for the attainment of the goals of the Alliance for Progress; (2) to furnish small amounts of assistance to other developing countries faced by threats of Communist subversion; (3) to provide tangible evidence of U.S. support and cooperation to allied and friendly countries that have granted us access to strategic bases and facilities; and (4) to complete prior-year commitments to former recipient countries whose economic progress makes possible an increasingly rapid phaseout of all grant aid.

Civic action projects, which involve a country's military forces in nation-building activities, received special emphasis in many of the Southeast Asian, Latin American, and African programs. As a result, entire countries benefited through the construction of additional roads, schools, sanitary facilities, medical dispensaries, and communications facilities.

About 16,700 foreign military personnel participated in MAP training programs during the year—6,700 in the United States and 10,000 overseas. Some 95 percent of these were nationals of developing countries who acquired not only new professional skills but also new understanding of democratic processes.

As in previous years, our collective security policy brought both encouraging and discouraging developments. Among the latter was the outbreak of armed conflict between India and Pakistan on September 8, 1965, which led to the suspension of all military assistance—grant aid and sales—to both nations. The embargo on grant aid was still in effect at the close of the year, although the sale of limited quantities of support equipment was being reconsidered. On the other hand, the deployment to South Vietnam of more than 25,000 Korean combat and civic action forces, trained and equipped through MAP, illustrated the benefits that the United States and its allies can derive from the program.

The MAP program for fiscal year 1967, submitted to the Congress in early 1966, called for \$917 million in new obligational authority, which together with an estimated \$110 million in reappropriations and recoupments would provide a total program of \$1,027 million. In line with the Supplemental Defense Appropriation Act of 1966, enacted on March 25, 1966, the funds for the support of South Vietnamese forces and other free world forces in Vietnam were shifted from the MAP request to the regular Department of Defense budget. This shift was clearly indicated since MAP was not designed to support sustained military operations but only to assist in the equipping of friendly military forces and in providing for peacetime consumption and initial combat stocks. Accordingly, wartime resupply must be financed from other sources.

Military Export Sales

The military sales program of the Department of Defense complements military grant aid and, like it, is designed to support our foreign policy objectives. It is directed primarily toward those countries that have achieved economic advances during recent years which allow them to bear an increasingly larger share of their own defense costs. The sale of U.S. materiel to such friendly states assists in achieving the basic objective of enhancing our collective security posture by providing weapons to our allies at the lowest possible cost to them. It also contributes to cooperative logistics support arrangements and standardization within alliances. In addition, it helps, as discussed later, to offset the unfavorable balance-of-payments impact of our overseas deployments.

Orders during the 5-year-period fiscal years 1962-66 totaled \$8.3 billion and, in addition, commitments to order amounting to \$2.8 billion were still outstanding on June 30, 1966. About 90 percent of these orders and commitments, totaling \$11.1 billion, were received from economically developed countries in Western Europe and from Canada, Australia, New Zealand and Japan. Most sales—\$8 billion or about 72 percent—were made for cash. Over \$2 billion, or about 18 percent were on credit provided by the Export-Import Bank without any Department of Defense guaranty. Thus, only \$1.1 billion—or about 10 percent—represented orders and commitments involving credit provided or guaranteed by the Department of Defense.

Nearly 60 percent of all orders and commitments were for 18 major weapon systems such as F-4, F-5, F-104, F-111 and C-130 aircraft, POLARIS, PERSHING, and HAWK missiles, combat vehicles, and guided missile destroyers, sold principally to economically developed countries which require and can afford these relatively sophisticated and expensive equipments.

With respect to the less developed countries, the Department of Defense has pursued a fundamentally negative sales policy aimed toward dissuading such nations from acquiring equipment that they cannot afford or that is not essential to their minimum defense requirements. The political, economic, and military implications of each purchase request from a less developed nation are evaluated carefully by all interested agencies of the Executive Branch in order to limit arms races, minimize impacts on social and economic development programs, and yet enable the country to maintain a defensive posture commensurate with the external and internal threats confronting it. When so indicated by these case-by-case reviews, transactions are not completed or agreement is reached on the sale of less expensive and less sophisticated equipment or of lesser quantities than originally sought. The

value of the equipment eliminated by this review policy was several times that of the sales actually made.

A considerable part of the sales during the 1962-66 period resulted from bilateral and multilateral arrangements for coproduction. While tending to sacrifice lower unit costs obtainable from longer U.S. production runs, coproduction enables foreign customers to gain technological skills and other industrial and economic advantages and, at the same time, includes for the United States substantial sales in the form of technology and components. Examples of successful coproduction programs are HAWK, SIDEWINDER, and F-104G aircraft in NATO, M-113 armored personnel carriers in Italy, and F-4 aircraft and UH-1D helicopters in the United Kingdom and Germany.

In cooperative development projects, mutual advantages are being derived from the pooling of technical resources and the sharing of development costs. Such advantages were a factor in agreeing to developing with Germany a main battle tank to be deployed in the 1970's and in agreeing with the United Kingdom to develop a jet lift engine for a V/STOL aircraft.

In a few instances, sales transactions have involved reciprocal procurement arrangements under which the Department, recognizing a foreign country's substantial purchases from the United States, procures military equipment from that country to meet U.S. defense requirements. Under such arrangements foreign vendors must compete with U.S. sources and the Department benefits in terms of price, quality, and delivery schedule as was the case in the selection of the Rolls Royce Spey engine to be built in the United States under license for the A-7A aircraft.

III. Defense Management

The extraordinary demands of the conflict in Southeast Asia, superimposed upon the regular Defense program in fiscal year 1966, provided a stern test of the management innovations introduced into the Defense Department during the preceding 4 or 5 years. On the basis of the first and most critical year of the Vietnam buildup, it appears that the new organizational arrangements and management techniques met that test exceptionally well. The planning-programing-budgeting system continued to perform its intended function, readily accommodating itself to the special requirements of the Vietnam conflict. The cost reduction program continued to generate new savings, although at a somewhat lower level than in the previous year as the urgent demands of our forces in Southeast Asia took precedence over all other activities. The new Defense agencies, e.g., the Defense Intelligence Agency, the Defense Communications Agency, the Defense Contract Audit Agency, and the Defense Supply Agency, all carried out their tasks with notable success.

By the end of the fiscal year, defense production capacity had been substantially increased, the training establishment greatly expanded, and research and development capabilities concentrated on the immediate problems encountered in Vietnam. The flow of men and materiel to Southeast Asia was approaching peak levels, and the construction of ports, airfields, cantonments, warehouses, and maintenance facilities was in full swing.

Budget

The original fiscal year 1966 Defense Budget was prepared and transmitted to the Congress well before the decision was made to deploy major combat forces to Southeast Asia. The President's initial request, forwarded to the Congress on January 25, 1965, totaled \$48.6 billion in new obligational authority, approximately \$8 billion less than the amounts initially proposed by the military departments and Defense agencies during the previous fall and \$1.1 billion less than planned for fiscal year 1965. Expenditures were estimated at \$49.0 billion, also somewhat less than the \$49.3 billion estimated for 1965. The overall reduction in financial requirements envisioned in this

budget reflected in large part the substantial completion of the military buildup begun in 1961.

On May 4, 1965, while the fiscal year 1966 authorization and appropriation legislation was still before the Congress, the deteriorating situation in Southeast Asia caused the President to request a special \$700 million Supplemental for the balance of fiscal year 1965. These funds were required to help finance the immediate costs of the unanticipated U.S. force deployments to Vietnam and to take certain precautionary long leadtime actions to facilitate future production expansion. A joint resolution providing these funds was approved on May 7.

In late July, the increased direct involvement of the United States in the Vietnam conflict brought a requirement for substantial additional funding. However, the many uncertainties concerning the future pace of the buildup and the operational situation in Southeast Asia made it impossible at this time to develop the detailed procurement lists, construction schedules, and manpower programs used to support the regular budget request. Therefore the same type of funding device used in the fiscal year 1965 Supplemental Appropriation Act, a single Southeast Asia Emergency Fund appropriation, was employed for the \$1.7 billion amendment to the 1966 budget, submitted to the Congress on August 4, 1965. This sum was not intended to finance the total additional costs of the buildup but only those actions necessary to accelerate deliveries and to start the production of new items and the construction of facilities directly related to the conflict. The pending appropriation bill already contained special authority permitting the extra personnel and operating expenses associated with the buildup to be met without prior appropriations by the Congress.

The fiscal year 1966 authorization bill had passed the Congress in late May and included several major changes in the Department's original request. The number of Fast Deployment Logistics (FDL) ships was cut from four to two, a nuclear-powered frigate and two attack submarines were added, and additional funds were included for research on the Advanced Manned Strategic Aircraft (AMSA). In addition, the act provided that in the future the appropriation of emergency funds for research and development and of procurement funds for tracked combat vehicles would require prior authorization. The name of the Military Air Transport Service was changed to the Military Airlift Command, the ship tonnage limitation formerly required by the Vinson-Trammell Act was repealed, and the existing provision requiring at least 35 percent of all conversion, alteration, and repair work on naval ships to be performed in private shipyards was eliminated. This last action was subsequently nullified in the Appropriation Act.

The fiscal year 1966 appropriation bill passed the House on June 23 and included funds for the two additional attack submarines and the extra AMSA research effort previously authorized. For the nuclear-powered frigate, however, only long leadtime items were funded. Additional money was made available to maintain the Army's reserve components at higher strength than requested, and a proposed change in the appropriation structure to facilitate a reorganization of these components was denied. The reductions made by the House included \$64 million for the two FDLs which failed to receive authorization and over \$100 million in research and development.

The Senate's final consideration of the appropriation bill included the \$1.7 billion Southeast Asia amendment and the Department's appeals of some of the House actions, including the failure to approve a more flexible method for financing the Army reserve components. The Senate and later the House passed the \$1.7 billion Southeast Asia amendment without change but insisted on prior legislative authorization for any reorganization or realignment of the Army's reserve components.

As approved by the Congress on September 21, 1965, the general appropriation bill for fiscal year 1966 totaled \$46.8 billion. While including a few major internal funding shifts, the final appropriation was only \$86 million less than requested. Separate Congressional action provided \$1,757 million for military construction—\$292 million below the original request—and \$107 million for civil defense—with the \$87 million reduction being accounted for primarily by the elimination of shelter construction subsidies. The full amount requested for military assistance, \$1,170 million in new obligational authority, was approved by the Congress on October 5, 1965.

Thus, of the total of \$50,265 million requested by the Department of Defense through the 1st session of the 89th Congress, \$49,800 million was appropriated, a reduction of \$465 million.

During the fall of 1965, the additional Vietnam financing required for the remainder of fiscal year 1966 was developed in detail in conjunction with the preparation of the fiscal year 1967 Defense budget. The budget estimates for both years were based on the same force buildup, deployment plans, and operational assumptions—with the fiscal year 1966 supplemental request representing the additional financing needed before July 1, 1966. Since there was no way of knowing how long the conflict would continue or how it would evolve, it was necessary for budget purposes to choose an admittedly arbitrary termination date for funding Vietnam combat operations—the end of fiscal year 1967. It was made clear that additional financing would be sought if it later appeared that the conflict would continue beyond that date or if the tempo of operations expanded beyond expectations.

A fiscal year 1966 supplemental request, totaling \$12,346 million in new obligational authority for the Department of Defense, was transmitted to the Congress on January 19, 1966. Five days later the fiscal year 1967 Budget was submitted, requesting \$59,855 million for military programs. An important change in funding responsibility was made in both of these requests. The requirements for the support of the South Vietnamese and other free world forces engaged in Vietnam, previously financed in the military assistance program, were shifted to the budgets of the military departments. This approach, similar to that used during the Korean conflict, eliminated the problem of maintaining separate financial and logistics systems for the support of these forces. On March 8, a further supplemental appropriation, totaling \$864 million, was requested to cover those fiscal year 1966 costs of the military and civilian pay raises, enacted in 1965, that could not be absorbed within the available funds. Both supplementals were approved by the Congress without change—the Southeast Asia request on March 23 and the personnel pay supplemental on May 10.

Thus, a total of \$63,474 million in new obligational authority was requested for fiscal year 1966 by the Department of Defense, of which \$63,009 million was approved—compared to \$50,493 million for fiscal year 1965. After adjustment for the contract authority ultimately used—for which prior appropriations were not required—new obligational availability for 1966 totaled \$63,533 million and total obligational availability, including carryover and reimbursements, \$82,622. Direct obligations for the year totaled \$61,868 million and expenditures \$55,377 million, compared with \$50,224 million and \$47,401 million, respectively, in fiscal year 1965.

International Balance of Payments

The Department continued and intensified its effort to limit the impact of the Defense program on the Nation's international balance of payments during fiscal year 1966. In spite of this effort, the net adverse impact rose, primarily because of the expanded conflict in Southeast Asia. By fiscal year 1965, the net adverse balance on the "Defense" account had been reduced from \$2.8 billion in fiscal year 1961 to \$1.4 billion—the combined result of a \$350 million decrease in oversea military expenditures, including a significant reduction in defense-related expenditures by other agencies and a \$1.0 billion increase in receipts from the sale of U.S. military equipment. However, in fiscal year 1966, the substantial construction and logistics effort required for the buildup in Southeast Asia and the large increase in the number of U.S. military personnel in that area created additional foreign exchange costs of about \$500 million. This increase,

taken together with some decline in sales receipts, served to raise the net adverse balance for the year to about \$2.1 billion (see table 15).

This figure would have been considerably higher but for the special procedures and safeguards established over the past years to curb foreign exchange expenditures. Additional steps were taken during fiscal year 1966. Changes in disbursement procedures made it more convenient for military personnel abroad to leave their pay on the books or to send it home. To encourage servicemen overseas to save more of their pay, the Department sponsored legislation to establish a high-interest-paying Uniformed Services Savings Deposit Program. To hold down the foreign exchange costs of the massive Southeast Asia construction program, a vigorous effort was made to ensure that U.S. materials, transportation, and services were used wherever feasible, even though this might entail additional costs. As a result, only about one fifth of the total amount paid the principal U.S. contractor in Vietnam during fiscal year 1966 entered the international balance of payments. Despite such actions, however, total U.S. military expenditures abroad were still rising at the end of the fiscal year.

Financial Management

During the fiscal year 1962-65 period, the major concern of Defense financial management had been the introduction and refinement of the programing function throughout the Department. Programing involves determining long-term goals and objectives, establishing time-phased schedules for achieving them, grouping like functions and activities so that their interrelationships can be better seen and managed, and, finally, estimating the resources required for the approved long-range plan in detailed physical and financial terms. The resulting Five Year Defense Program, with its procedures for continuous modification and updating, depicts at any moment the entire approved plan of the Department of Defense for 5 years beyond the current date.

The programing system was the first major step in the creation of an integrated management mechanism known as the planning-programing-budgeting system. It, together with the use of cost/effectiveness analyses in choosing among alternative courses of action, significantly improved the process of defining national security objectives and determining the resources required for their attainment. The President directed on August 25, 1965, that similar systems be installed in the major agencies of the executive branch and encouraged the remaining agencies to apply these principles to the extent practical.

The programing approach, however, did not deal directly with the task of managing resources at the operating level. To assist in this task, a major new improvement program was started in fiscal

year 1966, called resource management systems. This program covered those methods and procedures that: (1) Deal with resources, e.g., manpower, weapons, services, and real property; (2) help to manage these resources from the planning stage to the time when they are consumed or disposed of; and (3) constitute "systems," in that they involve recurring, orderly cycles of planning, reporting, and feedback information.

The initial actions to improve existing resource management, designated Project PRIME (Priority Management Efforts), were scheduled to be ready for implementation by the end of fiscal year 1967. The two major objectives of Project PRIME are, first, the integration of programing, budgeting, and management accounting so that plans are made and resources budgeted and accounted for in the same terms and, second, the development of better information for managers at all levels, based on the consumption of resources as they are used day by day by the Department.

Substantial progress was made during the fiscal year 1966 toward both objectives. A major revamping of the programing structure and procedures was completed. New programs were established for communications and intelligence, for central supply and maintenance activities, for training, medical, and other specialized personnel activities, and for administration and associated activities. Detailed definitions were prepared, for the first time, for each of the approximately 1,100 individual program elements. Program element coverage was adjusted to make each element accord as closely as possible with an organizational subdivision. New procedures were issued aimed at identifying and resolving the key issues related to military forces early in the decision-making cycle. And finally, the procedures by which changes to the Five Year Defense Program are proposed and decided were streamlined.

In addition, considerable preliminary work was done to facilitate more extensive improvements in the future. The present congressional appropriation structure and the Department's accounting procedures focus on traditional allotment categories that relate appropriated funds only slightly with the cost, timing, or purpose of the funds actually used. To remedy this deficiency, the Department is planning four principal changes. First, the cost of military personnel will be charged to the organizations or programs for which they work. Second, the appropriation accounts—i.e., the functional financial accounts by which the Congress appropriates funds—will be "purified" so that an account will comprise either "expense" items only or "investment" items only. Third, the use of working capital funds will be expanded to facilitate the identification by mission organization of expense items consumed in contrast to those acquired. And finally, a uniform ac-

count structure will be designed to provide consistency throughout the entire programming-budgeting-operations cycle. By the end of the fiscal year, each of the military departments had started tests at one of its military installations to help in the determination of the best way to achieve these objectives.

Logistics Management

The Defense Department's logistics system is designed to provide our armed forces with all the weapons, equipment, supplies, facilities, and services that they need to carry out their missions and to do this at the lowest possible cost to the taxpayer. Over the past several years, new management procedures and organizational changes, combined with major increases in the procurement of war reserve material, raised the readiness and effectiveness of the logistics system to levels unprecedented in peacetime. Paralleling this improvement effort, a comprehensive cost reduction program was developed and installed throughout the Department.

Fiscal year 1966 provided a test for both of these efforts, as the cost reduction program had to operate in a new war environment and the logistics system had to support a major expansion of the force structure and a rapidly rising level of combat operations in Southeast Asia. With respect to the former, major economies continued to be achieved during the year despite the understandable preoccupation of logistics managers with the needs of the Vietnam conflict. With respect to the latter, General Westmoreland reported that "never before in the history of warfare have men created such a responsive logistical system. * * * Not once have the fighting troops been restricted in their operations against the enemy for want of essential supplies."

The priority accorded the filling of all Vietnam requirements was reflected in the creation of a Special Task Force in July 1965. This group was given the mission to ensure that all the resources required in Southeast Asia are provided expeditiously and to identify potential problem areas for immediate corrective action by appropriate Defense officials.

Procurement and Production

In response to the needs of the force buildup and combat operations in Southeast Asia, procurement and production rose rapidly during fiscal year 1966. Since the reserve components were not called up, new units had to be added to the active force structure. Additional quantities of aircraft and other long leadtime items had to be ordered far in advance in order to offset projected combat losses. Finally,

since war reserve stocks of munitions are maintained to cover requirements only until increased production can catch up with combat consumption, new procurement had to be initiated promptly when these items began to be consumed in quantity.

Military prime contract awards, which had totaled \$28.0 billion in fiscal year 1965, reached \$38.2 billion in 1966—the highest level since the peak Korean war year of 1952, when contracts worth \$43.6 billion had been awarded. The number of separate procurement transactions during the year was over 14 million—8 percent more than during the preceding year—and the number of major transactions, i.e., those over \$10,000, rose nearly a third. The dollar value of contract awards for ammunition rose more than 270 percent, for textiles and clothing 245 percent, for tank-automotive items 84 percent, for weapons 71 percent, for subsistence 57 percent, for aircraft 34 percent, and for electronics and communications equipment 30 percent.

Prompt action was taken to expand production facilities. Funds programed for this purpose rose from \$56 million in fiscal year 1965 to \$280 million in 1966. Almost \$200 million of this total was invested in additional ammunition production capacity—\$107 million in Government-owned ammunition plants and \$89 million in private plants.

Production of air-delivered munitions rose by 600 percent during the year. For the new 250-pound and 500-pound high-explosive bombs the increase was 500 percent, and the first 750-pound bombs—out of production since the end of the Korean war—were coming off the line by the end of the year. The output of napalm, cluster bombs, and flares was also greatly increased. Production of the 2.75-inch rocket resumed and by the end of the year the rate had reached about 184,000 per month.

The output of ground-delivered munitions was increased by 160 percent during the year. Because of the large stocks carried over from the Korean war period, many items had been out of production for a long time and new lines had to be established. By the end of the fiscal year, deliveries were being made from most of these new production lines. In the last quarter small arms ammunition (5.56-mm., 7.62-mm., and 30-calibre, etc.) was being delivered at the rate of almost 200 million rounds per month and 40-mm. grenades at about 800,000 rounds per month. Among the important items for which production was restarted were the 105-mm. illuminating cartridges and the 155-mm. high-explosive shells. New production sources were established for the 105-mm. and 8-inch high-explosive shells and the 81-mm. and 4.2-inch mortar rounds.

In the case of aircraft, the existing production base enabled industry to respond promptly to the increased demands. The production of F-4 models rose from 41 to 55 per month during the year—a 34-percent

increase—and production of the UH-1 helicopter from 67 to 124 per month—an 85-percent increase. The CH-47 helicopter production rate increased from 5 to 11 per month.

As the Vietnam procurement buildup proceeded, the possibility of delivery delays as the result of production bottlenecks in important industries developed, and actions were taken to prevent this from happening. Using its authority under the National Priorities and Defense Materials System, the Department developed a list of critical items which included aircraft forgings and extrusions, electronic systems and components, copper, machine tools, textiles and clothing, and certain chemicals. In July 1965, the Defense Department referred 61 cases to the Business and Defense Services Administration of the Department of Commerce for special assistance in preventing delays. In January 1966, the number of referred cases had risen to 152 and by June had climbed to 542.

In addition, the Defense Department's Master Urgency List, used as a guide in assigning priority ratings to certain procurement items and in resolving production resource conflicts, was revised to include selected rounds of ammunition, bombs, and rockets as well as the Southeast Asia construction program. The military allocation and priority assignment system adopted new procedures permitting the Department of Commerce to act on the verbal request of Defense procurement agencies in urgent situations. Meetings were also held with industry representatives in 30 major cities by Defense-Commerce teams to promote a thorough understanding of the Defense materials system and prevent its misuse.

Continuing the practice of recent years, management review teams surveyed 22 major procurement offices of the Army, Navy, Air Force, and Defense Supply Agency to ensure Department-wide compliance with the policies and procedures spelled out in the Armed Services Procurement Regulations. The success of this program has led to the establishment of a similar review of post-award contract administration activities.

The reorganization of the Department's contract administration services was completed during the year, implementing a plan originally approved in December 1964. The reorganization involved the consolidation of certain contract administration offices of the military departments under the new Defense Contract Administration Services with one central headquarters and 11 regional offices. Establishment of the last two regional offices was completed in December 1965.

One of the continuing goals of Defense procurement policy is to ensure that small business concerns and labor surplus areas receive a fair share of Defense work. Out of a total of \$34.9 billion contract awards to business firms in the United States during fiscal year 1966,

\$7.6 billion or 21.8 percent of the total, went to small business concerns—the highest dollar volume awarded since data on such awards became available in 1951. In addition, Defense prime contractors reported that \$5.1 billion of the \$12.1 billion of their Defense-related subcontracts, or 41.9 percent, went to small business firms. Plants in labor surplus areas received \$3.2 billion. Although the dollar volume of these contracts was lower than in previous years, the decline was proportionately less than the reduction in the number of major labor surplus areas resulting from the generally favorable economic conditions existing throughout the Nation during the period.

Supply Management

To assure maximum responsiveness to the logistics needs of the combat forces in Vietnam, a single consolidated supply system, operated by the Army, was established to manage all common-use items for U.S., Vietnamese, and other free world forces in that area. The military departments were made responsible for managing, funding, and budgeting logistical support furnished to such free world forces under the Military Assistance Program. In a related action, the U.S. Army Depot, Japan, took over the U.S. Army Logistics Center in Japan, formerly financed and operated under the Military Assistance Program for the support of foreign forces in the Pacific area.

In the handling of requisitions, a key factor in avoiding shortages is prompt transmittal to the proper source of supply. A major improvement in this area has been made possible by an automatic addressing system that forwards requisitions through a rapid communications network to an automatically operated addressor which redirects incorrectly routed requisitions to the proper supply point. During fiscal year 1966, about 238,000 requisitions were automatically corrected and rerouted. The new system was being readied for worldwide application at the end of the year.

To give intensive management surveillance to the procurement of materiel having particular military importance, especially to the Southeast Asian conflict, the logistics staff of the Office of the Secretary of Defense was reorganized on a major item commodity basis during the year. Special management surveillance, involving regular reporting and analysis of detailed data on inventories, production, and consumption, was applied to 284 of the most significant items of ammunition, aircraft, and equipment.

The fact that many supply management functions are highly susceptible to automation has permitted the Department to reduce the number of inventory control points during the past 6 years from 44 to 22, as the handling capacity of individual control points increased.

Automatic data processing equipment is also proving of great help in developing more accurate requirements forecasts and in gaining more effective control over worldwide supply inventories. Progress made during the year in developing standard data systems and in improving the Federal Supply Catalog system, together with the excellent communications network already available, will permit further standardization of the entire supply process. The continuing review and updating of design specifications for military equipment and supplies has also contributed significantly to the Department-wide standardization of such materiel.

Transportation

In many cases, the pacing factors in the buildup turned out to be transportation to Southeast Asia and the local port capacity. The latter was particularly constraining in the early months of the buildup. As ships began to encounter long waiting periods before they could be unloaded, special efforts were made to ease the situation. On November 26, 1965, deep-draft ships with military cargo waiting or holding in nearby staging areas totaled 90, but by the end of the year this number had been reduced to 32. Similarly, the average daily discharge rate, which had been 14,500 measurement tons in the first quarter of the fiscal year, climbed to 28,400 measurement tons by the last quarter.

To meet the rising shipping requirements, the Military Sea Transport Service (MSTS) increased the number of ships that it operated or controlled from 201 to 448. Of these, 100 were General Agency Agreement ships, reactivated from the National Defense Reserve Fleet. Monthly shipments by sea to South Vietnam, which had been running about 284,200 measurement tons in June 1965, rose to 790,900 measurement tons a year later. In order to monitor this greatly increased traffic, a special Pacific Movements Priority Agency was established in Oakland, Calif. This agency screened all cargo shipments to Southeast Asia, deferred those which were considered non-essential, and scheduled shipments to match the port capacities in the area. Six troop transports were transferred from the Atlantic to the Pacific to help in handling the increased passenger traffic. In total, MSTS transports carried 113,758 passengers to South Vietnam during the year.

During fiscal year 1966, the Red Ball Express concept, originated in World War II, was revived to support the military effort in Vietnam—but with a difference. First used in 1944, when supply difficulties threatened the Allied sweep through France, it involved a huge fleet of trucks, each with a red ball painted on its bumper to indicate that

it had priority over all the other road traffic in France. In 1966 the roads were air lanes, stretching 10,000 miles from Travis AFB, Calif., to Vietnam and the trucks had been replaced by aircraft—primarily four-engine jets traveling 400–600 miles per hour. The new Red Ball Express, started on December 6, 1965, is used primarily to carry, on a priority basis, spare parts for aircraft, tanks, bulldozers, trucks, and other equipment out of commission in Vietnam. The system is designed to deliver any spare part to Vietnam within 7 days after determination of its nonavailability in local stocks. By June 28, 1966, approximately 4,300 tons of Red Ball cargo had been air-expressed to Saigon from Travis AFB. These deliveries, representing 83,615 separate requisitions, permitted the prompt return to operation of 4,747 helicopters and aircraft, 1,882 heavy duty trucks, 247 bulldozers, 150 pieces of materials-handling equipment, and many other items, such as 175-mm. guns, 8-inch howitzers, generators, and water purification units.

As previously mentioned, the Military Airlift Command (MAC) raised significantly the utilization rate of its transports during the year in order to achieve an early and substantial increase in overall airlift capability. The addition of 90 new C-141's to the force helped greatly in this respect. The tonnage of cargo flown to South Vietnam by MAC increased by 150 percent during the year—to 300,000 tons. With the addition of the C-141's, MAC was able to initiate direct service to South Vietnam from airfields on the east coast, making it possible to deliver priority cargo to Saigon in 38 hours at a cost of approximately \$709 a ton. This same movement would have cost more than twice as much and taken nearly three times as long in the past, when C-124 aircraft operating from west coast airfields would have had to be used.

MSTS also began to use a new method for procuring ocean transportation from commercial carriers. Instead of booking military cargoes with commercial carriers at rates established through conferences with operators' associations, the new system provides for direct negotiations with individual carriers. Rates obtained under the new system for North Atlantic routes were 14 percent lower than those formerly offered. By the end of the year, comparable savings had not yet been achieved for the Pacific routes.

The Military Traffic Management and Terminal Service (MTMTS), responsible for the movement of passengers and cargoes within the continental United States and the movement of household goods worldwide, experienced, like the other transportation agencies, a substantial increase in its workload during fiscal year 1966. In taking over its new responsibility for the terminal service function, MTMTS consolidated 15 military ocean terminal organizations into four common-user terminals and 15 Service-managed terminals at aerial ports of

embarkation into 7 military air traffic coordinating centers. These consolidations helped MTMTS in handling a 150-percent increase in cargo workload with only a 12-percent increase in staff.

Construction

The Vietnam construction program expanded rapidly during the year in line with the increased deployment of U.S. forces and the increased tempo of operations. At the beginning, it was confronted by serious obstacles, as it was impossible in the early stages to determine not only how many ports, air bases, depots, and cantonments would eventually be required, but also their exact location. The force structure, concept of operations, enemy reactions, and focal points of activity could not be defined precisely nor, once defined, could they be expected to remain static. Accordingly, the early decisions were based on the best gross estimates of the needed facilities available at the time. Based on these, civilian contractor forces were mobilized, procurement of equipment and materials was started, and military engineering forces were deployed.

By the end of fiscal year 1966, the construction program included 8 jet fighter bases, 6 new deep water ports, 26 hospitals, 280,000 kw. of electrical generating capacity, POL storage for 3.1 million barrels, 75 airfields capable of handling C-130's, and cantonments for almost 465,000 men.

Since the use of civilian contractors in the construction program was clearly advisable, it was decided to expand the Navy's existing cost-plus-fixed-fee contract in Vietnam with the Raymond, Morrison-Knudsen (RMK) combine. In July 1965, the contractor's construction operations were still relatively small. His work force numbered less than 12,000, including only 500 U.S. nationals, with a "work-in-place" capability estimated at \$5 million a month. The contractor was working at six sites, but had no camp or yard facilities of significance outside of Saigon. In view of the urgency of the construction program, two additional firms—Brown and Root, and J. A. Jones—were added to the original RMK combine, forming RMK-BRJ, which rapidly expanded its operations.

By December 1965, \$410 million had been made available to the contractor, and the work force had grown to 24,000, with a "work-in-place" capability of \$10 million a month. Six months later, on June 30, 1966, the work force had again doubled in size—totaling 51,700, including 4,300 U.S. nationals—and the "work-in-place" capability had tripled—being estimated at \$31 million a month. Some \$733 million had been assigned to RMK-BRJ for work on 782 projects located at 47 sites throughout South Vietnam. The value of work actually performed totaled \$229 million, of which \$166 million was related solely to the

military program while the remainder involved projects principally financed by the Military Assistance Program and the Agency for International Development.

At the same time, military engineering units were made responsible for a substantial share of the construction program. Projects totaling \$209 million were assigned to such units in fiscal year 1966 and the value of work performed was estimated at \$21 million.

Steps were also taken to meet the requirements for better communications to and within Southeast Asia. The Southeast Asia capacity of the AUTODIN (Automatic Digital Network) system was expanded with the addition of two switches, and a switch originally scheduled for Hawaii was moved to Korat, Thailand. The SYNCOM III communications satellite provided an alternate link between Hawaii and Southeast Asia. Cable communications projects approved included five locations in Vietnam, a link between Vietnam and Thailand, and another one between Vietnam and the Philippines. All of these projects were under construction at the end of the year.

Cost Reduction

The initial Defense Department 5-year cost reduction program, started in 1962, was completed in fiscal year 1966. It was thought originally that a major cost reduction effort might cut recurring military logistics costs by about \$3 billion a year within 5 years. As time passed, it became clear that the potential of the program had been greatly underestimated and, as accomplishments mounted, goals were steadily revised upward. By June 30, 1966, total savings for the 5-year period amounted to \$14.3 billion, of which \$4.5 billion was realized in fiscal year 1966 (see table 33).

In spite of the strains and dislocation caused by the Vietnam buildup, improved performance continued to be achieved in fiscal year 1966 across the entire spectrum of logistics activities. Some \$1,859 million of excess supply stocks were returned to productive use, an increase of nearly \$400 million over fiscal year 1965. The number of approved value engineering proposals by Defense contractors rose to 979 compared with 700 in the previous year. The rate of competitive contracting rose from 43.4 to 44.4 percent of the total dollar value of contract awards. Cost-plus-fixed-fee contracts, the least desirable type, amounted to only 9.9 percent of the total, compared with an original goal of 12.3 percent.

The effort to seek out and terminate unnecessary operations was continued during the year, with the result that another 175 activities were identified for future closure, reduction, or consolidation. Ultimately, these actions will release 150,000 acres, two industrial plants, and nearly 55,000 military and civilian personnel for other purposes.

Finally, the Defense Supply Agency in fiscal year 1966 processed one-third more requisitions than in 1965, handled 55 percent more tons of materiel, and bought twice the dollar volume of supplies—achieving a 20 percent improvement in productivity per manhour.

In fiscal year 1967 and subsequent years the cost reduction program will be an integral and permanent part of the Defense management system. Goals will be established and cost savings will be measured on a year-to-year, rather than a 5-year basis. The new program will be compatible with the Government-wide cost reduction program for which the old program served as pioneer.

Manpower Management

The force buildup during fiscal year 1966 posed severe challenges to military manpower management. The risks and burdens of combat had to be spread as equitably as possible. Unnecessary turbulence in military and civilian personnel programs had to be avoided despite the pressures of a rapidly expanding organization. Substantially increased numbers of men without prior military service had to be quickly and adequately trained to meet immediate requirements. To retain trained personnel, continued emphasis had to be placed on measures enhancing the attractiveness of a military career. Additional civilians had to be employed to fill the new jobs required by a growing Defense establishment and replace military personnel in support-type positions. These challenges were met. More than 200,000 additional men were deployed to Vietnam during the year, while the United States retained its capability to meet contingencies elsewhere in the world and to send further reenforcements to Southeast Asia. At the same time, the policy to limit duty tours in Vietnam to 12 months was maintained.

Vietnam Related Actions

The decision to counter Communist aggression in Southeast Asia with the deployment of U.S. combat forces raised the immediate question of how best to meet increased troop requirements. The obvious alternatives were either an expansion of the active forces, the call-up of reserve units, or a mixture of both. As noted earlier in this report, it was decided after careful consideration not to call up reserve units. Instead, the reserves were to be kept highly ready and available for call in the event other contingencies occurred or the initial force requirements estimate proved inaccurate. Thus, while steps were promptly taken to increase the readiness of selected reserve units, the active establishment turned to the task of organizing and training the new units needed to offset deployments to Southeast Asia.

The initial plan to increase the size of the active military establishment, presented to the Congress in early August 1965, called for the addition of 340,000 military personnel to the previously planned strength of 2,640,000 for the close of fiscal year 1966. While the size of the military buildup was tied to the tentative operations plan for the Vietnam conflict, its timing was in part influenced by the capacity of the active training establishment, especially that of the Army.

The additional military manpower was obtained from three principal sources—higher draft calls, an increase in voluntary enlistments, and the involuntary retention of selected personnel already on active duty.

Draft calls, which had averaged about 12,000 a month through the first 8 months of calendar year 1965, were increased sharply and reached 40,000 in December. For fiscal year 1966 as a whole, 339,700 men were inducted, compared to 102,600 in 1965 and the 110,500 total originally projected for the year. The great majority of the inductees, 317,500, went to the Army, while the Navy and Marine Corps took 2,600 and 19,600 respectively.

Voluntary enlistments, stimulated in part by the pressure of the higher draft calls, also rose sharply. Total first enlistments during fiscal year 1966 increased to 548,200, compared to 318,200 in 1965.

While these sources provided the untrained manpower, additional steps were necessary to obtain the experienced officer, noncommissioned officer, and specialist personnel for the larger force structure. To meet this requirement, regular officers of the Army and Navy had to be made subject to selective retention beyond their requested resignation date or voluntary retirement date. Under this policy, the resignations or retirements of about 1,000 Army officers and 950 Navy officers were denied or deferred during the year. In the Marine Corps, terms of all regular officers were initially extended, except in hardship cases. Since this announcement served to forestall requests for retirement or release, the exact number of Marine Corps officers affected is not known, although 350 would probably constitute a reasonable estimate. By the end of the year, it appeared that the Marine Corps, like the Army and Navy, would soon be able to adopt a policy of selective retentions.

With respect to the enlisted ranks, only the Department of the Navy had the authority to retain such personnel involuntarily in the absence of a declared state of national emergency. Under this authority, about 56,000 regular Navy and 30,000 Marine Corps personnel were involuntarily kept on active duty in fiscal year 1966 for a period of up to 4 months. During the latter part of the year, the length of the extension period was gradually reduced, and it was expected that involuntary retentions would be eliminated entirely by early fiscal year 1967.

Part of the requirement for more noncommissioned officers and specialist personnel was filled by accelerating promotions in certain occupational specialties. In addition, more personnel in the top enlisted grades were authorized, based upon the capability of each Service to attain the new strength levels without a serious decrease in experience levels.

A military-civilian job conversion program was announced in September 1965. This program called for hiring about 60,000 civilians to do civilian-type jobs currently performed by military personnel. Including training and support spaces, some 75,000 officers and enlisted men would be freed thereby for duties that must be performed by military personnel. The first conversions were made in January 1966 and by the end of the fiscal year 25,871 substitutions or 43 percent of the planned total, had been completed.

All of the Services expanded their officer candidate and flight training programs, two of the primary sources for new officers. For example, the Army more than tripled its output of officer candidates over the previous year by expanding the officer candidate schools at Fort Benning and Fort Sill and opening new ones at Fort Belvoir, Fort Knox, and Fort Gordon. In addition, the Services requested reserve officers with certain specialties to volunteer for active duty; however, no reserve officer was involuntarily called up.

To help in meeting the requirement for more medical personnel, the "doctors draft" was increased and 2,432 physicians and dentists were brought to active duty in fiscal year 1966, compared to 673 in 1965. Efforts to recruit women physicians were also intensified. At the same time, pre-induction processing and commissioning procedures were streamlined to bring physicians on active duty as promptly as possible.

By December 1965, it became evident that more forces might be needed in Southeast Asia than had been planned in August. In January, therefore, the end-year military manpower objective was increased to 3,093,000, a net addition of 453,000—instead of 340,000—over the number originally projected in the fiscal year 1966 budget. Actual strength rose to 3,094,000 on June 30, 1966.

All of the military Services made major contributions to this significant achievement. The Army, which carried the largest share of the load, opened new recruit training facilities at Fort Benning and Fort Bliss and increased the capacities of other training centers and service schools. In addition, four Strategic Army Forces (STRAF) divisions were used, temporarily, to help with the recruit training. By the end of the year, preparations were nearly complete for opening new centers at Fort Lewis, Fort Bragg, and Fort McClellan. The Marine Corps, Navy, and Air Force also expanded their existing training facilities. Marine recruit training was compressed from a 12-week into an 8-week

period by intensifying the training schedule and increasing the number of training hours per week.

The priority given to the training needs of the active forces inevitably affected the training of men joining the Reserve Enlistment Program (REP), interest in which increased greatly during the year in part as a result of the higher draft calls. The backlog of untrained reservists rose rapidly, reaching 133,000 by June 30, 1966. However, REP personnel who were members of Selected Reserve units were given priority for training over other reservists, and no significant backlog occurred among members of these units. The continuing expansion of the training establishment is expected to eliminate most of the backlog by the spring of 1967.

In order to share the hazards of combat as equitably as possible, the length of a military tour of duty in Vietnam was kept at 12 months. Plans were initiated to ensure an adequate rotation base to support the projected deployments. In addition, Vietnam assignment policies permit exemption of a sole surviving son from combat duty and preclude 17-year-olds from being sent to combat areas.

Medical care in Vietnam was better than in any previous war in the Nation's history. Disease rather than combat wounds was the most frequent cause for admission to hospitals—accounting for about 70 percent of all hospitalizations in Vietnam. The most frequent causes for admission were diarrhea and dysentery, which yield to treatment rather readily. Cases of infectious hepatitis occurred but not at anything like an epidemic rate; still, since this disease generally requires a long period of hospitalization, all forces in Vietnam were given an immunizing serum for maximum protection. The most difficult disease problem encountered was a drug-resistant variety of malaria, called falciparum, which is most prevalent in the Vietnamese highlands. Efforts to control the disease included not only improved techniques of mosquito control but also an intensive program to develop new drugs, some of which were expected to be ready for field testing early in fiscal year 1967.

To help in meeting the problem faced by servicemen assigned to Vietnam who were unable to secure conventional life insurance, the Congress enacted in September 1965 a new serviceman's group life insurance program. Under this program, each serviceman is automatically provided \$10,000 of protection, unless he elects a \$5,000 coverage or decides not to participate at all. A \$2 monthly premium is deducted from his pay for the full amount of coverage. The program is supervised by the Veterans Administration and is underwritten by some 540 participating insurance companies.

Other Manpower Management Actions

In accord with the Government's policy of keeping the compensation of its personnel comparable to the pay scales in private enterprise, the pay of both military and civilian personnel was increased early in the fiscal year. The Military Pay Act of 1965, enacted on August 21, 1965, raised the pay of personnel with over 2 years of service by an average of 6 percent for officers and warrant officers and 11 percent for enlisted personnel. Personnel with less than 2 years of service received their first pay increase since 1952, amounting on the average to 22 percent for officers and warrant officers and 17 percent for enlisted personnel. In October 1965 civilian employees received an average salary raise of 4 percent. Additional increases in military and civilian pay were being considered by the Congress in the spring of 1966 but the legislation had not been approved by the end of the fiscal year.

To increase first term reenlistments by men with scarce technical skills, the Military Pay Act of 1965 also established a variable reenlistment bonus program. This variable bonus can be one to four times greater than the standard reenlistment bonus paid for all first term reenlistments. It is given only to men completing their initial period of service and is adjusted according to the relative scarcity of particular skills. The limited data available at the end of the fiscal year indicated that the program was having a favorable impact on reenlistment rates.

Mental standards for enlistment or induction into military service were revised effective November 1, 1965. The basic purpose of the revision was to ensure that men having a good prospect of completing training and performing well in service would not be denied an opportunity to serve. Enlistment standards of the military Services using the draft were generally brought into line with the standards used for induction. Previously, mental standards for enlistees had generally been set higher than those for draftees. Moreover, high school graduates, whether volunteers or draftees, are now accepted automatically by the Army and Marine Corps if they attain the minimum score on the Armed Forces Qualification Test. This change stemmed from a study of military performance of new recruits which showed that a high school degree is a reliable indicator of future performance in military service. Overall, the rejection rate for draftees at induction for all causes dropped from about 50 percent in fiscal year 1965 to about 40 percent in fiscal year 1966, in part because of these revised standards.

Under the provisions of a new "GI Bill of Rights"—the Veterans Readjustment Benefits Act of 1966, enacted on March 3, 1966—service-

men with 2 years of active duty and veterans with service after January 31, 1955, were made eligible for many benefits formerly available only to World War II and Korean war veterans. The new law differs from its predecessors in that it does not require a discharge from service as a qualification for benefit, thus permitting active duty personnel with over 2 years of service to participate or retain their "rights" until completion of their military career.

As part of the over-all effort to limit new military construction in the United States during fiscal year 1966 essentially to operational facilities and those supporting Southeast Asia activities, the construction of some 8,500 military family housing units authorized for 1966 was deferred. As a stop-gap measure, the Congress was asked to increase the Department's authority to lease military family housing in the United States from 7,000 to 13,075 units. The 6,075 additional units would be leased in localities where new construction had been deferred.

New regulations were issued on May 2, 1966, designed to protect military personnel against "loansharks." Among other things, these regulations protect the serviceman from excessive charges, grant him the right to move property pledged as security beyond state or national boundaries when under military orders, permit repayment at an accelerated rate, provide safeguards against repossession, and allow cancellation of a contract before delivery. The directive also encourages the establishment of credit unions on military bases to provide a more convenient source of credit for military personnel.

Southeast Asia requirements and the military-civilian job conversion program combined to reverse the consistently downward trend in Defense civilian employment in recent years. While the original fiscal year 1966 goal called for a new post-Korean war low of 964,000 civilians, the Department ended the year with 1,103,700 civilians on its rolls.

Impressive results have been achieved by the Department's employment opportunity program, designed to protect the job security of career civilian employees whose positions are eliminated when military installations are closed. During the 2½ years since January 1, 1964, some 95,000 employees were affected by base closures, transfers of functions, or reductions in activities. Approximately 70 percent of these, or 66,200, were given other positions within the Department, and another 4 percent were placed in other Federal jobs. Retirements, resignations, and other separations accounted for 24 percent, or 22,000. The remaining 2 percent, about 2,000 employees, accepted non-Federal Government jobs. No employee was separated as a direct result of base closure without an offer of a Federal job opportunity.

Long-standing Defense policies provide equality of opportunity without regard to race, creed, color, or national origin for servicemen,

civilian personnel, and employees of defense contractors. These policies continued to be administered during fiscal year 1966 to achieve maximum utilization of the Nation's manpower resources. Attention was not limited to the prevention of discriminatory practices but included positive measures encouraging members of minority groups to take advantage of the many opportunities for advancement open to them. An Equal Opportunity Council, composed of representatives of the military departments and of the Office of the Secretary of Defense, was established in the spring of 1966 to give continuing emphasis to programs and problem areas in this field. The single most difficult remaining problem is that of adequate off-base housing for Negro service personnel and their families. Instances of continuing racial discrimination in the purchase or rental of off-base housing were reported by 102 commanders in a survey of 235 installations. Measures to alleviate difficulties of this kind were under study at the close of the fiscal year. As for defense industry, the Defense Contract Administration Services monitored compliance of business firms with the President's Executive Order 11246 of September 24, 1965, which asks government contractors to "take affirmative action to insure that applicants are employed, and that employees are treated during employment, without regard to their race, creed, color, or national origin."

Organization

The basic organizational framework of the Department of Defense continued to function well during fiscal year 1966. Such adjustments as were made reflected primarily the continuing evolution of managerial techniques and the adaptation of the organizational structure to the changing demands of modern military technology, the search for economy and efficiency, and the Vietnam conflict.

The upgrading of the systems analysis function in the Office of the Secretary of Defense was one of the evolutionary changes which took place in fiscal year 1966. Systems analysis had been formally introduced at the Secretary of Defense level in 1961 as an adjunct to the Comptroller's function. Since that time, the usefulness of that technique in the solution of complicated defense problems has received ever wider acceptance. When one of the seven authorized Assistant Secretaryships became vacant by the departure of the Deputy Director of Defense Research and Engineering in July, it was decided to use this position to give more adequate recognition to the importance of systems analysis in the planning and efficient management of the Defense program.

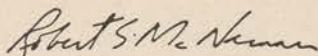
The major purpose of the systems analysis staff is to explore and compare the relative costs and effectiveness of the important choices

available to the decision-makers and to marshal whatever significant factual data can be of help to them. Many of the complex force structure and material decisions faced by the top Defense management lend themselves to the application of operations research or cost/benefit techniques of analysis. Since these decisions frequently involve the interest and participation of more than one military department and tend to be comprehensive in scope, dealing with the organizational, developmental, logistical, personnel, and financial aspects of a problem, Defense Department-wide coordination must be obtained. Working closely with officials in the military departments and the organization of the Joint Chiefs of Staff, the systems analysis staff suggests, monitors, and reviews analytical studies of Defense programs throughout the Department and, at the same time, develops improved techniques for estimating costs and benefits. Thus, the best thinking of both military planners and analysts are systematically brought to bear on the important force structure and weapon system decisions.

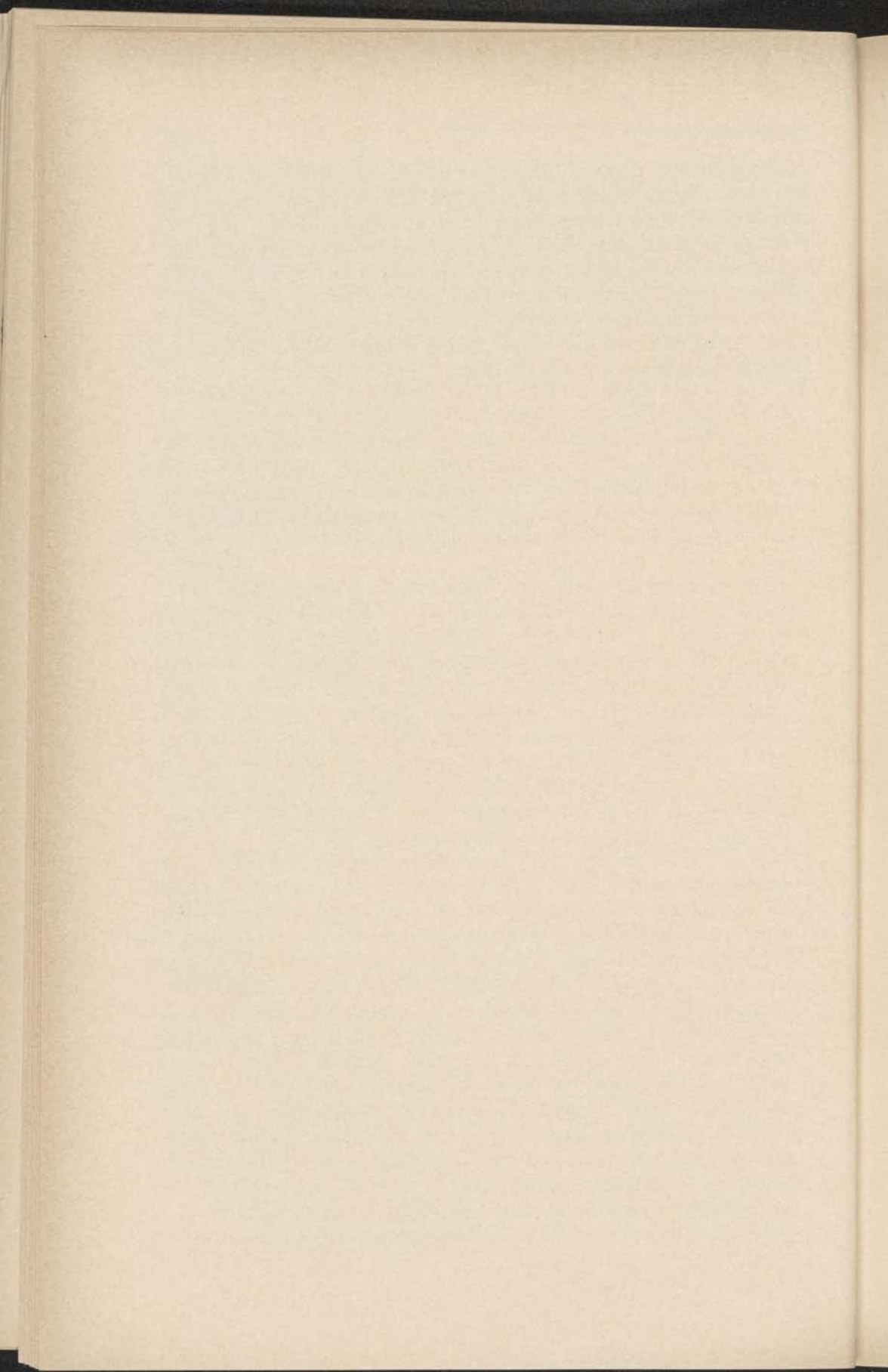
The establishment in March 1966 of a Special Assistant for Strategic Mobility (SASM) in the organization of the Joint Chiefs of Staff resulted from the increasingly felt need for a focal point for all aspects of strategic mobility planning and operation. The SASM, working closely with the three transportation single managers—the Military Airlift Command, the Military Sea Transportation Service, and the Military Traffic Management and Terminal Service—will be responsible for assuring the most effective utilization of all transport resources, currently as well as in the future.

The 1966 reorganization of the Department of the Navy, announced on March 7, 1966, represented probably the most significant organizational change of the year. This change abolished the bilinear organization of the Navy by giving the Chief of Naval Operations the same authority and responsibility over naval support functions that he has traditionally exercised over the operating forces. At the same time, the reorganization of the naval support establishment, initiated in 1963 with the creation of the Office of Naval Material, was carried one step farther. The Office of Naval Material became the Naval Material Command in charge of six subcommands—the Air Systems Command, the Ship Systems Command, the Electronics Systems Command, the Ordnance Systems Command, the Supply Systems Command, and the Facilities Engineering Command. These new subcommands took the place of four naval bureaus—the Bureau of Naval Weapons, the Bureau of Ships, the Bureau of Supplies and Accounts, and the Bureau of Yards and Docks. The assignment to the Chief of Naval Operations of authority over the Naval Material Command, the Bureau of Naval Personnel, and the Bureau of Medicine

and Surgery was expected to improve substantially the overall coordination of the Navy's support activities. The realignment of the responsibilities of the support bureaus on a functional basis strengthened the systems management approach to weapons development and acquisition, besides giving greater emphasis to ordnance and electronics. In addition, interdepartmental cooperation was being facilitated by bringing the organization of the Navy more in line with that of the Army and the Air Force. The new organizational arrangement became effective on May 1, 1966.

A handwritten signature in dark ink, reading "Robert S. McNamara". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

ROBERT S. MCNAMARA,
Secretary of Defense.



ANNEX

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Annex A
ANNUAL REPORT
of the
RESERVE FORCES POLICY BOARD

July 1, 1965, to June 30, 1966

The annual report of the Reserve Forces Policy Board on the status of the reserve programs of the Department of Defense is submitted, as required by law, for the period ending June 30, 1966.

The Reserve Forces Policy Board held four meetings during this period. Its deliberations were constantly concerned with the continued development of the well-trained reserve forces vital to the security of the Nation, recognizing that to be effective these forces must be in their maximum possible state of readiness before, not after, the beginning of any national emergency.

So gradually that only in retrospect are the full dimensions discernable, the reserve components have undergone a massive, all-pervading transformation in the decade since 1956. This change began before the Korean war but the events which gave them the great momentum have occurred in the past 10 years. During this period the reserve components have laboriously achieved a level of military competency that prewar leaders of U.S. military thought and actions probably would have considered unattainable.

The following persons became members of the Reserve Forces Policy Board between July 1, 1965, and June 30, 1966: The Honorable David E. McGiffert, Under Secretary of the Army; The Honorable Norman S. Paul, Under Secretary of the Air Force; Lt. Gen. John L. Throckmorton, USA; Lt. Gen. Charles W. G. Rich, USA; Rear Adm. Robert W. Copeland, USNR; Brig. Gen. Sidney S. McMath, USMCR, and Maj. Gen. Frank T. McCoy, Jr., AFRes.

Principal among the major subjects affecting the reserve components considered by the Reserve Forces Policy Board during fiscal year 1966 were:

1. Draft and manpower procurement outlook;
2. Army reserve components reorganization;
3. ROTC developments;
4. Application of Uniform Code of Military Justice to reservists; and
5. Callup and buildup of forces.

These were the subjects of special presentations and discussions. The Board also addressed itself to various items of proposed legislation, both those referred to the Department of Defense by the Congress for comment and those originating within the Department.

Personnel

The strength of each reserve component in fiscal year 1966 is shown in tables 27 and 28 of the appendix.

Under the Reserve Forces Act of 1955, as amended in 1963 by Public Law 88-110, individuals enlisting without prior military service are required during their enlistment to perform an initial period of active duty for training of not less than 4 months. A longer time is required for training in many specialized skills. Personnel enlisting under this program have come to be known as REPs.

During fiscal years 1963, 1964, and 1965, there was no substantial problem of space for REPs in the training base. The problem then was to enlist enough personnel to fill the spaces available. However, increases in our participation in the Vietnamese war, and in the requirements and size of the active Army, created a problem for the Army in fiscal year 1966. REP enlistees were available in ample number but because of the Army's increased training requirement, saturation of its training facilities, and shortages of training personnel, the training opportunities for REP enlistees dropped drastically. On the closing day of this report the backlog of untrained personnel in reserve components units exceeded 125,000.

This training program is in its eleventh year of operation, and in this period has produced 1,030,561 basically trained men for the Ready Reserve. While the program has worked well under peacetime conditions a review of its operation at the present time, when we are engaged in actual combat in Vietnam, is useful.

The number of participants in this program during fiscal year 1966 is shown in table 30.

The screening of the Ready Reserve required by Section 271, title 10, U.S.C., covered 2,372,959 personnel during the period of this report. As a result, 511,701 were released from a Ready Reserve status, of whom 242,443 were transferred to the Standby Reserve or the Retired Reserve, and 269,258 were discharged. This screening procedure is continuous and intended to insure that the Ready Reserve is composed of qualified personnel available for mobilization.

Reserve Officer Personnel Act

The Reserve Officer Personnel Act, as amended, as codified in titles 10 and 14, U.S. Code, continues to serve generally the purposes for which it was enacted. Compliance with these provisions of the law has not as yet created serious adverse effects on the mobilization potentialities of the reserve components. The critical test years for the attritive features of ROPA will be from 1968 to 1971 when many officers commissioned during World War II will complete their service, and their removal from an active status will be mandatory. Procurement of officers to offset the anticipated losses will have to be about double the present effort, and it is hoped the ROTC Vitalization Act will be instrumental in achieving the increased officer production required.

The Army and Air Force now lack authority to exceed grade ceilings by the promotion of officers to fill reserve unit vacancies. Such unit promotions to lieutenant colonel by the Army and to major by the Air Force have been slow, and those to lieutenant colonel by the Air Force have been halted because of overages in grade.

Observing this situation, the Board again recommended several actions which, if implemented, would prove helpful toward a solution of this problem. The recommendations are:

- (1) To authorize the involuntary transfer to the Retired Reserve of those officers who fail to qualify for retention in an active status;

(2) To provide that reserve officers on extended active duty will not count against the authorized in-grade officer strength of the reserve components; and

(3) To recind the authority for declination of promotion.

The provisions of law which were the Reserve Officer Personnel Act, as it relate to Coast Guard Reserve officers, were adequate until the passage of Public Law 88-130, which changed the promotion system for Regular officers from "fully qualified" to "best qualified." As a result, and because of certain temporary provisions creating considerable attrition, a larger number of Regular officers have entered a zone of promotion earlier than they would otherwise. Therefore, by operation of the running mate system, a larger number of Reserve officers have entered a zone of promotion, thus enlarging the "hump" which has existed in the Reserve in the grades of captain and commander. Some attrition was created in these grades in fiscal years 1964, 1965, and 1966 by using boards convened under the authority of 14 U.S. Code 787a. While these provisions will be used again in 1967, only a small number of vacancies can be created by this method, allowing only a token number of promotions to these grades. In addition, because of few promotions to the grade of commander, the number of lieutenant commanders has reached the ceiling prescribed by law.

In the spring of 1964, the Commandant of the Coast Guard approved the proceedings of a board convened to study the promotion system for Reserve officers on inactive duty. That board recommended that legislation be proposed to remedy the above situation, and such legislation has been prepared for introduction into the Congress. The proposed bill would amend chapter 21 of title 14, U.S. Code by:

(1) Providing a "best qualified" system of promotion (and attrition) for all Reserve officers above lieutenant (J.G.) on inactive duty;

(2) Increasing the authorized strength of commissioned Reserve officers in an active status from 5,000 to 6,800;

(3) Changing the permanent grade distribution of Coast Guard Reserve officers, increasing the captains from 1.5 percent to 2.0 percent and decreasing the commanders from 7.0 to 6.5 percent, and providing that those percentages may be exceeded until 5 years from the effective date of the proposed legislation to alleviate the temporary "hump" situation; and

(4) Placing a 5-year limitation of service in an active status on Reserve rear admirals serving on inactive duty.

The Army Reserve Components

Since the birth of the Nation, one of the principles of U.S. military policy has been to support the active Army with a strong reserve force. In recent years, this force has been known as the Army reserve components, consisting of the Army National Guard of the United States (ARNGUS) and the U.S. Army Reserve (USAR). During this reporting period a number of actions were taken to improve the capability of these forces to fulfill their mission. Some of the major actions taken were the formation of the Selected Reserve Forces (SRF) and the inactivation of those low priority USAR units not required by current plans.

In the fall of 1964, the Department of the Army was requested to prepare plans to be executed in fiscal year 1966 for reorganizing the Army National Guard and Army Reserve forces to improve their early deployment capability and combat readiness. At the close of fiscal year 1965, Congressional hearings on the proposed reorganization plan were still in progress. By September 30, 1965, both the Senate and the House Armed Services Subcommittees had completed their hearings for the 1st Session of the 89th Congress on the proposed reorganization plan.

In September 1965, the Department of Defense Appropriations Act of 1966 (Public Law 89-213) was passed, which provided separate appropriations for the Army National Guard and the U.S. Army Reserve. The act required that the Guard be programed to attain a strength of not less than 380,000 and that the USAR be programed to attain a strength of 270,000. This action, in effect, precluded execution of the proposed reorganization in fiscal year 1966.

In August 1965, the Secretary of Defense reported to the Congress that the buildup of the active Army and the improvement of the readiness of a portion of the reserve components were necessary (a) to offset the deployments planned to Southeast Asia, (b) to provide some additional forces for possible new deployments, and (c) to be prepared to deal with crises elsewhere in the world.

Accordingly, a Selected Reserve Force (SRF) was developed by the Army Staff with the objective of increasing substantially the premobilization readiness of reserve component units so as to decrease the postmobilization time required for deployment. The SRF consists of three infantry divisions, five separate infantry brigades, a separate mechanized infantry brigade, an armored cavalry regiment, and many combat support and combat service support units. The total authorized strength of the force is approximately 150,500. The Army National Guard was authorized 744 units with a TOE strength of approximately 118,900; the U.S. Army Reserve was authorized 233 units with a TOE strength of approximately 31,600.

The following measures were instituted to improve the readiness of the Selected Reserve Force.

- (1) All SRF units were authorized 100 percent TOE strength.
- (2) SRF units were authorized a 50 percent increase in the number of drills for units and staffs. The SRF units were directed to undertake an accelerated training program.
- (3) SRF units were given priority for REP (nonprior service personnel enlisting in the reserve components) training spaces in Army training centers.
- (4) By transferring equipment from lower priority units and by giving SRF units priority for the issue of new equipment made available to the reserve components, the equipment posture of the SRF was significantly improved.
- (5) SRF units were authorized additional technicians.
- (6) Provisions were made for an increase of repair parts in order to bring equipment in the hands of the SRF units to combat-serviceable condition.
- (7) SRF units were directed to accomplish a maximum of administrative preparation toward the objective of being able to move to a mobilization station promptly after being mobilized. Planning for mobilization was based on a 7-day alert period.

The formation of the Selected Reserve Force was initiated in October 1965 and was completed by December 31, 1965. The three Army National Guard divisions in the SRF are composed of elements from nine Army National Guard divisions. In each instance, a division and one 100-percent-strength brigade was provided by a high priority division; one additional 100-percent brigade was provided by each of two low priority divisions. Three of the existing ARNG separate brigades were designed to be a part of the Selected Reserve Force; the remaining three separate brigades needed were formed from three ARNG divisions. Combat and combat service support units of battalion and smaller size, of both ARNG and USAR, were designated to be a part of the selected force. At the close of the fiscal year, the strength of the SRF was 144,030 (ARNG 115,251; USAR 28,779).

Concurrent with the action to establish the Selected Reserve Force, the Secretary of Defense announced that the Reinforcing Reserve units of the

USAR would be inactivated prior to the end of the calendar year 1965. The purpose of the inactivations was to make trained manpower in those units available to units of the Selected Reserve Force and other units being continued in the structure, and thus to reduce the Reserve Enlistment Program (REP) training requirements. After careful consideration of a Resolution of the Senate Armed Services Committee urging against the inactivation of approximately 750 U.S. Army Reserve units of the Reinforcing Reserve, the decision to inactivate these units was reaffirmed and announced on November 13, 1965.

The inactivations were completed on December 31, 1965. Of the 55,220 personnel in the inactivated units, 24,400 were reassigned to other USAR units; 1,019 joined the Army National Guard; 27,702 were transferred to the Ready Reserve Mobilization Reinforcement Pool; and 2,099 were discharged, retired, or transferred to the Standby Reserve.

The Army reserve components assigned strength at the beginning of fiscal year 1966 was 640,665 (ARNG 378,985; USAR 261,680). The 1966 President's budget, based on the proposed reorganization plan, had projected a beginning paid-drill strength of 655,000 (ARNG 385,000; USAR 270,000) and a year-end strength of 575,000, all in the ARNG. However, the Defense Appropriation Act of 1966 provided funds and required programing for a year-end strength of 270,000 in the U.S. Army Reserve and not less than 380,000 in the Army National Guard. The ARNG program was later revised to 418,500 due to the increase in strength required in the establishment of the Selected Reserve Force. The Immediate Reserve unit strengths were continued at the authorized levels, and the ARNG Reinforcing Reserve unit authorized strengths were reduced from 65 percent or 60 percent of TOE to 50 percent. The assigned strength of the Army reserve components at the close of fiscal year was 671,898 (ARNG 420,924; USAR 250,974).

It is estimated that the readiness of Immediate Reserve units, other than SRF, has declined slightly during the year, primarily as a result of the significant increase in the backlog of REP enlistees in non-SRF units awaiting their initial tour of active duty training. Additionally, the withdrawal of equipment to equip the SRF and to meet active Army requirements adversely affected the readiness of these units.

Lack of school quotas for certain hard-skill specialties, such as aviators and demolition specialists, hindered the achievement of full individual readiness training in some units.

Enlistments during the year totaled 221,045 (ARNG 125,036; USAR 96,009) of which 171,976 (ARNG 109,939; USAR 62,037) were of nonprior-service men requiring a minimum of 4 months' active duty training with the Army. At the same time that enlistments were increasing in the reserve components, the active Army strength was increasing. Although the training capacities of the Army training centers were expanded, it was impossible to accommodate all of the untrained accessions in all components. Because priority, of necessity, was given active Army trainees, a large number of untrained Army reserve component personnel were awaiting training at the end of the year. As of June 30, 133,109 enlistees (ARNG 79,106; USAR 54,003) were awaiting training. As an attempt to alleviate this situation, more than 10,000 ARNG/USAR enlistees were being provided some form of basic training at or near their homes by elements of 13 USAR training divisions. Plans were formulated to provide 2 weeks of basic training to 31,000 ARNG/USAR enlistees at calendar year 1966 summer camp. However, only completion of REP training meets the 4-month train-

ing prerequisite for oversea deployment and enables a reservist to become an effective member of his unit.

At beginning of the fiscal year, there were 26,924 unit technicians on duty (ARNG 22,423; USAR 4,501), including 5,027 in the Air Defense program and 142 in the program for the military support of civil defense. At the end of the year, actual technician strength was 26,697 (ARNG 22,939; USAR 4,028), including 4,970 in the Air Defense program and 216 in the program for the military support of civil defense. The decline in employment in the USAR occurred as a result of the inactivation of the USAR Reinforcing Reserve units and the announcement of the proposed reorganization of the Army reserve components.

In December 1965, the technician program was adjusted to provide 1,184 ARNG technicians to support the Selected Reserve Force (SRF). An additional 434 employees were authorized the USAR on May 23, 1966, to improve equipment readiness in the SRF units. As of June 30, 758 (all ARNG) SRF technicians were employed. During the month of June, temporary-hire civilians and 1,015 man-months of overtime were used to accomplish the ARNG objective.

Army aviator strength in the Army National Guard was 1,953 at the end of the year. The USAR aviator strength as of May 31 was 526. Aircraft utilization in the ARNG decreased due mainly to deferment of depot maintenance support for extensive periods because of active Army high priority requirements and difficulties in obtaining repair parts for earlier-model aircraft.

On June 30, 867 Army advisors were assigned to the Army reserve components, 509 to ARNG units, 358 to USAR units. This represents a net decrease of 573 (ARNG 266, USAR 307) for fiscal year 1966. Due to active Army requirements in Southeast Asia, no improvement is expected in the immediate future.

Heretofore, the Department of Army policy has been that training assemblies conducted at home stations would be of at least 2 hours duration. However, all units were encouraged to schedule a minimum of six multiple drill periods by conducting a number of single training assembly periods in 1 or 2 days. In these instances each training assembly was required to be of 4 hours duration.

Throughout fiscal year 1966, increased emphasis was placed on the conduct of multiple training assemblies at field training sites, and the Department of Army announced that effective October 1, 1966, all unit training assemblies will be of at least 4 hours duration. In addition, all units will be required to schedule, as a minimum, six multiple training assemblies each consisting of 4-hour periods. This will mean that most units will conduct a minimum of six weekends of training at a field training site; and in many instances unit commanders will elect to complete the total annual training assembly requirement by the use of weekend drills. The lengthened training assemblies and the encouragement for unit commanders to conduct a maximum of training in the field will contribute significantly to the attainment of improved readiness levels by the Army reserve components.

During fiscal year 1966 attendance at unit training assemblies averaged approximately 95 percent for the ARNG and 88 percent for the U.S. Army Reserve.

Because of the worldwide commitments of active Army forces, major field exercises were limited in fiscal year 1966. LOGEX 66 conducted at Fort Lee, Va., was the only major exercise for the Army reserve components. Certain ARNG units, with a total of 1,398 personnel, were provided air mobility training with the 26 USAR units (with 6,066 personnel) which had air mobility training.

Resident courses at the Army service schools provided a portion of the professional and specialty training for 13,863 (ARNG 6,862; USAR 7,001) members

of the reserve components. Participation in the Army area schools was 7,849 (ARNG 1,418; USAR 6,431). Initial enrollment in the State Officer Candidate Schools for the year was 4,217 and established a new record.

The reserve component school system, conducted by USAR personnel at night or on weekends, was operated in 344 locations, including Hawaii, the Philippines, Puerto Rico, Germany, France, Italy, England, and Spain. Total opening enrollment was 18,322.

There were 48 NIKE-HERCULES ARNG batteries in the continental United States (CONUS) and 6 in Hawaii as the fiscal year closed. The batteries were manned by ARNG technicians 24 hours a day, 7 days a week. The CONUS batteries were a part of the Army Air Defense Command's protection of selected population centers against air attack.

Following the inactivation of the USAR Reinforcing Reserve units, the equipment of these units was redistributed to the units of the U.S. Army Reserve being retained, giving first priority to the Selected Reserve Force. A relatively small portion of those assets were transferred to the Army National Guard units, and a few items were returned to the active Army.

With the establishment of the Selected Reserve Force, a program was initiated to raise the standard of its equipment from training serviceability to combat serviceability and, to that end, provisions were made for the increased supply of repair parts. Intensive maintenance programs at the organization and direct-support levels were supplemented by commercial overhaul contracts for the U.S. Army Reserve administered by U.S. Army depots.

Some major equipment items were withdrawn from the reserve components for use by the active Army during fiscal year 1966. Items withdrawn included 40-mm. gun (M-42 AWSP), 106-mm. recoilless rifles, self-propelled 105-mm. howitzers, and various types of wheeled vehicles. At the same time, additional equipment was issued to the reserve components including a number of the new self-propelled 8-inch howitzers (M-110), the self-propelled mortar carriers (M-106A1), and the M-60 machineguns. A sizable quantity of M-38A1 $\frac{1}{4}$ -ton trucks were issued to the Army National Guard during the last half of the fiscal year, in an "as is" condition. Approximately 50 percent of the ARNG M-48 combat tanks were replaced with M-48A1 models.

At the close of the fiscal year, reserve components units generally had sufficient equipment for effective training. The significant shortages were items also in short supply for the active Army. Overall, during the period July 1, 1964, to May 23, 1966, equipment with a value of approximately \$94 million was withdrawn from the reserve components and equipment valued at approximately \$74 million was issued, a small part of which was to replace equipment withdrawn.

Under a Department of the Army plan approved during fiscal year 1965 by the Secretary of Defense, military support of civil defense planning headquarters were established in each State and the Commonwealth of Puerto Rico, under their Adjutants General. Additional full-time officers and enlisted men in technician status, paid from Federal funds, were being added to the National Guard State headquarters to act as a military support of civil defense planning staff. The Commanding General, USCONARC, CONUS Army commanders, and Unified Command commanders of Alaska, Hawaii, and Puerto Rico are responsible for the planning and conduct of military support of civil defense in their areas, utilizing the State Adjutants General and their State headquarters. All military personnel, active and reserve, are reported by their respective Service chiefs as being potentially available for military support of civil defense. Upon declaration of a national emergency involving a nuclear

attack on the United States, military resources not committed to higher priority missions will be made available to State Adjutants General as required for the military support of civil defense. Military support of civil defense will complement and not be a substitute for civilian participation in civil defense operations.

Every State depends on the National Guard for assistance in natural disasters and extreme emergencies when control and recovery are beyond the capabilities of State and municipal agencies. The cost of these activities is borne entirely by the States. Among the emergencies for which assistance was requested from the ARNG during fiscal year 1966 were forest fires in Oklahoma; search and rescue in Nebraska and South Dakota blizzards; a tornado in Florida; aerial spray with coal dust and chemical pellets in Iowa to hasten the melting of a 10-mile ice jam on the Mississippi River; floods in Arizona (first in State history) and California; power failure in New York City, New York State, and much of New England; and riot duty in the Watts area of Los Angeles, Calif.

Concurrent with the announcement related to the proposed reorganization of the Army reserve components, all programmed construction projects not under contract were suspended and no further design contracts or minor construction projects were undertaken pending a review of facility requirements to support the realigned reserve force.

When it became apparent that a decision on the proposed reorganization was to be delayed for an extended period of time, it was determined desirable to go ahead with those projects which could be justified as satisfying a bona fide requirement under either the present force structure or the proposed force structure, provided the project was justified as urgently required for health, safety, or other compelling reasons.

During fiscal year 1966, there were no new Army National Guard armory or U.S. Army Reserve center projects placed under contract. There was one non-armory training project placed under contract at Camp Grayling, Mich., for the Army National Guard. Twenty-nine projects (24 armory and 5 nonarmory) for reserve component facilities already underway from prior years were completed. A program was undertaken for the acquisition and development of field training sites for weekend assemblies of SRF units in accelerated training. Planning for the improvement of training facilities at weekend and annual field training sites is currently in process.

At the end of the fiscal year, the reserve components required and occupied 3,818 armory-type facilities (ARNG 2,786; USAR 1,032). These included 2,643 State-owned and licensed, 364 federally-owned, 479 leased, and 132 donated or occupied by permit.

U.S. Naval Reserve

The overall readiness of the Naval Reserve continues to be evaluated as good. Unit forces of the Selected Reserve include 17 destroyers (DD), 21 destroyer-escorts (DE), 12 minecraft, and 38 fleet-sized aircraft squadrons of which 23 are antisubmarine warfare (ASW) squadrons. The ASW ships would require a brief refresher training period and the carrier aviation squadrons would require carrier qualifications before being fully combat ready. Minecraft and aircraft patrol and transport squadrons are ready now. However, the scheduled shipyard overhauls for 5 of the 21 DEs were deferred due to higher priority active fleet requirements. A reduction in material readiness of these ships accompanies these deferrals. Sufficient tactical aircraft are available to outfit either the Naval or Marine Corps Air Reserves if called to active duty, but not both.

Since 1958 the Navy has maintained the Selected Reserve as the highest trained and immediately responsive part of the Ready Reserve. It is designed to meet the essential mobilization day increment requirements of full mobilization, or the needs of any lesser contingency, and includes all drill pay personnel of the Naval Reserve together with assigned ships and aircraft. These personnel carry pre-cut orders to their mobilization billets, issued and kept current by the Naval Reserve Manpower Center at Bainbridge, Md.

The Selected Reserve is organized into five parts: Anti-Submarine Warfare, Mine Warfare, Fleet Augmentation, Fleet Support Activities, and Shore Establishment. Highest priority is assigned to the ASW and Mine Warfare part, plus certain squadrons assigned to Fleet Augmentation. These units are authorized more than the usual 48 paid drills per year to insure the highest possible degree of readiness, and their active training duty is performed as units of the fleet, often participating in major fleet exercises.

Drill pay strength of the Selected Reserve has been maintained near the authorized ceiling of 126,000 officers and men, and quality has improved by more effective inactive duty training. Drill pay personnel hold mobilization orders effective automatically in event of an attack upon the United States, or when directed in a lesser emergency. These orders are kept current by a continuous matching of personnel qualifications against M-Day billet requirements at the Naval Reserve Manpower Center (NRMC), Bainbridge, Md.

In addition to the officers and men in drill pay status, the Selected Reserve also includes men in non-pay status who have been preselected for mobilization billets, of whom approximately 20,000 are voluntarily drilling without pay. All have recently served at least 2 years on active duty and are fleet trained. Their mobilization orders are held by, and would be mailed from, local mobilization centers after M-Day on a time-phased basis. These orders also are maintained current by the NRMC.

The total Selected Reserve strength is the number of Ready Reservists the Navy is authorized to recall involuntarily in a national emergency declared by the President. Although there are some shortfalls in specific billet requirements by rank and designator, rating, and pay grade, the Naval Reserve in general could meet its M-Day requirements under this condition. The total requirements for officers and enlisted men under a full-scale mobilization which could not be satisfied within current Naval Reserve resources would be met through accelerated training programs, direct procurement of qualified personnel, use of ex-Navy volunteers, and other suitable procurement methods. Inactive Ready Reserve strength increased by 10,173, and there was an increase of 8,557 Ready Reserves serving on active duty. The Standby Reserve decreased by 7,722 and the Retired Reserve increased by 9,698.

Ready Reserve officer numbers declined from 55,231 to 53,282 during fiscal year 1966, a drop of 3.5 percent compared to 1.8 percent in fiscal year 1965. This loss is partially offset by an increase in the number of reserve officers serving on active duty. Standby Reserve officer numbers decreased by 6,290 to a total of 48,384 and the Retired Reserve increased by 9,045 to a total of 74,326.

Previous strength projections indicated that the large numbers of officers reaching retirement eligibility and mandatory attrition points would continue to exceed the numbers released from active duty under tightened Ready Reserve screening regulations which became effective in January 1965. Increased accessions during fiscal year 1966 nearly equaled the total loss, and it now appears that Ready Reserve officer strength should increase in 1967 or 1968.

Ready Reserve enlisted numbers not on active duty increased to a total of 283,871. This increase was due primarily to an excellent recruiting climate experienced through most of the year. This gain was made at the same time that reservists serving on active duty increased by 8,132 to a total of 65,580 by the end of fiscal year 1966, most of whom were fulfilling their 2 years of obligated service with the fleet.

As anticipated, the Standby Reserve enlisted strength continued to decline but at a much slower rate, with a loss of 1,432 for a year end total of 15,835. This compares to a total drop of 2,811 enlisted Standby Reservists in the previous year. Retired Reserve enlisted strength increased by 653 to a total of 4,132.

Major accomplishments to strengthen the Naval Reserve during fiscal year 1966 included the following.

The ASW ships now include 17 DDs and 21 DEs, with continuing replacement of DEs by DDs programed in subsequent years, with 39 reserve crews assigned to these 38 ships. In addition to the regular monthly weekend drills for each reserve crew, 251 Reserve cruises in these ASW ships were planned for fiscal year 1966, and a total of 286 were actually conducted. Each of these cruises was from 12 to 14 days in length.

Transitioning to the F-8 jet fighter and A-4 jet attack aircraft was completed during fiscal year 1966, providing these high performance aircraft with qualified pilots and support personnel in the Naval Air Reserve.

Pilot transition at the eight air stations, which had received 25 C-118 transport aircraft, was 100 percent complete at year end.

There was increased participation by both Naval Reserve training ships and aircraft squadrons in major and minor fleet exercises for operational training on both 2-week annual cruises and on weekend drills.

Continued reduction of the aircraft accident rate in the Naval Air Reserve from 0.66 accidents per 10,000 flying hours to an historic low of 0.62 accidents per 10,000 flying hours was achieved through emphasis on safety procedures and utilization of extra drills for proficiency flying.

In May of 1965 at the request of the Commander-in-Chief of the Pacific Fleet, the Naval Air Reserve began airlifting high priority Navy cargo to Southeast Asia. As of June 30, 1966, 7,587,669 ton miles of cargo had been carried westward and 33,753,566 passenger miles had been accumulated on return flights. This airlift was flown with volunteer reserve crews and will continue for the foreseeable future.

The screening regulations were tightened in an effort to insure that all Ready Reserve personnel are in fact available for active service on recall and that they are in billets which represent actual augmentation of the regular forces.

There was increased utilization of class A schools by approximately 7,100 men in fiscal year 1966, either just prior to their reporting for 2 years' active duty or at their first duty station. These men have all accepted an obligation to serve at least 2 years in a drilling unit of the Selected Reserve after release from active duty, by which time nearly all will have become petty officers.

The percentage of men reporting to active duty in pay grade E-3 or higher increased from 59.5 percent to 75.1 percent, and the average duration of their pre-active duty training decreased. Men reporting as E-3 are of more use to the Fleet and far more likely to advance to petty officer grade during their 2 years of active duty. Also, the decrease in the pre-active duty period means longer post-active duty Ready Reserve service when they are most valuable for mobilization purposes.

It was required that the pre-active duty training program provide for: (1) Qualification for a mobilization billet in pay grade E-2 within 6 months of enlistment; (2) recruits being kept out of the Selected Reserve until so qualified; (3) earlier classification and assignment to a path of rate training to meet mobilization requirements; (4) increased use of apprentice rate training at the E-2 level; and (5) completion of pre-active duty training by orders to active duty or to a class A school within 1 year of enlistment.

The Naval Reserve surface units currently occupy 429 training facilities, 23 less than the preceding year. Of the 429, 123 are jointly utilized with the Marine Corps Reserve, 107 with the Coast Guard Reserve, 24 with the Air Force Reserve, 43 with the Army Reserve, and 12 with the Army National Guard. The aviation components of the Naval and Marine Corps Reserve continue to operate from 12 Naval Air Stations and six Naval Air Reserve Training Unit stations.

During the fiscal year 1966, \$8.89 million was obligated for the construction of facilities for the Naval and Marine Corps Reserves. Long-range requirements, which include the construction of facilities at Naval Air Stations for the Naval Air Reserve and Marine Corps Reserve aviation and the rehabilitation or replacement of existing training centers for nonaviation elements, are estimated to be on the order of \$80 million.

U.S. Marine Corps Reserve

With the exception of certain personnel deficiencies, the Marine Corps Ready Reserve is capable of meeting its mobilization assignments. Deficiencies are for the most part shortages of junior officers, noncommissioned officers in the rank of sergeant and above, and certain hard-skill MOSs. These deficiencies can be reduced to an acceptable level by making grade and MOS substitutions.

The strength of the inactive duty Marine Corps Reserve increased during fiscal year 1966. As of June 30, 1966, the inactive duty Marine Corps Reserve strength was 148,977, a gain of 14,975 over fiscal year 1965. Of this total number, 115,051 are in the Ready Reserve. Within the Ready Reserve 48,000 (the authorized fiscal year end strength) are in the Organized Reserve.

The Ready Reserve strength at the end of fiscal year 1966 met the initial M/1 month mobilization requirements.

The Organized Marine Corps Reserve has a sound training program designed to produce the strongest, most effective Reserve force possible at an economical cost.

The excellent progress achieved in building and maintaining a trained Ready Reserve combat force is due to three prime reasons. First is the concept of predesignating a majority of the Organized Marine Corps Reserve units for unit deployment as elements of the 4th Division/Wing. Second is the experience of the Reserve officers who voluntarily remain in the units of the Organized Marine Corps Reserve. Third is the 6-month training program which provides fully trained, professional basic marines to the Reserve units.

The present structure of the Marine Corps Reserve provides flexibility to meet mobilization requirements of varying magnitudes, permitting response to a requirement for individuals, trained units, or a combination of these. During fiscal year 1966, significant progress was made in the Organized Marine Corps Reserve to increase the readiness posture of both individuals and units. Major actions to achieve this progress were:

Designation of the Commanding General, Marine Air Reserve Training Command (MARTC) as the Commanding General, 4th Marine Air Wing (MAW).

His duties as CG, 4th MAW, will be in addition to his regular duties as CG, MARTC.

Redesignation of 11 units was accomplished in February 1966. These units established headquarters companies for regimental-size units and the major elements of a Force Service Regiment.

Activation of a Spanish language detachment and a unit of the Force Service Regiment was accomplished in February 1966.

Activation of the 4th Division headquarters nucleus was achieved in March 1966. This headquarters, located at the Marine Corps Base, Camp Pendleton, Calif., is charged with making all necessary preparations for mobilization of the 4th Division and its combat support forces.

Deactivation of 11 units was accomplished in April 1966, and their mobilization missions were absorbed by units that were redesignated or activated.

Establishment of the Basic Specialist Training Program now provides intensive MOS training following recruit and individual combat training and continuation of the Technical Training Program.

The Marine Corps Reserve's Readiness Reporting System parallels the one in effect for the regular establishment, giving the Commandant a more complete appraisal of the total Marine Corps capability. The Readiness Reporting System has made it possible to evaluate accurately the effectiveness of the actions enumerated above. Recent reports have indicated continued improvement in the capability of the Marine Corps Reserve to perform its assigned mobilization missions. These reports also indicate certain deficiencies which detract from achievement of a maximum readiness stature, and these are receiving increased attention. As mentioned above, these include a shortage of certain major items of equipment, principally aircraft and aircraft supply, and a grade and hard skill MOS shortage in personnel.

Additionally, the multiple drill concept of one full weekend of training each month has made a significant contribution to the improved readiness posture of the Organized Marine Corps Reserve units.

Equipment

Aviation

The Marine Air Reserve, under the command of the Commandant of the Marine Corps, is logistically supported with facilities, aircraft, and related equipment furnished by the Chief, Naval Air Reserve Training. Procurement and support of Marine Corps-furnished equipment are by the Commandant of the Marine Corps.

During fiscal year 1966, F-8 and A-4 aircraft replaced all other tactical jet aircraft in the 4th MAW. These aircraft are not entirely satisfactory for training needs because they do not possess independent all-weather capability. Planes to perform electronic warfare or aerial refueling tasks are also lacking in the training inventory of aircraft.

Since enough UH-34-type helicopters are not available, the Organized Marine Corps Reserve is continuing to use the Navy antisubmarine-equipped SH-34G for maintaining flight proficiency. This helicopter is not completely satisfactory for training needs since it cannot be used to transport troops or heavy loads in air/ground training. Also, no heavy vertical lift or observation helicopters are available. As a result, tactical training of troops in helicopter operations is limited. Improvement of the aircraft situation is expected beginning in fiscal year 1967 through increased availability of UH-34-type helicopters. In later years a modernization program will commence to overcome the limitations of currently assigned aircraft.

During fiscal year 1966, Project HAIL, established in fiscal year 1965, continued to receive material for protection as war reserve stocks for the 4th MAW. Although appropriations have been made and there has been significant progress in the procurement of most items, there is a lag in obtaining aircraft support and Section M equipment, attributed to the long leadtime required for the majority of these items.

Ground

Equipping newly activated units, including the 5th Marine Division, created temporary equipment deficiencies in the ordnance, motor transport, and communication-electronic categories, by the draw-down on the pre-positioned war reserve stocks of the 4th Marine Division. The 4th Division still has the material capability of being mobilized subject to a few major restrictions in certain equipment categories. These deficiencies will be alleviated by authorized funding and current procurement during the latter part of fiscal year 1967 for the majority of items, and during fiscal year 1968 for the remainder.

Unit and individual equipment in the hands of the Organized Marine Corps Reserve is adequate to support the training mission. With the exception of certain types of radio equipment, major equipment items are of the same type used by the active Fleet Marine Forces.

Facilities

The Marine Corps Reserve effects maximum utilization of joint facilities in accordance with the policy expressed in the law and in Department of Defense policy concerning use of rental property.

At the end of fiscal year 1966, Marine Corps units occupied a total of 195 facilities. These are:

- 129 centers occupied jointly with the Navy or Army, or under other Service arrangements;
- 40 exclusively owned Marine Corps Reserve Training Centers;
- 7 exclusively leased Marine Corps Reserve Training Centers;
- 17 at Naval Air Stations;
- 1 at an Air National Guard Base; and
- 1 at a Marine Corps Base.

Improvement of ground training centers made during fiscal year 1966 to provide more adequate facilities included:

Completion of new training centers.....	3
Relocation of training center complex.....	1
\$300 to \$1,000 projects authorized for centers.....	65
\$1,001 to \$10,000 projects authorized for centers.....	46

Funds for operation and maintenance were appropriated as "Activity 4" (Marine Corps Reserve Training) of the Operations and Maintenance appropriation, covering purchase of supplies, major repairs, and minor construction of training facilities. About 98.1 percent of the funds available were used. The status of end-fiscal year 1966 operation and maintenance funds was as follows:

Departmental request (w/reimbursement).....	\$5,231,000
Appropriation	5,199,110
Apportionment (w/reimbursement).....	5,387,001
Recorded obligations (June 30, 1966).....	5,284,472

Air Reserve Forces

During fiscal year 1966 the Air National Guard and the Air Force Reserve displayed increased combat capability and readiness by ably assisting the U.S. Air Force in the execution of active Air Force missions. In many cases training programs were designated to suit such Air Force needs, producing an important force augmentation. In the flying units of the Air National Guard and the Air Force Reserve inspection to determine combat readiness was based upon the same criteria as those used for the active Air Force.

The growing requirements to prosecute the war in Vietnam also increased assignments for the Air Reserve Forces. Their direct support of the Military Airlift Command (MAC), the Tactical Air Command (TAC), and other major air commands helped ease some of the pressures brought about by increased demands levied upon the Air Force. The results achieved from Air Reserve Forces special missions as well as those accomplished as a byproduct of regular training are reflected, in part, in the more than 9 percent of MAC's total cargo airlift being moved by Air National and Air Force Reserve units. This represented 3,327 missions covering 175,627 flying hours and delivering 36,739 tons of cargo and 87,100 passengers.

A special humanitarian project was conducted during the months of November and December of 1965 by the Air Reserve Forces in executing a mission given to the Air Force by the Secretary of Defense. Operation CHRISTMAS STAR delivered Christmas gifts, collected from all parts of the Nation and by the U.S. Air Forces in Europe, to military personnel in Southeast Asia. The Continental Air Command, serving as coordinating agency for the Air National Guard and the Air Force Reserve troop carrier and military airlift units, worked with the 118th Military Airlift Wing, Nashville, Tenn., which was the basic coordinating point for all ANG participation. Eighty-five oversea missions were completed (75 ANG via C-97 and C-121 aircraft and 10 AFRes flying C-124 aircraft) delivering 630 tons of cargo, 160 tons of which represented MAC military cargo and the balance gifts. In addition, Air Force Reserve C-119 troop carrier units performed 121 missions in the Zone of the Interior, delivering 427 tons of cargo to pick-up points. This highly successful effort was accomplished by volunteer Air Guard and Air Force Reserve crews.

To help meet the demands of the Vietnamese conflict, Air National Guard and Air Force Reserve units participated regularly in airlift operations to the war area. For fiscal year 1966, 1,219 missions to Southeast Asia, totaling 54,424 flying hours, carried 10,998 tons of cargo and 1,820 passengers. Aircraft of the Air Reserve Forces utilized were C-97's, C-121's, and C-124's.

Inactivations in the Air Force Reserve during fiscal year 1966 included the 919th and 920th Troop Carrier Groups (C-123), Memphis Municipal Airport, Tenn.; the 923d Troop Carrier Group (C-119), Carswell AFB, Tex.; the 902nd Troop Carrier Group (C-119), Grenier AFB, N.H.; and three mobile communications squadrons with 21 detachments.

In December 1965, the Department of Defense announced the programed inactivation of eight Air Force Reserve C-119 troop carrier groups and three Air National Guard C-97/C-121 air transport groups. The ANG units were scheduled for inactivation in fiscal year 1967 and the Air Force Reserve units in fiscal year 1968.

Civil relief activity of the Air Reserve Forces included assistance rendered during the July 1965, Baytown, Tex. fire; the August 1965, Los Angeles (Watts

area), Calif., riots; the *Yarmouth Castle* sea disaster in November 1965; the Eureka, Calif., and Phoenix, Ariz., floods in January 1966; and the Grand Forks, N. Dak., flood during March 1966. Assistance in these disaster relief operations included airlifting of supplies and personnel, evacuation of the injured and stranded, medical service, and communications.

Air Reserve Forces personnel strengths in various categories as of June 30, 1966 were:

ANG units.....	79,883
AFRes units (include 513 nonprior-service personnel in delayed training status)	38,973
AFRes mobilization augmentation personnel.....	8,781
AFRes Ready reinforcements.....	2,226
AFRes nonprior-servicemen on AD training.....	1,419
AFRes in specialty training.....	659
AFRes Ineligible Reserve Section.....	143,302
Air Reserve squadrons.....	14,102
 Total Ready Reserve.....	 289,345
 Nonaffiliated Reserve Section (Nonobligors).....	 22,262
Nonaffiliated Reserve Section (Obligors).....	11,934
Inactive Status List Reserve Section.....	111,244
 Total Standby Reserve.....	 145,440
 Retired Reserve.....	 56,613
 Total Air Reserve Forces.....	 491,398

This represents an increase in strength of the Ready Reserve units of both the Air National Guard and the Air Force Reserve. The increase, in part, has been produced by conversions of five Air Force Reserve C-119 groups to C-124 aircraft; and approval in September 1965 for 11 military airlift groups of the Air Force Reserve and 9 tactical fighter groups, 4 tactical reconnaissance groups, and 1 tactical control group of the Air Force National Guard to man to 100 percent of their manning authorizations as a part of the selected reserve ("Beef Broth" units).

Drill pay ceilings still preclude the total manning of the Air National Guard units at their full wartime strength. As a result, some units are manned at a strength less than required to be rated fully "combat ready."

During fiscal year 1966 plans were completed for a Chaplain Area Representative program (CHAPAR) to make reserve chaplains available to active force, retired, and reserve personnel and to their dependents for spiritual guidance and other services, particularly in areas where there is no U.S. Air Force base nearby.

A Specialty Training program with 8 squadrons and 27 flights began January 1, 1966, in test form. It is designed to train Air Force reservists in specific specialties for which the Air Force has a mobilization requirement. Training is accomplished in groups of officers and airmen assigned to the same career fields. Areas of instruction include communications, development engineering, transportation, security and law enforcement, accounting and finance, data systems, command and staff management, education and training, aircraft maintenance, administration, civil engineering, supply, and personnel. Although the test period

was to end June 1, 1966, it has been extended to June 1, 1967, to allow for complete analysis.

The Air Force has received outstanding assistance from over 1,000 U.S. Air Force Academy Liaison Officers (LOs), all of whom are reservists not on extended active duty. These officers devote time and effort in counseling young men about the Air Force Academy, seeking to motivate those young men with the highest qualification to apply for entrance. Eighty-four percent of the entering class of 1966 had been counseled by a liaison officer.

The Air Reserve Forces active inventory of mission aircraft as of June 30, 1966 totaled 1,994. These included the following types:

Air National Guard

Type:	Number	Type:	Number
F-84F -----	263	F-101A/B/C/F -----	60
F-86H -----	76	F-89J -----	100
RB-57A/B/C -----	30	F-102A -----	308
F-100C -----	213	C-97 -----	154
RF-84F -----	134	C-121 -----	55
U-6/HU-16/C-119 -----	56	C-123J -----	8
KC-97 -----	63		
F-105B -----	26	Total -----	1,546

Air Force Reserve

Type:	Number	Type:	Number
C-119 -----	367	HC-97G -----	8
C-124 -----	97		
HU-116B -----	19	Total -----	495
KC-97G -----	4		

One relocation was effected during fiscal year 1966 when an Air Force Reserve Troop Carrier Group moved from Bradley Field, Windsor Locks, Conn., to Westover AFB, Mass. Upon relocation, the C-119 Troop Carrier unit was converted to C-124 aircraft and redesignated a Military Airlift Group.

Needed construction of AFRes training facilities for flying units was temporarily deferred due to the priority given to military construction requirements in direct support of Vietnam. Conversion from C-119 to C-124 aircraft and the increased recruiting resulting from this reorganization increased the requirement for administrative and training space. Although these are urgently needed facilities, they are of lesser priority than the on-line aircraft maintenance facilities required to meet the C-124 aircraft conversion schedule.

ANG and AFRes units continued to progress toward optimum combat readiness during the year. Within the "Beef Broth" units, by the end of fiscal year 1966 four of the 11 C-124 Air Force Reserve Military Airlift Groups had reached full combat readiness and five were combat ready except for minor deficiencies. Of the nine Air National Guard Tactical Fighter groups, four were fully combat ready and five combat ready but for minor deficiencies. Two of the four Tactical Reconnaissance groups were fully combat ready, and two combat ready with minor deficiencies.

Combat ready ratings of all flying units of the Air Reserve Forces at the end of fiscal year 1966 were:

AIR NATIONAL GUARD

Fully Combat Ready (C-1) :

Tactical fighter (F-105, F-100C, F-86H, F-84F)	4
Tactical reconnaissance (RF-84F, RB-57, F-101)	2

Combat Ready but with Minor Deficiencies (C-2) :

Air defense (F-102, F-89J)	13
Tactical fighter	10
Tactical reconnaissance	3
Military airlift (C-121, C-97)	19
Air refueling (KC-97)	3
Air commando (HU-16, C-119, U-6)	2

Marginally Ready with Some Mission Capability (C-3) :

Air defense	5
Tactical fighter	8
Tactical reconnaissance	3
Military airlift	3
Air refueling	3
Air commando	2

Not Ready (C-4) :

Air defense	4
Tactical fighter	1
Tactical reconnaissance	4
Military airlift	1
Air transport (C-123)	1

In the Air National Guard the majority of the units which were rated "not ready" and "marginally ready" were either undergoing conversion of aircraft or had manning limitations.

AIR FORCE RESERVE

Fully Combat Ready (C-1) :

Troop carrier (C-119)	17
Military airlift (C-124)	4

Combat Ready but with Minor Deficiencies (C-2) :

Troop carrier	7
Military airlift	5
Aerospace rescue and recovery (HU-16, KC-97G, HC-97G)	1

Marginally Ready with Some Mission Capability (C-3) :

Military airlift	1
Aerospace rescue and recovery	2

Not Ready (C-4) :

Troop carrier	6
Military airlift	1
Aerospace rescue and recovery	2

"Marginally ready" and "not ready" ratings are the result of aircraft conversions.

Air Reserve Forces capability and value have been demonstrated in the extensive use made of the Air National Guard and Air Force Reserve units although they are not recalled to active duty. All such activity was a voluntary effort by Air National Guardsmen and Air Force Reservists.

The Air National Guard

The Air National Guard fighter-interceptor units continued to perform a large portion of the Air Defense Command's runway alert operations including intercept and identification missions in CONUS, Hawaii, and Puerto Rico. These aircrews spent more than 98,000 man-days on alert (of which 16,500 were nuclear alerts), flew more than 28,000 hours in 15,200 sorties, and attempted 37,371 intercepts of which 35,739 were successful.

The Air National Guard assisted Air Force General Purpose Forces in 12 exercises during fiscal year 1966 in support of Tactical Air Command and JCS combined exercise programs. Eight of these were performed overseas. In this effort the Air National Guard logged 163,883 flying hours of which 91,627 were tactical fighter activity, 41,045 were tactical reconnaissance, 15,112 were on air commando missions, and 16,099 air refueling. General purpose aircraft of the Air National Guard include:

Type:	Number
F-84F -----	263
F-86H -----	76
RB-57A/B/C -----	30
F-100C -----	213
RF-84F -----	134
U-6/HU-16/C-119 -----	56
KC-97 -----	63
F-105B -----	26
F-101A/B/C/F -----	60
Total -----	921

Airlift missions by air transport units of the Air National Guard and Air Force Reserve, in support of the Military Airlift Command, were performed during required overwater training as well as on special assignments. The 25 Air National Guard groups, with 215 C-97 and C-121 aircraft, flew more than 2,200 oversea missions, moving 29,783 tons of cargo and 85,707 passengers in 161,122 flying hours. Essential cargo and passengers were airlifted to Southeast Asia, Europe, South America, Japan, Bermuda, Newfoundland, and Guantanamo Bay (Cuba).

The Air National Guard also assumed an aeromedical evacuation responsibility in August 1965, airlifting patients in CONUS and near off-shore areas. By the end of the fiscal year ANG Aeromedical Evacuation units had completed 598 missions, covering 3,381 flying hours, transporting 6,566 patients and 4,372 other passengers.

On resupply missions for the Alaskan Air Command the ANG C-123 unit flew 2,485 hours, delivering 776 tons of cargo and 1,664 passengers.

Fifty-eight ANG aircraft and crews flew 2,323 hours during 694 sorties in Exercises DIAMOND LIL XVIII, October 10-17, 1965; DIAMOND LIL XIX, January 23 to February 3, 1966; TROPIC LIGHTNING I, August 14 to October 2, 1966, and II, September 30 to December 4, 1965; CLOVE HITCH I, March 15

to April 1, 1966; SNOW SWEEP, June 19-26, 1966; and SEA RULER II, September 8-24, 1965.

Air National Guard force structure at the end of the year was as follows:

<i>Mission</i>	<i>Units</i>	<i>Aircraft</i>
Air Defense.....	22 squadrons...	F-102, F-89J.
Tactical fighter.....	23 squadrons...	F-105, F-100C, F-86H, F-84F.
Tactical reconnaissance.....	12 squadrons...	RF-84F, RB-57, F-101.
Air refueling.....	5 squadrons...	KC-97.
Air commando.....	4 squadrons...	HU-16, C-119, U-6.
Air transport.....	1 squadron...	C-123.
Military airlift.....	25 squadrons...	C-97, C-121.

Those Air Force reserve forces with wartime assignments to the Air Force Communications Service include seven Air National Guard mobile communications units plus the Air National Guard C-97 "Talking Bird." Their activities during fiscal year 1966 included operation and maintenance of the control tower and NAVAID facilities at the field training site at Alpena, Mich., from June 4 to August 27, 1965, in support of ANG flying units in training. This reduced the workload of the active Air Force units (AFCS) otherwise required. In addition, Vandenberg AFB borrowed an ANG mobile control tower while its own was under repair. Mobile communications units also trained in active communications centers at Scott AFB, Ill., Hamilton AFB, Calif., and Maxwell AFB, Ala.

The fixed aircraft control and warning squadrons of the Air National Guard at Greeley, Colo., and Salt Lake City, Utah, provided ground controlled intercept (GCI) coverage and master surveillance station coverage on a full-time basis. Two fixed ANG aircraft control and warning squadrons in the Hawaiian Islands complex provided air defense capability in that area for the Pacific Air Force. An ANG squadron on the island of Oahu and one on the island of Kauai provided the full GCI coverage on a 7-days-a-week, 24-hours-a-day basis. In Puerto Rico, the ANG squadron gave 14 hours per day GCI coverage from two locations—Ramey AFB and Punta Salinar.

The "Live Scheme" participation of 15 Air National Guard Ground Electronics Engineering Installation Agency Squadrons (GEEIA) and two communications maintenance squadrons assigned to AFLC repaired communications and electronics equipment on USAF programed projects. This relieved the overloaded active establishment while providing the ANG units with realistic training. A total of 113,546 man-hours was expended in constructive installation and maintenance of C-E equipment and systems, 88 percent being devoted to active Air Force projects.

The Air Force Reserve

Eleven Air Force Reserve military airlift groups, with 91 C-124 aircraft, provided direct support to the Military Airlift Command by completing 1,101 missions covering 14,505 flying hours, moving 6,956 tons of cargo and 1,393 passengers to destinations in Newfoundland, Bermuda, Europe, Southeast Asia, Alaska, South America, Canada, and Japan. Aeromedical evacuation programs of the Air Force Reserve in support of MAC produced 58 missions during 278 flying hours and transported 23 tons of cargo and 565 passengers.

During the final days of Operation POWER PACK, from July 1 to 5, 1965, Air Force Reserve C-119 units and crews performed 71 missions, flying 844

hours, covering 204,299 ton miles and 386,387 passenger miles, in the Dominican Republic crisis. This represented direct support to the Military Airlift Command and the Tactical Air Command.

Air Force Reserve troop carrier units, in support of TAC exercises, and of other commands (except MAC), completed 11,412 missions covering 53,363 flying hours, transporting 10,038 tons of cargo and 43,112 passengers. The 30 troop carrier groups with 427 C-119 aircraft also airdropped 392 tons of cargo and 117,251 troops, and airlanded 13,077 tons of cargo and 2,531 troops. In addition to TAC and MAC, Department of Defense and other agencies supported by Air Force Reserve airlift forces included the Alaskan Air Command, U.S. Air Force Academy, Air Defense Command, Air Force Logistics Command, Air Force Systems Command, Air Training Command, Air University, Continental Air Command, Strategic Air Command, Air Force Communications Service, U.S. Army, U.S. Navy, U.S. Marine Corps, Department of State, and the National Aeronautics and Space Administration.

TAC exercise support by the Air Force Reserve during ARCTIC SHORE, October 30 to November 15, 1965; KING CRAB, October 16-30, 1965; and CLOVE HITCH I, March 26 to April 9, 1966, produced 409 missions covering 3,042 flying hours during which 812 tons of cargo were delivered and 3,123 passengers were carried, in addition to five tons of cargo and 523 troops airdropped. For Air Defense Command mobility, the Air Force Reserve performed 25 missions during 226 flying hours and carried 110 tons of cargo and 237 passengers. In airlift for the ADC the Air Force Reserve flew 47 missions during 329 flying hours carrying 184 tons of cargo and 379 passengers.

Also for the active Air Force during fiscal year 1966, the Continental Air Command provided five Air Force Reserve aircraft and crews weekly to support U.S. Army Airborne training as well as additional aircraft to the Army Paratrooper School at Lawson Army Airfield, Fort Benning, Ga. The Air Force Reserve provided airlift for U.S. Army Reserve units to and from summer encampments, utilizing 150 aircraft.

The 434th Troop Carrier Wing (C-119), Bakalar AFB, Ind., improved the original version of the "Alamo Sling Shot" method of cargo drop which has been designed by the 433rd Troop Carrier Wing, Kelly AFB, Tex., in 1964. The improved version of "slinging" cargo containers out the rear hatch of the C-119 Flying Boxcar requires a double row of runways containing hundreds of rollers and an extended overhead yoke and winch. The system can now accurately eject more than 20,000 pounds of cargo on a single pass over the drop zone in less than 5 seconds into an area one-third smaller than that required for the gravity system.

To meet the Military Airlift Command's increased airlift requirements brought on by Southeast Asia needs, the 12 Air Force Reserve air terminal squadrons were on station at active USAF aerial ports for their 2 weeks of active duty. There the reservists worked alongside their counterparts in MAC to reduce backlogs. Four units trained at Hickam AFB, Hawaii, 5 at Travis AFB, California, 2 at McGuire AFB, N.J., and one at Charleston AFB, S.C.

During the year, five Air Force Reserve C-119 troop carrier groups were converted to the larger C-124 aircraft. Air National Guard conversions included four tactical fighter groups from F-89J aircraft to F-102A. Three ANG tactical reconnaissance groups converted from RB-57 to F-101 aircraft, and U-10 aircraft were withdrawn from four ANG commando groups which received U-6A's as temporary replacements.

The June 30, 1966, structure of the Air Force Reserve flying unit program was:

Military airlift.....	11 groups.....	C-124.
Troop carrier.....	30 groups.....	C-119.
Aerospace rescue and recovery..	5 squadrons....	HU-16, KC-97G, HC-97G

The Air Force Reserve aerospace and recovery squadrons, with a total of 25 aircraft (19 HU-16B, 4 KC-97G, 2 HC-97G), performed 297 missions covering 1,870 hours and delivering 127 passengers. Aircraft conversions from HU-16B to HC-97G began in fiscal year 1966 and will extend into fiscal year 1967. For expedience, some units were given KC-97G's on a temporary basis and will be converted to the HC series aircraft later.

Air Force Reserve medical units have made outstanding progress during the year in support provided active duty facilities as a byproduct of training, and have also improved their operational capability. The 21 medical service squadrons, 109 medical service flights, and 1 hospital helped in operation of weekend clinics at active Air Force bases and offered specialty consultation and emergency support. For example, at Nellis AFB, Nev., a reserve specialist took emergency calls while the active duty man recovered from emergency surgery which had been performed on him by another reserve specialist.

During this reporting period the 131 organized medical units of the Air Reserve Forces accomplished 65,000 dental examinations, 130,000 flying-physical examinations, 52,000 nonflying physical examinations, 500,000 immunizations, 75,000 X-rays, 18,000 electrocardiograms, and 195,000 other laboratory procedures.

Judge Advocate General Area Representatives (JAGARs), who are Air Force Reserve legal officers, have produced many important extra benefits for Air Force active duty, retired, and reserve personnel and their dependents. During fiscal year 1966 the JAGARs assisted in 688 real estate transactions, performing 760 special projects, gave 108 ROTC lectures, and accomplished 575 other services, or a total of 2,994 legal actions. Special projects included preparation of an evaluation report for the Department of Law, USAF Academy; preparation of an article on Law Day—USAF for Patrick AFB; research of state laws concerning benefits for reservists; office conferences; legal assistance by telephone; income tax assistance; and recruiting and casualty assistance.

The Coast Guard Reserve

The Coast Guard reports its reserve readiness as follows.

The Coast Guard Ready Reserve ceiling of 45,200, authorized by the Secretary of Defense on March 11, 1964, did not change during the year. The increase in personnel in the Ready Reserve from fiscal year 1965 through fiscal year 1966 caused a 4 percent increase in the ability of the Reserve to meet its Ready Reserve mobilization requirements. The Ready Reserve mobilization capability is now at 69 percent of the Ready Reserve ceiling. The requirements to be met by personnel in drilling units is 54 percent of the ultimate planned drill strength.

Coast Guard Reserve readiness cannot be called satisfactory at this time when task assignments are compared with the Ready Reservists available to carry out these assignments upon mobilization. While the Reserve is in excellent condition to meet requirements in the port security field, both the inadequacy of Organized Reserve unit strength for vessel manning, coastal forces, aviation, administrative and training support, and also a continuing shortage of adequate training equipment in most fields, must be recognized.

The total strength of the Coast Guard Ready Reserve not on active duty increased from 29,489 to 30,075 during fiscal year 1966, but the number of personnel assigned in a drill-pay status decreased from 16,578 to 16,041.

Training in a drill-pay status was provided in 288 organized units with 206 additional personnel training with various inter-Service training units. Volunteers in a nonpay status are assigned among 27 Coast Guard volunteer training units, seven Organized Reserve Port Security Units, and various inter-Service training units.

As of June 30, 1966, 118 organized units were designated as operational port security training units, with 897 officers and 7,731 enlisted men assigned. The concept of operational unit training as teams to perform specific functions upon mobilization was expanded by the organization of 5 additional Organized Reserve Port Security units (ORPSUs), making a total of 35. Each ORPSU is responsible for coordination of all Coast Guard Reserve port security training in a specific port area.

At the end of the fiscal year there were 517 officers and 3,444 enlisted men training for vessel augmentation and activation in Organized Reserve Training units, 27 more officers and 29 fewer enlisted men than a year before. Continued emphasis was placed on this activity particularly through preselection of recruits who are enlisted to train in the seagoing ratings.

Preselection was also being used for Coastal Force trainees in the six Coastal Force Organized Reserve Training units, which now number 32 officers and 305 enlisted personnel, compared to 31 officers and 280 enlisted men on June 30, 1965.

Training programs of other units continue to be reviewed to ensure alignment with mobilization requirements by rating and specialty.

A general shortage of training equipment for realistic operational training continued to exist. A special port security boat was designed during fiscal year 1966 to train men in wartime port security duties, and four boats were ordered with delivery scheduled for fiscal year 1967. With these, eight small boats will be available for port security training. Two additional Reserve training vessels were commissioned for operational shipboard and port security training. Five ships are used exclusively for Reserve training. Adequate training equipment and vessels will be acquired as funds become available.

Upon mobilization, unit operating equipment will be obtained through normal supply channels. Unit training equipment and training vessels will also be available to the regular service or to activated Reserve units.

The Coast Guard Reserve continued to drill at training facilities of other armed forces, primarily those of the Navy, or at facilities of Coast Guard operating units. In a few instances, other Government agencies' or commercial space was leased.

The Coast Guard Reserve Training Center at Yorktown, Va., is used for year-round training of Reserves on the east coast. During this year, 5,208 Reservists received training there in 24 courses or specialized areas of instruction. During the summer, a large variety of 2-week courses were taught for personnel on active duty for training. In the other 9 months the Center trained and graduated officer candidates and conducted many specialized and technical courses for both officer and enlisted Reservists. Most of the Center's buildings are of "temporary" World War II construction and need to be replaced. An approved unit development plan for the training center calls for renovation and replacement of facilities over a 10-year period.

On the west coast, the facilities of the Coast Guard Training Center at Alameda, Calif., are used for conducting the reserve summer training program.

One thousand and thirty-one Reservists participated in 19 specialized and rate training courses during fiscal year 1966.

The total fiscal year 1966 appropriation was \$23,550,000 which included a supplemental increase of \$1,050,000 for military pay raises. These funds maintained the Organized Reserve at close to the fiscal year 1965 level, providing a slight increase in the total Ready Reserve strength.

Reserve Officers' Training Corps

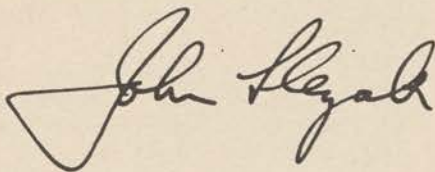
The Advisory Panel on ROTC Affairs operating under the Reserve Forces Policy Board met twice during fiscal year 1966 to review the current ROTC situation, especially the efforts and results of the services in the implementation of the ROTC Vitalization Act.

Despite the increase in the numbers of male college students and the increased incentives provided by the ROTC Vitalization Act, overall enrollment in the Senior Division ROTC Programs approximately equaled that of the year before. During fiscal year 1966 a substantially greater interest in the new 2-year ROTC program was demonstrated by approximately 3,300 students who enrolled for this year's 6-week Army basic summer camp as compared to the 623 who enrolled last year. Approximately 800 students enrolled this year for the 6-week Air Force basic summer camp, the same number as were enrolled last year.

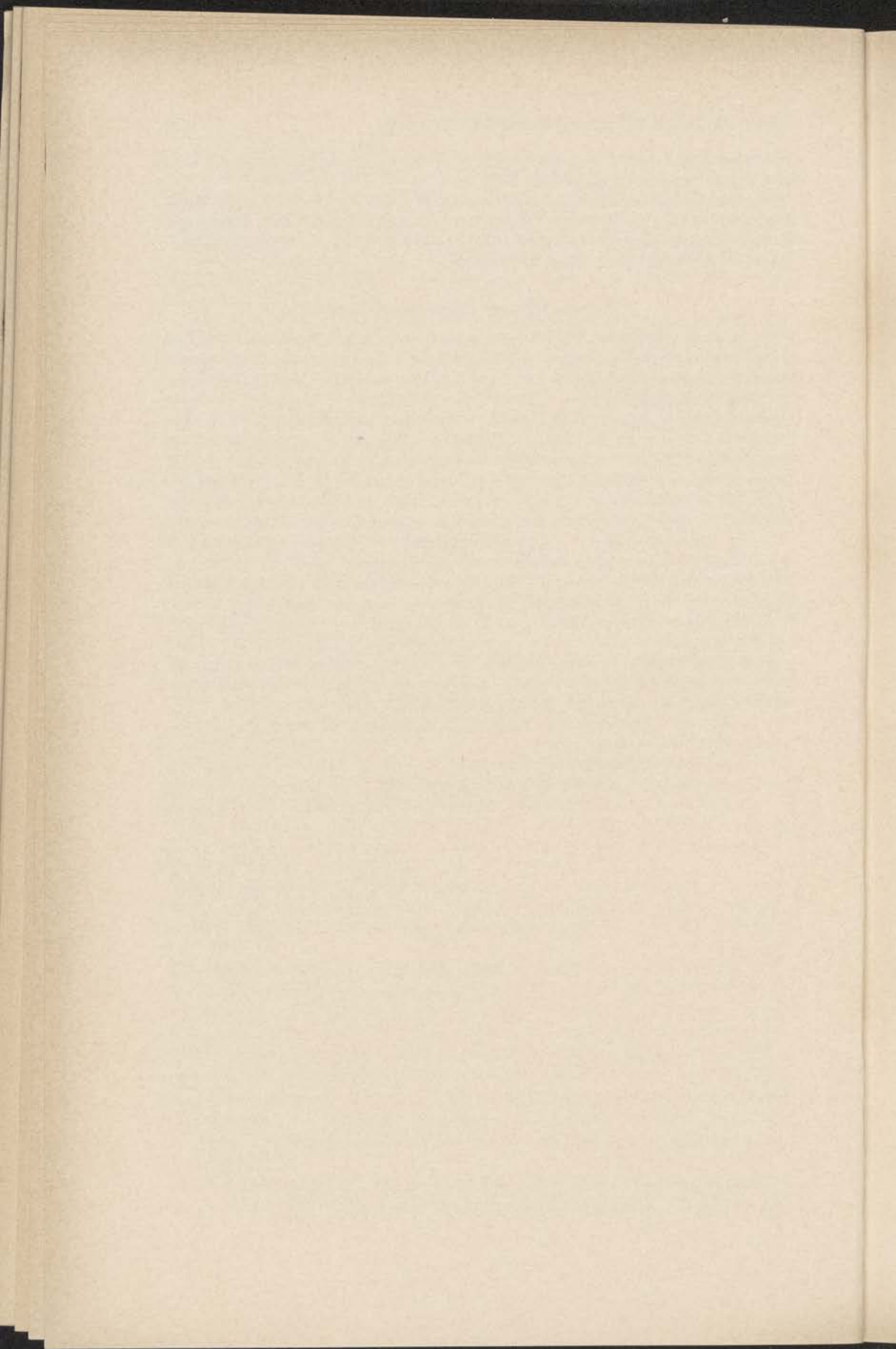
From the Navy ROTC program, which operates a primarily 4-year program at 53 institutions, about 15 percent of the graduates from the scholarship or "regular" program and 10 percent from the nonscholarship program are commissioned in the Marine Corps.

In addition to matters concerning enrollment and the meeting of Service ROTC-graduate requirements, other items of interest and importance considered by the Advisory Panel during this reporting period were:

1. Problems in connection with nonproductive ROTC units;
2. ROTC curricula;
3. Academic credit for ROTC courses;
4. Minority group participation in ROTC; and
5. Problems of selecting career-motivated ROTC students.

A handwritten signature in dark ink, appearing to read "John Slezak". The signature is fluid and cursive, with a large, stylized initial "J" and a long, sweeping underline that extends across the bottom of the signature.

JOHN SLEZAK,
Chairman, Reserve Forces Policy Board.



Annex B
ANNUAL REPORT
of the
DEFENSE SUPPLY AGENCY

July 1, 1965, to June 30, 1966

This is the fifth annual report of the Defense Supply Agency (DSA). As a consequence of the Southeast Asia situation, stock fund sales to the military Services during fiscal year 1966 increased about 55 percent to a total of \$2.92 billion. Moreover, projection of still greater demands in the future justified a considerable inventory buildup. Since these projections were validated and approved late in the year, they were reflected in a massive increase in obligations for future deliveries, although little increase in inventories had occurred by June 30, 1966. The year-end total of materiel on order was \$1.86 billion, however, almost equal to the Agency's total inventory on hand of \$1.99 billion. Therefore, this is in many respects an interim report, since the fiscal year ended during the preliminary phase of a major supply expansion program.

The timing of this report also reflects the first impact of a variety of problems connected with a rapid expansion of supply operations, before the effect of corrective actions became evident. For example, the number of customer requisitions processed increased 26 percent during the year, which quickly exhausted available stocks of some items. Because replenishment could not be effected in time, the surge in demand was accompanied by a drop of 4 percentage points in stock availability. Meanwhile, tonnage of materiel handled (shipped and received) increased by 66 percent, accompanied by a drop of 5.5 percentage points in on-time processing at depots. Although storage space available at DSA depots increased slightly during the year, available space utilized rose 9.5 percentage points to 78.5 percent.

One of the actions having major impact on DSA during fiscal year 1966, increasing both mission and personnel, was the completion of the nationwide establishment of Defense Contract Administration Services Regions (DCASRs). With the establishment on December 1, 1965, of the Los Angeles and San Francisco, Calif., regional headquarters, all 11 regions became fully operational, assuming functions and personnel previously associated with the military Services.

Changes in Agency Mission and Organization

The Defense Personnel Support Center (DPSC) was established at Philadelphia, Pa., on July 1, 1965, to replace the former Clothing and Textile, Subsistence, and Medical Supply Centers, all of which were disestablished during July 1965. The rationale for this change, and the expected benefits, were discussed in detail in the fiscal year 1965 report.

Effective September 30, 1965, five Defense Surplus Sales Offices (DSSOs) were disestablished, their missions and functions being transferred to other offices in

neighboring areas. The affected DSSOs were located at Seattle, Wash.; Pueblo, Colo.; Tinker AFB, Okla.; Memphis, Tenn.; and Rock Island, Ill. These actions completed a planned consolidation whereby the number of surplus sales offices was reduced from 18 to 12, and resulted in savings during the year of \$1.0 million.

Effective January 7, 1966, the DSA Special Purchases Offices (SPURs) located at New York, N.Y., and Oakland, Calif., and the Air Force Logistic Control Groups located at Brooklyn, N.Y., and New Orleans, La., were disestablished. DSA Supply Centers assumed responsibility for direct procurement support to the Army and Air Force, excluding Air Force activities in the Pacific area, for decentralized and noncataloged items related to catalog classes assigned to DSA.

Changes in Item Management Responsibility

At the end of fiscal year 1965, the five operating inventory control points of DSA were managing 244 Federal supply classes (FSCs) for all the military Services, and 45 classes for the Army only, encompassing a total of 1,368,900 centrally managed items.

During fiscal 1966, DSA assumed supply responsibility for the support of overseas dependent schools, and also for helium and helium gas cylinders. Both of these missions were assigned to DGSC.

Early in fiscal year 1966 the Office of the Secretary of Defense directed the military Services to begin applying the item management coding criteria, described in the DSA report for the previous year and embodied in DoD Manual 4140.26-M, published on July 1, 1965. These criteria were to be applied to 825,000 Service-managed items in DSA classes and to 150,000 items in the 45 classes mentioned above.

Coding began immediately and is expected to continue through December 1967. A total of 149,202 coding actions had been completed as of June 30, 1966, with DSA being designated as manager of 96,177 items. Of these, 13,942 had been capitalized to DSA by the end of the fiscal year. On June 30, 1966, DSA was centrally managing 1,333,800 items in 290 FSCs for all the military Services. This represented a net decrease of 35,100 items during the year, which can be ascribed mainly to the effectiveness of the DSA Inactive Item Review Program. That program involved review of 192,120 items and resulted in 92,178 item deletions during the year.

Distribution by supply center, inventory value, and annual sales of DSA centrally managed items are shown in table 38 in the appendix.

DSA Distribution System

No major changes were made during the year in the DSA Distribution System, which continued to consist of seven principal depots, four specialized support depots, and 16 direct supply support points (DSSPs) serving the Navy. On January 1, 1962, items assigned to DSA or about to be assigned were stored in 77 locations. In line with the concept of concentrating stocks next to military posts or near ports of embarkation, the use of temporary storage locations or attrition sites has steadily decreased. DSA policy for evacuation of stocks from attrition sites calls for disposition-in-place of excesses; bulk relocation of replenishment stocks from attrition sites into permanent depots and DSSPs in lieu of new procurement; attrition to satisfy customer demands; and finally, complete evacuation of attrition sites through bulk relocation into permanent depots when economically justified. DSA-owned materiel totaled 268,000 tons at 58 attrition sites in June 1963;

135,000 tons at 47 attrition sites in June 1964; 70,600 tons at 21 sites in June 1965; and 24,130 tons at 19 sites in June 1966. This improved concentration was achieved despite repeated capitalizations of additional material stored at such sites.

Depot Operations

Impact of the Southeast Asia situation upon DSA storage operations became very evident during the year. Occupied space in DSA depots increased from 13 million square feet on July 1, 1965, to 16 million square feet on June 30, 1966. During the same period available space utilized increased from 69 percent to 78.5 percent, and four depots—at Dayton, Ohio, Mechanicsburg, Pa., and Tracy and Stockton, Calif.—experienced some degree of overcrowding during much of the year.

To satisfy emergency requirements for additional materials-handling equipment at DSA-managed depots, a temporary holding (TH) pool was created by the expedient of retaining 266 units which had been replaced and which would normally have been declared excess. In addition, 39 units declared excess by the military Services were acquired for the TH pool, which completed the estimated requirement for 305 supplemental units. Since these units were intended for back-up rather than for steady operation, repair costs were expected to be minimal.

The DSA-wide program for mechanizing warehouse operations continues to progress. During the year, a contract was awarded for procurement of the pilot system at Defense Depot Ogden, and completion is expected in approximately 1 year. Two additional system designs were being completed for procurement during fiscal year 1966, for mechanized depot operations at the Defense Construction Supply Center (DCSC) and at Defense Depot Memphis. Design was also initiated for metals-handling systems to be installed at Defense Depots Tracy, Mechanicsburg, and Memphis.

The basic concept and initial implementation within DSA of the Warehouse Gross Performance Measurement System (WGPMS) was described in last year's report. During fiscal year 1966, the WGPMS was installed in 35 major CONUS supply installations of the military Services. Quarterly summary management reports depicting installation, service/agency, and total DoD performance were furnished the military department's Assistant Secretaries (I&L). Command attention was focused on those operational areas which the WGPMS numeric indicators of performance highlighted for study and management improvement efforts. Eight assistance appraisal visits to activities were conducted during this period, and plans were started for expansion of the concept to cover warehousing operations at ammunition depots, ocean and air terminals, air stations, and shipyards.

The increase in the rate of inductions into the Army during the year resulted in expanded requirements for clothing to equip recruits. To supplement clothing procurement, which lagged behind requirements for many of the "bag items" of initial troop issues, DSA initiated an Army Bag Item Repair Program in September 1965. Used clothing was shipped from Army installations to DGSC and Defense Depot Ogden. Items were classified as to condition, cleaned, repaired if necessary, and returned to stock. During fiscal year 1966, 3,040,705 items were received, 2,335,669 classified, and 1,025,887 items returned to stock resulting in monetary savings of approximately \$2.6 million. The cash value of speedy availability was difficult to compute, but this was a very desirable feature of the operation.

Civil Defense Support

During the year, DSA was made responsible for all logistic functions in support of the national civil defense program. Newly assigned functions included the development of materiel and budget requirements for the Office of Civil Defense and accounting for materiel.

Fallout shelter survival supplies were issued for stocking 11,626 facilities during fiscal year 1966, increasing the grand total of such issues for shelter to 74,667. The supplies issued during the year would be sufficient to sustain 7.5 million people for 14 days. In addition, 9,742 shelters were furnished with at least one radiation kit. Approximately 65.5 percent of the total shelter supplies procured (sufficient for 63 million persons for 14 days) had been issued by June 30, 1966.

During the fiscal year a pilot procurement and distribution of 2,400 ventilation kits was initiated. This kit was designed to qualify public fallout shelter space for many additional people by providing low-cost ventilation equipment. It can be operated by an electric motor or by a pedal-drive device.

At the end of fiscal year 1966, the shelter supply storage and distribution system consisted of 46 warehouses administered as follows:

Operated by:	Number of locations
Army -----	9
Navy -----	13
Air Force -----	4
DSA -----	5
GSA -----	15
Total -----	46

DSA maintains an emergency engineer equipment inventory which is used for pumping water during natural disasters or post-attack operations. Total value of this equipment, which comprised 45 units at the end of the fiscal year, was approximately \$7.5 million. During the year, approximately 114 miles of pipe, 158 pumps, and related items were loaned to 24 States for use in 91 communities. The heaviest usage was in the drought-stricken northeastern states and in mid-western states besieged by storms and floods.

Procurement and Production Program

Procurement awards during the year totaled \$5.74 billion. This nearly doubled the awards made in fiscal 1965. A competitive rate of 92.1 percent of total dollar awards was attained. Small Business awards aggregated \$2.44 billion, or 46.3 percent of all awards to U.S. firms, representing the highest percentage attained by the Agency since its activation. Awards of \$10,000 and above in the labor surplus area totaled \$709 million, or 15.8 percent of all DSA awards during the year. Procurement leadtime for awards of over \$2,500 averaged 32.4 days for fiscal 1966, a decrease of 3.8 days from the previous year. For small purchases, those under \$2,500, the procurement leadtime averaged 21.8 days or an increase of 2.4 days.

During the year automated applications for procurement and production operations were developed as part of the DSA-wide Standard Automated Material Management System (SAMMS). This system is scheduled to be implemented at the lead center (DCSC) on July 1, 1968. The procurement subsystem of SAMMS encompasses both large and small purchases. Salient features developed for

inclusion in this integrated system during fiscal 1966 were: Computer generation of purchase requests; computer preparation of delivery orders against requirements contracts; automation of purchase history; computer consolidation of buy requirements; automation of procurement reporting; and automated purchase control procedures.

The DoD Procurement Career Development Program continued to make progress during the year. On-the-job training programs were expanded both in number of courses offered and number of attendees. College-caliber personnel were hired for procurement trainee positions at the GS-5 and GS-7 levels, and the Procurement and Production Directorate received its first management intern. This 1-year program included a variety of on-the-job training both at headquarters and in the field, plus attendance at a resident procurement course.

Increased emphasis was given the DSA Zero Defects Program to persuade the DSA contractor community to provide error-free supplies voluntarily by preventing errors, rather than detecting them. The integrated quality and reliability program continued to emphasize the preventive role of quality disciplines, especially in the new DCAS regions. Military Service attitudes on the quality of DSA-furnished supplies were ascertained at all levels of the military Services by liaison with headquarters personnel, careful monitoring and quick resolution of unsatisfactory material reports (UMRs), and the Quality Check Program. In addition, quality audit programs at depots were enlarged in scope and detail to prevent defective items entering the supply system.

During fiscal year 1966 almost the entire strength of the industrial mobilization planning organization both at DSA Headquarters and in the field, was diverted to provide maximum procurement and production support for Southeast Asia. As a result, industrial mobilization planning was held to a minimum and was primarily directed towards extending the mobilization production agreements with planned producers for 1 year.

In order to meet urgent requirements due to the Vietnam buildup, DSA requests to the Department of Commerce for special assistance under the Priorities and Allocations Program increased. There were 466 such actions during fiscal 1966, which expedited delivery on existing contracts.

Starting about December 1965, difficulties were encountered in obtaining procurement coverage of items (particularly clothing) caused by substantially increased military requirements and a continuing high rate of civilian demand. It became necessary to resort to the use of rated orders under the Defense Production Act of 1950. During the fiscal year approximately 500 rated orders were issued to contractors. Of these, about 300 resulted in awards for 30 different items of clothing and tentage valued at about \$169 million.

In the face of heavy civilian demand, other special measures had to be taken to meet these requirements. Included among these measures were:

1. Changing, with Service concurrence, Government specifications to permit procurement of acceptable commercial products, wherever possible, to broaden the production base.
2. Procuring substitutes on an interim basis to meet urgent requirements when specification changes were inappropriate.
3. Increasing production of short supply items at Government-operated facilities.
4. Furnishing industry advance information of anticipated quantitative and delivery requirements.
5. Limiting accelerated delivery procurement to immediate operational support needs.

6. Avoiding payment of premium prices for accelerated deliveries wherever possible by reevaluation of such requirements with the Services.

7. Giving increased management attention to using more realistic production leadtimes and scheduling deliveries in consonance with industry capability.

Coordinated Procurement (Service-Managed Items in DSA-Assigned Federal Supply Classes)

As the administrator of the DoD Coordinated Procurement Program, DSA effected procurement in the amount of \$258.9 million, which was an increase of 169 percent over the previous year. There was wide variance among the Services in the matter of interpretation of the exception criteria of DoD Instruction No. 4115.1 for Service-managed items in Federal supply classes assigned to DSA for procurement. To secure more uniform application of the exception criteria, this Agency is developing and will coordinate with the Services an interpretation guide.

Defense-Wide Services

During fiscal year 1966, DSA continued to administer Defense-wide programs for cataloging, materiel utilization, surplus disposal, management of technical data, and coordinated procurement. DSA was also standardization assignee for approximately 2.4 million items, or 62 percent of the 3.8 million DoD items in the Federal Catalog.

Cataloging and Technical Data

There was a net increase of 7,319 DoD items in the Federal Catalog during the fiscal year. This actually represented over 353,000 additions and some 346,000 deletions. (See table 40 in appendix.) The net increase in catalog items can be attributed primarily to the introduction of repair parts for new major end items, plus the extended use of older equipments in Southeast Asia. As a result, inventory managers have been reluctant to initiate inventory disposal and/or item reduction actions for those maintenance parts which normally would become obsolescent.

DSA continued to give major attention to reductions in the number of items in assigned commodity classes. In fiscal year 1966, as a result of identification of duplicate or similar items and of standardization actions, decisions were made and concurred in by the military departments to eliminate 116,274 items. These decisions were based on a review of 283,445 items during the 12-month period.

A mandatory provisioning screening requirement was placed on all DoD activities in October 1965. Manufacturers' part numbers screened under this procedure totaled 3,505,220, an increase of 49 percent over the previous year. The percentage of provisioning items matched to existing Federal stock numbers (FSNs) increased to 35.9, compared to 26.3 percent in fiscal year 1965. Items screened in fiscal 1966 for purposes other than provisioning totaled 1,033,992, and of these 39.5 percent were matched to FSNs.

As part of the DoD-wide SAMMS concept, the initial draft of a Catalog Subsystem Requirement and Manual of Operating Procedures was completed and published in November 1965. Subsequent to publication, the Defense Industrial Supply Center (DISC) was assigned as the lead center for coordination, modification, and maintenance of this manual.

During fiscal year 1966, 45 Federal Item Identification Guides (FIIGs) were in various stages of completion. This program provides the capability for collection, storage, and dissemination of item intelligence for supply and production equipment essential to many functional areas. The improved FIIG will include inter-

changeability and substitution criteria and supply management data in a mechanized format. Four DSA centers and the Army Tank-Automotive Center were designated initiating activities, with all the military Services, DASA, NSA, and GSA participating in review and coordination. As of June 30, 1966, a total of 270 FIIGs was scheduled for development, incorporating the requirements of 1,136 description patterns.

The Federal Catalog ADP redesign project described in DSA's 1965 report was implemented October 31, 1965. It has successfully consolidated interrelated programs of the Defense Logistics Services Center (DLSC) into a common, more efficient work flow using common support files. It has also promoted positive processing control and distribution control and has generally operated to purify the files and prevent the entry of invalid data.

A long-range project designated the DLSC Integrated Data System (DIDS) will provide still more far-reaching improvements. Formulated in the previous fiscal year, this concept includes the following salient features: (1) Modernization, expansion, and integration of the DLSC systems (cataloging, materiel utilization, and marketing) to permit accomplishment of current and projected missions through 1970; (2) improvement in system responsiveness; and (3) capability for handling supplementary and new mission requirements. Since August 1965, a group of DSA, military Service, and GSA representatives have been developing the system requirement which will be coordinated with all interested agencies. On October 11, 1965, the Assistant Secretary of Defense (I&L) approved the concept as a basis for future planning to serve the needs of inventory managers in all functional areas. The military Services and GSA were afforded an opportunity to participate in the development of the system.

Military Standard Logistic Data Systems

An entire family of military standard data systems has been produced jointly by DSA and the military Services to meet current logistics requirements. The development of these data systems eliminated many of the varied procedures existing throughout DoD, and speeded the flow of logistics information through greater reliance on high-speed data processing equipment, communications systems, and machine-processable formats. Because of an increasing trend toward supply support crossing military Service lines, it was essential that a single monitoring agency assure uniform systems design and application among users. DSA has been designated as the single focal point in DoD for system design and administration.

On July 1, 1965, the Military Standard Transaction Reporting and Accounting Procedures (MILSTRAP) were added to the fully operational systems monitored by DSA. The scope and purpose of this system have been fully described in previous reports.

During fiscal year 1966, considerable progress was made in designing the Military Standard Contract Administration Procedures (MILSCAP). This system, when fully implemented, will impose uniform procedures upon the flow of CAS management data, which is currently submitted in varying formats to meet the differing needs of the military Services. A task group with DoD-wide representation completed its procedures development work and published a draft manual dated October 10, 1965. The draft was reviewed extensively by all echelons of the DoD, and all comments submitted were reviewed and clarified in a series of meetings held in April through June 1966. It is planned to publish a finalized operating manual with appropriate revisions by December 1966.

The Defense Automatic Addressing System (DAAS) is based upon the concept of transmitting requisitions and related MILSTRIP and MILSTRAP supply

documents to a single designated point for application of computer techniques for addressing and destination routing. This concept was tested at Gentile Air Force Station, Ohio, during the period March 4-September 15, 1965. Thereafter, a task group composed of representatives of the ASD(I&L), the military departments, the Defense Communications Agency, DSA, and GSA recommended that automatic addressing be continued and expanded. By memorandum of October 11, 1965, the ASD(I&L) approved the Defense Automatic Addressing System as a permanent part of the DoD logistics system complex, assigned responsibility for its operation and further development to the DSA, and directed that a phased implementation program be undertaken. Immediate objectives are to activate an alternate back-up facility at McClellan AFB, Calif., by August 1966; and to expand and reprogram the Gentile test facility by October 1966. Subscribing activities, as scheduled by the military Services, will be added to the system by December 1967.

During fiscal year 1965 a DoD-wide evaluation of the Military Standard Transportation and Movements Procedures (MILSTAMP) was conducted. This study confirmed the adequacy of the system concepts of documentation and movements control but identified the need for certain procedural improvements and the reorganization and reprint of the joint regulation. Drafting of the revised MILSTAMP was undertaken during fiscal 1966 and has been staffed with affected DoD components. A final MILSTAMP regulation with appropriate revisions is scheduled to be published in August 1966.

Item Entry Control

The DoD Item Entry Control Office develops and coordinates the policies, programs, and systems for preventing the entry of unnecessary items into the military supply system. A pilot test completed in fiscal year 1965 evaluated the use of a single-point technical review for all proposed new items in selected commodity areas during the provisioning-cataloging cycle. As a result of the pilot test, two principal actions were taken: (1) A plan to expand the technical review to all high-growth Federal supply classes was prepared, concurred in by the military Services and DSA, and forwarded to OSD(I&L) for approval; and (2) a study to determine the feasibility of performing a technical review during initial provisioning of all proposed new items prior to procurement was completed, feasibility established, and forwarded to OSD(I&L) for approval. Both of these proposals were approved by OSD(I&L)—the Initial Provisioning Study on December 3, 1965, and the Technical Review Expansion Plan on February 10, 1966. Coincident with these actions, Project SHAKEDOWN was integrated with the Item Entry Control Program, with full implementation scheduled for the end of calendar year 1966. The Technical Review Expansion Plan provides for the establishment of 13 DoD Technical Review Activities (DTRAs) within the military Services and DSA to perform a technical review of 67 high-growth FSCs accounting for approximately 70 to 80 percent of all new item growth. Full implementation is scheduled for July 1, 1967. As of June 30, 1966, a technical review of 128,690 items within selected FSCs, during and subsequent to the pilot test, resulted in 58,236 or 45 percent being returned to submitters. Of the total items processed, 45,913 or 35.6 percent were returned because duplicate or replacement items were already in the DoD supply system. The other 12,323 were rejected because of errors in identification or lack of technical data.

Materiel Utilization

Improvement of mechanized procedures designed to screen releasable assets of one military Service Inventory Control Point (ICP) against the requirements

of another is continuing. Reutilization resulting from this process, conducted centrally at DLSC and from direct interrogations between ICPs, totaled \$403 million during the year (\$231 million inter-Service reutilization and \$172 million intra-Service reutilization). Expansion of the "Plus" program, which assures that new procurement is only initiated after the nonavailability of usable excess has been confirmed, was phenomenal. Average assets recorded on the DLSC computer stood unchanged at \$5 billion, but the average inquiry figure rose sharply to \$62.6 billion during fiscal year 1966.

Utilization of military service declared excess, which in the past was screened primarily through manual rather than mechanized procedures, amounted to \$1,456 million during fiscal year 1966. The establishment of mechanized procedures to process the input of declared excess has progressed to the extent that the need for detailed descriptions by reporting activities has been largely eliminated.

The DoD centralized mechanized screening ("Plus") program continues to receive a good deal of management attention. After a successful test, the Federal Aviation Agency (FAA) became a regular participant during fiscal 1966. The National Aeronautics and Space Agency (NASA) has expressed interest, and is expected to participate beginning in 1967. Similarly, the SCRAPE project (Screening Country Requirements Against Plus Excesses) is designed to test the feasibility of matching the combined military assistance requirements of the defense forces of Greece, Turkey, Taiwan, and Korea against the "Plus" asset file.

DSA has the responsibility for DoD-wide reutilization screening of automatic data processing equipment (ADPE). The assignment applies to both Government-owned and leased equipment of commercial type and was implemented on July 1, 1964, by establishing an ADPE Reutilization Screening Office within DSA Headquarters. During its second year of operation, this program resulted in redistribution of excess equipment worth \$108.9 million—\$103.2 million Government-owned and \$5.7 million leased equipment—through centralized screening techniques. The total included \$65 million utilized by civil agencies through an interchange of information with GSA. The inventory of Government-owned ADPE on hand on June 30, 1966, was \$21.2 million.

Administered by DSA in cooperation with the military Services, the Weapons Systems Materiel Utilization Program promotes Defense-wide redistribution and utilization of excess military weapons assets and other special high-cost materiel generated from phaseouts and program terminations. This objective is accomplished through close working relationships between DSA and all echelons of the Services, Defense agencies, and other Federal agencies; early planning intelligence on military systems to be discontinued; the development of new or alternate uses of the materiel; the distribution of illustrated brochures and flyers; and promotional efforts by DSA personnel. Intra-Service and inter-Service transfers of phased-out weapon systems have been substantially improved by an intensification of the brochure advertising techniques introduced in previous years. During fiscal 1966 this procedure resulted in utilization of missile materiel amounting to \$127 million.

A procedure for specialized screening of high-value excess property (over \$10,000 acquisition cost) regardless of type, became fully operational during the year. This was an outgrowth of the brochure technique for weapon systems, and involved tailored distribution of special utilization flyers providing complete data on an item, including photographs, and calling the items to the special attention of selected potential users. Research to determine substitute and interchangeable uses for an item, and special efforts through telephone contacts promoted this program. Utilization of property costing \$48.8 million was realized from this effort in fiscal 1966.

Industrial Plant Equipment

The Defense Industrial Plant Equipment Center (DIPEC), which became fully operational on July 1, 1964, is charged with primary responsibility for development and maintenance of central records of the DoD inventory of industrial plant equipment (IPE), and the management of idle equipment. At the end of fiscal year 1966 DIPEC held records of some 377,056 items with an acquisition cost of \$3.64 billion. The Center received 44,303 requests for equipment during the year, and redistributed 12,329 units, with an acquisition value of \$160.4 million, which had been declared idle by military and contractor activities of the Defense Department. This amount was credited to the cost reduction program for fiscal year 1966. An additional \$24.1 million worth of IPE not eligible for cost reduction reporting was redistributed to the Military Assistance Program, the Atomic Energy Commission, NASA, FAA, and others. Total redistributions for fiscal 1966 amounted to \$184.5 million in terms of original acquisition cost of the equipment. Another \$4,539,663 worth of equipment was loaned to vocational schools under terms of Public Law 883.

DIPEC ended fiscal year 1966 with an idle equipment inventory consisting of 25,262 items valued at \$258.2 million, which is considered part of the DoD industrial equipment reserve. The balance of the reserve, controlled by the military departments, consists of 37,838 items valued at \$498.7 million. This portion of the IPE reserve is earmarked for specific mobilization requirements and is normally not available for allocation. At the beginning of fiscal year 1966 idle IPE was being stored at nine sites. During the year three storage sites were eliminated.

Until very recently, IPE was not effectively identified. The first handbook of standards for describing IPE which Defense activities use in preparing property records for their own management uses and for reporting idle IPE to DIPEC was published in April 1965. This covered electrical and electronic equipment and measuring instruments—FSC 6625—and has resulted in significant quantities of such property being reported to DIPEC by contractors for redistribution. Prior to the publication of this handbook, such property was reported by the contractors directly to GSA, for regional screening only, prior to disposal. A DoD-wide screening is now being accomplished prior to disposal. Twenty-three more IPE handbooks were published through June 30, 1966, covering an additional 57 of the 88 FSCs in the DIPEC scope. The standards provided by these handbooks will improve communications among Defense activities, and between Defense activities and their contractors. They are expected to make a significant contribution to improvements in property management.

Materiel Disposal

DSA is responsible for the administration of the DoD Disposal Program worldwide. This responsibility includes the development of systems, techniques, and procedures for disposable personal property in accordance with OSD policy guidance, supervision of resource programs for DoD disposal activities, elimination of disposal holding activities when practical and economical, and operation of Defense Surplus Sales Offices in CONUS. The Disposal Program involves several subprograms, i.e., utilization of DoD excess, donation, sales, demilitarization, and scrap preparation. Under authority of the Federal Property and Administrative Services Act of 1949, as amended, the costs incurred by all DoD elements engaged in the disposal of excess, surplus, and foreign excess personal property are reimbursed from the proceeds derived from the sale of surplus and foreign excess personal property. The remainder is transferred to the U.S. Treasury.

The dollar value of DoD property utilized or processed for disposal during fiscal 1966 was \$6.439 billion, of which \$2.748 billion was reutilized within DoD,

transferred to other Federal agencies and the Military Assistance Program, or donated to authorized recipients. Value of property sold, scrapped, abandoned, or destroyed during the year was \$3.691 billion. Gross proceeds received from sales was \$119 million. Further details regarding these programs are given in table 39 in the appendix.

Considerable reductions in program costs have been effected through consolidations. By the end of fiscal year 1966, the consolidation of 69 surplus holding activities of all the military Services had been directed. Fifty-two activities had completed consolidation, and reports from 44 of these indicated estimated annual savings of \$1.81 million. Fourteen more activities were planning for, or engaged in consolidation, and three consolidations had been canceled because of base closures.

Defense Documentation

The Defense Documentation Center (DDC) provides classified and unclassified management information services, without charge, to Government organizations and contractors engaged in Government research and development programs. As continuing additional requirements have been imposed for services to the research and development and logistics communities, DDC has developed from an R&D document supply activity into a major repository and retrieval activity for technical management information.

During fiscal year 1966, first priority for manpower and funds was assigned to the experimental development of the RDT&E Work Unit Data Bank. This is a bank of data on on-going research work. Information is stored and retrieved in much the same manner used in the documentation system for completed research projects. The new system was established in October 1965 and initially contained some 9,000 resumes. At the close of fiscal 1966, the file contained 18,584 resumes. The priority assigned to this project was based upon its potential for improving management efficiency in the Defense research and development effort.

The following additional DDC missions, with significant impact on the DoD Scientific and Technical Information Program, were implemented in fiscal year 1966:

1. Primary distribution of foreign technical reports.
2. Contractor performance evaluation report and contractor cost reduction report data bank services.
3. Central registration and certification of grantees, contractors, and U.S. Government agencies for access to DoD-sponsored scientific and technical information.
4. Initiation of a comprehensive advanced development program to develop new and improved products and services, particularly in the microfiche-related and ADP systems areas.

Improved processing techniques and innovations have been implemented by DDC for speeding the announcement and secondary distribution of technical reports. To reduce document announcement time, DDR&E has approved a weekly Technical Abstract Bulletin (TAB) ; air mailing of TABs west of the Mississippi ; a program to provide 75 percent of requested documents from shelf stock ; and selective dissemination of information via sets of microfiche to certain DoD components and Government agencies.

During the fiscal year, the center filled 1,342,000 requests for documents and added 48,667 titles to the TAB collection. Requests for bibliographies filled during the year totaled 17,403, an increase of 74 percent over the previous year.

Relationships with Federal Civil Agencies

Under terms of the DoD-GSA agreement reached at the end of 1964, a joint DSA-Federal Supply Service Materiel Management Review Committee was formed in 1965 to determine appropriate supply management assignments to DSA and GSA of Federal supply class (FSC) groups, classes, and items under DoD integrated management. Agency heads have approved initial management assignments of 99 FSCs to DSA and 53 to the General Services Administration. Transfer to GSA of items in these 53 primary Federal supply service classes is scheduled for July 1967. An additional FSC has been assigned to GSA but was not yet scheduled for transfer.

The DoD-GSA agreement further provided for DSA to consider support of all civil agencies for the commodities of fuel, electronics, clothing and textiles, and medical and subsistence supplies, provided significant economies can be achieved without impairing DSA's capability of effective support of military units in war or peace. Joint DSA/GSA/Federal civil agency studies were initiated to give effect to the DSA recommendations of 1965 that (1) planning continue for DSA assumption of fuel, electronics, and clothing and textiles, and (2) medical and subsistence be subjected to joint, intensive study.

As in previous years, the U.S. Coast Guard continued to obtain a full range of items from DSA, while the Veterans Administration (VA) and the Public Health Service (PHS) obtained medical items. FAA requirements for electron tubes increased during the year from a range of 500 items to 1,100 items.

In November 1964 the Office of Economic Opportunity (Job Corps) began to requisition clothing and subsistence items followed by designated items of general supplies. This support continued and increased in fiscal year 1966. Value of sales to the Job Corps during the year amounted to \$6,637,580, an increase of over \$4,000,000 from the previous fiscal year.

Supply of perishable subsistence to hospitals of the VA and PHS began in the last 3 months of fiscal year 1966 giving effect to a year-long field test and evaluation conducted by DSA/VA/PHS and GSA at the request of the Bureau of the Budget.

In continuance of the DSA effort to support Federal civil agencies, the following additional formal arrangements were made during fiscal year 1966:

<i>Civil agency</i>	<i>Commodity</i>
National Aeronautics and Space Administration.	All DSA commodities.
Department of Commerce (Maritime Administration).	Selected items from all Defense Supply Centers.
Health, Education, and Welfare-----	Medical items (rotation of civil defense medical stockpile). Perishable subsistence.
Veterans Administration-----	Perishable subsistence.
General Services Administration (Transportation and Communication Service).	Selected electronic items.

Defense Contract Administration Services

The Defense Contract Administration Services (DCAS) organization is responsible for providing a wide variety of support services to the purchasing offices of the military Services, NASA, other Federal agencies, and certain foreign governments. These services include pre-award surveys, review of contractor purchasing systems, quality assurance and inspection, property administration, production surveillance and reporting, transportation, payments to con-

tractors, industrial security, and other functions required in connection with industry performance on defense contracts. Responsibility for initial award of contracts and all decisions as to the nature and quantity of items and services to be purchased remains with the buying offices; DCAS performs those contract administration functions that can best be handled at or in close proximity to the contractor's plant. In addition to retaining responsibility for contract awards, the military Services are responsible for the administration of those categories of contracts not included in the DCAS mission assignment and contracts in specific plants assigned to them under the DoD Plant Cognizance Program.

Conversion and organization of the DCAS field structure was completed on December 1, 1965, with the activation of the last two Defense Contract Administration Services Regions (DCASRs). Eight of the total 11 DCASRs were activated during fiscal year 1966. The locations of the headquarters of all DCASRs, and the date of activation of each, are as follows:

Atlanta—October 1, 1965.

Boston—August 1, 1965.

Chicago—October 1, 1965.

Cleveland—August 1, 1965.

Dallas—June 1, 1965.

Detroit—April 1, 1965.

Los Angeles—December 1, 1965.

New York—November 1, 1965.

Philadelphia—April 1, 1964 (established by DoD; transferred to DSA September 1, 1964).

San Francisco—December 1, 1965.

St. Louis—October 1, 1965.

During fiscal year 1966, the level of workload experienced increased dramatically, far exceeding preconsolidation estimates. In December 1965, the first month of full DCAS nationwide operation, the total number of contracts being administered was 227,775; by June 1966, the number was 293,931, an increase of 29 percent. During the same period, the number of invoices completed changed from a monthly rate of 89 thousand to 148 thousand, an increase of 65.7 percent, while the dollar value of material inspected and released for shipment rose from a monthly rate of \$1,144.1 million to \$1,446.9 million, an increase of 26.5 percent. To handle this increased workload, total military and civilian manpower increased from 17,457 full-time permanent employees in December 1965 to 20,454 on June 30, 1966; an increase of only 17.2 percent. These increases are for the most part attributed to the impact of the Southeast Asia (SEA) buildup, added NASA requirements, and the transfer to DCAS of the administration of some contracts previously assigned to the military departments under the DoD Plant Cognizance Program.

Some of the areas of major effort during fiscal year 1966 were:

Quality Assurance.—the Southeast Asia buildup created a significant workload in suppliers' plants, particularly in the ammunition, weapons, clothing, and medical commodities. Through extensive training and some recruitment, the challenge has been successfully met. To meet changing industrial and defense technologies, and other factors affecting readiness to perform, DCAS is pursuing a program to acquire quality assurance skills, training approximately 1,000 quality assurance personnel performing on NASA contracts, and arranging for quality assurance personnel to attend service schools, non-Government schools, and colleges.

Plant Safety.—Included in the initial CAS functional assignment from the military departments was responsibility for monitoring safety in contractors' facilities pertaining to nonhazardous materials and processes involved in Government contracts. Early in 1966 DCAS was assigned, for contracts administered,

the additional responsibility for maintaining surveillance of flight safety and safety matters regarding hazardous and dangerous materials and processes. A DSA representative has chaired a DoD committee to develop ASPR guidance on hazardous and otherwise dangerous material safety, uniform contract safety clauses, and a DoD manual prescribing standards to be followed by manufacturers of such materials.

Delinquent Contracts.—Due to the urgency of the Southeast Asia situation, special management attention was given to reducing contracts in a delinquent delivery status. Increased leadtimes for materials and overloaded plant conditions contributed to a rising trend in contract delinquencies. The managers of selected delinquent contractor concerns were visited by DCASR personnel to emphasize the importance of timely deliveries and to assist the contractors in attempting to reduce their delinquencies.

Defense Materials and Priorities Assistance.—Special emphasis was placed on accomplishment of the objective of the Defense Materials and Priorities Assistance Program, which necessitated the reorienting, training, and indoctrination of Government employees and Defense contractors. DCAS participated with the Business Defense Services Administration, Department of Commerce, in nationwide briefings attended by approximately 25,000 Defense contractor representatives in 30 U.S. cities. Additionally, vigorous in-house training was conducted, and a continuous program was developed for providing technical assistance to both Government and contractor personnel.

Industrial Security.—Immediately following consolidation of the industrial security function, action was taken to identify cleared facilities which had not been engaged in classified procurement for 18 or more months. Administrative termination of these "dormant" facilities has contributed to the efficiency of the program in that resources can be expended at facilities actually engaged in classified procurement.

Small Business.—A vigorous Small Business and Economic Utilization Program was pursued. Subcontracting programs have been established in prime contractor plants and are being revised quarterly by a DCAS field force of small business and labor surplus area specialists.

Management of Property.—Significant improvements have been made in the management of property. New programs provide for more thorough analyses and qualitative evaluations, better identifications of conditions, and sounder bases for conclusions and actions covering areas such as:

1. Contractor property control systems.
2. Contractor use of industrial plant equipment.
3. Centralized management of functions, skills, and reports.
4. Revised job standards for property administrators.
5. Training of property administrators and their supervisors.
6. Regulatory coverage of contractor/Government responsibilities.
7. Establishment of a 2-year program to reconcile records of the national inventory of industrial plant equipment with property in the possession of contractors.

Mechanization of CAS Data Systems.—As reported in fiscal year 1965, plans to establish a fully automated management information system concurrent with the activation of the DCASRs had to be abandoned, largely because of delay in reconciling the differing data requirements of the military Services. The punched card accounting machine system initially established, known as MOCAS I, supplied these differing requirements with considerable difficulty by performing a large volume of card processing supplemented by manual processing of

both inputs and outputs. During fiscal year 1966, the MOCAS I system was revised to provide improved output products for management and, at the same time, to streamline the data processes. This system improvement, utilizing the original ADP equipment, IBM 1401's and Honeywell 200's, was referred to as MOCAS IA and is scheduled for implementation at all DCASRs during calendar year 1967. During the year it also became apparent that the limitations of the original equipment coupled with the increased workload at the DCASRs dictated that new ADPE be acquired. System specifications, identified as MOCAS IB, were developed with the primary objective of obtaining, on a competitive basis, better ADPE for the MOCAS system at all DCASRs. The MOCAS IB system is scheduled for implementation at all DCASRs during calendar year 1968. Both of these systems (MOCAS IA and IB) still provide for meeting the differing requirements of the military Services. The MILSCAP system, discussed earlier in this report, is expected to provide a long-range solution to this problem.

To summarize, the Defense Contract Administration Services mission has been implemented. Contract administration services functions are being performed effectively and efficiently, with savings in costs over the previous methods. More significant benefits and improved performance are expected to be achieved as the DCAS organization stabilizes and gains additional experience and performance data in operations. Conversion to the current DCAS organization was achieved without any significant adverse impact upon the Government organizations and personnel involved.

Budgeting and Funding

Generally, DSA uses appropriated Operations and Maintenance (O&M) and Research, Development, Test and Evaluation (RDT&E) funds to pay operating costs (except military personnel costs); and a Stock Fund to finance supply inventories. Other fund authorizations are also used for Military Construction; Procurement, Defense Agencies (PDA); and Family Housing.

DSA's share of the O&M Defense Agencies' appropriation for fiscal year 1966 was \$436.2 million. Additional funds of \$33.4 million were received from the military departments as reimbursement, so that the total DSA operating cost for the year 1966 amounted to \$469.6 million. Of this total, \$133.3 million was transferred to DSA from the military departments for operation of the DSA Contract Administration Services (CAS) which became operational before January 1, 1966.

RDT&E funds, within DSA, are used primarily by the Defense Documentation Center (DDC). In fiscal year 1966, DSA was authorized \$11.0 million, with actual obligations of \$9.4 million.

DSA used Military Construction funds totaling \$2.4 million during fiscal year 1966 to provide for administrative and logistical facilities, including minor construction and planning. Procurement, Defense Agencies' funds in fiscal year 1966 in the amount of \$8.4 million were used principally for materials-handling equipment, mechanized materials-handling systems, and automatic data processing equipment.

Under the appropriation Family Housing, Defense, \$0.1 million was obligated by DSA fiscal year 1966 to operate 99 family housing units.

Data reflecting final obligations and sales, by separate Defense Supply Centers of the Defense Stock Fund on June 30, 1966, are shown in table 38 in the appendix. A major buildup in DSA inventories during the fiscal year was authorized in successive increments reflecting tight fiscal controls, responsive to guidance from higher levels and based on progressive changes in the Southeast Asia

situation. For example, during the first quarter of fiscal 1966 DSA operated under a financial plan which called for an investment buildup of \$31 million. Ultimately, obligations exceeded sales by \$1,322.5 million. With proceeds of \$1.2 million from other unallocated income, the net investment change resulted in a final buildup of \$1,323.7 million, a significant reversal of fiscal year 1965 operations, when the net investment change amounted to a \$50.5 million drawdown. A noteworthy feature of the situation at the end of fiscal year 1966 was the fact that on-hand inventories had increased by only \$17 million during the year, while materiel on order had increased by \$1,403.8 million.

Personnel

By the end of fiscal year 1966, the transfer of approximately 20,000 personnel involved in the consolidation of the contract administration services function had been completed. Full consideration was given to the functional transfer rights and interests of all employees. The employees declared excess to the new staffing requirements were given offers of continued employment with DSA or other DoD agencies.

The DoD Centralized Referral Activity, established in March 1965 to assist in the placement of DoD employees scheduled for involuntary separation because of base closures, is operated by DSA. By the end of fiscal year 1966, 26,777 employees had been registered in the automated referral system. Of these, 13,544 had been placed in other jobs within DoD activities, 6,489 had been dropped from the system because of retirement, resignation, death, etc., and 6,744 remained available for placement.

Recruitment emphasis was directed to the Southeast Asia buildup. This is reflected by the increase in civilian employees in depots and supply centers, as shown in figure 1.

Military personnel positions in the Agency are staffed on the basis of balanced military Service representation, and are rotated among the Services. Rotation of service provides diversified career opportunities to the military personnel of the four Services. Military authorization by Service, as of June 30, 1966, was: Army 36 percent, Navy 29 percent, Marine Corps 2 percent, and Air Force 33 percent.

DSA Cost Reduction Program

DSA participation in cost reduction bears a priority second only to that of effective support to the armed forces. DSA's contributions to cost reduction are both direct and indirect. All of the Agency's operating elements participate directly in meeting DoD cost reduction goals. Indirect contributions result from DSA activity in administering Defense-wide programs and performing Defense-wide services, such as materiel interservicing, industrial plant equipment reutilization, and item reduction. These efforts are reflected in savings accruing to and reported by the military departments.

During fiscal year 1966 DSA accomplished direct cost reductions totaling \$198 million, compared to its established goal of \$185 million. The largest area of saving was in operating expenses, and accounted for \$64.6 million. The second largest area was inventory item reduction, and accounted for \$30.2 million. Value engineering contributed \$27.5 million, and a shift from noncompetitive to competitive procurement, \$15.7 million.

STATUS OF DSA PERSONNEL

	June 30, 1965			June 30, 1966		
	Total ¹	Civilian	Military	Total ¹	Civilian	Military
Defense Supply Centers_	19,695	-----	-----	21,941	-----	-----
Construction_	4,514	4,451	63	5,141	5,082	59
Electronics_	3,584	3,536	48	3,782	3,738	44
Fuel_	200	178	22	189	171	18
General_	2,428	2,357	71	3,038	2,976	62
Industrial_	2,649	2,602	47	2,783	2,740	43
Personnel_	² 6,320	6,085	235	7,008	6,813	195
Defense Depots_	6,088	-----	-----	9,711	-----	-----
Mechanicsburg_	1,563	1,527	36	1,871	1,843	28
Memphis_	1,571	1,539	32	2,082	2,059	23
Odgen_	1,713	1,686	27	3,327	3,306	21
Tracy_	1,241	1,219	22	2,431	2,416	15
Defense Contract Administration						
Regions_	4,171	-----	-----	20,974	-----	-----
Philadelphia_	2,177	2,139	38	2,396	2,351	45
Detroit_	1,122	1,107	15	1,200	1,181	19
Dallas_	872	825	47	966	925	41
Boston_	-----	-----	-----	2,790	2,748	42
Cleveland_	-----	-----	-----	1,636	1,610	26
Atlanta_	-----	-----	-----	1,568	1,519	49
Chicago_	-----	-----	-----	2,056	2,026	30
St. Louis_	-----	-----	-----	1,454	1,427	27
New York_	-----	-----	-----	3,057	3,004	53
Los Angeles_	-----	-----	-----	2,836	2,790	46
San Francisco_	-----	-----	-----	1,015	994	21
Service Centers_	2,460	-----	-----	2,565	-----	-----
DDC_	506	502	4	481	477	4
DLSC_	1,087	1,078	9	1,125	1,116	9
DIPEC_	482	481	1	490	489	1
DSASC_	385	334	51	469	424	45
Field Extension Offices_	³ 758	747	11	612	595	17
Headquarters_	956	837	119	1,177	1,031	146
Total_	34,128	33,230	898	56,980	55,851	1,129

¹ Includes part-time and temporary civilian personnel.² Clothing and Textile, Medical, and Subsistence Supply Centers were listed separately in fiscal year 1965 report.³ Industrial Security Clearance Office, Data Systems Automation Office, and Procurement Support Offices were listed separately in fiscal year 1965 report.

Figure 1

Supply Effectiveness

A uniform procedure for the measurement of supply effectiveness was one of DSA's earliest management objectives, and the current reporting system was implemented in November 1962. This requires standardized reporting by all supply centers, and measures effectiveness through two key indicators.

The first indicator, stock availability, measures the performance of the centers as inventory managers by the percentage of requisitioned items supplied from available stocks. The gross number of requisitions received by DSA supply centers rose from 15.9 million in fiscal 1965 to 20 million in fiscal 1966. The average monthly system availability rate for fiscal 1966 was 87.8 percent, a decrease of 3.7 points from the rate achieved in fiscal 1965. One significant reason for this decrease was a sharp increase in demands for clothing, involving both routine items to equip recruits and special tropical items required for combat operations in Vietnam. Occurring at a time when the clothing industry was heavily saturated with civilian demands, these requirements were not promptly filled and resulted in an annual clothing availability figure of 74.4 percent, compared to 94.4 percent in fiscal 1965. The only other critical commodity was construction supplies, which registered an availability rate of 81.5 percent. This figure was also a direct result of the Vietnam buildup, and was caused by unanticipated heavy demands for such specialized items as steel landing mats and concertina wire. None of DSA's other commodity areas experienced serious difficulties, and all of them registered availability indexes higher than the over-all average for the Agency.

The second indicator, on-time fill, measures supply system effectiveness by the percentage of items processed for shipment within the time frames specified in the DoD Uniform Materiel Movement and Issue Priority System. All shipments which do not meet the specified processing times are counted as late shipments, whatever the cause. Under peacetime operations, DSA offered 85 percent of the 15 million shipments effected during fiscal year 1965 within the prescribed time periods. During the early phases of the Vietnam crisis, the increased shipping workload at DSA's storage locations resulted in the on-time fill rate dropping to 78 percent in August 1965. From this point the rate fluctuated between 79 and 81 percent through the end of the fiscal year. Increased congestion in the depots tended to confirm that distribution difficulties were contributing to a lowered on-time fill rate, but the availability situation was also the cause of many late deliveries. The number of back orders on hand likewise increased steadily through the fiscal year, and the largest increases occurred in the areas of clothing and construction supplies. At the end of fiscal 1966, back orders on hand totaled 412,000, an increase of 165 percent during the year. Intensive management effort in the immediate future is expected to improve availability to the extent that many of these back orders may be released. However, since DSA policy is to count released back orders as late shipments, it appears probable that improvements in the on-time fill rate will lag behind progress in stock availability in the coming year.

Summary

In the 5 years since its establishment, it has become apparent that DSA has not solved and will not solve all the wholesale supply support and logistic services problems in the areas assigned to it by the Department of Defense. Some of these are almost inextricably bound up in the complex relationships of strategy and economics, the forward sweep of technology, and the rapid obsolescence of military materiel. But, during that same 5-year period DSA has demonstrated that

some military supply problems are susceptible to integrated management and that the Agency can handle them rapidly and well.

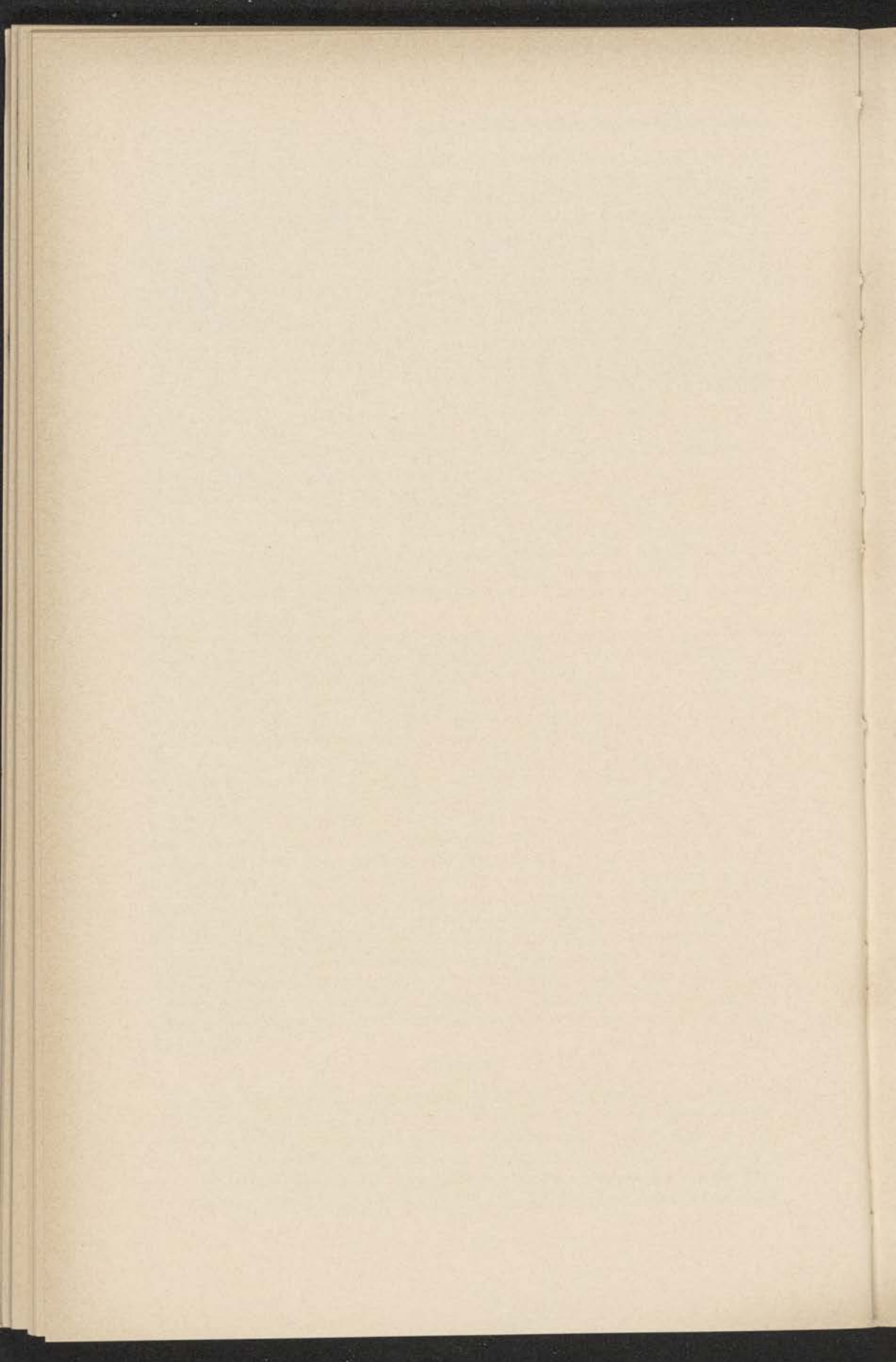
The current military commitment in Vietnam provides a challenge that differs in dimensions but not in kind from those successfully met by DSA in the past. The arbitrary timing of this report assures that the dimensions of this challenge are fully recorded, but gives only a limited scope for describing the Agency's response. Nevertheless, DSA is meeting its problems with determination, flexibility, and every prospect of success. All available evidence points to the soundness of the concept of integrated management of common supplies and related logistic services for the military forces during a major military commitment. It also confirms again the Agency's ability to provide effective and efficient support in time of peace or war.

A large, stylized handwritten signature in dark ink, reading "J M Lyle". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

J. M. LYLE

Vice Admiral, SC, USN,

Director, Defense Supply Agency.



Annual Report

of the

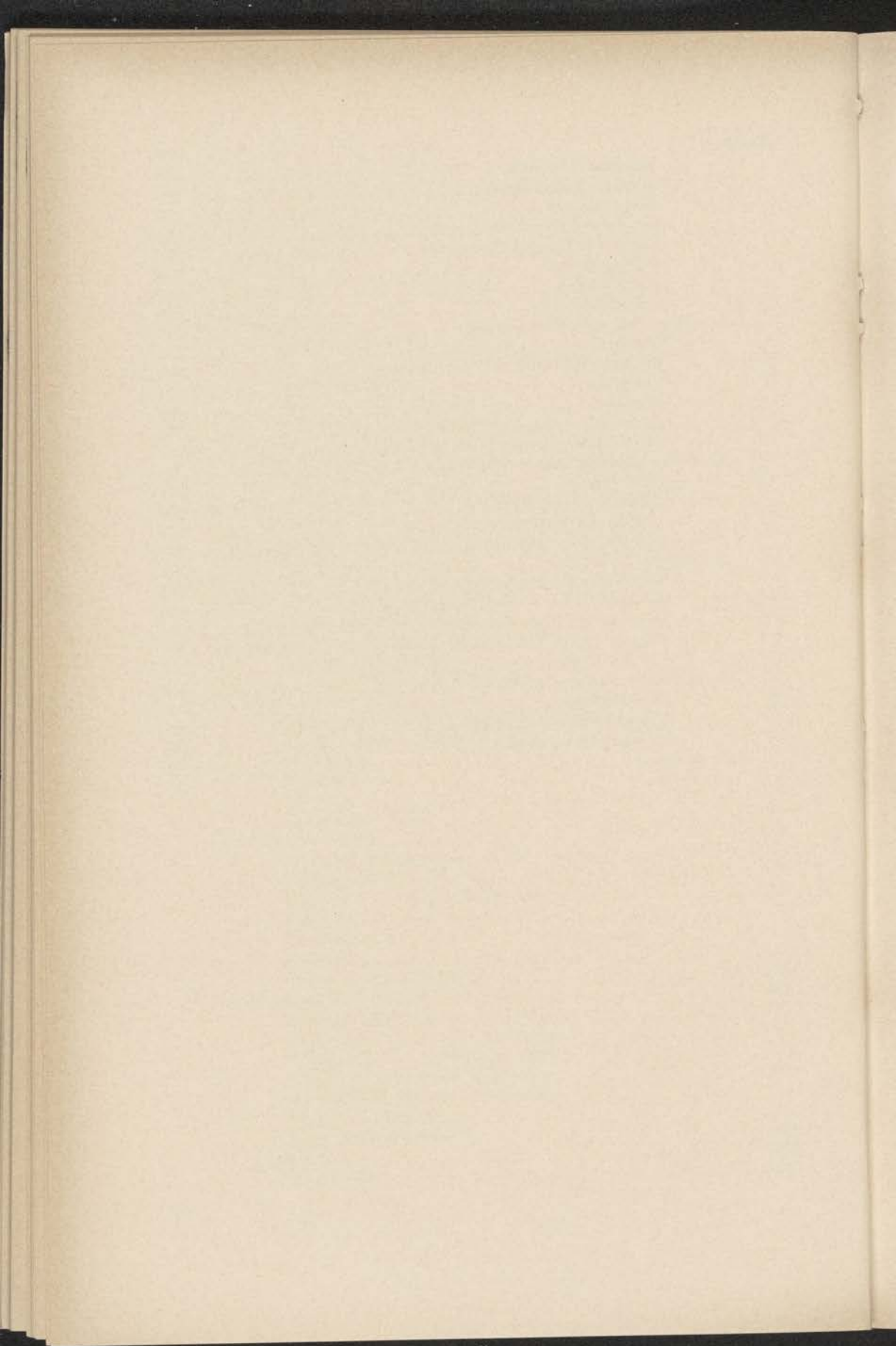
SECRETARY OF THE ARMY

July 1, 1965, to June 30, 1966

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I. Introduction

In fiscal year 1966 the commitment in Vietnam became the dominant factor in Army affairs. Army strength there rose from about 35,000 in July 1965 to around 167,000 in June 1966. The 173d Airborne Brigade was the only major combat unit in the country at the beginning of the year. Brigade forces from the 101st Airborne and 1st Infantry Divisions arrived in July 1965, followed in the fall by the remainder of the 1st Division and the entire 1st Cavalry Division (Airmobile). In January 1966 the second and third brigades, and in April the first brigade of the 25th Infantry Division landed. The wider involvement to meet Communist aggression produced a concomitant increase in Army casualties; as a result of hostile action, over 2,300 Americans were killed and some 13,000 wounded during the 12-month period. From January 1961 through June 1966 in Vietnam, the Army sustained almost double its Revolutionary War casualties and substantially more than those suffered in the War of 1812, the Mexican War, and the war with Spain combined.

During the year the Vietnam Service Medal was created, a Valorous Unit Award was established, and a U.S. Army, Vietnam, shoulder insignia was approved. Official campaign designations have been under study. The American soldier has fought with distinction in the distant theater: 3 Medals of Honor, 32 Distinguished Service Crosses, and 521 Silver Stars had been awarded to Army personnel by June 30, 1966.

The war in Vietnam has been fought in battalion rather than division terms, and has been characterized by isolated actions rather than continuous lines. The enemy has concentrated his forces in widely dispersed areas to attain local superiority; some of the heaviest fighting of the war took place in operations against these base areas. The nature of the enemy, the terrain, and the action has placed a premium on the Army's tactical mobility, and one of the most significant operational developments has been the verification of the airmobile concept.

The 1st Cavalry Division (Airmobile) was activated at Fort Benning, Ga., on July 1, 1965, from the resources of the 11th Air Assault Division (Test) and the 2d Infantry Division, and 90 days later the division was operational in Vietnam. Its high level of combat effectiveness, in which the helicopter has figured prominently, has demonstrated the validity of the airmobile concept.



Figure 1. Helicopter ambulances permit evacuation of the wounded directly to a supporting hospital.

The helicopter has also made it possible to evacuate a majority of the wounded from the scene of action directly to a supporting hospital.

In a brief span of months the United States deployed a combat-ready force of well over a quarter of a million men to a theater some 10,000 miles distant. Supporting that force in combat has been a tremendously difficult logistical task, requiring the construction in an underdeveloped country of extensive supply and support installations and the development of an intercontinental system of transport.

To sustain the forces deployed in Southeast Asia, in other areas of the world, and at home, and to support the necessary expansion of the Army and its continued modernization has required an enlarged and accelerated procurement program. To field the 1st Cavalry Division alone, for example, required divisional procurements in excess of \$28 million.

To meet increased combat consumption of ammunition while maintaining and building adequate war reserve and training stocks, the procurement program was increased from about \$360 million in fiscal year 1965 to \$1.3 billion in 1966; \$879 million is tentatively scheduled for 1967. To insure that production will meet requirements at any given time, the Army maintains a base of going production lines and standby facilities. In connection with operations in Vietnam, the Army

requested funds to build the general war reserves of ammunition, activated reserve facilities, and increased capacities in other government and private plants.

The buildup of the Army in fiscal year 1966 from 969,066 to 1,199,784¹ was accomplished through the enlistment and drafting of individuals, without calling up the reserves, extending terms of military service, or lengthening tours of duty in Vietnam. The creation of additional units to augment the active Army required the withdrawal of experienced cadre personnel from existing stateside and overseas units, causing a temporary reduction in their readiness. Replacement manpower was also trained to meet the large turnover that will occur in Vietnam from July through October 1966, anniversary of the major troop buildup in Southeast Asia and a peak period for duty tours to expire there. Veterans of the fighting will return home to be assimilated into strategic reserve units, substantially improving the level of training and passing on valuable experience to trainees.

Over the past year, training has been oriented toward the special requirements in Vietnam. Advanced individual training, for example, was modified to insure that infantry trainees would derive maximum advantage from lessons learned in the fighting in Southeast Asia. Those returning from the combat zone are assigned to training centers to give the program full effect. The Army is operating 13 training centers in an expanded program designed to meet worldwide needs, replace the monthly loss of men whose terms of service expire, and fill the new units being organized.

During the period 1960-65, the Army expanded from 14 to 16 divisions. In the first half of calendar year 1966 the 9th Infantry Division and three new brigades were activated, along with numerous support units of various types. The acquisition of these forces brought the active Army to 17 divisions and 4 independent brigade forces (the equivalent of $11\frac{1}{3}$ divisions), or $18\frac{1}{3}$ division force equivalents. Between June 30, 1961, and June 30, 1966, the number of combat maneuver battalions in the Army increased from 141 to 191; artillery battalions increased from 101 to 124, air defense batteries from 101 to 229, aviation companies—primarily helicopter—from 60 to 144. The Secretary of Defense noted in February 1966 that the United States had "more troop carrying and cargo helicopters operating in South Vietnam * * * than all of the [other] armies of the whole free world have combined in their total forces, or more than all the armies of the Communist world have combined in their total force."

The Army expansion to meet the emergency in Vietnam has been accomplished without calling the reserves into active service. Steps

¹ Strength figures throughout the report include applicable reimbursable personnel except where otherwise indicated.

have been taken to improve their combat readiness against a time of need. A Selected Reserve Force of three divisions, six brigades, and supporting forces has been manned at increased strength and equipped to support accelerated training. The manning of additional reserve units required to round out the active Army, establish a mobilization base, and support air defense units and the other Services, will be raised to, and maintained at, appropriate levels.

Although the war in Vietnam absorbed a major share of the Army's attention in fiscal year 1966, commitments in other areas of the world were not slighted. The Seventh Army in Europe retained its capability to meet the initial impact of aggression; the Army force in the Dominican Republic was reduced but maintained at a level consistent with peacekeeping requirements in the island country, where elections in June 1966 paved the way for the restoration of democratic government and an end of the commitment there.

At home and abroad the Army in the past year has carried forward the broad range of functions and activities that comprise its responsibilities to the Nation. The report that follows discusses these matters in detail.

II. Operational Readiness

The Army's increase in strength from 969,066 to 1,199,784 during fiscal year 1966 was a measure of its increased worldwide responsibilities. From an expanding base in the continental United States, the Army administered forces in Germany and Japan, continued the commitment in South Korea, assigned its forces remaining in the Dominican Republic to the Inter-American Peace Force, and above all, substantially enlarged the operational force in the Republic of Vietnam.

The Pacific and the Far East

The U.S. Army, Pacific (USARPAC), was deployed over a vast area from its headquarters in Hawaii to Japan, Korea, and Southeast Asia. Operational forces in the area increased during the year to a level of four infantry divisions, one airmobile infantry division, two airborne infantry brigades, four corps or equivalent headquarters, and such elements as an engineer brigade in Vietnam, a missile command in Korea, and air defense brigades in Korea and on Okinawa as well as separate artillery and air defense battalions and aviation companies.

The Army's principal occupation in the Far East was with the buildup and operations in the Republic of Vietnam, where the majority of USARPAC forces were deployed to the U.S. Army, Vietnam (USARV), as a result of the intensification of the war there. Operational control of the combat units was assigned to the Commander, Military Assistance Command, Vietnam (MACV), a unified commander who was also the Commanding General, USARV. The latter exercised direct control over logistical units responsible for supply, maintenance, construction, and transportation support of all Army units in Vietnam. Throughout the fiscal year the U.S. Army provided increased military assistance to the Republic; the most significant period of buildup came in the first two quarters, when strength increased by more than 112,464 personnel. Conventional divisional dispositions of the past gave way to a more fluid type of warfare based on the small unit and the individual soldier. U.S. forces set out to find, fix, and finish the enemy in actions characterized by increased intelligence operations, rapid deployment by helicopters, and full use of airpower. They concentrated on destroying the enemy rather than on seizing the terrain he occupied.

U.S. Army strength in Vietnam increased from 35,000 in June 1965 to approximately 167,000 at the year's end. The only major Army combat unit in Vietnam at the close of fiscal year 1965 was the 173d Airborne Brigade. During fiscal year 1966 the United States committed the 1st Cavalry Division (Airmobile), the 1st and 25th Infantry Divisions, the 1st Brigade of the 101st Airborne Division, and a proportionate number of combat support and combat service support units. The combat and combat support units were under the operational control of two corps-type headquarters—the I and II Field Forces, Vietnam.

The rapid construction of port and logistical depot facilities at Cam Ranh Bay and Qui Nhon by the 18th Engineer Brigade was one of the Army's most remarkable accomplishments of the year. Massive construction operations by Army engineer battalions provided essential facilities for troop housing, hospitalization, Army aviation, and storage and maintenance of critical supplies and equipment. Completion of the latter facilities and deployment of units of the 1st Logistical Command contributed to the capacity required to handle the increasing flow of supplies related to the buildup and the expansion of combat operations.

Combat units were committed soon after their arrival in Vietnam. Although there was an orientation and acclimatization period of 30 days, many units saw some action before the end of that period. Operations were of two kinds: Those devoted to clearing and securing tactical areas of responsibility, including base camps of the major commands, and search and destroy actions in areas of varying distances from base camps. In the latter, primary reliance was placed on airmobile forces. Some forces were committed to areas that had not been penetrated by friendly forces in many years. A major study of all combat operations led to recommendations for substantive changes in the organization of infantry, airborne, and airmobile battalions, to adapt them better to service in Vietnam.

Army units participated in approximately 4,700 battalion days of combat, conducted over 340 battalion-size or larger operations with over 290 enemy contacts, and made over 1,650 enemy contacts in company-size or smaller unit operations.

Because of Thailand's strategic position in Southeast Asia, conditions there are a matter of concern to the United States. During the year, Thailand faced growing insurgency within its borders, particularly in the remote northeast and southern sections. Early in 1966 Thai police and military elements launched a series of operations against insurgent bases. The United States continued to assist Thailand in improving its economic, military, and logistical position. The U.S. Army had over 4,100 personnel assigned to the U.S. Military



Figure 2. Army troops use a smoke grenade to flush Viet Cong from a camouflaged tunnel.

Assistance Command and the 9th Logistical Command in Thailand, and had support responsibilities for all current and future U.S. Air Force operations in that country. Among major Army undertakings were the development of the Sattahip port complex, the extension of the Bangkok bypass road toward Korat, the general improvement of logistical installations, and assistance to the Royal Thai Army to help improve its combat readiness.

The United States commitment in Korea continued with U.S. Eighth Army and Republic of Korea forces facing the North Korean Army along the demilitarized zone that divides the country. The major combat forces of the Eighth Army were the I Corps (Group), with its 2d and 7th Infantry Divisions, the 4th Missile Command, and the 38th Artillery Brigade (Air Defense). The I Corps (Group), whose mission was to defend the avenues of approach into South Korea on the west, stationed the 2d Infantry Division along part of the demilitarized zone and held the 7th Infantry Division in reserve. Units regularly conducted simulated combat training and held frequent training exercises to maintain combat readiness. The U.S. Military Advisory Group in Korea assisted the Korean Army to develop and maintain its forces.

On Okinawa, in addition to Headquarters, U.S. Army Ryukyu

Islands (USARYIS), and Headquarters, IX Corps, the principal Army forces were the 2d Logistical Command, added during the year to improve logistical support of operations in Southeast Asia; the 30th Artillery Brigade (Air Defense); the 7th Psychological Operations Group; and the 1st Special Action Force, Asia. Except for the 30th Artillery Brigade, which provided air defense for Okinawa, all units were in a deployable status to support contingency plans. There was a realignment of organizational structure and an increase in manpower during the year to meet increased responsibilities.

In Japan the mission of U.S. Army, Japan (USARJ), with headquarters at Camp Zama, was principally to provide logistical support to U.S. Army and allied forces in the Far East. While the buildup in Vietnam had an impact on the USARJ command, it was concentrated in the areas of military assistance, depot operations, and expansion of hospital facilities. In December 1965 the United States sent two 1,000-bed general hospitals and a 500-bed field hospital to Japan; they became operational that same month, receiving battle casualties direct from Vietnam and providing extensive specialized medical treatment.

Elsewhere in the Far East during the past year, the Army has been active through military assistance advisory groups (MAAGs) in Taiwan and the Philippines and with the Military Equipment Delivery Team in Burma.

Europe and Africa

U.S. Army, Europe (USAREUR), continued as the Army component of the unified U.S. European Command and an important element of the North Atlantic Treaty Organization. USAREUR represented about one-sixth of the Army's strength worldwide. Its major element, Seventh Army, was deployed along a 300-mile front of the so-called Iron Curtain with three mechanized infantry and two armored divisions. Two armored cavalry regiments formed a screen for these divisions and another armored cavalry regiment provided rear area security and a reserve for the Seventh Army. The fire power of the infantry divisions was increased during the year by the addition of a tank battalion in each division in lieu of a mechanized battalion. During fiscal year 1966 there was a reduction in USAREUR's strength through the reorganization of the mechanized divisions, the withdrawal of the last of the battalions temporarily deployed to Europe during the 1961 Berlin crisis, and the temporary drawdown of personnel to meet unit activations in the continental United States or deployments to Southeast Asia.

To maintain its ability to provide initial combat support, the USAREUR logistical structure was reorganized a second time in as

many years; two depot complexes were formed out of four by phasing out some activities and transferring others. This reorganization resulted in the return of 2,106 military and 36 civilian personnel to the United States and a reduction of 2,790 civilian spaces in France.

French demands during the year led to formulation of plans for withdrawing U.S. forces from France by April 1, 1967. This will require USAREUR to revise its combat service support and relocate U.S. NATO elements.

The U.S. Army Southern European Task Force continued to provide NATO forces in northern Italy with ground-delivered atomic support, including the SERGEANT missile system.

Augmentation of the Berlin garrison, which dates from the crisis of 1961, ended in January 1966 when the 1st Battalion, 21st Infantry, 24th Infantry Division, returned to its home station in West Germany. Other than this troop reduction, there has been little change in the Berlin situation during the past year. The garrison's operational readiness was kept at a high level through active training within the city and at major training areas in West Germany.

On January 17, 1966, a nuclear-armed B-52 bomber collided with a KC-135 tanker during air refueling operations over Spain and both aircraft crashed on the southeast coast of that country. Wreckage from the aircraft was scattered over an area of approximately 16 square miles. Engineer and aviation elements of USAREUR participated in the recovery and disposal of contaminated material scattered by the crash.

Alaska and Latin America

In the Western Hemisphere, in the strategic state of Alaska, and in Latin America, the Army also had significant responsibilities. U.S. Army, Alaska (USARAL), continued as the Army component of the unified Alaskan Command. Its major components included two mechanized infantry brigades, two air defense artillery battalions, the headquarters of the Support Command, the Yukon Command, the Northern Warfare Training Center, and the Alaska Military District. The bulk of the troops were stationed at Forts Richardson, Wainwright, and Greely. Major units of the mechanized infantry brigades were an infantry battalion, a mechanized infantry battalion, an artillery battalion, an engineer company, and a tank company.

Since ground transportation networks in Alaska were limited and many areas were accessible only by air, USARAL forces engaged regularly in air transportability and airborne training. Joint air mobility exercises provided training and a means of evaluating the readiness of forces to respond to contingencies anywhere in Alaska. United States and Canadian Army and Air Force units participated in stra-

tegic mobility exercises to provide training for operations on a nuclear battlefield and in a primitive northern area.

The Army component of the unified command defending the southern approaches to the United States, the U.S. Army Forces, Southern Command (USARSO), was located at various posts in the Panama Canal Zone. USARSO in 1966 had an infantry brigade, an air defense battalion, and a special action force. Major units of the brigade were a mechanized infantry battalion, an infantry battalion, and an airborne battalion. USARSO operated the School of the Americas and provided mobile training teams to help meet the training requirements of Latin American countries. In Puerto Rico, USARSO had the subordinate Antilles Command, with headquarters in San Juan, which was to be phased down to a small headquarters by December 31, 1966.

President Johnson and the Organization of American States announced on July 3, 1965, that elements of the 82d Airborne Division, which functioned as part of the Inter-American Peace Force (IAPF) since May 1965, would be withdrawn from the Dominican Republic because of the stabilization of the military and political situation there. The IAPF was commanded by a Brazilian general and consisted of military forces and special police units from Brazil, Costa Rica, El Salvador, Honduras, Nicaragua, Paraguay, and the United States. During August and September the IAPF dismantled weapon emplacements and completed the removal of wire barriers along the perimeter of the former rebel zone in Santo Domingo. On October 25, 1965, IAPF troops occupied the entire former rebel zone. By December 3, 1965, U.S. forces, excepting one brigade and necessary support troops, had been withdrawn from the Dominican Republic.

From February 1966 until elections were held on June 1, 1966, there were only minor incidents between members of the IAPF and the various Dominican Republic political organizations. By election time, all IAPF positions had been turned over to Dominican Republic police or Army units. U.S. forces helped train Dominican military forces and participated in many civic action projects, such as the building of schools and farm-to-market roads, and sanitation and health programs. An important project was the construction of a floating bridge across the Haina River, which the Dominican Government requested to replace a structure washed out by flood waters. The road from Santo Domingo to San Cristobal crossed this bridge and was the main traffic artery linking the capital with the western portion of the country.

The elections of June 1 brought Dr. Joaquin Balaguer to the presidency of the Dominican Republic and a decision by the Organization of American States to withdraw the IAPF over a period of 90 days. On June 28 final withdrawal movements began with the departure of 96 U.S. artillerymen.

Continental United States

The U.S. Continental Army Command (USCONARC), a major field command under the Chief of Staff, U.S. Army, embraced the numbered armies and other units within the continental United States and the Military District of Washington. Among CONARC's most important missions was the organization, training, and equipping of all Army units assigned to it. The Commanding General, USCONARC, was also the Commander in Chief, U.S. Army Forces Strike Command (USARSTRIKE), and in that capacity served under the Commander in Chief, U.S. Strike Command.

The continued removal of units from the USARSTRIKE troop list because of deployments to Vietnam made it necessary to add to the USARSTRIKE troop list, with certain exceptions, all unassigned U.S. Strategic Army Forces (STRAF) units, that is, strategic reserve units. Excepted units included those providing school support, those on special mission, those serving in the Dominican Republic, and those not considered combat ready. A revised USARSTRIKE troop list, issued on December 5, 1965, increased the assigned number of units to 168, but because activations and deployments resulted in continual changes in the composition of STRAF and in the readiness of its units, the list required periodic updating. As of June 30, 1966, it contained 182 units.

Putting into effect plans begun in 1964, the Second U.S. Army was inactivated on January 1, 1966, and the First and Second Armies were consolidated. Headquarters, First Army, was established at Fort Meade, Md. Fort Jay, at Governor's Island, N.Y., the former home of the First Army and a military reservation since 1794, was discontinued as a military post on June 30, 1966, and transferred to the U.S. Coast Guard.

Army Readiness

The most significant accomplishments during the past year that concerned Army readiness were the preparation of a large number of units for deployment to Southeast Asia and the expansion of the U.S. continental training base to permit additional unit deployments as required. The two programs were particularly significant because they were accomplished without calling reserves or extending terms of service.

The Department of the Army improved its readiness reporting system by publishing revised regulations that led to more meaningful reports from units in the field. To reduce their reporting load, however, and because more current information was available through

other reports, the Department of the Army excused units in Vietnam from reporting under the unit readiness regulations.

The most significant changes in the readiness reporting system were the provision of additional detailed instructions; the simplification and revision of the punch-card format of the reports to permit their transmission and more detailed analysis and evaluation by mechanical means; the requirement that the reports reflect both the deployability of equipment and the performance of a unit in maintaining the equipment on hand; and the requirement that, in reporting on repair parts, the report show the days of supply rather than the percentage of so-called line items on hand.

At the year's end there was some improvement in logistical readiness, for new items of equipment and repair parts were becoming more readily available than they had been in the past. Increased production should lead to continued improvement in the next year. The Army conducted separate field tests using proposed new training indicators and revised repair parts criteria in view of the next revision of Army Regulations on readiness which was in its preliminary stages at the end of the year.

To provide a free exchange of ideas concerning readiness between major commanders and their staffs on the one hand and the departmental headquarters on the other, the Department of the Army instituted the Secretary of the Army's Program for Command Supervision of Readiness in fiscal year 1965. The initial round of major presentations under that program was completed in September 1965, covering such matters as posture, progress, and problems of command. Presentations were made by various commands—the U.S. Army, Alaska; the U.S. Army, Europe; the U.S. Army, Pacific; the Army Security Agency; the Combat Developments Command; the Strategic Communications Command; the Army Materiel Command; the Army Air Defense Command; and the Intelligence Corps Command—and by staff agencies as well. Those by staff agencies were on transportation readiness (by the Office of the Deputy Chief of Staff for Logistics), personnel readiness (by the Office of Personnel Operations), funding readiness (by the Office of the Comptroller of the Army), and the readiness of potential enemies (by the Assistant Chief of Staff for Intelligence). Other major commands and staff agencies will make presentations during the first part of the new fiscal year.

A final aspect of operational readiness on which there was notable progress in the past fiscal year was that concerned with the combat support of the Army. Under the old system an Army field commander had to transact business with seven different service branches in order to obtain supply and administrative support. Because of the inefficiency of such an organizational arrangement the Army developed a

new system called Combat Service Support to the Army (COSTAR II). In accordance with COSTAR II, the Army grouped all supply and administrative functions under the Field Army Support Command, thus reducing the number of personnel required and making the system more responsive to the combat commander. The COSTAR II system is intended to bridge the gap between the functionalized service support available to the combat divisions and the functionalized supply management in the continental United States.

The Army completed reorganization of the Seventh and Eighth Armies under the COSTAR II system by December 31, 1965, and scheduled the reorganization of the supply and administrative system supporting the Army forces in Vietnam for the first quarter of fiscal year 1967. Units in the continental United States will be organized under the COSTAR II concept as they are activated. It is expected that the entire Army will complete its reorganization to the COSTAR II concept by the end of the first quarter of fiscal year 1967.

Special Forces and Psychological Operations

In fiscal year 1966 there were minor adjustments in the strength and deployment of Special Forces, including a reallocation of spaces to meet increased requirements for the 5th Special Forces Group in Vietnam. The Army also assigned to the Commander, U.S. Forces, Dominican Republic, on a permanent-change-of-station basis, the Special Forces elements that were deployed to the Dominican Republic in 1965 on a temporary basis. In addition to those in Vietnam and the Dominican Republic, there were also Special Forces at Fort Bragg, N.C.; on Okinawa; in Germany; and in Panama. The Latin America Special Action Force, of which the 8th Special Forces Group was the base unit, was active in providing military advice and assistance in ways basic to internal defense and development to 17 Latin American countries. In Vietnam, the 5th Special Forces Group, which was being increased in strength at the end of the fiscal year, had a diversity of missions. It worked with Montagnard tribesmen in the remote plateau areas in support of the Civilian Irregular Defense Group Program, and, beyond that, was responsible for broad pacification and rural construction programs that included a full range of tactical training, military civic action programs, and psychological operations. This work was primarily in areas where the Republic of Vietnam Army was not present in strength. In many cases the 5th Special Forces Group's work contributed to countering Viet Cong infiltration across international boundaries.

During the past fiscal year, the Army increased its psychological operations forces in the field by one battalion of 271 men for support

of Vietnam programs and one detachment of 37 soldiers assigned to the U.S. Forces, Dominican Republic. Major psychological operations forces remained stationed at Fort Bragg, N.C.—where there was one psychological operations group of three battalions—while other units remained deployed to support Army activities in Germany, the Panama Canal Zone, and the Pacific Command. Army psychological operations activities encompassed the support of combat operations in Vietnam, conduct of psychological operations programs in Korea, support of U.S. activities in the Dominican Republic, provision of training teams to military assistance advisory groups and missions, and support for the U.S. Information Agency (USIA). During the first half of fiscal year 1966, the Army reorganized all psychological operations units under the cellular structure concept. Thus each unit could be tailored to meet the special requirements of a particular command. For example, units could be tailored for strategic operations in support of broad programs in general, limited or cold war, for tactical operations in support of combat forces, and for consolidation-type operations after a battle. To the Army, this reorganization was a major advance in psychological operations.

Civil Defense*

The main objective of the nationwide civil defense program is to increase the survival potential of the population in the event of nuclear attack against the United States.

The nationwide fallout shelter system is the core of civil defense. A system is under development aimed at providing fallout protection for the total population at work, at home, or in school. Included in this program is the nationwide architect-engineer survey of existing large buildings with potential shelter areas that meet minimum protection standards and have a capacity for 50 or more persons. Public fallout shelter space for nearly 14 million persons was located by this survey during fiscal year 1966. This increased the nationwide shelter inventory to almost 150 million spaces. At the end of the year, shelter space had been licensed for more than 89 million persons, and space for more than 85 million had been marked. Space located in 74,667 facilities had been stocked with survival supplies that would be sufficient to take care of 68.8 million persons for 8 days or 41.3 million for 14 days.

Community shelter planning is a key aspect of the shelter program. An objective of the Office of Civil Defense is to provide financial support and guidance for local planning to assure effective use of available fallout protection in all communities in the United States and to

*An abbreviated version of the full report of the Director of Civil Defense appears as an annex to this report.

identify those areas in need of further shelter development. In fiscal year 1966, the Office of Civil Defense began to place community shelter planning contracts with representatives of large local planning areas to provide the services of local urban planners or professional planning firms. For smaller communities, the Office of Civil Defense began placement of contracts with the States to provide professional urban planning services for this purpose.

Several techniques have been developed to locate additional protective space in areas where community shelter planning reveals shelter deficits. Professional advisory services of architects and engineers are provided to incorporate fallout shelter design techniques in new construction at little or no additional cost. Smaller structures with potential shelter capacity for 10 or more but less than 50 persons are surveyed by architects and engineers to locate additional shelter space. Fallout shelter space can also be obtained for more people by providing ventilation in many shelters already located. During the fiscal year, a prototype system for procurement and distribution of 2,400 packaged ventilation kits was initiated. To further augment the nationwide fallout shelter system, a questionnaire survey of home basements was conducted in Rhode Island, and plans were made for similar surveys in other States.

Further development and expansion of the nationwide fallout shelter system were closely allied with improving and maintaining the operational readiness of complementary civil defense systems. These are essential to effective shelter usage and to preattack planning and postattack operations. They provide for: (1) Alerting and warning people of impending attack, (2) communicating with the public in emergencies and directing emergency operations, (3) collecting, evaluating, and disseminating information on radioactive fallout, and (4) assessing damage for planning and operational purposes.

All aspects of the civil defense program were supported by Federal assistance to more than 4,000 State and local governments that chose to participate and submitted required annual program papers. These governments covered about 89 percent of the population of the United States. Types of support included financial assistance, technical guidance, and training and education activities. Civil defense was further supported by continuing research to develop program perspective and guidance for future development. The program also included preparation of emergency information directed to the public; community service activities with various national organizations, associations, institutions, and agencies; activities geared to the needs of industry and labor; and liaison with civil defense officials of friendly countries.

The Office of Civil Defense is the organization responsible for conducting civil defense operations at the Federal level. The Director of

Civil Defense is directly responsible to the Secretary of the Army, to whom the Secretary of Defense has delegated these functions. The nature of the responsibility and leadership of civil defense remains civilian.

Just as civil defense is an essential element of continental defense, so military support is an important element of civil defense. Effective military support of civil defense in preattack and postattack operations is a means of greatly increasing the capability to limit damage from nuclear attack and speed recovery from it. This support of civil authority in civil defense operations is an emergency task within the mission of all active duty and reserve units of the military Services and Department of Defense agencies. Military assistance is thus designed to complement—not replace—civilian participation in civil defense operations. Although essential military operations would have priority, all military forces are considered potentially available for emergency support of civil defense.

The Department of the Army is primarily responsible for military support of civil defense within the continental United States and for insuring the effective use of resources made available by the other military departments and Defense agencies. As approved by the Secretary of the Army and the State Governors, State Adjutants General and their staffs at State military headquarters control operational employment of military personnel and units made available for support of civil defense at the State level. During an emergency caused by nuclear attack, the State Adjutant General, or his alternate appointed by State authorities, upon being mobilized would direct the use of military resources made available within the State to support civil defense operation.

The Commanding General, U.S. Continental Army Command (USCONARC), and the Continental United States (CONUS) Army Commanders guide and control the State military headquarters in performing their civil defense missions, except in Alaska, Hawaii, and the Commonwealth of Puerto Rico, where similar headquarters are controlled by the commanders of appropriate unified commands. Manpower authorized to plan and conduct the military support mission totaled 279 at the end of fiscal year 1966: 36 military and 18 civilian personnel at USCONARC and CONUS Army Headquarters; 3 military personnel and 1 civilian at the National Guard Bureau; and 221 National Guard technicians at State headquarters.

III. Plans and Training, Weapon Systems, Intelligence, and Communications

The Army Family of Plans

The Army planning system is designed to provide an integrated Army strategic concept, a basis for the statement of Army force objectives and required capabilities, the Army's contribution to joint planning, guidance for the formulation of the Department of the Army portion of the Five-Year Defense Program (FYDP), and planning guidance in areas other than strategy and force objectives, such as research and development. The Army family of plans consists of three basic documents. These plans start with the current year and look 20 years into the future. A related plan considers only the period that is immediately ahead.

The Basic Army Strategic Estimate (BASE) is a commander's estimate of the worldwide situation for the mid-range and long-range periods. It projects a worldwide strategic appraisal and a forecast of technological advances, and develops for all other Army planning a strategic concept to meet anticipated threats under conditions of cold, limited, and general war. The Army edition published in October 1965 had two new sections, one on alternative strategies and the other on national security policy recommendations. The former outlined strategic responses to developments that might occur but whose occurrence was too speculative to be covered in the basic strategic concept. It thus reached into the future to identify and project long-range trends and their implications to the Army.

The second of the Army's major plans, the Army Strategic Plan (ASP), determines Army objectives, forces, and deployment required for the execution of the strategic concept of the BASE as modified by decisions of the Joint Chiefs of Staff. The ASP in its mid-range time period serves as a base for developing the Army's contribution to the force requirements element of the Joint Strategic Objectives Plan (JSOP). In its long-range section the ASP provides broad basic guidance for Army long-range planning activities. It also provides guidance to the Army Force Development Plan (AFDP), indicating the Army's median risk military requirements.

The AFDP, the third of the Army plans published annually, serves as a logical corollary to the strategic concept discussed in the BASE as well as to the evolution of basic Army undertakings and objectives laid down in the ASP. Utilizing the guidelines found in both the BASE and the ASP, the AFDP serves as the principal instrument for introducing changes to the Army portion of FYDP. It also provides the framework for identifying problem areas, evaluating alternate solutions, and forecasting requirements. The goal is the creation of balanced Army forces that are, within reasonably attainable resources, modernized, well structured, and ready.

The AFDP for 1967-86, published on May 26, 1966, differed from previous editions. The intensification of the U.S. effort in Vietnam during the past year with no corresponding lessening of the Army's other global commitments necessitated almost continuous decision changes and thereby precluded systematic development of the AFDP in its conventional form. Thus, the current edition is abridged and includes only those elements that provide general guidance but are not specifically dependent upon an analysis of the total force.

Another Army plan, the Army Strategic Capabilities Plan, is closely allied to the three major plans. It further develops and expands for the immediate period the guidance provided in the Joint Strategic Capabilities Plan (JSCP). It provides guidance to agencies and commands of the Department of the Army for employment and support of Army forces in cold, limited, or general war, and reflects actual capabilities in consonance with existing programs and budget limitations.

Stability Operations

Military activities to assist governments of emerging nations in promoting stability and progress constitute the Army's "third principal mission" and are collectively referred to as "stability operations." They include advisory operations, antiguerrilla warfare, civil affairs activities to include military civic action, show-of-force deployments, peacekeeping missions, and all other military operations designed to foster development and forestall or resolve conflict in the political process within a nation or among nations. Put another way, these activities are concerned with matters of internal security and development and seek to maintain, restore, or establish a climate of order without which government cannot function effectively and modernization cannot be achieved. The Army's readiness for stability operations commands a full share of its resources and equal priority with readiness for both limited and general war.

During the past year, military activities promoting progress and stability were included within Army doctrine. Because success is

beyond the reach of military means alone and requires concerted political, economic, and social action, Army doctrine envisions support of and advice to the security forces of threatened governments. The aim is to prevent insurgency or subversion by establishing adequate internal defenses and by removing the underlying causes of conflict. Furthermore, the Army recognized that its officers had to broaden their knowledge if they were to understand the economic, social, and political problems of insurgency. Individuals and units for such operations may be drawn from any segment of the Army. In addition to possessing a high degree of professional competence, individuals must have a broad educational background in order to deal effectively with their foreign counterparts.

To provide a systematic means for conducting stability operations, the Army has been developing during the past fiscal year the concept of a regional assistance command (RAC), to be used when requested by the host government in underdeveloped regions troubled by latent or incipient insurgency. The purpose of such a command would be to participate in internal defense and developmental type operations. It would function in areas in which the level of instability was high and U.S. troop density was low. Assistance commands would consist of training, support, and combat elements.

Because stability operations are so closely related to land warfare, the Army will continue during the next decade to exercise a major share of the responsibility for their conduct in support of U.S. policy. It must improve the capability of units to fight side by side with indigenous forces, advise them, help them in actual construction, and instruct them in building or using equipment. It may be necessary to earmark certain resources for stability operations through inclusion in the Five Year Defense Program.

Doctrine and Systems

Implicit in planning and doctrine are certain fundamental concepts derived from projections of future alternative possibilities. In fiscal year 1966 the Army sought to systematize these matters in an Army concept program comprising three main studies.

The first, completed and approved during the year, was Army 70, which provided operational, organizational, and materiel guidance for the short-range program until 1970. Necessarily built upon the accomplishments of the old separate doctrinal, organizational, materiel, and evaluation programs of the Combat Developments Command, Army 70 directed attention toward the increasing importance of supporting such missions as stability operations while maintaining the Army's capabilities to engage in more intense forms of conflict.

Also completed during the year was one of two major doctrinal studies of the Army 70 program—TASTA (The Administrative Support to the Theater Army), which extended the functional concepts of COSTAR (Combat Service Support to the Army) to the entire army in the field and provided for functional commands to replace the area-oriented sections of the communications zone. TASTA exploited the advances of automatic data processing by introducing integrated computer systems into both the field army support command and the theater army support command for the control of logistic and administrative actions.

Finally, the Army completed and received approval of its Army 75 Concept Study, which dealt with the mid-range period, 1970-75. Because of its projection further into the future, Army 75 explored broader and more flexible concepts than those of Army 70. It visualized forces for the middle '70's capable of engaging successfully in all kinds of operations. The trend in Army 75 was toward two basic kinds of divisions—heavy and light.

With the completion and approval of the Army 85 Concept Study, on which the Combat Developments Command worked during the year, the basic framework of Army Concept Programs for the next 20 years will be complete. Comprehensive Department of the Army guidance to integrate the numerous and diverse actions of the combat development and research and development communities will then be realized for the first time.

The Army has revised its staff procedures for managing selected items of materiel from the conception of a requirement for the item through its retirement from the supply system. The position of a Department of the Army System Staff Officer (DASSO) to perform necessary management functions for an item was established. Each DASSO monitors a particular item in all of its aspects. Although in this respect he corresponds to a project manager, his responsibilities extend to doctrine, organization, training, and other functions not ordinarily monitored by a project manager. As the year ended, all DASSOs worked under the Assistant Chief of Staff for Force Development except the one assigned to the NIKE-X project, who was under the Chief of Research and Development.

Under DASSO monitoring, several areas of interest are worthy of mention. A number of doctrinal and requirements studies were initiated or are nearing completion. The first of these is the Small Arms Weapons Study (SAWS). SAWS was initiated in August 1965 to evaluate potential candidates for the future family of small arms for the Army. When the study is forwarded in the fall of 1966 it will recommend a course of action for the replenishment of present small arms or their replacement by others offering significant improvements.

Two other studies were initiated to address direct and indirect fire weapons families. The direct fire study is entitled Tank-Antitank/Assault Weapons Requirements (TATAWS), and the indirect fire study is the Optimum Mix Artillery Study. The Army also initiated a refinement of the Tactical Mid-Range Air Defense Study (TAMIRADS), first submitted in November 1965, which concerns requirements for tactical air defense, and includes SAM-D, VULCAN-CHAPPARAL, a surface-to-air version of the SIDEWINDER, HAWK, NIKE-HERCULES, and REDEYE.

The comprehensive analysis of requirements for mechanized infantry combat vehicles (MICV) was one of the continuing study efforts of the year. The important parts of this study are concerned with the size of the mechanized rifle squad of the 1970 time period, the small arms to be carried by the squad, and the doctrine for the employment of mechanized infantry. It was expected at the end of the fiscal year that it would be possible to seek industrial bids by August 1966 for a rapid-fire weapon system for the MICV.

In the combat systems area, work proceeded on several fronts during the year. In the field of small arms, additional XM-16E1 rifles were procured to permit equipping all U.S. Army maneuver battalions in Vietnam with this lightweight rifle. The XM-148 40-mm. grenade launcher which attaches to the XM-16 is also being procured for combat evaluation. As the year ended, the CAR-15 5.56-mm. submachinegun was being procured to determine its suitability as a replacement for the pistol in certain positions.

The Army made modest advances during the year on direct-fire weapons and missiles. It received first production deliveries of the SHILLELAGH, the long-range antitank missile fired from a 152-mm. gun tube mounted on the Sheridan armored assault vehicle or on one model of the M-60 tank. Tests of TOW, a tripod-mounted infantry antitank missile, were highly successful and at the year's end TOW was nearing production. The Army also initiated engineering development of the medium antitank assault weapon (MAW), a lightweight missile. It is hoped that with these new and greatly improved antitank weapons the entire character of antitank operations can be changed and that many tanks previously used in defense can be released to form a mobile reserve.

Several notable changes took place during the year in the Army's combat vehicle program. For example, the Army expanded the Joint U.S./Federal Republic of Germany main battle tank development program to include the development of a heavy equipment transporter for carrying the MBT-70 tank and a variety of other cargo. Development of the main battle tank progressed rapidly. It will be equipped with the XM-150 weapon system, which features an advanced

version of the SHILLELAGH and is also capable of employing conventional ammunition that will defeat any other known tank. The MBT will have considerably more mobility and protection than other tanks of either the United States or the Federal Republic of Germany.

In May 1966 the Army classified as standard the new Sheridan armored reconnaissance airborne assault vehicle. Armed with the SHILLELAGH and also capable of using conventional ammunition, it will add increased firepower and mobility to existing reconnaissance and airborne units. At the same time the M-60A1E1 tank, which uses the M-60 tank chassis with an improved turret gun firing the SHILLELAGH or conventional rounds, was classified for limited production. It will provide long-range fire power that is both accurate and able to penetrate any known enemy armor.

Fiscal year 1966 saw the Army's air mobility concept come into its own. With the activation on July 1, 1965, of the 1st Cavalry Division (Airmobile), and its subsequent deployment to Vietnam in September, came the first extended combat test of the concept. From the first major engagement in the Ia Drang valley to the operations in the highlands of Pleiku in May, the 1st Cavalry repeatedly validated the concept of fighting a land battle through the air.

While the airmobile division is the most spectacular and largest user of organic aerial vehicles, aircraft have had a tremendous impact on land combat across the board in Vietnam. The Army uses OV-1 Mohawk aircraft for reconnaissance and to seek out enemy forces. It moves maneuver elements and their fire support by helicopters at a time and place of its own choosing, and daily, in conjunction with ground transport and air transport of other Services, provides its fighting units with food, ammunition, and medical support. Use of the helicopter for command and control promises to become the norm. These elements of the airmobile concept are applied to the functions of land combat by all U.S. units in Vietnam.

The helicopter is also able to deliver small volumes of discriminating fire in the immediate vicinity of ground combat elements, fires which not only supplement the indirect fires normally delivered by artillery, but also complement direct fire weapons by extending their range and ability to attack targets masked by terrain. At the year's end, the UH-1B helicopter performed the aerial fire support tasks, but in production was the Cobra—an improved version of the Huey (UH-1)—which will improve aerial fire support of airmobile forces.

Perhaps as remarkable and dramatic in its own way as the developments in air mobility is the Army's effort to extend automatic data processing to the tactical, combat support, and artillery needs of the field army. The idea goes back at least to 1956, when the Continental Army Command sought the help of the Chief Signal Officer in explor-

ing the possibility of using automatic data processing in tactical military operations. In 1961 the Chief of Staff gave priority to a plan for developing and integrating automatic data processing systems into the tactical forces at or below the field army level. After the Army reorganization of 1962, the Army Materiel Command took over responsibility for developing the equipment. The culmination of the earlier efforts came in 1965 when the Army adopted the Implementation Plan for Automatic Data Systems within the Army in the Field (ADSAF).

ADSAF established three related but semi-independent subsystems—the Tactical Operations System (TOS), the Combat Service Support System (CS_s), and the Tactical Fire Direction System (TACFIRE). The systems are related because they are all tactical, but at the same time they are semi-independent because they are designed to solve different problems in three different commands. As the names indicate, each is concerned with one of the three broad functions of military operations—employment of maneuver elements, combat service support, and control of artillery fire.

In ADSAF the Army seeks to improve existing manual systems by automating the solution of problems that can be mathematically analyzed and to provide commanders in the field with accurate and timely information for tactical decisions. Each subsystem will employ devices for receiving, storing, processing, and transmitting data. In addition, the computer centers servicing these subsystems will be available to local users through the use of remote inquiry equipment. Because the three subsystems will be closely interrelated, they must be mutually supporting; however, in recognition of the unique characteristics of each one, they will be individually tailored to particular requirements and separately funded.

The purpose of the Tactical Operations System (TOS) is to assist commanders at division, corps, and army echelons to make timely tactical decisions by taking advantage of the capabilities of electronic data processing. It is a system for supporting commanders and staffs at division, corps, and army echelons by coordinating information (both friendly and enemy) and fire support. To a much greater degree than the other two systems TOS is influenced by the commander's mission, the type of enemy he faces, and the terrain and weather conditions that exist in his theater of operations.

For the next few years the TOS development will be focused on an experimental system in the 7th Army in Europe in an effort to define the automatic data processing requirements for the European theater. Complementary work in the continental United States will provide the data for systems for other geographical areas. It is expected that ultimately TOS will use the same computers and some of

the same equipment developed for TACFIRE, but the 7th Army will use currently available commercial equipment for the experiment.

The Combat Service Support System seeks to automate certain logistical, personnel, and administrative functions of the field army in order to increase the efficiency of combat service support operations. CS₃ envisions computers in all divisional support commands, support brigades, and field army support commands. The requirements of the communications zone will be satisfied by two systems, one of which will be located at an inventory control center and the other at a personnel and administrative center.

CS₃ will provide a transportable data system capable of worldwide deployment with a reasonable chance of survival in warfare. It will replace approximately 150 existing nonstandard installations, most of which are fixed, and it will provide reliable up-to-date information on combat service support activities for commanders planning and executing tactical operations. A test of this subsystem will be conducted in the III Corps at Fort Hood, in 1967 and 1968. In late summer of 1968 the installation will be evaluated and a decision made concerning its extension to the rest of the Army.

TACFIRE is a system for placing artillery fire on enemy targets as quickly, effectively, and economically as possible. It is designed as an automated system to replace present manual methods of field artillery fire direction to get "iron on the target." It is oriented toward the divisional artillery structure, although it is also planned to use it with corps artillery and to extend it to every artillery echelon in the field army.

Forward observers will send fire missions to the fire-direction center computer using digital message entry devices rather than voice communications, the idea being to get information into digital form as soon as possible. At the field artillery battalion, for example, the computer will be programmed to analyze fire missions from forward observers, print the fire mission along with a recommended fire order and the fire commands, and display on the digital plotter map the location of the target with respect to the terrain and the tactical situation. The gunnery officer will accept the recommendation or, using the artillery control console, make any modification or change he might wish. Pressing a button will send the fire commands to the firing batteries. The whole operation, from forward observer to firing batteries, is expected to take less than 30 seconds, a considerable reduction in the time the same operation takes today.

TACFIRE is the culmination of over 7 years of developmental work by artillerymen to achieve the substantial gains that appear possible from automatic data processing. TACFIRE has been completely de-

financed and experimental programs for all functions have been written and evaluated. The Army is confident that TACFIRE represents a program of minimum risk and relatively modest cost that will lead to substantially greater effectiveness.

Army Aviation

On April 6, 1966, the Chiefs of Staff of the Army and the Air Force reached an important understanding on inter-Service control and use of battlefield aircraft, thus solving a problem that has confronted the Army for some time. Under the agreement the Army relinquished claims to its transport planes (144 CV-2 twin-engine Caribous and 4 CV-7 Buffaloes), and to "future fixed-wing aircraft designed for tactical airlift" in return for Air Force release of all claims to helicopters and follow-on rotary wing aircraft designed and operated for intratheater movement, fire support, supply, and resupply of Army forces and those Air Force control elements assigned to the Direct Support Center (DASC) and subordinate thereto. In other words, the Army obtained sole responsibility for developing and using armed and transport helicopters, for example, in its airmobile operations in Vietnam. The Army retained its fixed-wing administrative aircraft and its twin-engine Mohawks.

Also under the agreement the Army agreed to train Air Force instructors for the Caribous at Fort Benning, Ga., who in turn would train their own pilots to operate the aircraft. Army pilots of the transport planes were to be retrained as helicopter pilots.

The importance of Army aviation during the fiscal year just closed may be gauged by the number of its aviators. The active Army and the reserve components began the fiscal year with 11,600 aviators and ended it with 12,100. At the end of the year there were more than 8,300 aircraft in the active Army and the reserve components, an increase of more than 1,000 airplanes and helicopters during the period. More than 43 percent of the inventory (3,600 aircraft) was overseas at the end of the year, an increase of 1,300 aircraft, due primarily to deployments to Vietnam.

To support active Army units already overseas or deploying to Vietnam, it was necessary to decrease the training of aviators for the reserve components. The year saw the beginning of a marked expansion of aviator training to a planned output of 410 active Army pilots per month; however, since the flight training courses during last 9 months, the aviator inventory will not increase substantially until the last quarter of fiscal year 1967.

ARMY AVIATOR TRAINING IN FISCAL YEAR 1966

Aviators trained	Fixed-wing	Rotary-wing	Total
Active Army-----	385	1, 151	1, 536
Reserve Components-----	5	20	25
Foreign Military-----	18	50	68
Total-----	408	1, 221	1, 629

Organization and Staffing

Founding it upon two basic documents, the table of organization and equipment (TOE) and the table of distribution and allowances (TDA), the Army inaugurated its New Army Authorization Document System (NAADS) on October 1, 1965, and scheduled the conversion of all units in the Army to this system by October 1, 1967.

The TOE reflects the task of a military unit designed for a combat operational role and the personnel and equipment needed to accomplish it. The TDA combines in one document the former table of distribution and table of allowances to prescribe the organizational structure, with personnel and equipment, for a special purpose military unit designed for administrative support of combat operational units and for which there is no appropriate TOE. Both of these documents reflect the full requirements of personnel and equipment needed by a unit to accomplish its assigned task and the authorizations toward these requirements that the Army is able to provide from available resources.

The policies and procedures pertaining to NAADS are directly linked with the unit readiness system and Department of the Army organizational policy. The readiness system is a technique for measuring the operational readiness of units, the organizational policy provides the standard for the development of unit organizational structures, and the NAADS documents the details of both. In combination these elements provide the means for the Army to control its resources and develop accurate statements of what it needs to accomplish its assigned roles and missions in national defense.

During the past year the Army published the Staffing Guide for U.S. Army Communications Facilities (DA Pamphlet 616-567), which provides guidance for determining the number and type of personnel required to operate and maintain teletypewriter and data relay systems and high frequency radio circuits, and to perform command, administrative, managerial, security, and logistical support functions at Strategic Communications Command fixed-station facili-

ties. Publication of the pamphlet brought to 17 the total number of staffing guides in use.

In addition to providing this new coverage, the Army also gave high priority to updating existing staffing guides on training, support, and other activities such as training centers, service schools, recruiting stations and districts, garrisons, headquarters of numbered armies in the continental United States, and medical laboratories.

Staffing guides provide a major tool for the conduct of manpower utilization surveys, which in turn play a key role in Army manpower control and management. During the past year manpower survey teams representing Headquarters, Department of the Army, and the major commands conducted a total of 419 manpower utilization surveys worldwide. In all, the surveys covered 230,294 personnel spaces and resulted in redistribution of 15,892 spaces to higher priority requirements.

In another area of manpower concern—the use of military personnel in essentially civilian positions—the past fiscal year saw a firm new policy and many conversions, the result of several circumstances. Deployment of troops to Vietnam, general augmentation of active duty military strength, and increased readiness of reserve forces made it imperative, as stated in a presidential memorandum to the Secretary of Defense, that “all military personnel are assigned to duties for which there is a direct military requirement.” Following preliminary studies to identify positions in which civilians could replace military personnel, the Army undertook conversion, during calendar year 1966, of 28,500 military positions (1,300 officer and 27,200 enlisted) and the accompanying elimination of 8,000 transient, trainee, patient, and student spaces for a total military reduction of 36,500.

The conversion goal for the end of fiscal year 1966 was 21,398. By June 30, 1966, 15,238 positions had been converted, representing 71 percent of the goal. The chief problem was the generally tight civilian labor market, particularly in higher skills, 4,750 positions (as of June 30) were reported as being under active recruitment for thirty or more days without being filled. Action taken to step up conversions included removal of previously established quarterly restrictions on conversions and modification of substitution criteria.

The Army during the past fiscal year realigned the functions of the Office of the Deputy Chief of Staff for Personnel (ODCSPER) and the Office of the Assistant Chief of Staff for Force Development (OACSFOR), centralizing in the latter office all manpower management so that one General Staff element would be responsible both for interpreting the manpower policy of the Bureau of the Budget and the Office, Secretary of Defense, and for applying it to the field commands. ODCSPER received responsibility for individual training in

the Army training centers and schools (excepting aviation training), as well as staff supervision over the U.S. Military Academy, West Point Military Reservation, U.S. Military Academy Preparatory School, U.S. Army War College, Defense Language Institute, Defense Information School, and the programs of the officer candidate schools. With this assignment the Individual Training and Schools Branch and the Training Activities Branch, OACSFOR, with all authorized spaces, functions, and personnel, were transferred to ODCSPER.

Under the same reassignment of functions, OACSFOR accepted responsibility for both civilian and military manpower allocation, including planning, programing, policies, and procedures. Its work now embraces authorization and utilization of manpower, the development of civilian manpower budget estimates and costs, and centralized approval authority for tables of distribution and allowances. OACSFOR, therefore, also received upon transfer the Authorization Division, Utilization Division, and Civilian Strength Program Branch, ODCSPER, with all their authorized spaces, functions, and personnel.

Training and Schooling

As might be expected, given the troop buildup in the Republic of Vietnam, the Army oriented much of its training program during fiscal year 1966 toward service in that country. Among other things, it established "Operational Reports—Lessons Learned," through which unit commanders and staff agencies could submit information, evaluations, and recommendations based upon operations. The Army furnished material derived from lessons learned during operations in Southeast Asia and in the Dominican Republic to unit commanders, schools, scientists, and others, and on the basis of recommendations developed, took actions in training, equipment design and modification, administrative procedures for the management of personnel and cargo and in other personnel and policy matters.

In its instructional program, the Army expanded its training in the Vietnamese language; established military assistance training advisor courses, including some for sector/unit, corps/division, and senior enlisted advisors; and revised appropriate instruction at service schools and training centers to increase emphasis on counterinsurgency. Counterinsurgency instruction emphasized such subjects as perimeter defense, duties of sentries, ambush drill, sanitation, jungle survival, area orientation, the use of the M-16 rifle, rotary-wing aircraft navigation, fire distribution from rotary-wing aircraft, physical conditioning, airmobile operations, avionics, radar, and general communications.

To insure that most new officers would gain practical experience in leading troops before entering the combat zone, the Army adopted a



Figure 3. In realistic stateside training, captured "aggressor" soldiers, dressed as Viet Cong, are searched.

policy under which newly commissioned second lieutenants of the combat arms (excepting certain officers in critical categories as determined on an individual basis) will receive a minimum of 4 months of training as unit leaders in the continental United States, Hawaii, or Alaska before assignment to a combat area as individual replacements; this with the proviso that, to maintain unit integrity, officers still in the break-in period would deploy with their unit if it was shipped to a combat area.

Expansion of Army training centers accompanied the expansion of the Army during the past year. For each additional basic combat training (BCT) company approximately 220 new soldiers can be added to the number entering training every week. Some idea of the expansion of the training centers and the men trained therein can be gained from a simple computation. From a base of 30 BCT companies in July 1965, their number grew to 48 by May 1966, the result of gradually adding 18 companies at Fort Polk, La.; Fort Dix, N.J.; Fort Jackson, S.C.; Forts Gordon and Benning in Georgia; Fort Bliss, Tex.; Fort Ord, Calif.; and Fort Leonard Wood, Mo.

Advanced individual training also had to be expanded so that BCT graduates could continue their military education. This expansion occurred in training centers and schools where the Army tailored the

training to satisfy the military occupational specialty requirements of the approved force structure.

During fiscal year 1965 the average trainee population was 105,570; during fiscal year 1966 it rose to 157,098. In fiscal year 1967, the number of BCT companies will increase from 48 to 63, and average trainee population is expected to rise to approximately 218,000.

The substantial expansion of training centers during the fiscal year was still not enough to keep up with personnel additions to the Army. Consequently, about 55,200 trainees had to go into units for their basic combat and advanced individual training under what was called the "train and retain" program. Historically, the Army has used divisions and nondivisional units for such training, but their use in fiscal year 1966 contributed to certain problems. One of these was the training of too many persons in some skills and not enough in others. Although this problem existed principally in the lower skills, the result was that personnel trained and qualified in certain skills were temporarily not available in sufficient numbers for worldwide Army needs.

As basic training expanded with the buildup, so did the Army school system, which embraced the schools under CONARC. The active Army enrollment in schools increased during the year by 106,000 from an initial program of 139,000. The increased load caused double shifting for 79 courses at 9 schools and triple shifting for 4 courses at 3 schools. It is estimated that some 413,000 persons will be enrolled in courses at these schools in fiscal year 1967.

A Department of the Army board was appointed in June 1965 to determine the adequacy and appropriateness of the current Army school system and the education and individual school training of Army officers in light of the responsibilities that will confront the military establishment in the foreseeable future. Chaired by Lt. Gen. Ralph E. Haines, Jr., the board submitted its recommendations to the Chief of Staff in February 1966. Approved modifications in the Army school system will take effect in fiscal years 1967 and 1968.

In August 1965 the Army's fiscal year 1966 programed level of graduates from its officer candidate schools stood at 1,800. With the increased officer procurement dictated by the buildup, the Army in September 1965 raised the 1966 programed level to 6,527. This necessitated expansion of existing officer candidate schools for Infantry and Artillery, and the opening of one school each for the Corps of Engineers, the Signal Corps, and Branch Immaterial. The last was to provide general training for Armor, Ordnance, Quartermaster, and Transportation officer candidates, while the appropriate existing service schools would follow with branch-oriented training.

The Army's civil schooling program continues to provide officers with graduate degrees for the 4,461 research and development posi-

tions, high staff positions, and positions in the service schools for which the Army Educational Requirements Board has certified that graduate degrees are required. In view of the Chief of Staff's approval of certain recommendations of the Haines Board, it is expected that there will be additional requirements for officers with graduate degrees in the area of systems analysis/operations research and automatic data processing.

Intelligence Activities

On March 1, 1966, the Army inaugurated its Civilian Career Program for Intelligence and began filling civilian positions at the GS-13 level and above through Army-wide referral lists with a view toward securing the best qualified persons.

The discontinuance of the U.S. Army Intelligence Corps Command highlighted the organization changes in intelligence structure that took place in fiscal year 1966. The Army discontinued the command to simplify the complex structure at Fort Holabird, Md., where one general officer was at once Commandant of the U.S. Army Intelligence School, Chief of the Intelligence Corps, Commanding General of the Intelligence Center and Fort Holabird, and Acting Commanding General of the U.S. Intelligence Corps Command. With all these responsibilities, he had to report to four higher headquarters.

In changing the intelligence command structure in July 1965, the Army vested the responsibility for centralized control of counterintelligence operations in the continental United States in the U.S. Army Intelligence Command (AINTC), of which the Counterintelligence Operations Group at Fort Holabird became the nerve center. Area counterintelligence groups in the continental United States, generally co-located with the various army headquarters, came directly under the Counterintelligence Operations Group. The U.S. Army Investigative Records Repository at Fort Holabird also came under the AINTC.

The Army established, under the Office of the Assistant Chief of Staff for Intelligence (OACSI), the U.S. Army Administrative Survey Detachment (ASD) and the U.S. Army Intelligence Material Support Office (IMSO). It placed these directly under OACSI because of the sensitive functions of ASD and the peculiar intelligence orientation of the supply function of IMSO. Also placed under OACSI were the Intelligence Threats and Forecasts Group, established January 21, 1966, which will prepare intelligence assessments of enemy capabilities to support U.S. Army research and development, combat developments, and long-range planning; the Defense Central Index of Investigations, established February 1, 1966; and the De-

partment of Defense National Agency Check Center, established March 1, 1966.

Another effort to simplify the intelligence organization during the year was the abolition of the Intelligence Corps (a 1961 redesignation of the former Counterintelligence Corps, which went back to 1942). Several of its functions went to the Department of the Army staff or other agencies. One of the most important of these is the Office of Personnel Operations (OPO). However, ACSI will establish the selection criteria for intelligence personnel in coordination with OPO.

At the direction of the Department of Defense, on March 1, 1966, an Enlisted Intelligence Career Development Program was initiated to provide an articulated career system for enlisted personnel on an individual name basis and with career opportunities and incentives. Military Occupational Specialty Career Groups 96 (General Intelligence) and 97 (Special Intelligence) compose the new enlisted career program through which individuals will progress up a ladder of seven rungs from recruitment through education to assignment.

The Continental Army Command Tactical Intelligence Center (CONTIC), established at Fort Bragg in 1964, suffered a severe blow in mid-1965 when the Army alerted nearly all of CONTIC's units for deployment to Vietnam. Consequently, the Army reorganized CONTIC in October 1965 with an authorized strength of 165 persons, and on March 31, 1966, redesignated it as the Continental Army Intelligence Center. It operates directly under Headquarters, USCONARC, and provides increased tactical support for major tactical units and headquarters within the continental United States and the U.S. Strike Command. The deployment of intelligence organizations to Vietnam to meet the unprogrammed needs of the U.S. Military Assistance Command resulted in temporary shortages in most U.S. military intelligence organizations outside of Vietnam.

Another development of the year was the Department of Defense's assumption on July 1, 1965, of operational control of the Army's attaché system, together with the attaché systems of the other services, the organizational arrangement of which was explained in last year's report.

As a part of the 1962 reorganization of the Army, the Medical Information and Intelligence Agency, Office of the Surgeon General (OTSG), went to the Defense Intelligence Agency (DIA), although the responsibility for the production of scientific and technical intelligence remained with the OTSG (and with the other services), so that each service would be most responsive to the intelligence in its own area. The plan was that the Army's Foreign Science and Technology Center (FSTC) would produce biomedical scientific and technical intelligence but, since the plan never materialized and since DIA pro-

duced only area health and sanitation studies, another reorganization of the activity became necessary. Accordingly, the OACSI studied the matter in 1964 and recommended the transfer of military medical, scientific, and technical intelligence from the FSTC to the OTSG, which took place on January 1, 1966.

Communications and Electronics

The Army portion of the Defense Communications System (DCS) was expanded further during fiscal year 1966 with inclusion, on April 1, 1966, of the Joint European Microwave System, a multichannel facility providing trunking circuits from Headquarters, U.S. Army, Europe, to the depot and logistical facilities in France, to tactical units in the forward area of Germany, and to Headquarters, Allied Powers in Europe. In Southeast Asia there was progress on the expansion of the Army portions of the integrated wideband communications system which was also a part of the DCS.

Responsibilities of the Strategic Communications Command (STRATCOM), the Army's principal manager for strategic communications, increased during the year in several ways. In July 1965 it assumed operational control of the communications relay operations at Fort Sam Houston, Tex., and Fort McPherson, Ga. In the following month it assumed operational and maintenance control of all DCS facilities in the Republic of Vietnam, and in October of a system crossing Vietnam to Bangkok, Thailand. Command rearrangements in October and November, which included making the Commanding General, STRATCOM-EUR, also the Deputy Chief of Staff for Communications-Electronics, Headquarters, USAREUR, improved communications support in the European theater. Later, in March 1966, there was a similar rearrangement of command relationships in Southeast Asia, where the 1st Signal Brigade grew out of a consolidation of signal organizations in Vietnam and Thailand. Its commander became the signal officer of the U.S. Army, Vietnam, which gave the Commanding General, USARV, operational control of the brigade, less its Thailand elements, and left the Commanding General, STRATCOM, with technical control over the brigade's DCS-Army activities.

Problems in matters affecting enlisted personnel grew out of the continuing expansion that STRATCOM experienced during fiscal year 1966. Increases in strength requirements resulting from short tours overseas led to reestablishment of a broader training base. Where, however, the Army could not provide the additional training required for handling particularly complex equipment, the Department of the Air Force or the manufacturer was asked to provide it.

Although there was marked progress during the year toward completion of the Army portion of the European tropospheric scatter system, funding limitations caused postponement of the projected completion date to June 1967. Similarly, both progress and problems marked the year's efforts in automatic switching. In the continental United States there was an increase in the number of Army connections with the Automatic Voice Network (AUTOVON), and there was at the same time progress overseas on the construction of seven AUTOVON switches.

Although augmentation of the Automatic Digital Network (AUTODIN), a complex data-card-and-computer system, fell behind in the continental United States, the relocation of one switch to Hawaii accelerated the provision of improved digital communications to Southeast Asia by permitting the Army to concentrate on the Hawaiian and Philippine portions of the system. A succession of engineering changes, however, coupled with anticipated problems, made the planned 1967 and 1968 activations very doubtful.

In May 1966 the Army received primary responsibility under DCA for operating and for training operating personnel from three Services for the Automatic Secure Voice Communications program. Another development, for which STRATCOM served as the executive agent, was the completion of a high-speed, secure facsimile network linking five key government buildings in the Washington, D.C., area. The new equipment permits two-way record conversations and transmission of an exact copy of an average size document from one station to another in less than 10 seconds.

During the year there was also progress in providing modernized voice terminal facilities in the command center of the Department of the Army and the major field commands. Included are such terminal facilities as those at the Army Operations Center in the Pentagon and at 13 other locations around the world, one of which is the command operations center of the Commander, U.S. Military Assistance Command, Vietnam (COMUSMACV). Other military communications accomplishments of the year included site surveys and construction of facilities in the Army's program for power improvement; the awarding of contracts for equipment for the improvement of 27 Army-operated DCS circuits; and the activation of additional companies to improve the capability of the 11th Signal Group, a STRATCOM unit, to respond quickly to nontactical communications requirements in any part of the world.

Events and experience during the past year confirmed the conclusion that centralization of command authority in Washington and the exercise of authority from that level substantially increased the demand for telecommunications service throughout the Army and

the entire Defense establishment. The year also confirmed that much of the tactical and nontactical communications in a limited operational area, such as that in Southeast Asia, must be planned, operated, and maintained in conjunction with nontactical communications rather than as separate and distinct communications systems.

Expansion of trunking facilities in Southeast Asia accompanied the troop buildup in that area. The integrated wideband communications system, which was mentioned earlier, ties together the long-line communications of the DCS, including submarine cable, microwave, tropospheric scatter, satellite, and high-frequency radio circuits, both into and within the area, that are required for trunking purposes.

The program in Southeast Asia will also improve the over-all telephone system through the installation of new telephone exchanges. At the end of the year there was an effort underway to replace tactical teletype and telephone equipment with the fixed type and to improve manually operated message or record communications by the speedier and more economical AUTODIN facilities already mentioned.

As part of its responsibility to support the Initial Defense Communications Satellite Projects (IDCSP), the Army last year deployed transportable ground terminals to Hawaii and the Philippines to back up conventional systems. Other terminals would provide communications between such critical areas as Southeast Asia, Hawaii, and the continental United States. Elsewhere, as in Ethiopia, terminals would provide highly reliable communications to remote areas of the world. Later improvements in this initial system, plus the introduction of small terminals of tactical design, should provide integrated satellite communications for both tactical and strategic long-distance needs. (On the limited operational communications of an earlier military communications satellite experiment, see the SYNCOM material in ch. VIII.)

In the area of tactical communications, the Army achieved success in its efforts to provide combat commanders with improved command and control facilities. Of particular significance was the program for introducing for combat use new series of transistorized frequency-modulated (FM) two-way voice radio equipment, one series of which (the AN/VRC-12) has a range of 20 miles and another of which (the AN/PRC-25) has a range of 3-5 miles. These would be used by infantry, artillery, and armor units, which previously had not all used the same kinds of radio equipment. Before the close of fiscal year 1965 the Army had equipped five divisions and three armored cavalry regiments in Europe with these new FM sets, and in fiscal year 1966 it sought to supply the same equipment to its troops in Southeast Asia. Despite the moisture-proofing problems encountered in Vietnam, the

new sets provide, in comparison with those they replace, less weight, more compactness, more channels, improved range, greater reliability, and simplified maintenance. Other pending plans and actions include procurement of new radios for Army squads and a radio teletypewriter with a range of 100 miles for use at corps level and above.

Problems of increasing urgency have been created by new radio spectrum requirements, which must be met despite the spectrum congestion resulting from new applications, developments, and requirements, not only in military communications and electronics, but also in nonmilitary. The complexity of the problem led the Army in the past fiscal year to seek through a contract the development of a method for processing and retrieving information about frequencies. One of the contractor's responsibilities was the development of an engineering technique for radio interference and propagation predictions. From this grew the joint frequency records system, for which the U.S. Military Communications-Electronics Board designated the Department of the Army as the office of record.

One feature of the joint frequency record system is the joint frequency list, which the Department of the Army is to publish. It is a compilation of all worldwide military frequency assignments and includes such information concerning frequency as power, location, circuit path, user, and authority to use. A second feature of the system is the joint frequency usage report, which reflects actual hours of use for all military assignments listed in the joint frequency list between 15 kilocycles and 30 megacycles. Provision has also been made for coordinating the joint military system and the nongovernmental systems. At the close of fiscal year 1966 there were approximately 75,000 frequency records of the Army, Navy, and Air Force in the new joint frequency records system, which was scheduled to operate in September 1966. These and other efforts to manage their use of the radio spectrum more efficiently engaged Army communicators at the year's end.

IV. Personnel

The size of the military establishment of the United States, of which the Army is the largest constituent part, makes it evident that administration of the military and civilian personnel of the Department of the Army is a responsibility of considerable magnitude. The many men and women who make up the Army itself and those civilians who administer and support it at home and abroad have, in appropriate instances, to be recruited, trained, supervised, disciplined, housed, fed, paid, hospitalized, motivated, rewarded, insured, and retired. This is a task of no mean proportions.

Officers and Enlisted Personnel

During fiscal year 1966 the Army was authorized a strength in excess of 1 million for the first time since 1962. The authorization was increased from 961,000 at the end of fiscal year 1965 to 1,159,000 for fiscal year 1966. The increase was necessary to support the conflict in Vietnam.

On June 30, 1966, the actual strength of the Army was 1,199,784, a substantial increase over that authorized. This included 102,268 commissioned officers, 4,200 nurse and medical (officer) specialists, 11,318 warrant officers, 1,079,682 enlisted personnel, and 2,316 cadets. Officer procurement totaled 22,263 during fiscal year 1966. The ratio of officer to enlisted personnel decreased from 1:7.7 to 1:9.5, primarily because of the large number of new enlisted accessions during the year. Inductions and first enlistments averaged 26,000 and 14,200 per month respectively.

At the end of fiscal year 1965, the Army had a trained strength of 881,503 and a trainee strength of 87,563, while by the end of fiscal year 1966 the trained strength reached 1,032,431 and trainee strength rose to 167,353. Army operating forces decreased to 54.1 percent of total Army strength.

Retention of junior reserve officers was a continuing problem in 1966. Even though the retention rate of 25.5 percent for fiscal year 1966 was a slight improvement over the two previous years, the number of junior reserve officers electing to remain on active duty beyond their service obligation continued to fall considerably short of requirements. This shortage forced the Army to look toward more

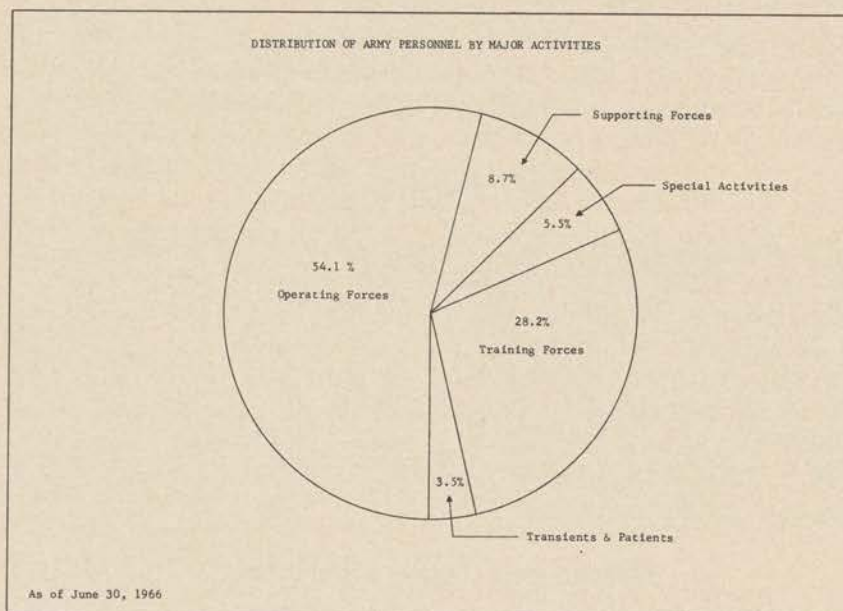


Figure 4

(OFFICER PROCUREMENT BY SOURCE IN FISCAL YEAR 1966)

Source	Accessions
Service Academies.....	562
Reserve Officers' Training Corps.....	9,690
Officer Candidate School.....	3,351
Voluntary Active Duty.....	763
Professional (JAGC, WAC, MSC, CHAP).....	1,135
Medical Corps, Dental Corps, Veterinary Corps.....	3,517
Regular Army Appointments (from civil life).....	10
Miscellaneous ¹	69
Nurses and Medical Specialists.....	1,144
Warrant Officers.....	1,984
Total.....	² 22,225

¹ Includes administrative gains such as recall from retired list, inter-Service transfers, etc.² Excludes 38 reimbursable personnel.

rapid promotions to the grade of captain to meet grade requirements, which meant that the experience level for this grade would be lower than desirable.

Because of the rapidly increasing use of automatic data processing throughout the Army, the demand for personnel professionally qualified in the information systems and automatic data processing field

has far outstripped the available supply. Among the steps taken to resolve this dilemma are two that affect officer careers. First, a military occupational specialty (MOS) prefix has been authorized which will permit adequate identification of positions requiring both functional skills and ADP skills as well as identification of officers qualified to fill such positions. Second, an officer program has been authorized which will enable officers to specialize in automatic data processing duties. Officers specializing in this field will receive equal consideration with their contemporaries for appropriate command assignments and for attendance at service schools and colleges and at civilian educational institutions.

The Army obtains its enlisted personnel through enlistments and inductions under Selective Service. It seeks to reenlist trained soldiers

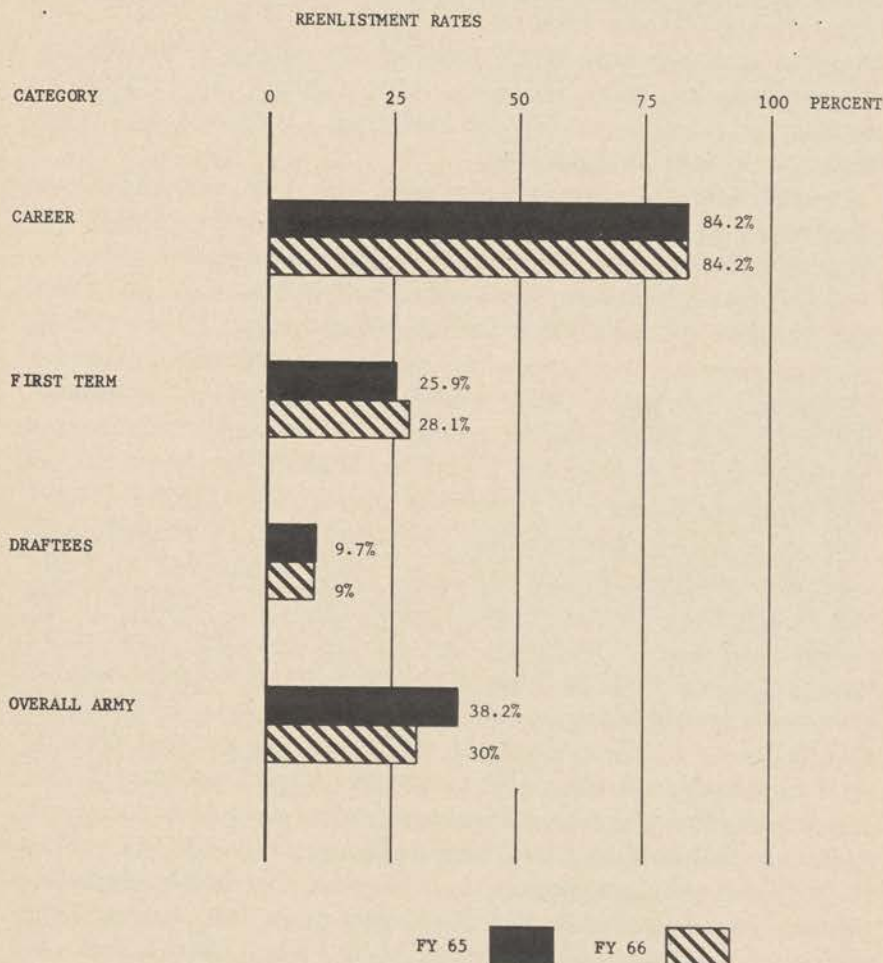


Figure 5

obtained from either source on expiration of their terms of service. During fiscal year 1966 there were 170,113 first enlistments, an increase of 68,212 or 67 percent over fiscal year 1965, resulting primarily from rapid expansion and higher draft calls. There were 317,509 inductions under Selective Service.

Retaining trained personnel by reenlistment, however, remained a serious problem. The career Regular Army reenlistment rate (83.4 percent) declined approximately one percentage point from 1965, but the reenlistment rate for those serving their first term increased to 28 percent as compared to 25.7 percent for fiscal year 1965. Three out of four eligible first-term Regulars elected not to remain on active duty. The inductee reenlistment rate increased to approximately 10.2 percent, though the number of inductees enlisting in the Regular Army increased from 4,266 to 12,571, perhaps largely because of a program that permitted 10,137 inductees to reenlist in the Regular Army before their entry into basic combat training. This program increased the inductee reenlistment rate from 1.9 percent in October 1965 to 29 percent in June 1966.

Overall Army reenlistments for fiscal year 1966 were thus lower numerically than the previous year (79,106 compared to 80,864) and reflected a decrease of approximately 8 percentage points in rate.

To improve recruitment, the Congress included in the Military Pay Act of 1965 a provision for a Variable Reenlistment Bonus (VRB). The new program was instituted by the Army on January 1, 1966 for enlisted men qualified in 247 critical military occupational specialties. While bounties or bonuses have been paid for reenlistments in the Army for over a century and a half, the VRB is payable to men in designated specialties who reenlist or amend their enlistment for 2 years or longer subsequent to December 31, 1965. It is paid in addition to other entitlements, such as special and incentive pay, and is not subject to the \$2,000 total cumulative restriction that applies to the standard reenlistment bonus. On April 22, 1966, the Army announced a special application of the VRB to the rotational and deployment requirements for 113 critical specialties in Southeast Asia. This included a reduction of the minimum total active duty commitment from 69 to 48 months for the designated specialties. A qualified enlisted man in pay grade E-4 who reenlists for the first time can receive as the proceeds from both a standard reenlistment bonus and the VRB as much as \$6,150, partly upon reenlistment and the remainder in five annual installments upon each of the five anniversary dates. In fiscal year 1966, the Army programed 14,818 VRB awards at a cost of \$9.3 million, and for fiscal year 1967, 40,137 awards at a cost of \$29.6 million.

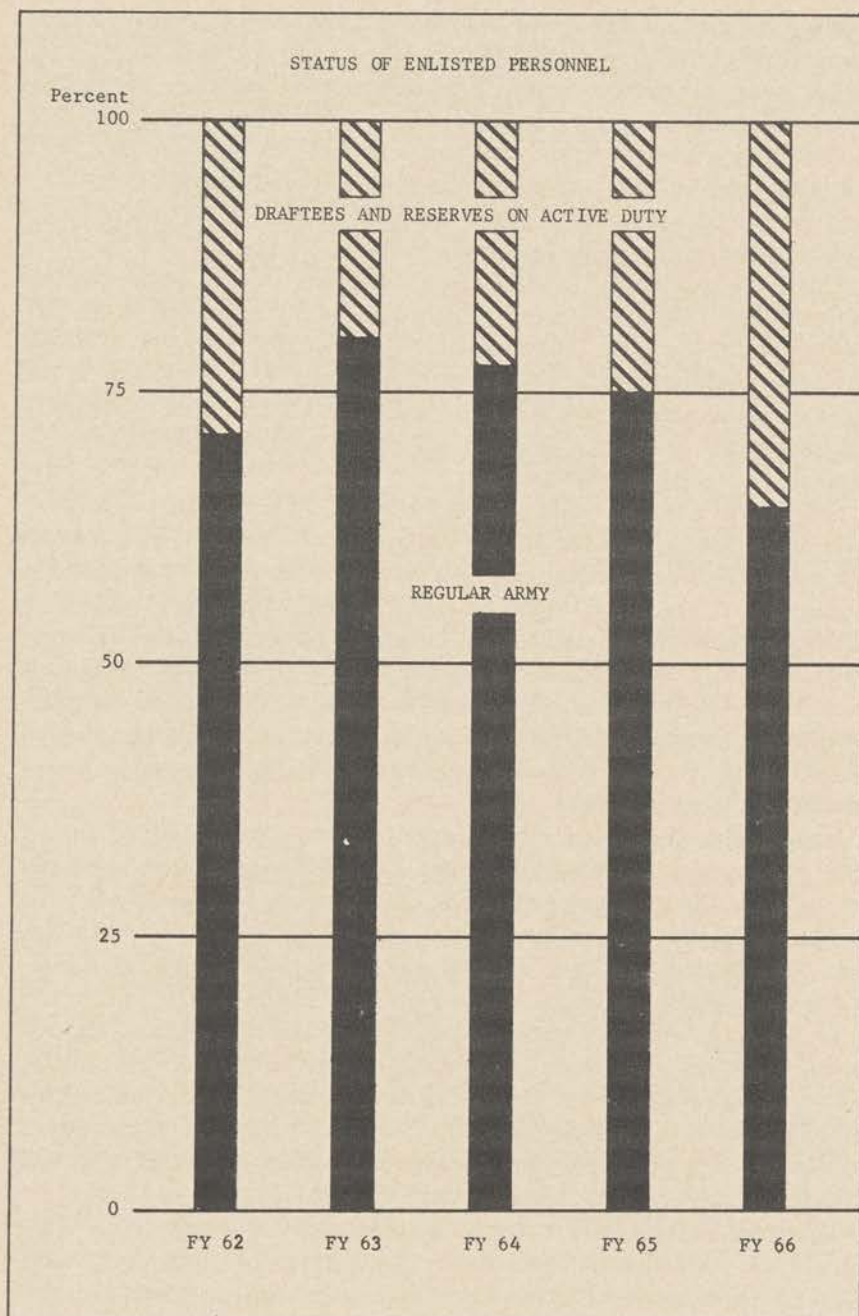
The beginning of fiscal year 1966 marked the completion of the first phase of the Army Recruiting Service reorganization plan. Highlights of the reorganization were the establishment of the U.S. Army Recruiting Command with headquarters at CONARC, withdrawal of the recruiting mission from continental U.S. Army commanders, consolidation and reduction of administrative overhead, and separation of recruiting and processing functions. The resultant organization is a streamlined, highly responsive field recruiting force.

A major step forward in enlisted procurement was the establishment in the fall of 1965 of the reception station reenlistment option for inductees. From October 1965 to June 1966 a small field force of career counselors obtained 10,315 3-year reenlistments from inductees at reception stations, and during this period filled all available uncommitted quotas for long-term, hard-to-fill service schools providing work in military occupational specialties.

The steady augmentation of U.S. forces in Vietnam through fiscal year 1966 prompted a change in the policy of using the continental United States as the sustaining base for all overseas assignments, including short and long tours. To avoid an unacceptable turnover of officer personnel in key positions at home, the Army combined all long-tour areas with the continental United States to form the sustaining base for short-tour areas. Returnees from Vietnam will be assigned both in the continental United States and overseas, and especially to USAREUR, to replace skilled personnel withdrawn to support the buildup in Southeast Asia.

Assignment procedures for short-tour areas insure that personnel who serve a normal tour in Vietnam are placed at the bottom of the priority list for reassignment there. On the other hand, persons with certain necessary skills will not remain in the United States or in long-tour oversea areas as long as those possessing less critical skills, although the Army will assign all persons with similar skills on an equitable basis. Qualified volunteers may be assigned to Vietnam, regardless of their current assignment, if a requirement exists for their grade, branch, or specialty, but they must have sufficient service remaining to complete the full 12-month tour in Vietnam or agree to extend their enlistment. The statutory requirement that a person have 16 weeks of training before assignment to Vietnam applies to all.

To increase the retention rate of married enlisted women, the Army on July 1, 1965, discontinued the policy permitting early release because of marriage. In addition to requiring minimum periods of service following completion of school training and assignment to duty stations, the new policy permitted early release only if enlisted women were denied assignments sufficiently close to their husbands to permit establishment of joint households. On June 20, 1966, the Army elimi-

*Figure 6*

nated marriage entirely as a reason for discharge for all women who enlisted or reenlisted on or after that date.

To support the troop buildup during fiscal year 1966, the Army initiated a selective retention program, both voluntary and involuntary in character, to retain on a selective basis individuals who otherwise would be lost through voluntary retirement, resignation, or relief from active duty. Under the voluntary part of the program, the Army offered to retain certain reserve officers on active duty for up to 3 years past their planned release dates. Under the involuntary part of the program, the Army denied voluntary retirement, resignation, or request for relief from active duty to certain officers because of an overriding military need for their services that could not be met otherwise. In February 1966 the Army suspended the policy of denying enlisted retirements.

The Army provided cadre and other skilled personnel to support the expansion of the training base in the continental United States, reconstitute the U.S. Strategic Army Forces, and activate additional units for deployment to Southeast Asia. This required an adjustment in the distribution of such personnel in four oversea commands (U.S. Army, Europe; Eighth Army in Korea; U.S. Army, Alaska; and U.S. Army, Southern Command). As the Army withdrew these persons or as soon after withdrawal as possible, it provided replacements, primarily recent graduates from advanced individual training courses. Highly skilled personnel, comparable to those in the grades withdrawn, will be assigned to the commands as soon as trained personnel become available.

In November 1965, the Department of the Army conducted an administrative test to determine the Army's capability and the time required to select individual reservists from the Ready Reserve mobilization reinforcement pool to fill a division-size force. The test also served as a check on mobilization procedures and on the ability of participating agencies to meet requirements on short notice, and exposed potential problem areas. Consequently, it enabled the Army to improve operational procedures and techniques and pointed up the value of centralized control of procedures and resources.

There were a number of matters during the year affecting the work and careers of the Army's enlisted men. The Army revised its military occupational specialty (MOS) structure effective July 1, 1965, the first restructuring of the enlisted MOS system in more than 10 years. The revised system permits grouping of related military jobs in numerical and alphabetical sequence and improves personnel utilization by facilitating the logical substitution of personnel between related MOS.

In response to reorganizations within the Army and to support activities in Southeast Asia and other emergency requirements, the Army

expedited revisions of 11 enlisted career groups, all of which are of critical importance to existing operations. In addition, it developed and authorized for use in July 1965 a new MOS (67-N) for a single-motor turbine observation/utility helicopter mechanic, as an emergency measure in support of operations in Southeast Asia. At the same time, the Army developed and authorized for immediate use in that theater revisions in MOS-91B and MOS-91C for medical and clinical specialists respectively. To revitalize the Noncommissioned Officer Logistics Program (NCOLP), the Army developed a new MOS (76-N) for procurement sergeants and asked the U.S. Army, Pacific, to recommend positions for inclusion in the NCOLP. By the end of the fiscal year 77 new key positions in Vietnam had been added to the program.

Believing that soldiers require functional training before specialization, the Army this past year developed the Army functional specialties concept, which CONARC is to test. Under this concept, first-term personnel with no prior service are to receive broad training in the six functional military occupational specialties of the combat, communications, general maintenance, motor maintenance, clerical, and general technical soldier.

Because of the requirements of the troop buildup that began in 1965, general enlistment and induction standards were relaxed on November 1, 1965, and again on April 1, 1966. In addition, there was also a revision in the standards for insular Puerto Ricans, to authorize acceptance of only those who could qualify for direct shipment to the continental United States for basic combat training. The Army discontinued the previous 8-week prebasic training for Puerto Ricans, which had consisted mainly of instruction in English.

To provide increased flexibility in the utilization of members of the WAC, as reported last year, enlisted women in grades E-5 and above were assigned during fiscal year 1966 to Alaska, to Fort Lewis, Wash., and to Vietnam without the establishment of a WAC unit in each of those places.

A good beginning was made during the year by the Office of Personnel Operations in securing professional assistance in solving problems in personnel management through contract research. At the end of the fiscal year the Research Analysis Corporation was at work on mathematical models for projecting Army personnel resources against future qualitative and quantitative requirements. There were also specifications for a research contract to establish a computerized system for gathering detailed job data on Army duty positions, storing these data in electronic computers, and programing various analytical reports. This system, called the Military Occupational Information

Data Bank, should enable the Army to make major improvements in many areas of military personnel management.

There was a downward trend during fiscal year 1966 both in the number of court-martial trials and in the number of nonjudicial punishments imposed under Article 15 of the Uniform Code of Military Justice. This indicates continuing improvement in the state of morale and discipline and suggests that leadership measures are increasingly effective in averting and disposing of disciplinary problems. The decrease in trials and nonjudicial punishments is particularly significant when considered in light of the increase in the size of the Army during fiscal year 1966. There were 35.19 persons per 1,000 strength, or a total of 38,613, tried by court-martial during fiscal year 1966, as compared with 42.72 per 1,000 (43,456) in fiscal year 1965. By type of court-martial, the fiscal year 1966 statistics show that 1.34 persons per 1,000 strength (1,476) were tried by general court-martial, as compared with 1.52 per 1,000 (1,553) in fiscal year 1965; 21.07 per 1,000 (23,121) were tried by special court-martial, as compared with 24.40 (24,813) in fiscal year 1965; and 12.77 per 1,000 (14,016) received summary courts-martial as compared with 16.8 (17,090) in fiscal year 1965. In addition, statistics for fiscal year 1966 indicate that approximately 156.35 persons per 1,000 strength, or a total of about 171,365, were punished under the provisions of Article 15 of the Uniform Code of Military Justice, as compared with 186.44 per 1,000 (189,608) in fiscal year 1965. The absent-without-leave (AWOL) rate for fiscal year 1966 was lower than that for 1965, decreasing from 52.9 to 50.9 per 1,000 persons.

Army military personnel during the year ending November 30, 1965, committed 21,689 offenses subject to the jurisdiction of foreign courts. In 15,766 cases the United States obtained waivers of jurisdiction permitting appropriate disposition by U.S. military authorities. This represented nearly 95 percent of the 16,661 cases in which there was concurrent jurisdiction and the United States could request a waiver under applicable international agreements. Army military personnel received unsuspended sentences to confinement by foreign courts in only 39 cases, ranging from 10 days for simple assault in France to 12 years for murder in Germany.

The worldwide complex of confinement facilities at the end of fiscal year 1966 consisted of one disciplinary barracks and 44 stockades. Included were three transit stockades, a new type of facility planned and developed through experimental operation during fiscal year 1965 for housing military prisoners until designation of a confinement facility. Experience in both Vietnam and the Dominican Republic demonstrated the advantages of the transient stockade, which requires a minimum number of custodial personnel. The Army closed five stockades in

other areas by continued emphasis on consolidation and intensive utilization of confinement facilities. Indeed, despite the troop buildup, the end of the fiscal year showed a net decrease of three in the number of operating Army confinement facilities.

The experiences of World War II and of the Korean war disclosed that the rate of military disciplinary confinements jumped sharply during periods of increased mobilization. Shortly after World War II began, the rate reached 18.8 for each 1,000 persons. It dropped to 8.3 in 1951, but rapidly increased to 12.8 in 1955 as a result of the Korean war. By comparison, the confinement rates for fiscal years 1963, 1964, 1965, and 1966 were 4.9, 4.2, 4.6, and 4.2, respectively. These figures indicate a stabilized confinement rate apparently unaffected by the troop buildup of 1965-66.

Until fiscal year 1965, military authorities inspected all prisoner correspondence, excepting mail addressed to judge advocates general. In 1965, however, the Department of Defense directed that there would no longer be any inspection of such mail addressed to the President, other high-ranking civil or military officials, a prisoner's defense counsel, any other military or civilian attorney of record, or a chaplain.

The decision to close the Naval Disciplinary Command at Portsmouth, N.H., will result in an inter-Service merger of correctional activities and the confinement, perhaps in 1968, of Navy, Marine Corps, and Coast Guard prisoners at the Army Disciplinary Barracks at Fort Leavenworth, Kans.

The Army's parole system for Army and Air Force prisoners, which is administered by The Provost Marshal General with the assistance of Federal parole authorities, complied during fiscal year 1966 with the policy of the U.S. Board of Parole in giving a preliminary hearing to an alleged violator.

At the end of the last fiscal year the Department of Defense made the Secretary of the Army the agent for the Department of Defense Industrial Defense Program. Effective August 1, 1965, the Secretary assigned this new responsibility to The Provost Marshal General, who also became responsible for maintaining the record files of all industrial defense surveys, including those previously conducted by other agencies and military departments.

Pay, Housing, and Awards

Legislation of August 1965 improved considerably the status of military compensation in relation to compensation in other sectors of the economy. It provided an average increase in basic pay of 10.4 percent and gave uniformed Services personnel with under 2 years' service a basic pay increase of approximately 18 percent, their first

significant increase since 1952. In addition, it adjusted retirement pay for cost-of-living increases from 1962 to 1965 and further specified conditions which the consumer price index must satisfy as a basis for future cost-of-living increases in retired pay. Perhaps the most significant provision of this legislation, however, was the requirement for an annual review of the adequacy of military compensation and a quadrennial review of the principles and concepts underlying military compensation. A joint Services and civilian study group under the direction of the Assistant Secretary of Defense (Manpower) recently undertook the first quadrennial review, to be completed in December 1966. Legislation to provide an additional increase in military pay would depend upon the results of the review.

For fiscal year 1966, Congress approved \$16.4 million in funds for bachelor officer quarters (BOQ) and \$106.9 million for troop housing and supporting facilities at permanent Army installations. Of this amount the Department of Defense in December 1965 temporarily deferred \$11.9 million for BOQ and \$80.7 million for housing and facilities. When constructed, the facilities will provide adequate permanent quarters for approximately 2,300 bachelor officers and 24,150 enlisted personnel. This compares with provision for 550, 1,304, and 1,100 BOQ, and 6,332, 12,559, and 26,000 barracks in fiscal years 1963, 1964, and 1965, respectively. The current deficit in permanent barracks is about 135,000 spaces or about 34 percent of the requirement. For bachelor officers there is a corresponding deficit of about 10,800 spaces or about 49 percent of the requirement. To satisfy the remaining requirement it will be necessary to provide approximately 1,600 BOQ spaces and 21,500 barracks spaces each year through fiscal year 1973. This is the Department of the Army objective for replacing and modernizing its old temporary facilities.

The new construction program for fiscal year 1966 provided for 1,680 units of family housing, which were temporarily deferred as priority was given to Vietnam requirements. From prior year programs, however, the Army completed 1,750 units and had 1,310 units under construction. In addition, the Army received an allocation of 5,176 leases, 4,270 of them in the continental United States and 906 overseas. The Army's gross requirements for family housing based on long-range strength and deployment for permanent installations is 357,828 units. Assets consisting of military controlled units and off-post housing, including those for voluntarily separated families, total 246,168 units. The gross deficit, which includes personnel on unaccompanied tours, voluntarily separated families, Reserve and National Guard advisors, and MAAG personnel for whom family housing is not programed, is 111,660 units. On the basis of eliminating these personnel categories, the Department of Defense program limitation reduces the total to

36,149 units. Included in the 5-year program (1967-71) are 9,610 new units to be constructed worldwide from appropriated funds plus 1,750 rental guarantee units for Germany from unappropriated funds.

A thorough study of the quantity and quality of family housing and the policies which govern such housing was undertaken in April. It will be completed in December 1966 and a new doctrine for Army family housing will be developed.

Awards and decorations have always been a commander's primary means of providing tangible recognition for outstanding acts of heroism and meritorious service. To make the award program responsive to the field commanders, the Department of the Army during the past year delegated authority to grant the Silver Star and lesser awards to the Commanding General, U.S. Army, Vietnam, and to the Commanding General, U.S. Forces in the Dominican Republic. It further delegated authority to award the Silver Star, Distinguished Flying Cross, and lesser awards to unit commanders of two-star rank and above, and delegated authority to award the Bronze Star and all lesser awards to separate brigade commanders in Vietnam.

Morale

In the course of the fiscal year 1966, as an aid to troop morale, the Department of the Army increased the authorized strength of the U.S. Army Chaplaincy from 1,270 to 1,442 persons, and military authorities requested various denominational agencies to nominate additional clergymen to serve as chaplains. At the year's end, approximately 73.2 percent of the Army chaplains were of the Protestant faith, 24 percent of the Catholic faith, and 2.8 percent of the Jewish faith. Over 20,000,000 persons attended religious services at Army installations during the year.

The patronage and sales volume of commissary stores increased worldwide at a rate of 6.5 percent during fiscal 1966, principally because of the increased number of retired military personnel and the additional demand for subsistence items by active duty military families. The workload and congestion in sales outlets increased the need for additional commissary store facilities, and, of course, for an expanded work force. During the fiscal year the Army and Air Force Exchange Service (A&AFES) took over responsibility for operating the Exchange Service in Vietnam.

As another aid to morale, the Army established a television station for troops in Vietnam, where the commander estimated he would require 2,000 television sets a month up to a total of 14,900 sets. From the first of the fiscal year through May 1966 the Army had shipped 4,240 television sets of the requested total. At the same time the Army

provided free 16-mm. picture service for troops in Vietnam. The Army and Air Force Motion Picture Service (A&AFMPS) began a limited theater construction program during the year and operated over 2,200 theaters and film outlets.

In the past year, The Adjutant General developed group health, life insurance, and retirement programs for employees of nonappropriated fund activities. Included were persons working in officers' and noncommissioned officers' open messes, post restaurants, and military and civilian welfare funds. Employees of the A&AFES and A&AFMPS already have a similar program.

The Army community service program was established in July 1965. This program created a centrally located, responsive activity for assisting the Army member and his dependents in resolving social problems beyond the scope of their own resources. A major area of service has been the assistance given those families whose sponsors have been assigned to restricted areas.

Medical Care

The Army seeks to provide its troops in both peace and war with the best health and medical care that modern medicine affords. During the past fiscal year, the rate of admissions for active duty Army military personnel to hospital and quarters was 323 per 1,000 average strength per year as compared to 270 per 1,000 in fiscal year 1965. The principal reason for this increase was troop exposure to the conflict in Vietnam, where about 16 percent of the admissions among active duty Army personnel occurred. The noneffective rate, which is the average daily number of Army personnel in an excused-from-duty status due to medical causes per 1,000 average strength, rose to 11.4 from 9.4 of the preceding year. Patients injured as the result of hostile action in Vietnam numbered 0.8 per 1,000 average strength, while the disease rate was also higher because of the high incidence of malaria, diarrheal disease, dermatophytosis and other diseases of the skin, fever of undetermined origin, and slightly higher rates for viral hepatitis among troops in Vietnam.

At the beginning of fiscal year 1966, the Army Medical Service had two helicopter-ambulance medical detachments operating in Vietnam. During the year the Medical Service provided additional air ambulance support by assigning two detachments, an air ambulance medical company and an air ambulance platoon, as organic parts of the airmobile division. The introduction of these units and the reorganization of the previously assigned units increased the aeromedical support to some 60 air ambulances. The basic aircraft used by the air ambulance units was the UH-1D helicopter, which can transport six

litter patients, nine ambulatory patients, or a combination thereof. The air ambulances in Vietnam averaged over 4,000 aeromedical evacuations a month with average pilot flight time approximating 50 hours a month. The highly mobile U.S. forces operating in Vietnam today, often in geographically isolated spots, require a medical evacuation system that is mobile, flexible, and responsive. The speed and range of the helicopter permits removal of the majority of the wounded from the battle area directly to a supporting hospital. The more seriously wounded usually reach a hospital within 1 to 2 hours after injury and, in many instances, in less than an hour.

The Selective Service System, at the request of the Department of Defense, issued a special call for physicians in January 1966, which included a call for 949 physicians for the Army. Under an Executive order of the President signed on January 18, 1966, there was also a special draft call for male nurses and optometrists, the first time such specialists had been drafted. The special registration stimulated voluntary applications for commissions in the Army Nurse Corps and the Medical Service Corps. In January 1966, the Army also announced the Warrant Officer Nurse Program for graduates of 2-year nursing courses, with selection to be made by The Surgeon General's Selection Committee and appointment normally in the W-1 grade. Although qualified doctors of osteopathy could be considered for appointment and assignment in the Medical Corps in both the regular and the reserve components, the program was still voluntary at the close of fiscal year 1966. In other words, osteopaths were not subject to the draft as doctors. At the same time, the Army intensified recruitment of women physicians, who have been commissioned in the armed forces since 1950, as commissioned officers for immediate duty. As an inducement, the Army guaranteed initial assignment of women physicians in the continental United States or overseas, as desired, but not involuntary duty overseas during their initial tour. Processing of medical service registrants and volunteers was speeded up.

Experience in the optical program suggests that environmental factors in modern life and today's military complexities may be responsible for a 15 percent increase in the number of soldiers wearing glasses (from 18 to 33 percent) since World War II. This increased demand for eyeglasses, of course, had an impact upon the Army laboratories that fabricate them in the continental United States, Europe, Hawaii, Korea, Okinawa, and Vietnam. These laboratories also supply all spectacle needs for the Air Force as well as some of the Navy's needs. During the past fiscal year the laboratories made 1,142,000 pairs of glasses, which represented a 20 percent increase over the previous year. During World War II the Army met its needs for glasses within the continental United States through purchase arrangements.

In its dental program during the past fiscal year the Army emphasized preventive dentistry. To that end, the Army Dental Corps and the School of Dentistry of the University of Missouri in August 1965 cosponsored the second of three planned annual conferences on preventive dentistry, most of its sessions being held at the Walter Reed Army Medical Center.

Safety

The President's Mission SAFETY-70 program, with an objective of reducing the Federal employee injury rate by 30 percent by 1970, generated increased interest in the Army safety program. Analysis of preliminary accident data for fiscal year 1966 indicates substantial improvement in the major areas of review. Civilian and military personnel injury frequencies were reduced by 11 and 15 percent, while Army motor vehicle and aircraft accident frequencies were reduced by 6 and 27 percent. There was a 27 percent reduction in military personnel fatalities when the increased strength of the Army was considered. Fiscal year 1966 was one of the best years in the history of the safety program in terms of accident and fatality reduction. In May 1966 the National Committee on Films for Safety voted the top plaque award to the Department of the Army for its film, "The High Cost of Negligence."

In using and transporting radioactive materials, the Army continued its excellent record during the past year. It had a nationwide network of specialists who could handle radiation problems and was prepared to assist both Government and industry as a participant in the Interagency Radiation Assistance Program. The Army provided safety instruction in handling nuclear weapons for safety personnel of the U.S. Army, Pacific, and offered a course in aircraft familiarization for safety personnel at the Army Aviation School at Fort Rucker, Ala. It also held a 3-day conference for Army safety directors, developed and distributed training kits, and distributed the National Safety Council's motion picture, "More Safely Tomorrow." Once again the Department of the Army received the National Safety Council Award of Honor; although awarded within the reporting period, it was an award for the previous fiscal year. It was also the twentieth time in 22 years that the Department had been honored by the council. Within the Army itself, the U.S. Army, Pacific, the Eighth Army, and the 7th Infantry Division received the Army's Award of Honor for Safety, while the Army Materiel Command, the First Army, and the 2d Armored Division received the Army's Award of Merit for Safety.

Despite what was, on the whole, a year of considerable progress for the Army in the safety field, various problems emerged that

caused some concern. Increased accidents, for example, accompanied the troop expansion in Vietnam, and required the establishment there of positions for safety specialists, which the Army was filling at the year's end. A continuing problem was the difficulty in attracting young safety specialists into an occupation whose average employee-age was advancing. Action is being taken to recruit and train younger safety specialists.

Civilian Personnel

For every five men in uniform, there are two civilians performing necessary support functions. As of the close of the year, the Army employed about 491,000 civilians, of whom approximately 71 percent were in the continental United States. The remaining 141,000, including 120,000 foreign nationals, worked in various other parts of the world. There was a substantial increase of about 38,000 employees during the year. In the last 4 months of the fiscal year, conversion from military to civilian occupancy was completed for about 71 percent of the 21,398 positions scheduled for conversion as of June 30, 1966.

During the year the Army gave attention both to the closing of unnecessary bases and to the reorganization and realignment of functions in the interests of economy and efficiency. Since 1963 such actions have affected 34,000 employees, none of whom, however, has been separated without an offer of another job. Of the 8,600 persons remaining to be placed at the end of the year, many were in activities not scheduled to close for another year or longer.

As a phase of its effort to help employees adjust to the changes following base closures and other management actions, the Army provided retraining for 634 persons at 33 different installations during the first 9 months of the fiscal year. By the fourth quarter, however, almost all of the retraining activity had come to an end as a result of the demand for personnel occasioned by the buildup in Southeast Asia.

As in years past, the Army relied heavily in fiscal year 1966 upon local civilian nationals to support activities in various foreign areas; indeed, the 120,000 foreign nationals employed during the past year comprised nearly half of the total civilian and military forces in those activities. Although local wage trends moved consistently upward, wage costs were markedly lower than they would have been had U.S. citizens held the same jobs. Employment of foreign nationals also contributes to good international relations. It should be emphasized, too, that local civilian manpower in support activities in times of hostilities can release military personnel for combat functions. In Vietnam at the

close of the fiscal year, the Army utilized some 15,000 Vietnamese civilians in direct support of operations.

Continuing its emphasis on career management, the Army this past year tested new career management concepts and procedures in the comptroller career field and planned a preliminary report on the matter before the end of September 1966. If the report is favorable, the changes will be applied to all career areas. The Army supported the effort to develop a procurement career program for the entire Department of Defense, and established an Army-wide career program for librarians that would cover 800 library positions and become operational in August 1966. The librarian program was the twelfth Army civilian career program to be established, and when it becomes operative there will be 75,000 civilian employees of the Department of the Army covered by the new career management system.

A continuing shortage of qualified civilian personnel at both the professional and technician level in the information systems and automatic data processing field has created a need for a career pattern for specialists in this field. In response to this need, an Army-wide program has been established for career management of such personnel. Primary responsibility has been assigned to the Special Assistant to the Chief of Staff for AIDS as the functional chief of the career field. The program provides for intake of both trainees and experienced personnel, for the training and development of personnel from ADP trainee through the executive levels and, as job opportunities open, for Army-wide referral of qualified career program participants.

The special study of civilian career management made in 1965 recommended the establishment of a general management course to last for 3 or 4 months for civilian employees at the GS-14 and GS-15 levels. Consequently, during the past fiscal year a high-level task group met to make the necessary plans. These will be reviewed by the Secretary and the Under Secretary of the Army.

At the year's end the Army looked toward a long-range plan for coordinating the development and approval of requirements for over 7,000 civilian positions in the Department of the Army at and above GS-14 grade with the development and approval of tables of distribution and allowances. In the future, the management of GS-14 and GS-15 positions will involve a greater degree of centralized review than exists today, while the intensive, individual review and approval now given each supergrade position (GS-16 through GS-18) will be continued.

In accordance with Department of Defense policy, the Secretary of the Army established in fiscal year 1966 a central pool of spaces and funds to support projected long-range instruction of civilian employees. The long-term instruction intended was full-time instruction

away from the job for approximately 6 calendar months. The Army has made \$600,000 available for this program. Altogether, 109 persons from 27 commands and other activities benefited from this program during the year.

In recent years there has been a significant growth in union activity on the Federal level. Approval in the past fiscal year of 84 bargaining units, which raised the total to 397, represented nearly a 30-percent increase over the 313 units approved by the end of fiscal year 1965. For the first time, the number of units having exclusive recognition (205) exceeded those with only formal recognition (192). Since exclusive recognition carries with it the attendant right to a written agreement, a continuation of this trend to seek exclusive recognition is anticipated. The number of written agreements in the Department increased substantially during the fiscal year, with 117 in effect at the end of the year, an increase of more than 33 percent over the 87 approved agreements in the Army a year earlier. Since fewer than 60 percent of the exclusive units have exercised their right to a written agreement, this number will continue to grow for some time.

According to more than three-fourths of the research and development managers and supervisors interviewed in a recent Department of the Army survey, the Army's scientific and engineering staffs are significantly better than they were 4 or 5 years ago. Development of staff members and a superior quality of new talent were among the reasons given by a large sampling of the managers and supervisors interviewed. They also credited "comparability" pay increases as making Army salaries more nearly competitive with those in private industry and contributing to a new low in the resignations of Army scientists and engineers. Increasing appreciation of the contributions by research and development scientists and engineers was evident during the year in the steady growth of the number receiving awards for their performances, suggestions, and patents, and of those honored as authors of papers read at the Army's biennial science conferences conducted at West Point.

Individual questionnaires completed anonymously by more than 2,400 scientists and engineers—representative of all grade levels and significant occupational specialties—indicated a number of other favorable trends and aspects. These included greater satisfaction than in the past with the administrative and technical supervision received; good military-civilian relations, with civilian supervision of research and development activities becoming more general and extending to higher organizational levels than had been the case when a survey was made in 1959; and strong support for the basic features of the new career program for scientists and engineers. At the same time, the survey indicated the importance scientists and engineers attach to

modern laboratory facilities and the need for completing such facilities now in the planning stage.

Another personnel survey made during the past year covered the employment of retired military personnel. The dual compensation act of 1964 removed some of the obstacles to the use of retired military personnel and also made a matter of law the former Department of Defense policy that retired military personnel could not be employed within the Department within 180 days of their retirement except in compliance with certain conditions. The 33 installations covered by the survey hired about 24,000 new employees during the past year, of which 1,032 were retired military personnel. The survey indicated that there was generally a high degree of compliance with the spirit and intent of both the policy and regulations concerning employment of retired persons.

In another investigation, the American Institutes for Research contracted with the Army for a study on the effectiveness of communications from Headquarters, Department of the Army, to operating civilian personnel offices. The problem, the Institutes found, was not so much with local understanding of the policy communications as it was with the administration of the policy in the light of local conditions.

Still another survey made during the year dealt with the Army's oversea workforce of U.S. citizens. This followed the suggestion of the Subcommittee on Manpower of the House Post Office and Civil Service Committee, which had conducted hearings on a proposal that the overseas employment of U.S. citizens be limited to 5 years. The Army, which is the only Department of Defense agency with a formalized rotation program, obtained data on virtually all of the 12,425 U.S. citizens working in foreign areas; survey findings will be used to improve the existing program.

The Army, as the coordinator for the Department of Defense tri-Service teacher recruitment program, this past year selected 1,695 teachers for schools throughout the world. Of this total, 871 were for the Army, 715 for the Air Force, and 109 for the Navy.

In its employment of minorities, the Army continued to emphasize local plans of action as the most effective means of carrying out the Equal Employment Opportunity Program. Army civilian personnel regulations were revised to reflect Civil Service Commission requirements under the program. The Army also continued the Administration's emphasis on the employment of women, particularly in the upper grades, in which it employed, in grades GS-12 and above, 1,198 women by the end of March 1966. For years the Army has employed qualified handicapped persons, and during calendar year 1965 it appointed 1,776 such persons to positions in the United States—2.13 percent of all handicapped persons hired in this country. As of January 1,

1966, the Army had employed a total of 109 mentally retarded persons at 42 installations under special appointing authority. Of that number, 89 were still employed at the end of the fiscal year, 6 having been promoted.

V. Reserve Forces

Since the founding of this Nation, one of the principles of our military policy has been to support the active Army with a strong reserve force. In recent years, this force, consisting of the Army National Guard (ARNG) and the U.S. Army Reserve (USAR), has been known as the Army reserve components. During fiscal year 1966, several actions were taken to improve the capabilities of the reserve components in fulfilling their mission of providing trained units and qualified individuals to reinforce the active Army during a mobilization. Two major steps were the formation of the Selected Reserve Force (SRF) and the inactivation of low priority USAR units not required in current contingency plans.

Proposed Reorganization of the Reserve Components

In the fall of 1964, the Secretary of Defense requested the Department of the Army to prepare plans to be executed in fiscal year 1966 for reorganizing the reserve components to improve their early deployment capability and combat readiness. By September 30, 1965, the Senate and House Armed Services Subcommittees had completed hearings on the proposed reorganization for the 1st session of the 89th Congress.

In September 1965, Congress passed the Department of Defense Appropriations Act of 1966 (Public Law 89-213) which provided separate appropriations for the Army National Guard and the Army Reserve and required that the Guard be programed to attain a strength of not less than 380,000 for fiscal year 1966 and that the Army Reserve be programed to attain a strength of 270,000. This action in effect precluded the execution of the proposed reorganization in fiscal year 1966.

Selected Reserve Force

In August 1965, the Secretary of Defense reported to Congress that the buildup of the active Army and the improvement of the readiness of a portion of the reserve components were necessary to offset planned deployments to Southeast Asia, to provide additional forces for possible new deployments, and to be able to deal with crises elsewhere in the world.

Accordingly, the Army created the Selected Reserve Force to increase substantially the premobilization readiness of certain reserve

component units, thereby decreasing the postmobilization training time required for deployment. The formation of the SRF was initiated in October 1965 and was completed by December 31, 1965. The SRF consists of three infantry divisions, five separate infantry brigades, a separate mechanized infantry brigade, an armored cavalry regiment, and many combat support and combat service support units. The three divisions were formed from elements of nine Army National Guard divisions. In each instance, a high priority division provided a division base and one 100-percent-strength brigade; two low priority divisions provided two additional 100-percent-strength brigades. Three of the existing ARNG separate brigades were designated as part of the SRF; the remaining three brigades of the SRF were formed from three low priority ARNG divisions. The National Guard and Army Reserve furnished combat support and combat service support units of battalion-size and smaller for the Selected Reserve Force.

The TOE strength of the 977-unit SRF at the end of the fiscal year was approximately 150,500. The ARNG was authorized 744 units with a TOE strength of approximately 118,900; the Army Reserve was authorized 233 units with a TOE strength of approximately 31,600. At the close of the fiscal year the assigned strength of the SRF was 144,030 (ARNG: 115,251; USAR: 28,779).

A number of measures were instituted to improve the readiness of the SRF. All units were authorized 100 percent TOE strength, a 50-percent increase in the number of training assemblies for units, and a 100-percent increase in the number of training assemblies for unit staffs. Units were directed to undertake an accelerated training program and were given priority for Reserve Enlistment Program (REP) training spaces in Army training centers. The equipment posture was significantly improved by transferring to SRF units equipment held by lower priority units and by granting a priority to SRF units in the issuance of new equipment earmarked for the reserve components. Provisions were also made for increasing the availability of repair parts in order to bring SRF unit equipment to combat serviceable condition, and additional technicians were authorized. Finally, SRF units were directed to accomplish a maximum of administrative preparation so as to be able to move to a mobilization station promptly after being mobilized. Planning for mobilization was based on a 7-day alert period.

Inactivation of Army Reserve Units

Concurrent with the action establishing the Selected Reserve Force, the Secretary of Defense announced that the Reinforcing Reserve units of the Army Reserve would be inactivated before the end of calendar year 1965. The purpose of the inactivation was to make trained man-

power in those units available to units of the Selected Reserve Force and to reduce Reserve Enlistment Program training requirements. After careful consideration of a resolution of the Senate Armed Services Committee urging against the inactivation of approximately 750 Army Reserve Reinforcing Reserve units, the decision to inactivate these units was reaffirmed and announced on November 13, 1965.

The inactivations were completed on December 31, 1965. Of the 55,220 personnel in the inactivated units, 24,400 were reassigned to other Army Reserve units, 1,019 transferred to the Army National Guard, 27,702 were transferred to the Ready Reserve Mobilization Reinforcement Pool, and 2,099 were discharged, retired, or transferred to the Standby Reserve.

Reserve Component Readiness

The reserve components' assigned strength at the beginning of fiscal year 1966 was 640,665 (ARNG, 378,985; USAR, 261,680). The President's Budget for fiscal year 1966, based on the proposed reorganization plan, projected a beginning paid drill strength of 655,000 (ARNG, 385,000; USAR, 270,000) and a year-end strength of 575,000, all in the ARNG. However, the Defense Appropriations Act of 1966 provided funds and required programing for a year-end strength of 270,000 in the Army Reserve and not less than 380,000 in the Army National Guard. The Army National Guard program was later revised to 418,500 because of the increase in strength required by the establishment of the Selected Reserve Force. The Immediate Reserve unit strengths were continued at the authorized levels and the ARNG Reinforcing Reserve unit authorized strengths were reduced from 65 and 60 percent of TOE to 50 percent. The assigned strength of the reserve components at the close of the fiscal year was 671,898 (ARNG, 420,924; USAR, 250,974).

Enlistments during the year totaled 221,045 (ARNG, 125,036; USAR, 96,009) of which 171,976 (ARNG, 109,939; USAR, 62,037) were nonprior service enlistments requiring a minimum of 4 months' active duty training with the Army. At the same time that enlistments were increasing in the reserve components, active Army strength was also increasing. Although the training capacities of the Army training centers were expanded, it was impossible to accommodate all of the untrained accessions in all components. Because priority, of necessity, was given active Army trainees, a large number of reserve component personnel had not been trained at the end of the fiscal year. As of 30 June, 133,109 enlistees (ARNG, 79,106; USAR, 54,003) were awaiting training. Elements of the 13 Army Reserve training divisions helped to alleviate this situation by providing some form of basic training to

more than 10,000 Army National Guard and Army Reserve enlistees at or near their homes.

At the beginning of the fiscal year, there were 26,924 unit technicians on duty with the reserve components (ARNG, 22,423; USAR, 4,501), including 5,027 in the Air Defense program and 142 in the program for military support of civil defense. As of June 30, 1966, actual technician strength was 26,967 (ARNG, 22,939; USAR, 4,028), including 4,970 in the air defense program and 216 in the program for military support of civil defense. The decline in employment occurred as a result of the inactivation of the USAR Reinforcing Reserve units and the prospect of the proposed reorganization of the reserve components.

In December 1965, an adjustment in the technician program provided 1,184 ARNG technicians to support the Selected Reserve Force. On May 23, 1966 an additional 434 employees were authorized the USAR to improve equipment readiness in the SRF units. As of June 30, 1966, 758 technicians, all ARNG, were employed. During the month of June, temporary hire civilians and overtime to the equivalent of 1,015 man-months were used to accomplish the ARNG objective.

Concurrent with the announcement regarding the proposed reorganization of the Army reserve components, all programed construction projects not under contract were suspended, and no further design contracts or minor construction projects were undertaken pending a review of facility requirements to support the realigned reserve force. When it became apparent that a decision on the proposed reorganization faced an extended delay, the Department of the Army decided to begin those projects that, under either the current force structure or the proposed force structure, could be justified as being urgently required for health, safety, or other compelling reasons.

During fiscal year 1966 there were no new Army National Guard armory or U.S. Army Reserve center projects placed under contract, though one nonarmory training project was placed under contract at Camp Grayling, Mich., for the Army National Guard. Twenty-nine projects (24 armory-type and five nonarmory) for reserve component facilities already under way from earlier years were completed. A program was undertaken for the acquisition and development of field training sites for weekend assemblies of SRF units in accelerated training. The Army was planning for the improvement of training facilities at weekend and annual field training sites as the fiscal year closed.

At the end of the fiscal year, the reserve components required and occupied 3,818 armory-type facilities (ARNG, 2,786; USAR, 1,032), of which 2,643 were State-owned and licensed, 564 federally owned, 479 leased, and 132 donated or permitted.

Following the inactivation of the USAR Reinforcing Reserve units, their equipment assets were redistributed to the units of the U.S. Army Reserve remaining in the force structure, with first priority to the Selected Reserve Force. A relatively small proportion of these assets were transferred to Army National Guard units, and a few items were returned to the active Army.

With the establishment of the Selected Reserve Force, a program was initiated to raise the standard of its equipment from training serviceability to combat serviceability. To that end, provisions were made to increase the supply of repair parts, and intensive maintenance programs at the organization and direct support levels were supplemented by commercial overhaul contracts administered by Army depots.

Some major equipment items were withdrawn from the reserve components for use by the active Army during fiscal year 1966—including the 40-mm. M-42 twin gun; 106-mm. recoilless rifle; self-propelled 105-mm. howitzer; and various types of wheeled vehicles. At the same time, additional equipment was issued to the reserve components including a number of the new self-propelled, 8-inch howitzer M-110; the self-propelled mortar carrier M-106A1; and the machine gun M-60. A sizable quantity of M-38A1 ¾-ton trucks was issued to the Army National Guard during the last half of the fiscal year in an "as is" condition and approximately 50 percent of the Army National Guard M-48 combat tank assets were replaced with the M-48A1.

At the close of the fiscal year, reserve component units generally had sufficient equipment for effective training. The significant shortages were in modern equipment items, many of which were also in short supply in the active Army. During the period July 1, 1964, to May 23, 1966, equipment with a value of approximately \$94 million was withdrawn from the reserve components; during the same period, equipment with an approximate value of \$74 million was issued, a small part of which was to replace withdrawn equipment.

Heretofore, Department of the Army policy has been that inactive duty training assemblies conducted at home stations would last a minimum of 2 hours. In addition, all units were encouraged to schedule a number of multiple drill periods by putting together, in 1 or 2 days, a number of single training assembly periods. In these instances, each training assembly was required to be of 4 hours' duration.

Throughout fiscal year 1966, increased emphasis was placed on multiple training assemblies at field training sites. In the early part of fiscal year 1966, the Department of the Army announced that, effective October 1, 1966, all unit training assemblies would be of a minimum of 4 hours' duration. In addition, all units would be required to schedule a minimum of six multiple training assemblies consisting of

four 4-hour periods. In most instances, this would mean that a unit would spend a minimum of six weekends at a field training site; in many instances, unit commanders would elect to complete the total annual training assembly requirement by the use of weekend drills. The lengthened training assembly and the encouragement for unit commanders would elect to complete the total annual training assembly requirement by the use of weekend drills. The lengthened training assembly and the encouragement for unit commanders to conduct a maximum of training in the field would contribute significantly to the attainment of improved readiness levels by the reserve components. During fiscal year 1966, attendance at unit training assemblies averaged 95 percent for the Army National Guard and 88 percent for the Army Reserve.

Because of the worldwide commitments of active Army forces, major field exercises were limited in fiscal year 1966. LOGEX 66, conducted at Fort Lee, Va., was the only major exercise available to the reserve components. Because of higher priorities associated with the requirements of the active forces, GUARDLIFT 66 was not held. Even though the overall GUARDLIFT program was canceled for 1966, certain National Guard units with a total of 1,398 personnel were provided air mobility training. SKYTHRUST, the USAR counterpart of GUARDLIFT, provided air mobility training for 26 USAR units (6,066 personnel).

Resident courses at the Army service schools provided a portion of the professional and specialty training for members of the reserve components. Enrollments for Army service schools were 13,863 (ARNG, 6,862; USAR, 7,001). Participation in the Army area schools was 7,849 (ARNG, 1,418; USAR 6,431). Initial enrollment in the State officer candidate schools for the year was 4217, which established a new record.

The reserve component school system, conducted by USAR personnel at night or on weekends, was operated in 344 locations, including Hawaii, the Philippines, Puerto Rico, Germany, France, Italy, England, and Spain. Total opening enrollment was 18,322.

Air Defense

The 48 on-site NIKE-HERCULES batteries in the continental United States and the six fire units in Hawaii manned by Army National Guard technicians were operational around the clock during the last year. The CONUS batteries were a part of the Army Air Defense Command, to protect selected population centers against air attack.

Budget

Although the President's Budget for fiscal year 1966 requested funds for the support of the reserve components based on the proposed reorganized structure, the Congress approved funds for the continuation of a separate Army National Guard and Army Reserve. Funds totaling \$939.5 million were provided in separate appropriations to support each reserve component. Included was a supplemental appropriation of \$107.7 million to support the SRF and an associated accelerated training program. Total obligations during the year were \$875.1 million.

Status of ROTC/NDCC

Despite the increase in the population of male college students and the increased incentives provided by the ROTC Vitalization Act of 1964 (Public Law 88-647), enrollment in the Senior Division Reserve Officer Training Corps program declined slightly. At the same time, a substantially greater interest in the new 2-year ROTC program was evidenced by the nearly 3,337 students who enrolled for this year's basic summer camp as compared to the 623 who enrolled last year. This fivefold increase in the number of participants in the 2-year program, plus preliminary estimates from professors of military science at the 247 colleges and universities that support Army ROTC, suggest that enrollment in the advanced course in fiscal year 1967 may be somewhat larger than it was in fiscal year 1966; this will result in an increased output of ROTC officers in fiscal year 1968.

For the school year 1966-67, the Army awarded 400 additional ROTC 4-year scholarships to high school graduates and 600 2-year scholarships to ROTC cadets completing the basic course in the Senior ROTC Division. Over 9,000 high school seniors applied for 4-year scholarships, and about 3,000 college sophomores for the 2-year scholarships. Individuals selected to receive scholarships were found to be very well qualified academically and to have participated extensively in extracurricular activities.

As a part of the expansion of the Junior ROTC program, authorized and required by the ROTC Vitalization Act of 1964, the Department of the Army will increase the number of schools participating in its Junior ROTC program from 251 in fiscal year 1966 to 434 in fiscal year 1967. This expansion will permit the conversion of National Defense Cadet Corps (NDCC) schools to Junior ROTC schools in fiscal year 1967 and will allow 48 schools to be added to the number of participating institutions.

To provide for consolidation and improved management of all officer procurement programs of the Army, the Department of the Army

will transfer the General Staff responsibility for the ROTC and NDCC programs from the Chief, Office of Reserve Components, to the Deputy Chief of Staff for Personnel, effective July 1, 1966. Although this action will centralize Army officer procurement activities in one agency of the General Staff, it is not anticipated that it will result in significant departures from previous policies applicable to Army ROTC.

VI. Management, Budget, and Funds

In fiscal year 1966, the pressures of expansion and extensive deployments to Southeast Asia increased the cost of operations. Congress appropriated to the Army and the Army obligated more funds in 1966 than in any fiscal year since 1952. The challenge to Army management, in its constant endeavor to procure and support the most efficient land forces at the least possible cost, was therefore all the greater, though the effort took no distinctly new direction.

Management Systems and Techniques

The Army's management systems must be developed within the overall framework of Department of Defense systems. A new DoD Resource Management System will become effective July 1, 1967. To insure that the Army Resource Management System will be consistent with the DoD system and responsive to the needs of management at all Army echelons, the Army is intensifying the study of its management systems and techniques. A civilian firm of management consultants completed an evaluation during the past fiscal year and concluded that the systems design, with certain modifications to correct areas of weakness, is adequate to meet the needs of the Army and the demands of the DoD system. Studies in this area will continue, however, until July 1, 1967; thereafter the system will be refined as necessary.

Development of a resource management system for the Military Traffic Management and Terminal Service (MTMTS) received much attention during fiscal year 1966. The Secretary of the Army was designated in fiscal year 1965 as Single Manager for Military Traffic, Land Transportation, and Common-User Ocean Terminals. MTMTS is the single-manager operating agency established within Department of the Army as a major command to handle these responsibilities. The MTMTS charter authorized the financing of internal operating costs of the agency, including the headquarters, all traffic regions, military ocean terminals, and the Defense Freight Railway Interchange Fleet, under the Army Industrial Fund, effective July 1, 1965. The Secretary of the Army recommended, and the Secretary of Defense approved, a plan providing for the development and installation of all elements required for a total command cost system within 1 or 2 years.

The resources management system must provide separate identification of MTMTS operating costs, distinguishing among port handling costs (direct and indirect), traffic management costs, intermediate command headquarters costs, and MTMTS headquarters costs. MTMTS will develop and publish tariff rates for terminal services subject to the approval of the Assistant Secretary of Defense (Comptroller) designed to reimburse the Industrial Fund for total costs incurred in rendering the services.

In recent years, the Department of the Army has placed increased emphasis upon the need for central control of logistical and financial management systems. The Army Supply and Maintenance System (TASAMS) achieved this centralization within the Army wholesale supply structure at inventory control points. Similar programs have been, or are being, installed in oversea commands. In CONARC, the test installation of the Centralization of Supply Management Operations (COSMOS) underwent further development during the past fiscal year. COSMOS procedures provide for withdrawal of the bulk of supply management operations from individual installations and centralization at one point within each Army area and at Headquarters, CONARC, thus reducing the accountable points from approximately 80 to 6. The test COSMOS organization has been established at Headquarters, Sixth Army, and staffed with the necessary personnel to accomplish the detailed planning inherent in the development and installation of a system where automatic data processing equipment is extensively employed. Originally, it was expected that the operational test at Sixth Army would be evaluated by June 1966. However, unforeseen delays have caused the evaluation date to be rescheduled into late fiscal year 1967.

The Department of the Army is also currently designing a program, within the overall policy guidance of OSD, for an integrated management information system to supersede the cost and economic information system previously prescribed by the Secretary of Defense to standardize the collection and use of cost data for selected major items of equipment. The new program, designated the Selected Acquisitions Information and Management System (SAIMS), will provide for the collection of standard-type data for performance measurement, for use in estimating or analyzing the cost of weapon system development, and for measurement of the economic impact of defense spending.

Fiscal year 1966 marked the third year of Army participation in the Department of Defense project for the Development of Improved Management Engineering Systems (Project DIMES). This project has as its objective, within a 5-year period, the substantial adoption of accepted industrial management techniques at all suitable defense

activities and is divided into three phases: Phase I—work measurement and methods improvement; Phase II—integration of standards into work planning and control systems; and Phase III—development of standard cost accounting systems. The 11 pilot installations participating in the program are three arsenals, three depots, two proving grounds, two national inventory control points, and a repair and utilities activity (post engineer). The two pilot arsenals and three pilot depots moved into Phase II of the program in the past fiscal year; other installations are in Phase I. The two arsenals, Watervliet, N.Y., and Rock Island, Ill., made some progress in developing the standard cost accounting system visualized in Phase III. Savings realized in all of the Army pilot installations in Project DIMES up to March 1966 amounted to over \$11 million.

The revitalized effort to obtain a broader use of work measurement techniques throughout the Army is also progressing at a satisfactory pace. An Army regulation establishing policies, objectives, responsibilities, and relationships to other management programs was published as was an instructional pamphlet, "How and Where to Use Work Measurement in the Army." Work measurement pilot studies within the United States and overseas have been completed and are now being analyzed. Based on this analysis, work measurement techniques will be extended to all installations where it is practicable and profitable to do so.

During the year, also, the zero defects program, in successful operation in the Army Materiel Command for approximately 3 years, was extended Army-wide. The objective of this program is to enhance military readiness by motivating individuals to produce work free of defects, that is, encouraging an attitude of "doing the job right the first time," whatever the job may be.

The effort to improve the reporting system and cut down on the reporting workload also continued, with the emphasis during the past fiscal year on reduction in reporting imposed on tactical units of the Army. Army elements in Vietnam—through rescission, transfer of responsibility to other commands, or reduction in content—now prepare 27 reports instead of the 73 previously required. This success prompted a study on reducing reporting required of other tactical units of the Army. The study is expected to be completed in August 1966. Meanwhile, a review to reduce reports initiated by the Army Staff resulted in a 16 percent reduction by March 31, 1966, 6 percent more than the goal of 10 percent initially established for the end of the fiscal year.

The Army Status Report provides a means for informing the Secretary of the Army regularly and briefly on the overall condition of Army affairs and on major areas requiring top management atten-

tion. It was revised in February 1966 to make it more responsive to the Secretary's needs. Now updated on a weekly basis, it analyzes significant program trends, deviations, and problem areas, making it possible for the Secretariat and Staff to manage resources more effectively and improve the Army's capability to accomplish its mission.

The new accounting systems for the Research, Development, Testing, and Evaluation (RDT&E) and Procurement of Equipment and Missiles, Army (PEMA), appropriations were further refined during the year. The managerial accounting system for the RDT&E appropriation, which provides a uniform method for accumulating total costs on each project, was expanded at installation level and extended to general and special operating agency level. The Army issued a regulation outlining policies and procedures for the Procurement of Equipment Missiles Army Management Accounting and Reporting System (PEMARS), thus completing Phase I of this program. A reevaluation of the concepts involved in the later phases of the system was made to assure that policies outlined therein would be in consonance with the Department of Defense Resources Management System. Tests of PEMARS at the AMC Missile Command and at the Aviation Command proved the system practical, feasible, and necessary; partial implementation will commence with the new fiscal year.

Special accounting problems have arisen with regard to military construction in Vietnam and the Dominican Republic. An evaluation of conditions in Vietnam lead to the inescapable conclusion that normal peacetime controls and detailed accounting procedures for each specific construction project were unduly burdensome. Accordingly, the Office of the Secretary of Defense in February and March 1966 provided fiscal and accounting guidance that grants maximum flexibility to COMUSMACV in management of the construction program, requiring only the minimum of accounting and reporting necessary to assure adequate financial control and compliance with statutory provisions.

To resolve problems concerning administration and accounting for funds and other resources provided by the Department of the Army for military construction in the Dominican Republic, Headquarters, CONARC, was designated as the funding operating agency.

Army Information and Data Systems

A common denominator of almost all of the new management and accounting systems introduced into the Army in recent years has been the increased use of automatic data processing equipment as a means of speeding operations and making them more efficient, storing information for quick retrieval, and reducing manpower required for

routine, repetitive tasks. The advantages of uniform systems for management of personnel, supplies, and services and for handling financial transactions can be fully realized only through the use of the most suitable automatic data processing equipment.

At the end of fiscal year 1966, the Army operated 512 data processing installations using 507 computers and 7,629 punchcard machines, representing an increase of 57 data processing installations and 109 computers, and a decrease of 521 punchcard machines during the year. In June 1965, the Army selected the UNIVAC 1005 as its standard card processing computer to replace conventional punchcard machines at selected installations, and 100 UNIVAC 1005's were installed during the year. Another 41 remained to be installed at year's end. This modernization has increased processing capability while reducing costs, and it facilitates centralized development of computer programs that can be used at many installations.

The Army-wide automatic data processing (ADP) equipment complex provides improved information processing in all areas of Army operations, including tactical operations (see ch. III) as well as those of personnel, logistical, and financial management. Savings accrued from the installation of automated information systems, officially documented in the cost reduction program, amounted to \$9.5 million during fiscal year 1966, equivalent to 5 percent of the Army's total expenses for data processing during the year.

During fiscal year 1966, the Army made considerable progress in the development of an overall Five Year Army Information and Data Systems Program. Completion of the initial program is scheduled for the middle of the next fiscal year. This program will serve as a basic management tool for planning, guiding, and reviewing the overall information systems complex of the Army.

Meanwhile, systems planning, development, and improvement continued apace throughout the Army. The Army Materiel Command is developing a National ADP Program for AMC Logistics Management (NAPALM), a 5-year program to automate functions and develop comprehensive standard ADP systems among its subordinate commands and installations. Equipment specifications covering the first phase (12 installations at national inventory control points and arsenals) were released to manufacturers in April 1966, and equipment for the pilot installation is scheduled to be in place during the fourth quarter of the next fiscal year.

A proposed phase of the overall NAPALM program is the Test, Evaluation, Analysis, and Management Uniformity Plan (TEAM-UP), a project to develop standard systems and equipment at seven test and evaluation command installations. Plans for TEAM-UP have

been approved, and systems specifications are being prepared, with initial installation planned for fiscal year 1968.

A third Materiel Command project involves its Finance and Accounting Office. The object of this project is to automate the AMC appropriation and fund accounting system by revising the present manual and bookkeeping machine methods. Thirty-three AMC installations are scheduled to participate in this program, and the NCR-500 has been selected as the equipment to be used. AMC has chosen four prototype installations to test the system in different environments.

Within CONARC, successful evaluation of COSMOS will result in an automated system for centralized supply management. As an adjunct, the CONARC Class One Automated System (COCOAS) is being developed as a standard system for major posts, camps, and stations within the United States. Major application included within COCOAS are post supply (if COSMOS is adopted, COCOAS will support that portion of supply management that remains a post function), maintenance, troop ration issue, civilian payroll, military payroll, military personnel accounting, and appropriation and fund accounting. The initial test installation will be made at Fort Sill, Okla., during the coming fiscal year. Following this test and its evaluation, the plan calls for extension of the system to 35 posts during the following two fiscal years.

In another area, the Corps of Engineers during fiscal year 1966 developed a plan for standardizing the data processing systems of engineer divisions and districts. Under this plan, business-type applications will be centralized at the engineer division headquarters, and scientific applications standardized insofar as practicable.

To improve supply effectiveness in direct support and general support units, tests were undertaken and a plan developed to convert present manual stock accounting procedures in these units to a mechanized system using a magnetic ledger-type computer. In the first phase, direct and general repair parts support units in Southeast Asia will be mechanized; in the second phase Army-wide requirements for installation of the system will be determined. During this second phase, full cognizance will be taken of the progress and capability of the CS₃ system under the ADSAF program. Packages containing computer equipment, mobile vans, and trained personnel will be deployed to Army units in Southeast Asia during the second quarter of fiscal year 1967.

In addition to the longer range projects discussed above, the Army deployed to Vietnam the 14th Inventory Control Center, equipped with punchcard machines to process supply data in that area. The unit was activated, trained, and deployed in a minimum of time, and it

provided a much-needed processing capability. To provide back-up support to the flow of logistics information from Vietnam and to process the large volume of requisitions that flow through Okinawa, USARPAC installed its computer-based standard supply system on Okinawa on a priority basis. This installation, using two large-scale computers, is now processing up to 330,000 requisitions monthly. Both projects have made major contributions to effective support of our fighting forces.

In personnel management and reporting, the Army for many years has operated a worldwide automated system under the overall monitorship of the Deputy Chief of Staff for Personnel. The U.S. Army Data Support Command (USADATCOM), a class II activity of The Adjutant General's Office, is responsible for design of the personnel reporting system and operation of that portion at Department of Army Headquarters. Fourteen data processing units, located in the various Army headquarters in the United States, in major oversea commands, and at other selected subordinate command headquarters, back up USADATCOM. Since 1962, the data processing units in the Army headquarters in the United States have operated a standard, computer-based system using RC 501/301 computers. During fiscal year 1965, Headquarters, USAREUR, also installed this system. During fiscal year 1966, Headquarters, USARPAC, set up a similar installation in Hawaii. The system in the Pacific will improve the flow of personnel data from Vietnam, as well as from the remainder of the area under USARPAC control.

The program for replacement of punchcard machines with UNIVAC 1005 card-processing computers will vastly improve personnel reporting. Existing plans call for a standard, centrally programed system to be installed on UNIVAC 1005's in 17 ROAD divisions and 12 personnel service companies during fiscal year 1967. At the same time, the installation of COCOAS will lead to major improvements in the processing of personnel data at major posts within the United States.

Changes in Army Staff Organization

To improve direction and management at top Army levels and to provide a closer link with comparable agencies in the Office, Secretary of Defense, some realignments were made in the Army Staff during fiscal year 1966. At the direction of the Secretary of Defense, in February 1966 a Force Planning and Analysis Office was established in the Office of the Chief of Staff to integrate Army requirements for force structure, manpower, materials, and readiness. This staff agency works closely with the Office of the Assistant Secretary of Defense (Systems Analysis) and, during its formative stage, the Director of Land Force

Programs in the latter offices was designated as a codirector of the Army Force Planning and Analysis Office to assist in its formation and initial operation.

In April 1966 the Office of the Chief of Staff was reorganized to reflect the impact of the establishment of the Force Planning and Analysis Office (FP&AO). The Office of the Director of Coordination and Analysis was disestablished and most of its functions assigned to a newly established office, that of the Deputy Secretary of the General Staff for Coordination and Reports (DSGS, C&R); one function was assigned to the Director of Army Studies and one to the FP&AO. The Office of the Director of Army Programs was also disestablished and its functions reassigned to the new FP&AO, the DSGS, C&R, the Deputy Chief of Staff for Military Operations, the Comptroller of the Army, and the Assistant Chief of Staff for Force Development.

In addition, in October 1965, because of the increased emphasis on strategic mobility planning, a Strategic Mobility Branch was established within the Directorate of Strategic Plans and Policy, ODCSOPS. In March 1966 a Directorate of Personnel Studies and Research was organized within the Office of the Deputy Chief of Staff for Personnel (ODCSPER). It will provide DCSPER with a continuous capability to conduct major personnel studies, and will develop improved techniques for analyzing a broad variety of manpower problems.

Army Cost Reduction Program

Two related themes characterized Army cost reduction program activities during fiscal year 1966—strong top-level emphasis on continued efforts to generate savings despite the demands of the war in Vietnam and continued work to improve the administration and effectiveness of the program. Army leadership at all levels, from the Chief of Staff to local field commanders, continually stressed in messages and statements the importance of individual contributions to economy and efficiency. Department of the Army circulars disseminated cost-cutting ideas and transmitted Presidential statements on cost reduction. The Army participated in the second annual DoD Cost Reduction Week, during which the general achievements of the program were given widespread publicity and outstanding individual contributions were recognized.

In the related effort to improve administration and control, the Army published a new regulation incorporating new reporting procedures. In support of both themes, cost reduction conferences and seminars and local campaigns of various types were conducted in Army commands throughout the world.

The success of the cost reduction programs is best demonstrated by the result—savings of \$1,364 million for fiscal year 1966, compared to a goal of \$1,164 million. The goal was surpassed despite materially decreased procurement savings opportunities resulting from a change in the type of procurement required to meet urgent materiel needs in Southeast Asia.

Thus the Army exceeded its cost reduction goal for the fourth consecutive year. Tens of thousands of individual savings actions contributed to this end, ranging from some that amounted to only a few dollars to others that amounted to millions. A few examples illustrate this:

A special review in the Office of the Deputy Chief of Staff for Logistics of the replacement rate of a radio relay set resulted in the elimination from procurement of 247 sets, at a savings of \$2,114,000.

A civilian employee at Watervliet Arsenal suggested the use of parts from weapons excess to Navy requirements in the repair of Army 40-mm. antiaircraft guns. This resulted in savings of \$352,100.

Multiyear procurement of personnel carriers by U.S. Army Tank Automotive Center saved \$5,478,000 from what would have been the cost of procurement of the same items on single year contracts.

Publication of nuclear weapons equipment manuals in loose-leaf form permitted page for page changes instead of frequent reprinting of the entire manual. The savings, at Picatinny Arsenal, amounted to \$133,860.

A new system for preparation and issuance of building security passes saved \$34,000 in the U.S. Army Service Center for the Armed Forces, Washington, D.C.

A Korean national employee suggested a modification of telephone equipment to avoid procurement of additional equipment to meet a requirement for expanded service. After successful testing, the suggestion was accepted and saved \$95,600.

In CONARC, an employee suggested a new method of repairing shower room floors, using an epoxy overlay technique. Applied to 144 shower units, the technique saved \$18,847.

International Balance of Payments

Numerous Army activities have international balance of payments (IBP) implications, among them oversea procurement, support, and employment; the spending habits of U.S. military and civilian personnel overseas; and the sales of U.S. materiel and services to allied nations.

During fiscal year 1966 the Army continued its efforts to control and reduce the net adverse balance of oversea expenditures. Expenditure

DEPARTMENT OF THE ARMY
CHRONOLOGICAL SUMMARY OF THE BUDGET ESTIMATE, FY 1966
(In millions of dollars)

	Department of Army submission	President's Budget	Appropriated PL 86-213, PL 89-202	Transferred from emergency fund Southeast Asia PL 89-213	New obligational authority		
					Supplemental military and civilian pay raise PL 89-426	Supplemental Southeast Asia PL 89-374	Total appropriated
Military Personnel, Army-----	4,401.6	a 4,102.6	a 4,092.3	-----	222.1	b 833.6	c 5,148.0
National Guard and Reserve Personnel, Army-----	516.2	459.8	-----	-----	-----	-----	-----
Reserve Personnel, Army-----	-----	-----	238.6	-----	-----	7.5	246.1
National Guard Personnel, Army-----	-----	-----	271.8	-----	-----	45.9	322.2
Operation and Maintenance, Army-----	3,580.0	3,379.1	3,483.6	-----	-----	1,077.2	4,594.2
Operation and Maintenance, Army-----	-----	-----	-----	-----	-----	33.4	-----
National Guard and Reserve-----	326.7	292.0	-----	-----	-----	-----	-----
Operation and Maintenance, Army-----	-----	-----	208.8	-----	-----	35.7	246.5
National Guard-----	-----	-----	-----	-----	-----	-----	-----
Rifle Practice-----	.5	.5	.5	-----	-----	-----	.5
Procurement of Equipment and Missiles, Army-----	2,278.5	1,223.1	1,204.8	504.5	-----	2,465.0	4,174.3

See footnotes at end of table.

CHRONOLOGICAL SUMMARY OF THE BUDGET ESTIMATE, FY 1966—Continued

	Department of Army submission	President's Budget	Appropriated PL 88-213, PL 88-202	Transferred from emergency fund Southeast Asia PL 89-213	Supplemental Southeast Asia PL 89-374	New obligational authority	
						Supplemental military and civilian pay raise PL 89-426	Total appropriated
Research, Development, Test and Evaluation, Army-----	1,690.7	1,438.0	1,406.4	-----	28.0	-----	1,434.4
Subtotal, excluding Construc- tion accounts-----	12,794.2	10,895.1	10,906.8	504.5	4,492.9	262.0	16,166.2
Military Construction, Army-----	637.6	441.4	323.4	64.6	509.7	-----	897.7
Military Construction, Army Na- tional Guard-----	4.0	-----	10.0	-----	-----	-----	10.0
Subtotal, Construction accounts-----	641.6	441.4	333.4	64.6	509.7	-----	907.7
Total-----	13,435.8	11,336.5	11,240.2	569.1	5,002.6	262.0	17,073.9

^a In addition, \$210 million transferred from Defense and Army Stock Funds and \$80 million from Army Industrial Fund.

^b Includes \$210 million appropriated in lieu of transfer from Defense and Army Stock Funds (see footnote ^a).

^c In addition, \$30 million transferred from Army Industrial Fund.

and receipt targets were assigned to all Army commands and staff agencies having IBP transactions. A number of actions directed by the Secretary of Defense were completed that streamlined support activities while maintaining mission capability.

Army military and civilian personnel overseas were urged to channel personal spending and saving into U.S. enterprises and curtail expenditures on local economies. Commands acted to increase receipts of nonappropriated fund activities and encourage personal savings through bond purchases, soldiers' deposits, and in American savings institutions. Steps to increase the sale of U.S. weapons and equipment to allied nations and expand the use of U.S. facilities through cooperative logistic arrangements were increasingly successful.

Urgent offshore support related to Vietnam caused an overall Army increase in the IBP in the year.

Budget and Funds

The original budget estimate for the regular appropriations for fiscal year 1966 prepared by the Army called for \$13.4358 billion in new obligational authority (NOA). As a result of OSD and Bureau of the Budget review, the President's Budget submitted to Congress contained \$11.3365 billion in NOA for the Army, and Congress reduced this to \$11.2402 billion. Supplemental appropriations of funds for supporting the effort in Southeast Asia and for financing the civilian and military pay raise, however, eventually brought the new obligational authority available to the Army in fiscal year 1966 to \$17.0739 billion, a high for recent years. The actions on these budget requests are traced, by appropriation, in the following table:

The table below shows total funds obligated by the Army, actual and estimated, for fiscal years 1965, 1966, and 1967. The total obligations cannot, however, be compared directly against new obligational authority granted by the Congress for each year. In the so-called "no-year" appropriations (PEMA, RDT&E, and Military Construction) obligation authority can be carried over from one year to the next. Moreover, the Army acquires additional obligational authority each year from reimbursable sales to customers as, for example, through the Military Assistance Program.

OBLIGATIONS

(Millions of dollars)

	Actual, fiscal year 1965	Actual, fiscal year 1966	Estimated, fiscal year 1967
MPA.....	4, 348. 4	5, 254. 7	7, 012. 0
RPA.....	212. 9	220. 5	309. 0
NGPA.....	269. 3	301. 3	362. 0
O&MA.....	4, 258. 3	5, 563. 5	8, 383. 0
O&MARNG.....	192. 5	247. 6	239. 0
RIFLE.....	. 5	. 4	. 5
PEMA.....	2, 641. 0	6, 957. 2	7, 100. 0
RDT&E.....	1, 479. 1	1, 638. 4	1, 636. 0
MCA.....	592. 6	735. 2	967. 0
MCAR.....	2. 6	. 2	10. 0
MCANG.....	2. 1	. 2	14. 0
Total.....	13, 999. 3	20, 919. 2	26, 032. 5

The full cycle of budgetary reporting for the operating appropriations was automated during the second year of development of The Automated Army Budget System (TAABS). Over 23 different types of computer schedules were produced from data submitted by 24 Army commands and agencies. These schedules were used by Headquarters, Department of the Army, staff agencies to help prepare budgetary estimates and justifications for the apportionment of appropriated funds. Further steps are planned in a phased building-block approach toward development of a total budget information system.

Testing of the Centralized Automated Military Pay System (CAMPS) progressed from the central computation of 1,200 military pay accounts for payment by a local finance officer in 1964 to a test structure of about 60,000 accounts in CONUS, Vietnam, and Germany. These accounts are maintained by a computer at the U.S. Army Finance Center, where monthly computations are performed; local finance officers pay participating personnel. The AUTODIN network,

when fully developed, will be used to transmit pay data. The central computer will also provide budgeting/accounting data for management purposes.

Total system documentation for the CAMPS will be submitted for evaluation and approval in fiscal year 1967. Under current plans it would be installed Army-wide during calendar year 1968 and be fully operational by January 1, 1969. The system should be readily adaptable to the planned DoD Joint Uniform Military Pay System.

Army Study Program

There was continued improvement in the overall coordination and direction of the Army study program during the year. Under the general monitorship of the Director of Special Studies, Office Chief of Staff, the correlation of the study program was advanced by the emphasis placed upon it by heads of Army staff agencies and major Army commanders involved in the initiation, monitoring, or review of important Army studies. The system of designating study coordinators in the appropriate Army staff agencies and major commands provided a beneficial arrangement to facilitate the exchange and coordination of study information. The Army Study Documents and Information Retrieval System (ASDIRS) provided an improved capability for rapid retrieval of information on past and current studies.

The 1966 Army Master Study Program, a formal, approved listing of those major special studies expected to have a significant impact on overall Army planning, programing, and budgeting, was found to have increasing use not only for the Army staff but also for OSD, the separate Defense agencies, and the other Services. The program represents an orientation of Army studies toward the broad Army mission and concepts established by the Chief of Staff. It provides a mechanism by which the Army staff can detect gaps in the overall Army study effort and areas requiring greater emphasis, and take appropriate action to assure that the program is, in the aggregate, well-balanced, comprehensive, and conceived in terms of developing an effective army under anticipated future combat conditions. The principal changes to be noted in the program developed for calendar year 1966, over the initial effort of 1965, were an increase in the contributions by major Army commands and more detailed coverage of the personnel and training fields.

The Army Study Advisory Committee initiated a major examination of the Army's operations research/systems analysis (OR/SA) requirements, to develop a plan for an orderly increase in the Army's personnel resources, military and civilian, in the area. One objective is

to improve the Army's in-house capability to perform operations research/systems analysis, to apply these analytical techniques in special studies, and to make effective use of OR/SA products throughout the Army.

The Combat Developments Command developed a series of Army concept programs, designed to provide overall, unifying, doctrinal forces for the combat, combat support, and combat service support forces of the Army in the field in a specified time frame. For example, ARMY-70 covered the period 1965-70; ARMY-75, from 1970-75. The purpose of each concept program is to facilitate the orderly development and integration of new weapons and equipment, new organizations, and new doctrine into Army forces of the future (see ch. III).

Two projects, started in 1964 to provide a command realistic background for studies, progressed to the pilot stage during the year. One volume of the *Forecast of Conflict Environment*, a projection of a realistic spectrum of conflict and of alternative future trends, was produced and evaluated as a prototype for the development of additional volumes. Eventually, the *Forecast* will cover projections of likely conflict throughout the world. A related project called the Rainbow Scenarios also reached prototype stage. The scenarios were designed as projections of hypothesized conflict situations in various geographic areas for use in appropriate Army studies and planning documents. The *Forecast* and the Rainbow Scenarios are expected to be completed in fiscal year 1967.

VII. Logistics

Last year's report emphasized the need for the Army to maintain a state of materiel readiness sufficient to meet contingencies that might arise in any part of the world. The Army buildup and combat operations in the Republic of Vietnam put that readiness and, in fact, the whole Army logistical system to a test such as it has not encountered since the end of the Korean war. The effects of expansion and participation in conflict were reflected in every aspect of Army logistical operations.

In general the Army logistical system has met its test well. But, as always, there have been problems. Since the Korean war, equipment, methods, organization for logistics, and logistical systems have changed immensely. In September 1965 the Chief of Staff convened a special Board of Inquiry chaired by Lt. Gen. Frederic J. Brown to carry out a comprehensive analysis of the current Army logistics system and to determine what changes were needed to better satisfy the current requirement for constant materiel readiness. In April 1966 the board issued an interim report recommending certain actions of a "quick-fix" nature that required no major change in other portions of the logistics system. The board is continuing its studies and expects to issue a final report in November 1966, recommending whatever major improvements and refinements in the logistics system it deems necessary. In all likelihood, any changes recommended will take several years to put into effect.

Procurement

Procurement of aircraft, missiles, ammunition, and other items of major equipment under the PEMA appropriation for the Army and other customers increased from a level of about \$1.5 billion annually in fiscal years 1955-60 to almost \$2.5 billion annually in fiscal years 1961-65. Procurement in fiscal year 1966 was two-and-one-half times that in fiscal year 1965, totaling \$7.140 billion, a result of greatly expanded support required for Vietnam. The fiscal year 1966 budget originally approved by Congress for Procurement of Equipment and Missiles, Army (PEMA), amounted to \$2.076 billion, only slightly more than in fiscal year 1965. However, Congress added funds to that figure in August 1965 and in March 1966, specifically to provide sup-

port for forces in Southeast Asia. These additions and other adjustments raised the PEMA funds for fiscal year 1966 to \$5.183 billion (not including \$1.724 billion for customer accounts), more than double the amount of the original program.

The most significant increases in the procurement program over 1965 were for Army aircraft (up 214 percent), weapons and combat vehicles (up 130 percent), communications and electronics (up 142 percent), ammunition (up 288 percent), and production base support (up 343 percent).

Because of industrial leadtime, deliveries cannot keep pace with either appropriations or the obligation of funds for procurement, and most of the deliveries of major equipment in any 1 year result from procurement contracts placed in previous years. This was for the most part true in fiscal year 1966, though as a result of accelerated programs to meet additional requirements for Southeast Asia, 1966 deliveries did increase 25 percent over 1965, as is shown in the following table:

MAJOR EQUIPMENT DELIVERIES

(Millions of dollars)

	Fiscal year 1965	Fiscal year 1966
Total.....	2, 355	2, 937
Fire Power:		
Missiles.....	451	362
Ammunition.....	497	799
Weapons.....	55	54
Mobility:		
Combat Vehicles.....	354	268
Tactical and Support Vehicles.....	296	423
Aircraft.....	290	520
Communications and Electronics Equipment.....	265	336
Other Equipment.....	147	175

The increase was due primarily to the procurement of increased quantities of items with relatively short production leadtimes for both the Army and other customers and to accelerating production of some prior year procurements. The expansion of the ammunition program is of particular note. The Army's own ammunition procurement program increased from about \$360 million in fiscal year 1965 to approximately \$1.3 billion in fiscal year 1966 and, in addition, the Army had to procure increased quantities of ammunition for the Marine Corps and bombs for the Air Force. Requirements included special purpose items with early delivery dates. For all these reasons, additional production capacity had to be provided, both through reactivation of

Government-owned facilities (eight ammunition plants) and expansion of facilities operated by private industry.

Expediting procurement required some special reprogramming measures. It became apparent early in the third quarter of fiscal year 1966 that to provide timely support for forces in Southeast Asia it would be necessary to advance some items from the fiscal year 1967 budget and to establish other items for immediate procurement. In March 1966, the Deputy Secretary of Defense approved an accelerated procurement program proposed by the Army in the amount of \$355 million, primarily in four areas—tracked combat vehicles, tactical and support vehicles, communications and electronic equipment, and other support equipment. Early in May 1966 he approved items totaling \$356.3 million for immediate procurement to meet urgent Southeast Asia requirements, mainly in the ammunition and other support equipment categories.

At the beginning of fiscal year 1966 the "on hand" inventory of major items of materiel funded by PEMA was approximately \$14.5 billion against a total requirement then set at \$23.5 billion. During the year the total requirement was decreased to \$22.2 billion as a result of a reevaluation under revised logistic guidance from OSD. Although operations in Vietnam resulted in an increased demand for and consumption of specific items, this was more than offset by the decreased requirement.

During the past year, production was initiated on a number of new items, such as:

- AH-1G Cobra attack helicopter
- CH-54A heavy-lift cargo helicopters
- CHAPARRAL, guided missile system designed to protect front-line areas from low-to-medium-altitude aircraft
- General Sheridan armored reconnaissance/airborne assault vehicle
- M-16E1 rifles, 5.56-mm.
- $\frac{3}{4}$ -ton utility trucks
- AN/GRC-106 single sideband radio sets, vehicle mounted, 50-mile range
- DeLong piers for use in Vietnam
- M-60A1E1 tanks mounting 152-mm. gun-launchers that can fire either the new SHILLELAGH antitank guided missile or conventional ammunition
- Devices to improve the ability of a soldier to see and shoot at night

The PEMA portion of the President's Budget for fiscal year 1967 totals \$3,561.1 million and represents approximately 20 percent of the

overall Army budget. It is premised on force objectives and logistics guidance furnished by the Secretary of Defense. It provides combat consumption for approved forces deployed in Vietnam only through June 30, 1967. Requirements beyond that date are projected at peacetime levels. While this is a relatively austere projection of the Army's military hardware requirements, it will provide for replacement of losses resulting from combat and training consumption and wearout, and for continuation of PEMA modernization at a rate comparable to that of the past few fiscal years. It will also enable the Army to introduce more new items and new combat capabilities. Continuation of the war in Vietnam beyond the June 30, 1967, planning date will no doubt require the approval of a fiscal year 1967 supplemental budget.

Among items included in the fiscal year 1967 budget, ammunition accounts for approximately 30 percent of the total dollar value, aircraft for about 17 percent, tactical and support vehicles for about 15 percent, and missiles and tracked combat vehicles each for about 10 percent. Recent actions by the House and Senate Armed Services Committees have increased the authorization contained in the original PEMA budget by \$173.4 million for a revised total authorization of \$3,734.5 million. The Department of Defense requested the addition of \$19.9 million for procurement of more OH-6A Pawnee observation helicopters at an advantageous price option. The Congressional committees also added \$153.5 million for preproduction activities directed toward deployment of the NIKE-X antiballistic missile defense system.

During the past 4 years the Army has made a concerted effort to increase competitive procurement. However, in a situation where speed in contract award, production, and deliveries is paramount, some shifts from competitive to noncompetitive procurement are almost mandatory. In order to sustain the progress made in recent years and at the same time provide expeditious support for Southeast Asia operations, a separate preaward review procedure was established at the direction of the Deputy Secretary of Defense. Under this procedure, all proposals to shift procurements of over \$10 million from a competitive to a noncompetitive basis must be approved in advance by the Assistant Secretary of Defense, Installations and Logistics (I&L). All such procurements between \$1 million and \$10 million must be approved in advance by the Assistant Secretary of the Army (I&L). Procurements under \$1 million may be approved at lower echelons.

Review procedures are designed to provide prompt handling and immediate response, and experience shows they can be accomplished within several hours after receipt of a request. The system has worked satisfactorily to date to keep noncompetitive procurements at an

absolute minimum without undue delay in the preaward administrative process.

Another new and unusual procedure developed to cope with the rapid increase in requirements associated with the Vietnam buildup is the multiyear concept in executing the total program. Under this concept, contracts were let early in the fiscal year for total fiscal year 1966 requirements, though the original President's Budget, as amended, did not provide sufficient funds to meet them. Funds were obligated only in the amount contained in the original budget, and enough reserved to cover termination costs in the event the funds required to cover the balance of the program were not appropriated. This procedure avoided the necessity for placing contracts on a fragmentary basis throughout the year, enabled the Government to take advantage of lower prices for quantity purchases, and reduced production leadtime and the administrative burden and expense associated with repetitive procurements.

During the past year there has been some concern that accelerated military buying programs might create an adverse impact on both consumer prices and the availability of consumer goods. To preclude any major difficulties in this regard, plans were developed to identify the general commodity areas and those industries supplying the Department of Defense upon which the civilian market is vitally dependent. Initial studies were to detect shortages of basic raw materials, components, skilled labor, and other factors that might contribute to price increases and shortages of consumer goods.

The preliminary reviews revealed a lack of capacity in some industries and a general reluctance to accept additional military orders at the expense of commercial production primarily because there is no assurance of continued high volume military procurement. Certain shortages of materials and equipment were found among makers of electronic components, and of copper, brass, and aluminum products. It appeared that industry was also having difficulty obtaining qualified engineers, machinists, and assembly workers. The industries most affected to date include producers of machine tools, producers of electronic components (primarily tubes and transistors), and the metal working industry (mainly manufacturers of forgings, castings, and extrusions). The number of requests for priority assistance received from contractors between January 1 and the end of May 1966 was nearly double that of calendar year 1965, a strong indication of tight production schedules and overloaded capacity. A number of means have been adopted to minimize the impact of expanded military procurements on prices and the availability of consumer goods—range bidding to spread orders among producers, increased use of Government-owned production facilities, development of alternative sources

or substitute items, and release of material from national stockpiles, among others.

In consonance with existing statutes requiring that special procurement assistance be extended to small business concerns, Army agencies awarded such firms \$1.9 billion in prime contracts during fiscal year 1966, 18.7 percent of the total of \$10 billion awarded to all business firms. Of the small business awards, \$445 million in contracts were awarded under the set-aside procedure. Further, a total of \$776 million in prime contracts has been awarded to firms located in labor surplus areas as defined by the Department of Labor, including \$29 million awarded by preference under the limited set-aside procedure.

Materiel Readiness

The high-level emphasis on materiel readiness continued during fiscal year 1966. The new program for continuous review of readiness matters, initiated by the Secretary of the Army and the Chief of Staff in January 1965, provides for a series of annual reviews in depth of the readiness posture of each major command and activity to develop a free exchange of ideas concerning the improvement of readiness between major commanders and their staffs and Army staff principles. This type of review focuses attention on major problems in readiness at the top echelons of command and leads to quick corrective action where policies and procedures must be revised Army-wide. In addition to the top level reviews, a continuing program of staff visits has contributed to improvement in materiel readiness and consistency in reporting techniques, though a shortage of qualified officer personnel in the Office of the Deputy Chief of Staff for Logistics has resulted in some curtailment in the program.

Thorough analysis of unit readiness reports, materiel readiness reports, and reports of staff visits revealed clearly a need for refinement of logistic indicators used to establish the condition of materiel readiness for each unit and to show the state of availability and serviceability of equipment and supplies. The Department of the Army is currently revising pertinent regulations to establish more realistic logistic indicators and refine reporting procedures.

Materiel Maintenance

The maintenance of old equipment is as important as providing the new to insure the maximum degree of combat readiness. In fiscal year 1966 the Army spent \$542.4 million for depot maintenance activities. Of this amount, \$355.8 million was applied to the actual production programs in such functions as overhaul, conversion, renovation,

modification, repair, and inspection and test. Through performance of these functions, unserviceable but economically repairable equipment can be restored to serviceable condition and applied as an asset against Army inventory requirements.

Remaining funds, \$186.6 million, were used for programing and planning; technical and engineering services; procurement of tools, equipment, and modification kits; and basic issue list items. Included in the above amounts is \$162.3 million spent for materiel maintenance in support of the Army buildup and operations in Southeast Asia.

In addition to the \$542.4 million spent for depot level maintenance, \$176.8 million was used for maintenance of equipment in fixed field shops. None of the above figures includes the cost of maintenance performed by troop units.

During the year steady progress was made on the Army Ready Materiel (ARM) Project No. 24, initiated 4 years ago to improve materiel readiness and to promote economy in the operation of the Army's non-TOE support maintenance activities. There are more than 70 of these activities; they employ a total of 12,000 personnel (mostly civilians), and operate at an annual cost of about \$125 million. They occupy 738 buildings (a total space of more than 7 million square feet), most of which are temporary World War II structures, and some former horse stables and warehouses. Most of these buildings have passed the point of economical occupancy. Door clearances in some are too small for today's larger equipment. Duplication of shop functions is difficult to eliminate because of the many widely separated buildings used by the activities.

ARM Project No. 24 proposed to improve conditions in a three-phase operation. Phase I provided for the elimination of the six separate technical service operations at each installation and consolidation under the control of one maintenance officer. Phase II involved maximum physical consolidation and functionalization—facilities common to the support of more than one commodity area such as paint, electrical, welding, and sheet metal shops were to be consolidated. Phase III was to develop the ultimate design concept for construction of future consolidated facilities using a functionalized layout that permits efficient workflow and materials handling.

As a result of the first two phases, CONARC reported savings amounting to 4 percent in personnel, 17 percent in buildings, and 9 percent in space. Plans for Phase III were completed and initially presented to the House and Senate Armed Services Committees in the fiscal year 1965 military construction program. They involved construction of a consolidated maintenance shop at Fort Carson, Colo., to support equipment assigned to the 5th Infantry Division. The engineering study produced by contract clearly supported the need

for the facility, and indicated that accumulated savings would surpass the cost of the building in 7½ years. Funds for the facility were denied, however, during a conference of the House and Senate committees on the grounds that the plan was "the result of a management study rather than a field requirement," and this project was eliminated from the fiscal year 1967 military construction program. It is now included in the fiscal year 1968 program as the highest priority item in CONARC's proposed MCA program for that year.

During the year the Chief of Staff approved a plan (NEW IRON-SIDES) to improve programing of repair parts used in combat vehicle overhaul. The Army Materiel Command has been directed to prepare the necessary back-up information for submission of a program change proposal required to finance, store, and issue repair parts. Meanwhile, forms have been developed to improve data for forecasting and programing overhaul requirements.

Under the Army technical assistance program, the Department of the Army provides technical personnel to major commanders to assist in developing an organic capability to cope with materiel readiness problems. As a result of a DoD study of contract support services, during fiscal year 1966 the Army revised its basic policy governing the use of contract personnel for this purpose. The new policy emphasizes the attainment of an organic, self-sustaining maintenance capability within the Army itself for new and complex equipment as early as possible in the life cycle of such equipment. Some 560 contract technicians have been identified for conversion to or replacement by Department of Army civilian personnel by December 31, 1966.

Army Aircraft

During fiscal year 1966, the Army had many problems in the area of Army aircraft inventories and distribution. Although the overall increase in Army aircraft was approximately 16 percent, there was a 3 percent decrease in fixed-wing aircraft while the rotary-wing craft increased by 28 percent. The ratio of fixed-wing to rotary-wing aircraft went from 49:61 to 32:68 during fiscal year 1966.

Between July 1, 1965, and June 30, 1966, there was a 183 percent increase in Army aircraft in Vietnam and at the same time aircraft utilization rates nearly doubled. In spite of these large increases, operational readiness of aircraft was maintained above 70 percent.

During fiscal year 1966 an ad hoc group continued to review availability rates of Army aircraft, worldwide, and to adjust standards as necessary. Because of deployment of additional aircraft to Vietnam, new operational standards were established for that area for the OH-13, OH-23, UH-1, CH-47, and CH-54 aircraft. Standards were also

established for the first time for the TH-13, TH-55, and T-42 aircraft, which were introduced into the aviation training base during the year.

Supply and Depot Management

Buildup and deployments to Southeast Asia have created many special problems in estimating requirements for materiel and in distributing assets in a fluid situation. A Department of the Army Distribution/Allocation Committee was established on September 15, 1965, to provide a means of assuring the best use of assets to support the buildup. This committee is composed of representatives of various Department of the Army staff agencies, AMC, CONARC, and specialists from the National Inventory Control Points. It is under the chairmanship of representatives of the Deputy Chief of Staff for Logistics. The committee identifies problem items that require control, conducts detailed reviews of requirement-versus-asset positions of items identified for control, allocates the items among claimants, directs necessary distribution or redistribution, and recommends action to improve supply. In essence, the committee has two purposes—to control problem items and to prevent other items from becoming problems.

Meanwhile, despite increased workloads and problems, the Army continued to make progress in modernizing its supply and depot management practices. Consolidation and reduction of Army depot storage and maintenance facilities went ahead generally on schedule. The Fort Worth, Tex., Army Depot was transferred to the General Services Administration on January 1, 1966, and it is expected that the Erie, Ohio, Army Depot and the Schenectady-Voorheesville, N.Y., Army Depot will close as scheduled on January 1, 1967. These depot closures will bring the total covered storage space released in the development of The Army Supply and Maintenance System (TASAMS) to 13.6 million square feet. Additional savings in personnel and storage space are anticipated when the closing of the Sioux, Nebr., and Black Hills, S. Dak., Army Depots, scheduled over a 3-year period, is completed in 1967.

The Warehouse Gross Performance Measurement System (WGPMMS) adopted by DoD was established as planned at 13 Army general supply depots in the continental United States during the second quarter of fiscal year 1966. The Army plans to extend it in the near future to ammunition depot operations in the continental United States and to oversea commands.

Speed in depot operations is becoming more essential each day. In recent years, the Army has made significant progress in speeding up logistical operations in many areas, but the depot system has not

kept pace. The materials-handling systems in use today are outmoded. To keep pace with other elements of the supply system and to enable depots to respond more quickly to emergency demands, the Army developed a modernization program for the depot system in the continental United States to equip depots with the most practical and advanced materials handling systems and aids available and to standardize their application where feasible. This program was approved by the Secretary of Defense in September 1965. The Army expects to acquire equipment and to modify facilities over a 3-year period at a cost of \$12.3 million. The program is expected to generate savings of approximately \$3.9 million annually beginning in fiscal year 1970, and to eliminate 524 personnel spaces.

In May 1966 the Army completed a manpower productivity study of its depot operations for fiscal years 1963-65, using overall statistical indices prescribed by recent DoD instructions for use in programing and budgeting. The study showed the overall productivity indices in Army depots in the United States had increased each year, but that the overall index of output per production man-hour had increased in depots handling ammunition but not in depots handling only general supplies. This appears to be attributable to the vastly greater increase in the workload in ammunition depots. A new productivity study is being conducted to determine data for fiscal year 1966. Upon its completion, the Army expects to make greater use of the data for assessing manpower utilization in the formulation of the next budget.

Much of the material that flows through the Army depot system is handled under the Army Stock Fund. Stock Fund operations in fiscal year 1966 were the largest since its inception in 1952. In the fall of 1965, when the estimated requirements for fiscal year 1966 operations were being prepared and evaluated, the stock purchase authority for the Army Stock Fund was set at \$2.239 billion. The last authority for fiscal year 1966, approved in June 1966, totaled \$4.76 billion. While there were times during fiscal year 1966 when the Army experienced, for a very short period, stop-and-go funding under the Stock Fund, to a considerable degree program changes were requested and approved sufficiently in advance to prevent disruption in requisitioning and procurement of supplies.

Support of Oversea Operations

The extensive deployments to Southeast Asia during the year created many logistical problems of extraordinary difficulty. The Army had to exert major efforts in all phases of its logistic system—supply, transportation, maintenance, construction, and support services. Although there have been many allegations of supply shortages in South-

east Asia during fiscal year 1966, COMUSMACV and his major field commanders have stated that no operation has been adversely affected by supply shortages. And, while the massive logistical buildup in Southeast Asia proceeded, the Army had also to continue normal support to troops deployed in other parts of the world, support a going operation in the Dominican Republic, and begin the adjustment of its European line of communications.

To support U.S. forces in Vietnam, two logistical commands were reorganized and deployed to the Pacific Area—the 1st Logistical Command to Vietnam to serve as the key logistic operator in that country and the 2d Logistical Command to Okinawa to provide backup support. The logistical command in Vietnam is organizing depot complexes or support commands at Saigon, Cam Ranh Bay, and Qui Nhon to support U.S. and other free world military assistance forces. The concept of logistic operations envisions supplies in the depots, at sub-areas, and in forward direct support areas that supply and maintain equipment for combat troops.

The 2d Logistical Command on Okinawa, as the major logistic operator in USARPAC for support of Southeast Asia, provides backup support for subsistence, petroleum, and ammunition to forces in Vietnam and is the principal supply source for secondary items, repair parts, and expendables. It also provides general support maintenance.

At the request of the Joint Chiefs of Staff, the Army developed a plan for a single common user supply system for all U.S. and allied military forces in Vietnam, and in March 1966 the Secretary of Defense approved carrying out the first phase. In this phase the Army is assuming responsibility for furnishing about 3,500 general supply items, packaged petroleum products, and subsistence to all three U.S. Services. Further expansion of the system is dependent upon approval by the Secretary of Defense of the Army's proposed phasing and resources requirements.

The method of establishing initial stocks for resupply of troop units deployed to Vietnam, pending the establishment of normal requisitioning procedures, has been so-called push or automatic resupply shipments. Under this system standard packages were developed consisting of all items in all classes of supply consumed by the troops (except aviation items). Each package was designed to meet the requirements of a brigade or large-size unit for a given number of days. The first automatic resupply shipment left the United States in July 1965, and the last package for the initial deployments was shipped in April 1966. However, two additional packages, each consisting of 60 days of supply of repair parts, will be shipped in August 1966. Except in special cases to fill requisitioning gaps, support the introduction of new equipment, and provide adequate initial support for

accelerated or unscheduled troop deployments, these two packages will complete the push package shipments and the remaining supply requirements for Vietnam will be requisitioned under normal supply procedures.

By far the greater part of the large cargo tonnage moved to Southeast Asia during fiscal year 1966 went by ship; 4,449,600 measurement tons of Army cargo moved by ocean transportation, some 3,542,700 measurement tons from the United States and the rest from Hawaii or points in the Far East. Airlift of Army cargo amounted to 65,000 short tons, some 35,900 short tons from the continental United States.

Over 261,200 Army passengers were moved to Southeast Asia during the year, 146,100 by airlift and 115,100 by MSTs passenger ships. While the normal passenger flights to Vietnam originate at the Travis Air Force Base/Oakland Army Base complex in California, a direct service was inaugurated from McGuire AFB, N.J., on May 1, 1966, to relieve the overload at Travis. This channel is currently handling only individual training graduates but other unaccompanied individual replacements will be airlifted from McGuire by the end of calendar year 1966.

Several actions have been taken to expedite the shipment of items urgently needed in Vietnam. The Red Ball Express was established by the Secretary of Defense on December 1, 1965, as a special temporary supply and transportation procedure to cover movement by air of critical repair parts necessary to remove equipment from deadline. Airlift space for the Red Ball Express has overriding priority and express cargoes cannot be off-loaded, transshipped, or interrupted en-route. A minimum of one flight daily from Travis AFB is assured. Between the first flight on December 8, 1965, and June 30, 1966, over 8.3 million pounds of eligible cargo had been outloaded under this procedure.

Because of the limited availability of airlift, the Joint Chiefs of Staff (JCS) sanctioned the establishment of a special accelerated ocean service labeled SEA (for Southeast Asia) Express. This is a direct commercial ocean carrier service between the west coast and Saigon that has reduced the sea transportation time by 10 days. The first SEA Express sailed in April 1965 and carried 3,777 short tons of military cargo diverted from the overtaxed airlift service. Since November 1965, SEA Express has averaged 60,000 short tons per month, with a high of 103,867 short tons in May 1966.

The Supply and Maintenance Command established a Logistics Control Office in San Francisco on March 1, 1965, to coordinate supply and transportation matters for Army shipments to Southeast Asia and other areas in the Pacific. Requirements for Red Ball Express shipments of repair parts, for instance, come directly to the Logistics

Control Office. Meanwhile, great improvements are being made in documentation to help in identification and physical handling of cargo shipped by ocean transport.

At the receiving end, CINCPAC, with the approval of the JCS, established on January 16, 1966, the PACOM Movements Priority Agency (PAMPA) for the purpose of insuring that sea and air cargo for the entire Pacific Command area is moved in accordance with the priorities assigned by the recipient, and that supply movements are kept in balance with development of discharge and clearance facilities and the availability of airlift and sealift.

Maintenance support plans for Southeast Asia, worked out jointly by AMC and USARPAC, are consistent with the logistics structure. The detailed plan identifies the types of unserviceable equipment considered eligible for evacuation for offshore maintenance when beyond Army capability in Vietnam itself. A program was established to insure a continuous flow of unservicable repairable components to the United States from Vietnam for repair and return. Full advantage will be taken, for instance, of returning Red Ball Express air transports.

Two quick-reaction teams were dispatched to Vietnam in 1966 to supplement the normal technical assistance provided oversea theaters and two more are in process of being dispatched. Storage specialists have been sent for temporary duty in Vietnam, as well as to many other areas of the world, to help solve technical storage problems.

The Army Floating Maintenance Facility aboard the Navy ship *Corpus Christi Bay* assumed its general support aircraft maintenance role in Vietnam on April 6, 1966. Its workload, however, has included both aircraft and other component items in approximately a 1-to-1 ratio. The feasibility of a second floating maintenance facility is currently under consideration. Provision of replacement personnel for these facilities, however, involves special problems. Lengthy on-the-job training is required in both special maintenance skills and tasks unique to shipboard assignments. Personnel must be requisitioned almost a year in advance to allow time for the training, and the lengthy training cycle precludes assignment of any but regular Army personnel. A program to encourage qualified personnel to volunteer was recently started.

A very essential part of the logistical effort in Southeast Asia has been the military construction program. Port facilities, roads, warehouses, barracks, and airfields, have had to be started almost from scratch before the military buildup could proceed. In recognition of the magnitude and complexity of the Army construction program in Vietnam, the 18th Engineer Brigade was deployed in August 1965. This provided an urgently needed capacity to direct and coordinate the

efforts of the increasing Army engineer troop construction force. Of equal importance, the deployment of the brigade provided a staff engineer capability for the newly organized Headquarters, U.S. Army, Vietnam (USARV), since the brigade commander was also designated as USARV Engineer. However, it soon became apparent that closer management, coordination, and direction of all Service construction programs in Vietnam were needed. Accordingly, the position of Director of Construction, MACV, was established on February 15, 1966. The director, as head of a tri-Service organization, has responsibility for direction, management, and supervision of a combined construction program to meet MACV requirements and for coordination of all DoD construction activities in Vietnam save only those performed by troop units organic to or assigned to major combat units. Major construction forces of the Army, Navy, and Air Force, and civilian contract construction under the Navy's Officer-in-Charge of Construction (OICC), have all been brought under the purview of one "construction boss."

Creation of the office has helped to eliminate competition by separate Service and civilian construction elements for limited labor and materials and has brought a billion dollar construction program, with individual priorities, under central direction. This has been accompanied by a grant of considerable flexibility in management of the construction program within overall funds allotted (see ch. VI).

Under the command and direction of the USARV Engineer, and the supervision and coordination of the Director of Construction, Army troops will continue to have a most important role in the construction program in Southeast Asia. Up to April 30, 1966, Army construction units carried out construction projects with materials valued at \$32.2 million, including those funded under the military assistance program for the Republic of Korea troops. Of primary importance, a sufficient number of port facilities at Cam Ranh Bay, Nha Trang, Qui Nhon, and Vung Tau were built or improved to support the expanded combat force. Other important accomplishments in Vietnam include construction of 1.3 million square feet of warehousing and sheds to provide covered storage; clearing, grading, and paving of 2.5 million square feet of open storage; construction of about 800,000 square feet of cantonment and administration buildings; repair or improvement of 400 miles of roads; construction of nearly 2 million square yards of airfield pavement; and installation of steel storage tanks capable of handling more than 16 million gallons of liquid fuels.

In Thailand, a smaller engineer contingent, with the assistance of the Royal Thai Engineers, completed on March 25, 1966, the Bangkok Bypass Road (see ch. XI). Other construction under way or completed in Thailand includes a 90,000-barrel tank farm, depots, hardstands, and a 1,000-man troop cantonment.

Corps of Engineers divisions and districts also have responsibility for design and construction of projects in support of Southeast Asia in the United States, Okinawa, and Japan. The Army program in these areas, plus work in Thailand, totals \$222.7 million funded from the amendment to the fiscal year 1966 DoD appropriation (\$28.7 million) and the supplemental appropriation of March 1966 (\$194 million). The program funded under the amendment is progressing according to schedule; contracts were awarded for \$53 million under the supplement by the end of June 1966. In addition to the Army program, the Corps of Engineers also constructs for the Navy and Air Force in the Ryukyus, Japan, and Taiwan. Work currently assigned totals \$69 million (\$22 million for Navy and \$47 million for Air Force.)

Success in Vietnam depends heavily upon airmobile operations and air lines of communication. New airfields, ranging from those with 10,000-foot runways capable of handling jet transports to strips of less than 3,000 feet for C-130 transports and Caribou cargo planes, have had to be carved out of rain forest and virgin territory. Moreover, innumerable helicopter landing pads have had to be constructed throughout the country, many of them on ground under enemy control.

New types of surfacing materials that can be quickly laid and that can sustain the wheel loads of today's aircraft are required for construction of the airfields and landing pads. The more important types procured for this purpose during the first year that U.S. land forces were committed to combat in Vietnam included:

M-8A1 Mat: A nonpierced version of the old M-8 pierced steel mat, heavier and only half as strong as the high-strength aluminum mats, but much less costly, and suitable for places where air transport is not required and for landing fields serving Army aviation or C-130's.

AM-2 Mat: Aluminum landing mat with a strength roughly equivalent to 9 inches of concrete but which can be laid down in a fraction of the time required to lay concrete. Its weight, however, is somewhat high for air transport.

MX-19 Mat: A lightweight high-strength aluminum mat developed by the Army in 1965 (considerably lighter than AM-2).

T-17 Membrane: A two-ply nylon fabric membrane material recently developed by the Army; weighing only a twelfth as much as even MX-19 mat, this material will serve as an all-weather, dust-free surfacing over any soil conditions initially strong enough to withstand traffic loadings of Army fixed-wing and rotary-wing aircraft and Air Force cargo aircraft up to C-130's. It has excellent potential for use in rapidly constructed heliports, forward area logistical airfields, open storage areas, tent floors, and temporary road surfacing. Production of the mat has been started.



Figure 7. Army engineer troops placing T-17 membrane on soil surface of an airfield runway in Vietnam.

The buildup in Vietnam has provided the first real opportunity for operational testing of the Army's Engineer Functional Component System (EFCS), established in 1957. This system provides standard plans and designs for virtually every type of installation or facility required by a military force in a theater of operations. In planning, the theater commander needs only to develop a statement of the construction required in terms of the installations needed—for example, six 1,000-man troop camps, three 500-bed hospitals, and a 200,000-barrel POL tank farm. Each installation and facility is identified by a code number. Through properly programed automatic data processing equipment, inventory control points and CONUS supply agencies can translate the code numbers into itemized bills of materials, requisitions, procurement directives, and shipping orders. A system of ordering under the EFCS was put into effect by the Army in October 1965 when it became apparent that normal single-line requisition and supply procedures under MILSTRIP could not keep up with the rapidly expanding construction program in Vietnam. Materials ordered under the code numbers are assembled into EFCS packages at a designated Army depot and moved to the aerial or ocean port of shipment in accordance with priorities assigned by the U.S. Army, Vietnam.

Innovations in engineer equipment have facilitated operations in Vietnam. Sectionalization of engineer construction equipment has permitted it to be transported by sling load under the Chinook helicopter. Moreover, Engineer Research and Development Laboratories

stripped, rearranged, and redesigned components of the standard 600-gallon-per-hour water purification unit and mounted it on a half-ton weapons carrier that can be slung under a Chinook or carried in a Caribou airplane.

Other actions have been taken to provide the best possible support for the individual soldier. As a result of heavy, unpredictable demands for clothing and individual equipment, shortages have inevitably developed, and it was necessary to ration some items so that all personnel would receive their minimum essential needs. On April 25, 1966, DCSLOG, designated by the Chief of Staff as the single contact point within the Army for clothing and individual equipment, established a Clothing and Individual Equipment Project Office to work with the Defense Supply Agency (the procuring agent for most items), and major Army commands in solving these problems. It is currently estimated that shortages will be overcome by the end of December 1966.

Special efforts are also under way to relieve shortages of mobile laundry units in Vietnam and so reduce dependence upon Vietnamese laundries. A standard pack of ration supplements with 22 components (soap, tooth paste, razor blades, candy, and such items) has been developed and is now being supplied to troops in Vietnam. Several newly developed dehydrated food packets are also being field tested there, including a 25-man uncooked meal designed to eventually replace canned B rations in forward areas and a long-range patrol packet designed for individual feeding in situations where group feeding is impossible but water is available. Also being field tested is the M packet, a lightweight, flexibly packaged individual food packet with no special requirement for water.

In the continuing peace-keeping operation in the Dominican Republic, logistic support for the initial phases of the operation, in May 1965, was provided in consonance with JCS and Army contingency plans. Resupply support was furnished from Fort Bragg, N.C., and transported by the Tactical Air Command. As the operation progressed, logistic support was arranged through routine requisitioning procedures and a logistics control office was established at New Orleans, La., by the Army Materiel Command to process requisitions. Supplies were shipped from various depots to Charleston AFB, S.C., for air delivery or to New Orleans for sea delivery. A contract was awarded a commercial shipping company for sea transportation providing one round trip every 10 days. With establishment of the Inter-American Peace Force and consequent reduction of U.S. troops, the Army continued to provide support for its own forces through these channels. It also undertook to supply other elements of the force through its supply system to the extent that such support was not

available from allied countries. All supplies issued to forces of other countries are paid for by MAP funds.

In Europe, as the result of actions by the French Government (see ch. II), the United States has been forced to plan readjustments in the line of communications. As part of the Defense Department team concerned with the problem, the Army began to take appropriate preparatory actions within its authority. To minimize the impact of moving, current shipments have been diverted and stocks in France drawn down by issue to troops elsewhere in Europe. Stocks remaining in France have been reviewed to select for movement those essential to support of U.S. forces. In April 1966 the Army stopped all future construction awards.

Plans have been developed for the relocation of vital supplies and the disposal of the remainder. U.S. facilities in France are valued at \$700 million. An additional \$300 million has been expended on NATO infrastructure. It is estimated that there are approximately 1.5 million tons of supplies about equally divided between France and Germany. There are large amounts of excess stocks in Germany (124,000 tons) and France (176,000 tons) because of the modernization in recent years of Seventh Army. Some of these excess stocks may be used elsewhere in Europe to meet MAP requirements; some will be disposed of in Europe as salvage; and some will be returned to the United States. Actual disposition will depend on requirements and priorities of the military Services and other Government agencies.

The U.S. Army Communications Zone, Europe, was designed to support U.S. forces in peace and war. To counteract the adverse impact of the loss of its installations and facilities in France and to insure the continuance of a strong, viable support capability so essential to the U.S. forces in Europe, the Army has planned the development of an adequate alternative support structure. Initial actions taken during fiscal year 1966 are prudent steps toward the orderly relocation of the U.S. Army Communications Zone from France.

Looking toward the future, in order to improve reaction time in support of contingencies, the Army is continuing to judiciously pre-position in oversea areas materiel configured to appropriate units. This will permit airlifting troop units, with their individual equipment and light weapons, to marry up with the pre-positioned materiel in the oversea theater.

Two significant innovations programed for the 1970's should greatly increase the reaction capability of U.S. forces. One will be the introduction of C-5A aircraft which will start to enter the system in 1969. The C-5A will have a lift capacity four times greater than that of the largest current cargo aircraft, a greater range and speed, and will carry nearly all types of Army equipment. Not only does the intro-

duction of such a large intercontinental airplane imply greater flexibility and responsiveness in deploying and resupplying military forces by air; it also calls attention to the advantages to be obtained by a complementary air line of communications within the theater of operations. The other innovation will be the introduction of fast deployment logistic (FDL) ships. The FDL ship represents a unique high-speed ship design concept which includes large humidity-controlled storage areas; a roll-on-roll-off configuration; a helicopter lift-on-lift-off capability; stern ramp discharge for amphibious vehicles and beach lighter operations; and the ability to transfer cargo, equipment, and personnel from ship to shore in nonassault over-the-beach operations.

A special study of great interest to all Services and to the Department of Defense, entitled "Army Logistics Support Concept—Air Line of Communications," was scheduled for completion by the Army in June 1966, but is currently under revision. This pioneer study will develop a logistic concept for an air line of communications for the 1970-75 time frame and will focus attention for the first time on gaps in logistics doctrine and concepts that must be filled as a result of advancing technology in air transportation. Featured will be a new approach to computing resupply requirements for the Army's divisions in combat that is designed to provide the logistician with data on requirements for aerial resupply of forces from division to platoon level.

Transportation

Oversea movement of both Army cargo and Army passengers increased in volume in fiscal year 1966 as a result of the buildup in Southeast Asia. A total of 12,373,000 measurement tons was shipped on vessels furnished by MSTs, 4.4 million tons more than were shipped in 1965; 115,600 short tons were shipped on aircraft furnished by the Military Airlift Command, approximately 51,100 tons more than in 1965. Approximately 1,040,800 Department of the Army passengers moved overseas, 272,300 more than in fiscal year 1965—789,400 by airlift and 251,400 by surface ships. The heavy movement by airlift reflects the Army policy of making maximum use of fast transportation to save man-days spent in travel.

The buildup in support of Vietnam operations also generated increased requirements for vehicles, watercraft, and rail utility equipment for administrative use in the United States as well as in Vietnam itself. Through detailed review, the Department of the Army is carefully validating requirements to keep this increase to a minimum.

Several ships from the James River Reserve Fleet have been released by the U.S. Maritime Commission to support training of terminal

service units and U.S. Army Reserve personnel. For the overall build-up in Vietnam, the Army has expedited repair and shipment of large quantities of watercraft to support COMUSMACV operations.

Cooperation with the National Aeronautics and Space Agency in Project APOLLO continued with three air deliveries of the lunar excursion module via Chinook helicopter from Tulsa, Okla., to Cape Kennedy, Fla.

Installations

The original fiscal year 1966 appropriation for Army construction, worldwide, totaled \$323.4 million, exclusive of family housing. This should have permitted an increase in the rate of replacement and modernization of facilities, but DoD deferral of projects amounting to \$206.3 million resulted in an actual decrease in the rate. Construction starts during the year totaled \$162.5 million and projects completed during the year cost \$178.4 million. Some \$39.9 million was approved for construction in support of research and development. The largest single allocation, amounting to \$14.9 million was applied to NIKE-X development, with an additional \$9.1 million programed for construction of facilities to support this NIKE-X development program. In addition, construction starts on PEMA-financed projects for industrial facility expansion and replacement totaled \$56.5 million, while completions amounted to \$19.4 million.

No funds for facilities to support Southeast Asia operations were included in the original budget because firm requirements had not been developed. However, \$64.6 million was included for this purpose in the amendment to the DoD general appropriation in August 1965 and, as additional requirements developed, the Secretary of Defense provided \$23.4 million for advance procurement of construction materials pending submission of a supplemental appropriation request. The supplemental appropriation provided \$509.7 million for Army construction in support of Southeast Asia operations, including \$1.6 million for three research and development projects.

In sum, during fiscal year 1966, major emphasis shifted to construction in support of Southeast Asia operations while the long-range program of replacement and modernization marked time, leaving a total deficit in permanent facilities of about \$2.9 billion excluding family housing. When normal construction funding can be resumed, impending structural failures of World War II facilities will make the \$300 million annual funding program proposed by the Army all the more important.

Much of the construction program in the United States in support of Southeast Asia involves expansion of the training base for both the active Army and the reserves—expansion of existing training centers;

establishment of basic training centers at Fort Bragg, N.C., Fort Campbell, Ky., and Fort Lewis, Wash.; establishment of advanced individual training at Fort Lewis and at Fort McClellan, Ala.; establishment of combat support training at Fort Huachuca, Ariz.; and more than doubling the officer candidate school capacity in the training base. While maximum use is being made of existing facilities by alteration and improvement, some new construction is involved, primarily in provision of ranges, training courses, and classrooms to support modern training methods.

On December 8, 1965, the Secretary of Defense announced details of 149 actions concerning decisions to consolidate, reduce, or close DoD activities in the United States and overseas. Of these, 37 involved Army activities and will produce, when completed, annual savings of \$73.5 million. Total savings estimated from closing of Army installations and facilities announced since March 30, 1961, amounts to \$261 million annually.

Of the Government-owned industrial facilities under Army control, eight ammunition plants were reactivated during the year in support of the Southeast Asia buildup. This makes a total of 41 out of 54 plants in full or partial operation. The 5-year program to eliminate deferred maintenance at these plants, initiated in fiscal year 1965, continued under funds appropriated for fiscal year 1966. An evaluation completed during the year concluded that one of the plants, the Charlotte Army Missile Plant, Charlotte, N.C., will not be needed upon completion of present work orders and it can be reported to the General Services Administration for disposal by July 1967.

Aside from these industrial facilities, about \$612 million was spent on local maintenance and management of Army facilities in fiscal year 1966, a slight decrease from the previous year. During the year, the Army actually managed fewer facilities because of closures, and the decrease in building footages more than offset the increase in materiel and salary costs. The backlog of essential maintenance and repair at year's end totaled \$73 million.

At the end of the fiscal year, 21 activities were operating under the Army Industrial Fund, including 10 arsenals, four proving grounds and research activities, two traffic management and terminal service areas, four depot maintenance divisions, and a pictorial center. The Defense Printing Plant of the U.S. Army Support Center, Ogden, Utah, which was the first industrially funded activity in the Army, was transferred to the Air Force on June 30, 1966, reducing the number from 22 to 21.

Revenues earned by the Army Industrial Fund in fiscal year 1966 amounted to \$878.9 million against costs of \$879.4 million. Civilian employment in Industrial Fund activities as of June 30, 1966, was 60,995,

reflecting a net decrease of 485 since the end of the previous fiscal year. This decrease was due primarily to phasedown of operations at Watertown Arsenal and Springfield Armory preparatory to their closing, offset by the expanded workload in support of operations in Southeast Asia and to the assumption by MTMTS of additional responsibilities formerly performed by other Defense agencies.

Around the world the Army controls 15.2 million acres of land, which, with improvements constructed after initial acquisition, cost \$10.9 billion. This compares with the 14.9 million acres of land managed during the previous fiscal year. During the year, the Army disposed of 27,786 acres that, with improvements, had an original cost of \$127 million. Disposal of an additional 51,998 acres having an original cost of \$154.8 million, reported to the General Services Administration during the year, is in process. The Army also acquired fee title to 37,102 acres for the expansion of Fort Riley, Kans., and 52,905 acres for the expansion of Fort Carson, Colo. During the period, approximately 1,456,554 acres that temporarily were not required for military purposes were leased, and receipts in the amount \$4,952,589 were deposited in the U.S. Treasury.

As real estate agent for other Government agencies, the Army acquired approximately 2,995 land tracts for the Air Force, costing \$5.3 million. During the year, real estate services were also furnished NASA, AEC, and the U.S. Weather Bureau.

The commercial electric power supplying tactical weapons and communication systems is backed up by Army-owned power sources throughout the United States. The most massive blackout experienced in this country occurred on November 9, 1965, with the failure of an electric grid serving New York and New England. A minor loss of production and communications resulted at the Army arsenals and armories in the area; however, every tactical weapon system, including associated radar and communication equipment, was maintained fully operational and in an active state of readiness during the failure. Power for this equipment and for critical facilities such as hospitals and Army airfields was supplied from local gasoline or diesel-driven generators installed in anticipation of just such emergencies.

Support Services

Support services include a wide variety of activities, such as the supply of food and clothing, that involve meeting the personal needs of the individual soldier. As of June 30, 1966, there were 3,327 troop messes in operation worldwide, not including those unreported in active theaters of operation. In addition, other food service activities included 26 central meat processing facilities, 13 central pastry

kitchens, and 20 garrison bread baking agencies, as well as innumerable field bread bakeries serving troops overseas. Some 161 commissary stores provided food requirements for approximately half a million Army families worldwide with annual sales totaling \$427 million, while 123 commissaries supplied the above messes with subsistence issues totaling over \$287 million. There were 128 clothing sales stores in operation in the continental United States and overseas, 70 laundries, and 38 dry-cleaning plants. Four new initial clothing issue points were added at reception centers bringing the total to 12.

During the year some shortages of selected items of food and clothing developed because of the rapid increase in military demand. Short supplies of butter and pork products on the commercial market forced prices upward and led to restrictions on the purchase and consumption of both items. In clothing sales stores, principal shortages developed in Army green uniforms (shade 44), duffel bags, raincoats, utility uniforms, cotton khaki uniforms, overcoats, and footwear. Shortages of uniforms in particular sizes contributed to a large demand for alterations. Inductees and recruits were issued reduced allowances of personal clothing, for instance, one Army green uniform (instead of two) and two cotton khaki uniforms (instead of four). With shortages and increased manufacturer's costs, it is apparent that the cost of the initial clothing bag will increase perceptibly during the next fiscal year.

Several new clothing items were made available during the year. The Army green overcoat for men, shade 44, was placed in selected stores and installations for optional purchase on July 1, 1966. The target date for optional purchase of the new women's green overcoat is October 1, 1967. The Army green uniform (shade 344) went on sale in clothing sales stores on July 1, 1965, and the women's lightweight AG-344 uniform was placed in selected stores on January 1, 1966.

In property disposal activities, the consolidation, satellization, and elimination of disposal holding activities continued during the past year. Nine disposal activities previously operated by the other military Services were consolidated with Army activities, and 11 Army activities were either consolidated with or satellited on disposal activities operated by other military Services. Five other Army activities are involved in consolidation actions. Disposal operations in oversea commands remained unchanged.

The inventory value of excess, surplus, and foreign excess personal property turned over to property disposal activities worldwide during fiscal year 1966 was \$1,143 million. The inventory value of property sold, other than scrap, was \$294 million, and proceeds realized from all sales, including scrap, amounted to \$44.2 million. The total cost of the program was \$31.5 million.

During fiscal year 1966 the Army operated eight mortuaries, in Germany, France, Italy, Hawaii, Japan, and Okinawa, for the purpose of preparing remains of military personnel, dependents, and certain other eligible categories whose deaths occurred in the commands served by those mortuaries. Effective July 1, 1966, the Army assumed responsibility for providing mortuary support to Vietnam and Thailand, increasing the number of operating mortuaries worldwide to 10.

Mortuary service for eligible deceased personnel within the United States is provided through contract with local civilian mortuaries. Army installations awarded a total of 36 contracts in the report year.

Enactment of Public Law 89-150 on August 28, 1965, extended authorization for transportation at Government expense for remains of dependents of members of the armed forces who die while the member is on active duty (other than for training) regardless of where death occurred.

In fiscal year 1966 the Army continued to make progress toward meeting the need for additional burial space at Arlington National Cemetery. This expansion began during fiscal year 1965 and provided approximately 18,000 additional gravesites. A contract for the construction of the permanent gravesite for the late President John F. Kennedy was awarded to the Aberthaw Construction Co. of Boston, Mass., on July 16, 1965, and the work is expected to be completed early in the fall of 1966. It is estimated that approximately 10 million people have visited the grave of the late President since November 1963.

Meanwhile, work was also completed on contracts for development of additional gravesites in eight other national cemeteries. Beverly National Cemetery, Beverly, N.J., however, was closed to further interments in February 1966, except those in reserved gravesites or second interments in existing graves under the single gravesite policy.

Impressive military committal rites at Golden Gate National Cemetery, San Bruno, Calif., on February 24, 1966, marked the interment of Fleet Admiral Chester W. Nimitz, USN. A significant event at the National Memorial Cemetery of the Pacific, Honolulu, Hawaii, was the dedication on May 1, 1966, of a memorial structure erected by the American Battle Monuments Commission to commemorate U.S. servicemen who died in Pacific Ocean areas during World War II.

Interments in national cemeteries under Army jurisdiction during fiscal year 1966 totaled 48,574, while 171,162 Government headstones and markers were furnished to mark the graves of eligible deceased members and former members of the armed forces interred in private cemeteries throughout the United States and various foreign countries, and to mark all graves in national, post, and military cemeteries.

VIII. Research and Development

Research, testing, developing, proving, and modification are a never-ending cycle, for by the time one device or piece of equipment is in the hands of a soldier, a new model is on the way to him. In this way the Army keeps up to date and the soldier is provided with the best food, clothing, weapons, stores, and other equipage that his country can produce.

Funding

The Army's budget for research and development (R.&D.) for fiscal year 1966 was about \$100 million more than the amount appropriated for fiscal year 1965. In the table below, the figures shown for fiscal year 1965 represent the current financing including emergency funds, a supplemental appropriation, and prior year funds reprogramed. Most of the increase resulted from accelerated support for operations in South-east Asia.

FUNDING OF ARMY R&D PROGRAM BY PROGRAM CATEGORY

(In millions of dollars)

Program category	Actual, fiscal year 1964	Actual, fiscal year 1965	Planned, fiscal year 1966
Research.....	89.9	77.6	87.0
Exploratory Development.....	256.8	276.1	230.4
Advanced Development.....	102.8	93.0	148.3
Engineering Development.....	709.6	705.6	612.3
Management and Support.....	186.2	249.4	269.9
Operational Systems Development.....	79.9	117.8	171.0
Total.....	1,425.2	1,519.5	1,518.9

A new accounting system for the research, development, test, and evaluation (RDT&E) appropriation, put into effect in fiscal year 1966, provided objective essential data to support management policies for program controls, reprogramming controls, and related managerial reports. The regulation provides a base for an integrated financial program and appropriation accounting and reporting system that would use, where applicable, single source documents while providing controlled R&D data to financial and program managers at all levels.

Project PROVOST

PROVOST is the title for a project initiated by the Department of Defense for a priority research and development program to respond quickly to operational needs in Vietnam. In August 1965 the Director of Defense Research and Engineering asked the Army to provide an initial estimate of weapons and equipment that could be made available in the near future, programs or development that the Army felt should be accelerated, and new programs that should be started in the light of Vietnam requirements. As a result, numerous projects were selected for accelerated effort in fiscal year 1966 and financed by \$14.6 million in emergency funds and \$28 million in supplemental appropriations. Included under Project PROVOST were such projects as an expendable one-shot flame projector; ambush detection devices; a jungle canopy device to aid airmobile operations over dense jungle areas; smoke markers; illuminating devices; and various types of weapons, ammunition, communications, and surveillance devices ideally suited for such operations as those in Vietnam.

Firepower

Pending the findings of a study of the Army's future requirements for small arms, the Army continued research and development on the so-called special purpose individual weapon (SPIW). Competitive models of the SPIW were in engineering development at the end of the fiscal year under contract with Aircraft Armaments, Inc., and at the Springfield Armory, Mass.

In the field of antitank weapons, the Army continued development of the tube-launched, optically and automatically tracked, wire-guided weapon known as TOW. It will be capable of defeating all known armored vehicles, whether moving or stationary, at required ranges, and will replace the older 106-mm. recoilless rifle and the ENTAC wire-guided missile as the infantry heavy antitank weapon. A new medium antitank assault weapon (MAW) was under development by McDonnell Aircraft Corporation to replace the M-67 90-mm. recoilless rifle. The new MAW promises a substantial increase in effectiveness over the M-67.

During fiscal year 1966 the Army conducted extensive environmental tests on the engineering model of the division support missile LANCE to determine its ground mobility and other capabilities. The firing test program began in March 1965 and continued through the rest of the year.

To provide a replacement system for HERCULES and HAWK air defense missile systems, the Army undertook a study of the surface-to-

air missile defense system, called SAM-D for short. This was designed specifically for use in a field army, primarily against a high performance aircraft threat, but may also be used to combat short-range tactical ballistic missiles. In the Army's view, SAM-D would be the principal tactical air defense weapon of the 1970's, although it might also be used in conjunction with an antiballistic missile system for terminal bomber defense in the continental United States.

The Army received approximately \$390 million in fiscal year 1966 for continued research and development on the NIKE-X, an antiballistic missile system. This was the largest item in the Army RDT&E budget. Included in the system are two missiles—a long-range ZEUS-type missile and a short-range, very high acceleration missile known as SPRINT—together with complex phased-array radars and high speed/high capability data processing equipment. The first successful guided flight of the new SPRINT missile took place in November 1965.

The 155-mm. lightweight close support weapon system, a new development in artillery weapons that has a considerably greater range than the current standard system, received attention during the past year. Efforts were made to secure standardization of the system within countries of the North Atlantic Treaty Organization to allow the ammunition of several countries to be used interchangeably.

Mobility

To develop a successor to the current M-60 tank, the United States in 1962 entered into a joint program with the Federal Republic of Germany to develop a main battle tank. Scheduling at the end of the fiscal year called for the tank to enter into advanced production engineering during the next year and to enter the operational inventory in the early 1970's. The new tank will incorporate numerous advances in technology making it vastly superior to the M-60 series. Its main armament is to be the 152-mm. SHILLELAGH, the infrared, command-guided missile, previously mentioned (see ch. III), which will be carried also by the Sheridan armored reconnaissance vehicle that is intended to replace the M-56 self-propelled assault gun and the M-41 light tank.

The Army continued to place emphasis during the year on improving its tactical wheeled vehicles. Progress in the development of the XM-656 5-ton truck with its eight independently suspended wheels was excellent, resulting in type classification of the truck in April 1966 as Standard A. Similarly, development ended on the new 1¼-ton truck XM-561, the Gama Goat, which also received the type classification Standard A. This vehicle has an articulated coupling between the tractor unit and the cargo unit, which allows an unusual degree of

mobility. The Gama Goat is scheduled to be a forward area tactical vehicle to replace the M-37 $\frac{3}{4}$ -ton truck, and possibly some of the M-151 $\frac{3}{4}$ -ton trucks in forward area units. During 1966 testing was completed on the 8-ton XM-520E1 cargo GOER and the XM-559E1 tanker GOER, both of which received Standard A type classification in May 1966.



Figure 8—The Army's new 1 $\frac{1}{4}$ -ton truck, the Gama Goat, a forward area tactical vehicle with unusual mobility.

Considerable progress was made in 1966 in the development of the heavy lift helicopter (CH-54), for which a Federal Aviation Agency Restricted Category type certificate was issued on July 30, 1965, and a Department of the Army limited production type classification on August 3, 1965. The first operational unit employing the CH-54A, the 478th Aviation Company, Heavy Helicopter, went to Vietnam in September 1965. By using the heavy lift helicopter, Army combat forces in Vietnam improved their ability to recover downed aircraft and to move large bulky loads that exceeded the capacity of the CH-47 medium helicopter. During the first 6 months of combat use, the CH-54's recovered five CH-47's, two CV-2's, six CH-34's, 51 UH-1's, and nine OH-13's. The Secretary of Defense approved the Army's request for Army procurement of additional CH-54's in early 1966. Modifications considered desirable as a result of field testing and operational use were

expected to increase the effectiveness of the aircraft, the range of missions it could undertake, and the variety of the support services it could give combat and logistical units.

The advanced aerial fire support system (AAFSS) development program also made significant progress during fiscal year 1966. The AAFSS was designed to be a stable, manned, aerial weapons platform incorporating armament, avionics, and fire control into an advanced high-speed rotary-wing aircraft. The two competing contractors (Lockheed and Sikorsky) submitted their proposals in August 1965, and in November 1965 the Army selected the Lockheed California Company as the prime contractor and the company began engineering development for the fabrication and test of 10 prototypes. The AAFSS was designated the AH-56A.

Pending availability of the AAFSS, and because of more immediate requirements for an interim improved armed helicopter that could be supplied quickly at relatively low cost and with the least impact on the Army's supply system and training base, the Army obtained authority to procure the AH-1G (Cobra) helicopter. The Cobra is essentially a modified UH-1B helicopter but, while it incorporates many UH-1B components, it has a streamlined, narrow fuselage, thus significantly reducing aerodynamic drag and producing increased speed and performance. The AH-1G is to be tested on an accelerated basis.

During fiscal year 1966 the CV-7A light tactical transport aircraft completed engineering tests, service tests, and a highly successful 600-hour, 90-day operational evaluation with U.S. forces in Vietnam. Results of these tests substantiated Army estimates that the new STOL (short takeoff and landing) transport would be twice as effective as its earlier CV-2B (Caribou) predecessor. In consonance with the Army-Air Force agreement regarding fixed-wing tactical airlift, the Army transferred the CV-7A development program to the Air Force on July 1, 1966.

Communications-Electronics

The policy of placing and keeping the best of modern equipment in the hands of troops makes for a never-ending challenge, one that is perhaps especially apparent in electronic communications equipment programs, including the satellite program. The Army has in development a single sideband AM transistorized radio teletypewriter set that will provide a new dimension in flexible combat communications. The AN/GRC-108, planned for issue in 1969, will use the same basic radio components as the now standard AN/GRC-106 but will have a range of 100 miles and be used at corps level and above, or in other circumstances in which long range is a primary consideration. These and

other radio sets and their related equipment will provide the communication needs of the Army up through the field army level in the period 1965-75.

In satellite communications, the Army continued during the past year to operate five synchronous communications (SYNCOM) ground terminals for the Defense Communications Agency in support of the research and development effort of the Department of Defense. In addition to the R&D aspects of the program, SYNCOM provided limited operational communications to and from Southeast Asia. With the beginning of fiscal year 1967, however, the R&D work on SYNCOM was to end and the ground terminals of the network were to pass to the operational control of the Army's Strategic Communications Command under the DCA. The network itself would remain operational during the life of the SYNCOM II and III satellites. Development of the Army's highly transportable satellite communications ground terminal, the AN/TSC-54, which is expected to be available during fiscal year 1967, continued throughout the period of this report.

Another aspect of the communications satellite program during the year was the initiation of the joint Tactical Satellite Communications Research and Development Program. At the end of the year the Army's requirements, along with those submitted by the Navy, Marine Corps, and Air Force, were being refined and consolidated for validation by the JCS for consideration by the Secretary of Defense. Upon approval, they would serve as the basis for a joint tactical satellite communications study and R&D program, which is expected to lead to an effective tactical system in the near future.

Work continued on the random access discrete address (RADA) communications system, the early history of which was dealt with in last year's report. During the past year experimental validation of the basic techniques of this system was completed. When the system becomes operational, it will provide the equivalent of automatic dial telephone service for selected users within an army division without the use of switchboards, wire, cable, or bulky radio relay equipment.

As the year ended the Army was replacing two existing surveillance and target acquisition radars, the PPS-4 and TPS-33, with the new AN/PPS-5 ground surveillance radar. Effective to 5,000 meters for moving personnel and 10,000 meters for moving vehicles, the range of the PPS-5 is greater than that of the PPS-4, although somewhat less than that of the TPS-33. The AN/PPS-5 range was considered sufficient for the detection and location of targets within the capability of the weapons of maneuver battalions and reconnaissance troops for which it was destined.

Because of the operational needs of the fighting in Vietnam, the Army last year accelerated its night vision program, under which it had developed means for helping friendly troops to see at night—infrared viewing devices, low light level optical equipment, and devices to amplify starlight sufficiently to recognize and identify visible images or to aim individual weapons equipped with infrared sights with considerable accuracy. During the year the Army let production contracts for a small starlight scope, a crew-served weapons sight, and a night observation device. It also sought to develop even smaller devices of greater sensitivity.

MALLARD, an interesting and significant international cooperative project, grew out of the ninth annual meeting of the Chiefs of Staff of the American, British, Canadian, and Australian (ABCA) Armies held in Australia in May 1965. It is a jointly shared project covering research, development, and production of a common, secure, switched, tactical communications system for the ABCA Armies, and also for the ABCA Air Forces and Navies, as might be required. As approved, MALLARD was to be carried out in three phases. In MALLARD I, the Communications System Working group, composed of representatives from the ABCA Armies, is to develop an ABCA concept of military operations and a communications plan, among other things. National approval is to be secured at the end of Phase I. It is planned that MALLARD II, which will include detailed study of the systems and equipments, and MALLARD III, to be concerned with engineering, development, and production, will become the responsibility of the Joint Program Management Board. Responsibility for the U.S. contribution has been assigned to the Army Materiel Command, which has already established a project management organization patterned after that for the U.S.-German development of the main battle tank. The phases of Project MALLARD have been scheduled so that the system will be completed for operational use by 1977.

Electromagnetic or radio interference is a growing problem in all stages of the Army's communications-electronics program. The Chief of Communications-Electronics has staff responsibility for the Army's Electromagnetic Compatibility Program and for the Department of Defense's program in this area, which the military establishment had to initiate because of radio interference between electronic equipment and systems. Radio frequency compatibility is the capability of electronic equipment or systems to operate in their intended environment at particular levels of efficiency without interruption because of unintentional interference.

During the past year the spectrum signature measurement facility at the Army's electronic proving ground, Fort Huachuca, Ariz.,

shifted its emphasis from measuring the characteristics of current Army communications electronics equipment to measuring newer equipment as it became available. At the same time, the electromagnetic environmental test facility at Huachuca provided significant test and analysis support. It used field tests on a small scale to determine the effects of interference and to confirm means of predicting interference in environments that might be typical of field operations. The crucial nature of the subject may be visualized when it is remembered that any sizable modern military force uses a great deal of electronic equipment, the failure of which, through electromagnetic interference, could be fatal to operations.

Miscellaneous Research and Development

An additional sampling of the Army's research and development activities will further illustrate their universal importance. At the turn of the year, the Army was working closely with the Navy to develop a fast deployment logistic ship, which would have a speed of possibly 28 knots; large humidity-controlled areas; construction permitting equipment to be rolled as well as lifted on and off the vessel; a stern ramp for discharging amphibious vehicles; and facilities for transferring men and materiel by helicopter—to mention some of its proposed features (see ch. VI).

The Chief of Engineers initiated feasibility studies for research and development connected with permanent construction materials and techniques. A construction engineering laboratory will be located adjacent to a suitable university with which the Engineers could cooperate. The Engineers continued their applied research on extra-terrestrial construction problems; conducted studies of lunar engineering problems; provided consultative services at the request of NASA; and continued, in cooperation with NASA, to identify and evaluate lunar resources of engineering significance. The Engineers also continued to analyze and evaluate lunar engineering technology having potential application in the solution of certain of the Army's terrestrial problems.

There was, indeed, a broad Army research program in various areas that showed promise of military application. Research conducted on drug-resistant strains of falciparum and vivax malaria encountered by U.S. forces in Southeast Asia led to the discovery of several promising drugs. There was also research in the physical sciences in such areas as mathematical probability theory, cast metals, fuel cells, and light-weight armor materials. Research into the human factors in small unit training, in leadership, and in language and area training received support. In the field of environmental sciences, work included studies

for improving equipment, techniques, and systems for acquiring, extracting, processing, and disseminating military geographical intelligence, and concerning the effects of the atmosphere upon ballistic missiles. In furtherance of a program begun several years ago to increase its availability and to disseminate new research knowledge, the Army developed a chemical information and data system plan along with the additions to the inter-Service data exchange program.

IX. Public Works and Military Engineering

The continuing pressures of an expanding world population have made the conservation of natural resources one of the most urgent problems facing peoples and governments. Through its public works program the Department of the Army has joined with other Federal and State agencies and the general public in acting to preserve the natural beauty and lifegiving qualities of the Nation's water, woodland, mineral, fish, and wildlife resources. In addition to public works, Army engineers and scientists made significant contributions in fiscal year 1966 to the Army's nuclear power and mapping and geodesy programs.

Public Works

During the past year the Corps of Engineers pursued its water resources development program, a major element of the Federal program for conserving and developing the Nation's water resources at an accelerated rate. Comprehensive plans for major river basins that involve continuing Congressional coordination should be ready by 1970. The Army participated in the activities of a number of Federal and State agencies having interests in the development of water resources, including the Economic Development and Urban Renewal Administrations, the President's Appalachian Regional Commission, the Federal Council for Science and Technology, and the National Academy of Sciences.

The Army had 62 channel and harbor and 25 lock and dam projects underway during the fiscal year. To meet the customary needs of commerce and navigation, primary attention in fund allocation was given to work on deep draft harbors and major inland waterways. The Army also participated in eight beach protection construction projects and three bridge alterations. Navigational project construction costs totaled about \$285 million.

Fourteen replacement structures are being built at an estimated cost of \$882 million as part of a \$1.8 billion program to modernize canalized waterways. Replacement or construction of existing locks and dams on the Ohio and Mississippi Rivers, in the Black Warrior-Tombigbee system, and on the Monongahela River are among the most important projects in this program.

The Arkansas River navigation project on the Arkansas and Verdigris Rivers is proceeding on schedule. Fourteen of the locks and dams are under construction; the remaining three are scheduled to be under construction within the next 2 years. Based on the current construction schedule, navigation will be open to Little Rock, Ark., in 1968 and to Tulsa, Okla., in 1970. The total estimated cost of work along the navigable reach is \$904.9 million, including \$133 million for bank stabilization and channel rectification.

Construction was initiated on the Dworshak Reservoir, on the North Fork of the Clearwater River in Idaho; this will be the highest straight axis concrete gravity dam in the United States. Construction of the main dam is scheduled for award in fiscal year 1967, with a total estimated project cost of \$231 million.

The United States signed a treaty with Canada in fiscal year 1966 for the construction of Libby Dam and Reservoir on the Kootenai River in Montana. The initial contract of \$43,906,727 was awarded for relocation of sections of the Great Northern Railroad, including construction of a 7-mile tunnel. For purposes of defining the 5-year construction period set forth in the treaty, the established initiation of construction date was set at June 30, 1966. The total estimated cost of the project is \$352 million.

The country is reminded annually of the importance of flood control, and, while protection has been provided against some ravaging waters in recent years, much more remains to be done. In the year just completed, the Army worked on 175 flood control projects, and since 1936 has completed over 800. Despite this progress, which resulted in \$622 million in flood damage prevention through projects in operation during the year, large sections of the country are still vulnerable to floods. The disastrous floods of the past year again provided evidence of the urgent need to translate control plans into completed projects.

During fiscal year 1966, 419,500 kilowatts of generating capacity were placed in commercial operation at four Army hydroelectric projects. As the period closed 9,431,900 kilowatts of generating capacity were in operation at 45 projects located in 20 States, representing 4 percent of the total generating capacity and 21 percent of the hydroelectric generating capacity in the Nation.

Construction was completed during the year on the Fox Point Barrier, R.I., hurricane protection project and operationally completed on the New Bedford-Fairhaven-Acushnet, Mass., project. Construction on hurricane protection projects continued at Stamford, Conn.; New Orleans-Venice, La.; Fire Island Inlet to Montauk Point, N.Y.; and at Freeport, Port Arthur, and Texas City, Tex. Preconstruction planning continued for projects at New London, Conn., and

Point Judith, R.I. Preconstruction planning was started for those at Mystic, Conn., and at Lake Pontchartrain, La.

Included in the present water resources development program are 3,770 projects with an estimated \$27 billion construction cost. Over \$15 billion has been appropriated, while over \$11 billion remains to be funded.

An appraisal made several years ago of water resources needs to 1980 revealed that, based on median projects of population, gross national product, and industrial development, about \$28 billion in capital investment would be needed to meet demands. Gradual increases in annual water resources development appropriations will thus be necessary to keep pace with the mounting demands on the Nation's water resources.

CIVIL WORKS APPROPRIATIONS

FISCAL YEAR 1966

(Thousands of dollars)

Construction, General.....	994, 179. 0
Planning and Design.....	23, 798. 0
Construction.....	970, 381. 0
Operations and Maintenance, General.....	183, 112. 0
Mississippi River and Tributaries.....	84, 942. 5
General Investigation.....	310. 0
Planning and Design.....	-----
Construction.....	57, 132. 5
Maintenance.....	27, 500. 0
Expenses, General.....	16, 922. 0
Investigations, General.....	25, 465. 0
Flood Control, Hurricane and Shore Protection Emergencies.....	19, 750. 0
Permanent Appropriations (Maintenance and Operation of Dams; Hydraulic Mining; Payment to States)..... Estimated.....	5, 591. 2
Total.....	1, 329, 961. 7

CONSTRUCTION

Type of project	Number under construction	Number placed in useful operation
Navigation:		
Channels and Harbors.....	62	58
Locks, Dams, and Canals.....	25	0
Bridge Alterations.....	2	0
Flood Control:		
Reservoirs.....	55	9
Local Protection.....	78	30
Multiple-Purpose, Including Power.....	30	0
Beach Protection.....	8	1
Total.....	260	98

PERFORMANCE AND PROGRESS

Navigation:	
Commerce (Great Lakes and inland) (Calendar Year 1965) (1/6 of U.S. total).	257 billion ton-miles.
Commerce Avg Annual Increase, 10 years.....	2 percent.
Dams; Navigation with locks.....	160.
Harbors, Commercial, improved.....	500.
Locks	240.
Waterways, total improved.....	22,000 miles.
Waterways, in commercial operation.....	19,000 miles.
Traffic (domestic and foreign) (Calendar Year 1965) ..	1,267 million tons.
Flood Control:	
Damages Prevented, cumulative (June 30, 1966)	\$14.6 billion.
Damages Prevented, average annual increase (over 10 years).	\$640 million.
In Operation:	
Reservoirs	247 (includes multiple-purpose reservoirs).
Reservoirs	211 (with flood control storage).
Local Protection.....	690 (includes 190 under general authorities).
Reservoir Storage (June 30, 1966).....	199 million acre-feet.
Flood Control.....	75 million acre-feet.
Other	124 million acre-feet.

PERFORMANCE AND PROGRESS—Continued

Electric Power:

In Operation (1/5 of U.S. total hydroelectric)-----	9.4 million kw.
Under Construction-----	5.9 million kw.
Additional Authorized-----	6.0 million kw.
Cumulative Energy (June 30, 1966) (42.5 billion kwh Fiscal Year 1966).	398.5 billion kwh.
Energy average annual increase (over 10 years)-----	14 percent.

Water Supply:

Municipal and Industrial Storage-----	5.2 million acre- feet.
Irrigation Storage-----	5.5 million acre- feet.
Storage, average annual increase, (over 10 years)---	11 percent.
Recreation Attendance (Calendar Year 1965)-----	168.6 million.
Attendance, average annual increase (over 10 years)---	17 percent.

Pollution Abatement

Executive Order 11258, dated November 17, 1965, requires that "heads of the departments, agencies and establishments of the Executive Branch of the Government shall provide leadership in the nationwide effort to improve water quality through prevention, control and abatement of water pollution from Federal Government activities in the United States." The Army has a direct connection in two major areas of operation—military construction and civil works.

In accordance with procedures prescribed in the Executive order, the Department of the Army prepared under the military construction program and submitted to the Director of the Bureau of the Budget, a "phased and orderly plan" for water pollution control. The plan consists of 39 separate projects to be completed over a 5-year period beginning in fiscal year 1968 at a total cost of \$23 million. As more States develop water quality standards, and as more pollution control requirements are established, it is estimated that the overall Army pollution control program may increase to a total of \$40-\$50 million.

The Department of the Army has had reasonably good success in obtaining Congressional approval of waste treatment projects over the past 25-30 years. The \$40-\$50 million estimated total cost of the Army's program is very small in comparison to the \$60-\$70 billion proposed in the next 6 years as the total amount required nationwide for water pollution control.

The plan for civil works projects consists of installations and/or corrective measures at 106 water resource projects and activities estimated to cost nearly \$9 million over a 5-year period from fiscal year 1968. The cost may double with the development of water quality

standards and the establishment of more stringent pollution control requirements by States.

Throughout the year effective planning for the proper use of natural resources at Army installations was emphasized. Land, forest, and wildlife management plans are required at appropriate installations. These plans provide for the development of proposed recreational projects, preservation of wildlife, and retention or restoration of natural beauty with landscaped plantings and other vegetation covers.

Total benefits from agriculture and grazing leases on Army lands, including civil works projects lands, for 1966 amounted to \$3.3 million on 1,900,000 acres. Much of this acreage is multiple-use land where grazing is permitted in conjunction with the Army's training mission.

Timber sales in fiscal year 1966 from 1,400,000 acres of managed forest on Army installations amounted to \$4.8 million; forest management costs were \$2.3 million. Progress was made in developing adequate technical direction over the forest management program.

Fish and wildlife programs were in operation at 100 Army installations and 57 civil works projects in cooperation with the Department of the Interior and State fish and game agencies. Pertinent Army regulations have been revised to emphasize recreation and the preservation of natural beauty as integral parts of natural resources programs. The total number of visits in calendar year 1966 by the public to Army installations for hunting, fishing, and other outdoor recreation activities will probably surpass the 1965 total.

Army civil works projects also provided recreational opportunities for the public. A total of 168.6 million people visited these projects in calendar year 1965, bringing the number of visits since 1952 to more than 1.25 billion. Over 4 million acres of new water areas were opened to the public for fishing, boating, camping, picnicking, and observing wildlife in natural surroundings.

During fiscal year 1966 the Army was called on to exercise its responsibilities for emergency flood control and rescue operations. Activities included flood fighting, rescue operations, and repair and restoration of damaged flood control works. The Army also provided assistance under Public Law 875, the Federal Disaster Act of 1950, at the request of the Office of Emergency Planning (OEP). Civil authorities received aid from the Army on many occasions during the year when natural disaster threatened or struck and the situation was beyond their capabilities to control.

In early September 1965, Hurricane Betsy crossed southern Florida and the Gulf of Mexico to strike northward into Louisiana and Mississippi. There was considerable shore damage on Florida's east coast, appreciable damage in Mississippi, and catastrophic damage in Louisiana. The President declared sections of Florida, Louisiana, and

Mississippi disaster areas. Army Engineers fought the flood, closed breached levees in the New Orleans area, rescued and evacuated the stranded, and provided technical advice and assistance. The Corps of Engineers has substantially completed a disaster assistance program in the damaged areas costing about \$50 million. Included in that program was the recovery of the chlorine-laden barge MTC 602, sunk during the hurricane in the vicinity of Baton Rouge, La.

Unusually heavy rains in late November and early December 1965 triggered floods in southern California. The President made a "major disaster" declaration covering the affected areas of that State. The Engineers performed emergency work at Tahquitz Creek in the City of Palm Springs. Additional disaster assistance requested by the OEP was provided by the Corps in San Bernardino County, Calif. Engineer projects within the flood area prevented substantial damage.

In late December 1965, heavy rainfall caused severe flooding in the Phoenix-Tucson area of Arizona. Corps personnel furnished technical assistance and, after the flood, repaired damaged levees. Again, more extensive damage was averted because of Corps projects already completed in that area.

In mid-December 1965, the Engineers emptied a pool behind an undrained highway embankment across Smugglers Gulch near Tijuana, Mexico. Rupture of this 108-foot-high, water-saturated embankment had posed a flood threat on the U.S. side of the international boundary. The Mexican Government has since initiated standby measures and plans to install adequate culverts to prevent a recurrence.

In late February 1966, ice jamming in the quad-cities area of the upper Mississippi River caused floods in the lowlands at Davenport, Iowa. Army Engineers used several new techniques to alleviate and remove the ice jams, including aerial dusting of the ice with calcium chloride and coal dust to hasten melting and crane-mounted wrecker balls and barge tows as icebreakers. In early March, towboats with barges, under Army contract, broke the ice jams and relieved the congestion.

In early March 1966, a serious flood potential developed from the spring runoff of melting snow in the basins of the upper Mississippi River and Red River of the North, and the Engineers, in cooperation with State and local agencies, took action to minimize damage during the flood period. The Corps also kept officials of the Canadian province of Manitoba informed of the flood situation on the U.S. reaches of the Red River of the North, as that river flows into Canada, and helped the Canadian Government procure sandbags for construction of emergency dikes.

In late April and early May 1966, heavy rains in northeast Texas caused severe flooding in the Trinity, Sabine, and Brazos River basins.

Property damage in the Dallas area was extensive; flood damage in the Trinity and Brazos River basins was nearly \$18 million. Completed Army flood control projects prevented another \$52 million in damages in the Trinity River basin and about \$18.5 million in the Brazos River basin.

On June 8, 1966, a severe tornado struck Topeka, Manhattan, Lansing, and Jarbola in northeast Kansas. The tentative estimate of damage was \$100 million. The President designated the zone a major disaster area. At the request of the OEP, 60 Army engineers were dispatched to the disaster areas to make damage surveys and to determine needed rehabilitation work.

In mid-June, heavy rainfall in northeast Kansas caused localized flooding along the lower Kansas River and the Missouri River below Kansas City. Damages were about \$1.5 million. Engineer Corps personnel were sent to the flooded areas to gather damage data and assist.

Nuclear Engineering

The Army nuclear power program has reached a plateau in the building and operation of nuclear powerplants. The four stationary plants built and deployed to Alaska, Greenland, Antarctica, and Wyoming between 1958 and 1962 have all had sustained power runs of over 2,000 hours and, as a group, had a significantly greater availability rate in 1966 (above 80 percent) than in any previous year. But reliability is not enough. The military nuclear powerplants must also be cost-competitive with power provided by diesel engines before widespread use can be justified. The Army recently canceled the gas-cooled trailer-mounted ML-1 development program because, even if successfully developed, it would not have been able to compete with other power sources in terms of cost.

Civilian nuclear powerplants, which have increased greatly in the past year, have made nuclear power competitive by developing extremely large plants with a capability of 500-1,000 megawatts. Since almost all of the Army's power requirements are for plants only one-thousandth as large, means other than size must be found to reduce costs.

The Army is currently investigating new concepts that show promise of significant cost reductions, extended operating time between refueling, and elimination of almost all operators. These new concepts involve designs (1) to eliminate control rods; (2) to circulate the coolant using the natural properties of heat rather than pumps; and (3) to use electrical generation techniques such as thermoelectric and thermionic devices having no moving parts.

There is one other nuclear powerplant in the Army's program, a 10-megawatt floating powerplant, the *Sturgis*, now undergoing final checkout and acceptance testing at Fort Belvoir, Va. The *Sturgis* will provide a valuable source of emergency power for stability-type operations and natural disasters. Consideration is being given to adding a desalting plant with a capacity of 500,000 gallons per day to the *Sturgis* to increase the range of its application. Based on experience gained in the design and construction of the *Sturgis*, it is believed that nuclear powerplants four times as large could be built in the same size hull.

The original objective assigned to the Army by the Secretary of Defense in 1954 of developing nuclear powerplants to provide electricity and heat for remote locations has been accomplished. The current objective is to find new ways of adapting nuclear power to increase the overall effectiveness of the Army in its worldwide mission.

Mapping and Geodesy

The buildup in Vietnam caused considerable change in the Army's mapping program for fiscal year 1966. Priorities were revised, old maps revised, and new ones created. In addition to the normal 1:50,000 coverage, the 1:25,000 scale pictomap was designed and 559 sheets produced in 6 months time. This product, based on recent aerial photography, is enhanced and colored for legibility and has been well received in Vietnam. The Army Engineers also provided military geographic documentation to 80 major units and briefed over 100 key personnel prior to deployment to Southeast Asia. In neither World War II nor Korea did the scope and magnitude approach that in support of Southeast Asia operations.

Joint Operations Graphics (JOG) have also received high priority because of their usefulness in planning worldwide joint operations. These medium-scale (1:250,000) graphics are designed in two versions, one for air forces and one for ground forces. They are currently being produced for Southeast Asia and areas of Strike Command interest.

Another important program is lunar mapping. Army support of NASA programs includes providing small-scale maps of the visible portions of the moon, medium-scale maps of a selected landing site, plastic relief maps and other graphic aids, adjustment of selenodetic control points, and assistance in navigational aids for lunar vehicles.

Field work was highlighted by the satellite tracking observations in the western Pacific area under the SECOR (Sequential Correlation of Range) project. The geodetic connections between the Tokyo Datum and Pacific Islands are being extended eastward and will

eventually connect the Tokyo, Hawaiian, and North American Datums.

Field operations in Africa continued on a cooperative basis. Ground control surveys continue in Ethiopia, Liberia, Sudan, Iran, and other countries in the Africa-Middle East area.

The Inter-American Geodetic Survey, a subordinate command of USARSO, continued to operate a cartographic school to train Latin American students and to provide technical assistance to help meet the cartographic requirements of Latin American countries.

Several realignments in the topographic field have been made because of changes in missions, economic-political factors, and the buildup in Vietnam. The Army Map Service, Far East, was phased out in Tokyo and reconstituted (less Japanese civilians) in Hawaii as the 29th Engineer Battalion (Base Topographic). The headquarters or the 64th Engineer Battalion (Base Topographic) was relocated from Wheelus Air Force Base, Tripoli, Libya, to Camp Darby, Leghorn, Italy, and a map depot and corps topographic unit were provided to the U.S. Army in Vietnam.

Development of new equipment and techniques to support Army topographic operations has concentrated on automating systems to provide a more rapid response to worldwide mapping needs. The delivery during fiscal year 1966 of the first units of the Universal Automatic Map Compilation Equipment (UNAMACE) has brought the Army a step closer to this goal. Other equipment, primarily to support UNAMACE and the rapid combat mapping system, was tested this year. Research in the area of numerical topographic data has resulted in delivery of basic equipment that can reduce terrain data to digital form and store the results on magnetic tape. These developments in automated systems components are rapidly changing the entire concept of mapping as it is known today.

X. Special Functions

The Army is responsible for the administration of certain domestic and foreign programs in the field of civil affairs. These special functions include the administration of the Panama Canal and the Ryukyu Islands, promotion of a national rifle practice program, and support for the Office of Economic Opportunity and the Job Corps.

Administration of the Panama Canal

As the personal representative of the President, the Secretary of the Army has special responsibilities for Panama Canal matters; he holds the stock of the Panama Canal Company, a corporate agency of the U.S. Government responsible for the maintenance and operation of the Panama Canal. The Governor of the Canal Zone is charged with the administration of the Canal Zone Government; he serves as president and as a director of the Panama Canal Company and is under the supervision of the Secretary of the Army.

Following the trend of the previous year, Panama Canal traffic increased in fiscal year 1966 to a new record of approximately 12,500 transits of ocean-going ships and toll revenues of approximately \$72 million (including credits for transits of U.S. Government vessels). During fiscal year 1965 there were 12,203 transits, while tolls amounted to \$67.2 million. Transits of Government vessels doubled during 1966 as a result of operations in Vietnam.

Canal revenues provide no direct financial profit to the United States, although annual interest payments are made, since the revenues are applied against operating and capital expenses of the canal enterprise. Detailed financial statistics are published in the annual report of the Panama Canal Company and the Canal Zone Government.

The Atlantic-Pacific Interoceanic Canal Study Commission continued its study of the feasibility and possible location of a sea-level canal in Central America. The Secretary of the Army, the Secretary of State, and the Chairman of the Atomic Energy Commission serve on the Advisory Council to the commission; the Army Chief of Engineers serves as its engineering agent, with responsibility for coordinating the study of the engineering feasibility of alternative sites and methods for building a sea-level canal. The Panama Canal

Company provides field logistical support for the commission's site surveys.

During the year, projected future capital programs for improving the canal and expanding its capacity were carefully considered on a cost-effectiveness basis, and the effects a sea-level canal might have on existing operations were reviewed.

Administration of the Ryukyu Islands

Article 3 of the Treaty of Peace with Japan placed the Ryukyu Islands under United States administration. Since the end of World War II, the United States has established its most important military base in the western Pacific in these islands, mainly on Okinawa, the largest island in the archipelago.

Government Affairs

The Ryukyus are administered by the Department of the Army under a Presidential Executive order that established a civil administration headed by a High Commissioner, who is an active duty member of the U.S. armed forces. The Executive order also provided for a Ryukyuan central government, with legislative, executive, and judicial branches.

The triennial legislative elections for the 32 seats in the Ryukyuan Legislature were held on November 14, 1965. The Okinawa Democratic Party remained the majority party by winning 19 seats in the unicameral legislature. Pursuant to an amendment to the Executive order, issued by President Johnson on December 20, 1965, the new legislature elected the Ryukyuan Chief Executive on March 16, 1966; heretofore, this official had been appointed by the High Commissioner from nominations made by the legislature.

Indicative of the efforts of the United States to delegate increased authority to the Ryukyuan Government was the fact that on January 1, 1966, only 96 ordinances issued by the United States were in effect as compared to 145 on August 1, 1964. Also, the Ryukyuan Chief Executive now has the authority to select his Deputy Chief Executive, as well as the departmental directors of his government, without approval by the High Commissioner.

To keep up with the Ryukyuan Government's increasing role in internal affairs, the United States continued to give special attention to the development of programs designed to utilize the abundant human resources of the islands. To ensure the availability of trained persons to provide leadership in public administration, business, agriculture, and education, Congress appropriated a total of \$815,000 to train about 600 Ryukyuan— including physicians, medical tech-

nicians, graduate and undergraduate students, national leaders, and large numbers of agricultural, industrial, and specialized trainees. Almost all of these were sent abroad for their education or training, about half of them to the United States.

The first session of the 89th Congress approved the Administration's legislative proposal to authorize payment of about \$22 million in Ryukyuan claims for compensation of land rentals and for damages suffered during the 7-year period from the end of World War II to the effective date of the peace treaty. During the spring of 1966, hearings were held in the House of Representatives on an appropriation bill to provide funds to make the authorized payments; as the fiscal year closed, Senate hearings on the bill were pending.

During the year efforts were made to strengthen Ryukyuan-Japanese relations. The United States has given public assurances that the Ryukyus, who are Japanese nationals and remain under the residual sovereignty of Japan, will eventually revert to Japanese jurisdiction. During meetings of January 1965 between President Johnson and Japan's Prime Minister, Eisaku Sato, the framework of the U.S.-Japan Consultative Committee was broadened to permit continued cooperation between the United States and Japan in promoting the welfare of the Ryukyuan people. This cooperative relationship was highlighted by Prime Minister Sato's 3-day visit to Okinawa in August 1965, during which he not only assured the Ryukyus that Japan would increase her economic assistance, but also publicly reiterated Japan's official acceptance of the fact that the United States must continue to govern the Ryukyus in order to ensure the maximum effectiveness of the U.S. Okinawan base in defending Japan and the rest of the non-Communist world in the Far East.

Economic Affairs

The economy of the Ryukyu Islands continued its healthy economic progress under U.S. administration. Total gross national product (GNP) rose to \$369.1 million in fiscal year 1965, an increase of 12.8 percent over the fiscal year 1964 GNP of \$327.1 million. Since prices rose only 1.7 percent in the same period, the real growth rate exceeds 10 percent.

Congress appropriated \$12 million in fiscal year 1966 for economic aid to the Ryukyus. Of this amount, \$2.8 million was earmarked for continued sewer construction in Okinawa's two main cities, Naha and Koza.

A most important economic factor of fiscal year 1966, and one which may contribute meaningfully to the economic growth of the Ryukyus, was the Army's request to Congress, on the recommendation of the

High Commissioner, to increase from \$12 million to \$25 million the annual authorization for aid to the Ryukyuan economy under Public Law 86-629. The request was based on a determination of funding requirements for fiscal years 1967-71 arrived at jointly by the U.S. civil administration and the Ryukyuan Government. The objective of the increased aid request would be to stimulate progress toward the goal announced in 1962 by President Kennedy of improving "the levels of public health, educational and welfare services so that over a period of years they reach those obtaining in comparable areas of Japan." For fiscal year 1967, \$5.3 million has been requested in addition to the \$12 million economic aid appropriation.

The quota imposed on Ryukyuan textile exports to the United States under the voluntary control system agreement, concluded in fiscal year 1963 between the Department of Defense and the U.S. Interagency Textile Administrative Committee, was increased in fiscal year 1966 to 10.5 million square yards.

A new 2-year agreement for fiscal years 1966 and 1967 was concluded on December 23, 1965, for the sale to the Ryukyus of U.S. surplus agricultural commodities under Title IV, Public Law 480. The 2-year program amounts to \$3,466,000, a significant decrease from previous years due to the omission of rice, which had been the principal dollar-generating commodity of the program.

Promotion of Rifle Practice

The National Board for the Promotion of Rifle Practice (NBPRP) and the Director of Civilian Marksmanship (DCM) fulfill the Secretary of the Army's statutory obligation to promote practice in the use of rifled arms among able-bodied citizens of the United States who are not reached through training programs of the active components of the armed forces. The purpose of this activity is to develop instructors and qualified marksmen available for service in time of national emergency, and to create a public sentiment which affirms the necessity of marksmanship training with rifled arms as a means of national defense. During fiscal year 1966 over 6,000 civilian rifle and pistol clubs participated in DCM programs. Over 55 percent of the membership of these clubs were between the ages of 12 and 25.

The National Rifle Association and the NBPRP jointly sponsored national rifle and pistol matches, including the National Trophy Rifle and Pistol Matches. During the past year these drew 5,953 competitors, most of whom also attended the small arms firing schools conducted by the Army Advanced Marksmanship Training Unit. In support of the National Trophy Matches, 31 trophy plaques, 36 special awards, and

nearly 3,000 special match medals and Army qualification badges were awarded to military and civilian competitors.

Through May of fiscal year 1966, the NBPRP also sponsored 42 "leg" matches which were held in conjunction with the National Rifle Association's Regional Rifle and Pistol Matches. At these matches civilian and military personnel competed to earn credits toward award of Distinguished Riflemen and/or Distinguished Pistol Shot badges.

At the 1965 World Moving Target Championships held in Santiago, Chile, members of the U.S. squad won both team events as well as one second-place and three third-place individual medals. In recognition of their accomplishments, seven members of the squad received U.S. Distinguished International Shooter badges.

The Arthur D. Little Company, Inc., under Army contract, conducted a study of the activities and mission of the NBPRP in 1966. The study concluded that the programs of the NBPRP contributed significantly to the training of the individual soldier and recommended that the programs be expanded and continued. The study also recommended minor changes in board membership and in the organization and administration of the Office of the Director of Civilian Marksmanship.

Support of the Office of Economic Opportunity and the Job Corps

During fiscal year 1966, logistical support for the Office of Economic Opportunity (OEO) and the Job Corps was expanded to include support for 14 Job Corps camps. This support was provided by CONARC and its subordinate elements on a reimbursable basis. Following policies and agreements established during fiscal year 1965, logistical support during fiscal year 1966 was for the most part routine and did not present any unsolvable problems.

XI. Military Assistance

The U.S. program of military assistance to friendly nations is a part of the larger foreign aid program that has been a major factor in U.S. foreign policy in the years since World War II.

Civic Action

Military civic action, a contribution through militarily supported public works and economic and educational endeavors to the well being of countries requiring such help, picked up considerable impetus in fiscal year 1966. President Johnson's call for "greater emphasis" upon the program and the publicity given actions in Vietnam made many aware of it for the first time. During the year the United States supported civic action programs in 33 developing nations, with main emphasis upon those in Southeast Asia and Latin America.

In Vietnam during the year, the Army and other Services provided medical treatment to over 6 million Vietnamese civilians, helped distribute in excess of 100,000 tons of food and relief supplies, and engaged in thousands of construction projects. Included were the repair or construction of 470 miles of roads, 65 bridges, 122 schools, and 35 dispensaries and other public buildings, such as refugee centers. Besides this direct effort of major proportions, the United States continued to support an indigenous program of civic aid in Vietnam that began in 1961. Development of an indigenous program in each country requiring aid continues to be the objective of the United States.

In Southeast Asia outside of Vietnam, the U.S. Army supported Thailand's civic action program with small teams of engineers who worked in close coordination with the Agency for International Development (AID) to provide advice and support for various development programs. Notably, U.S. Army engineers worked with Thai engineers to construct the 59-mile highway from Chachoengsao on the Gulf of Siam to Kabin-Buri, the largest civic action project ever undertaken by a U.S. military unit. Begun in April 1962, the highway was dedicated in March 1966. It provides a much-needed military bypass to the congested Bangkok area, and has already brought extensive economic improvement along the right-of-way to a region which previously was only sparsely inhabited. As the year ended, the joint



Figure 9. The Bangkok bypass road, being built in Thailand by U.S. Army engineers assisted by Thai engineers and civilians.

U.S.-Thai road-building program continued on an 86-mile extension of the new highway.

Under an agreement with AID and under the sponsorship of the Mekong River Committee of the United Nations Economic Commission, the Army Corps of Engineers is producing the first comprehensive Mekong River basin resources atlas. The governments of Thailand, Cambodia, Laos, and South Vietnam, and the Mekong River Committee and Tennessee Valley Authority are providing technical assistance. The atlas will provide physical, economic, and sociological data for national and regional planning agencies on the development of the basin.

Most Latin American nations now have well established civic action programs. After 4 years of military assistance program (MAP) and AID "seed money," civic action is energetically pursued in numerous ways and is increasingly self-sustaining in most of Latin America. The principle fields of the Latin American programs have been engineering and construction, health and sanitation, basic education, and vocational training. MAP support for civic action in Latin America totaled \$8.7 million in fiscal year 1966, while efforts financed by the countries themselves have climbed into the hundreds of millions of dollars per year. During fiscal year 1966 the Army furnished Latin

America with 18 civic action mobile training teams to support indigenous civic action programs. The Sixth Conference of the American Armies held in Lima, Peru, in November 1965, voted considerable time to discussions of civic action in the Americas, past, present, and future. There is an evident awareness among the leaders of the American armies of the importance and role of civic action in promoting internal stability and fostering the development of their countries.

Under another agreement with AID, the Army Corps of Engineers produced general inventories of physical resources on El Salvador, Costa Rica, and Honduras. These inventories cover natural resources, transportation, and economic and sociological areas, and are used for planning and decisions relating to rural, sociological, and economic development. Studies on Guatemala, Panama, Nicaragua, and Venezuela, and a regional study on all of Central America, are in process and will be completed in fiscal year 1967.

Foreign Military Training

The U.S. foreign military training program for fiscal year 1966 amounted to over \$31 million for grant-aid training and approximately \$5.7 million for military assistance sales training. This program covered approximately 12,000 training spaces in the continental United States, over 8,000 training spaces abroad, 91 orientation tours, 189 mobile training teams and 106 contract field technicians. There were over 60 countries included in the program. President Johnson's interest has led to augmentation of old programs and development of new ones. The effect will be seen in the military training program during the coming fiscal year.

In Africa, the newly independent nations lack military engineers. The U.S. Army sent a training detachment of 24 men to Guinea to organize and train a military construction company in that country paralleling an earlier project in Mali. The Army also sent 161 officers and enlisted men to Ethiopia, to stay until December 1966, to advise and train Ethiopian ground forces from general headquarters to battalion level.

A special leadership course for junior Laotian officers was established at Fort Knox, Ky., early in 1965, to continue through fiscal year 1968. It provides 23 weeks of instruction in English and 17 weeks of instruction in the techniques of leadership.

Missile training during fiscal year 1966 was marked by the initiation of the training of an Iranian HAWK battalion in March 1966 and the commencement of courses on the REDEYE, a shoulder-fired rocket weapon for members of the armed forces of Australia and Sweden.

The transfer of the German Air Force Surface-to-Air Missile School from Aachen, Germany, to the U.S. Army Air Defense Center, Fort Bliss, Tex., was announced in October 1965. The Government of the Federal Republic of Germany proposed the transfer as an extension of U.S.-German cooperation in the training of German personnel at various facilities within the United States. The school will train about 1,200 German students annually. All costs of rehabilitation and construction of facilities at Fort Bliss, as well as training costs, expected to be about \$1.7 million annually, will be borne by the German Government.

Of special significance in the fiscal year 1966 training program was the approval in March of the Department of Defense fiscal year 1966 supplemental appropriations bill. The bill authorizes the Secretary of Defense to transfer funding authority for materiel and training for the Republic of Vietnam, and for certain other free world military forces requirements in Vietnam, from the Foreign Assistance Act (MAP) appropriation to the regular Service appropriations.

International Logistics

The Army materiel portion of the fiscal year 1966 military assistance grant aid program totaled \$593.4 million and included varying degrees of support for 52 foreign countries or international organizations. The major emphasis continued to be on supporting Vietnamese and other allied forces in Vietnam, and other Southeast Asia countries on the perimeter of Vietnam. There were also considerable shipments to Korea and, outside of the Pacific area, to Iran and Turkey. In September 1965 the United States suspended MAP materiel and services intended for India and Pakistan because of hostilities between those countries.

The technical capabilities of several countries receiving MAP materiel support increased to the point where consideration was given to supplying such items as tanks and general purpose vehicles in an "as is" condition. This would permit considerable savings to the MAP and also improve the materiel readiness of the participating countries.

During fiscal year 1966 the Army sold materiel and services valued at \$350.6 million to 55 foreign countries and 2 international organizations under the military assistance sales program. Army sales for fiscal years 1967 and 1968 are estimated at \$664 million and \$652 million, respectively. Included in fiscal year 1966 sales were missile systems, weapons, tanks, combat and support vehicles, aviation and surface materiel, ammunition, electronics and engineer equipment, medical equipment and supplies, and miscellaneous repair parts and support equipment. Among the benefits to the United States of the

sales of military equipment and services to foreign governments are improved readiness of our allies, reduction of the U.S. balance of payments deficit, additional orders for U.S. industry, reduction of military assistance through grant aid, modernization of allied forces, and standardization of equipment among such forces. To promote this program, the Department of the Army logistical orientation tour program provided tours of U.S. Army installations and civilian production facilities in the continental United States for key military personnel from Austria, Belgium, Denmark, West Germany, Italy, Spain, and the Netherlands. The value of these tours to the U.S. military export program has been repeatedly demonstrated.

In another area of the sales program, the Army focused attention on closing out military sales cases dating from fiscal years before 1964. At the beginning of fiscal year 1966 there were 1,285 cases in this category involving \$1.3 billion. By the end of the year this amount was reduced to 498 cases totaling \$850 million. The Army's objective for fiscal year 1967 is to close out all cases down to those of fiscal year 1965.

As foreign countries have developed economically, they have expanded their industry and turned from direct purchases of U.S. military equipment to coproduction arrangements. In addition, some countries have entered the international arms market in competition with the United States. To meet this situation the Army is increasing its efforts to assure timely delivery of good military equipment to purchasers in those instances where the national interest is best served, and is inviting more active participation by U.S. industry in promoting such selected military sales. The Army has developed new reports to help its managers detect actual or potential problem areas or deficiencies in the supply system so that prompt corrective action can be taken. These reports will also provide information for the use of Army managers in providing information on the status of supply to customer countries and enable these managers to respond more quickly to questions from their customers.

At the year's end, the U.S. Army was participating in co-production programs with Italy, the Netherlands, West Germany, Canada, Norway, and with the NATO weapon production program. These programs, valued at approximately a billion dollars, will result in an estimated investment of \$235 million for goods and services in the United States. Included are an agreement, initiated in February 1963, to produce the M-113 armored personnel carrier in Italy, with production to continue through 1968; an agreement with Italy of October 1964 to provide for the Italian purchase of M-60A1 tanks in the United States and the production of additional tanks in Italy, where production is scheduled to begin in mid-1967 and be completed in 1969; an arrangement with the Netherlands of December 1965 for

the coproduction of the M-109 self-propelled howitzer; an understanding of May 1965 with West Germany of the coproduction of the UH-1D helicopter, production of which is scheduled to begin early in 1967; and the NATO programs. In the first of the NATO programs, the North Atlantic Council in July 1963 authorized Canada and Norway to participate in a NATO weapon production program under which they would produce the M-72 light antitank weapon (LAW), with Canada and Norway purchasing 50 percent of the required goods and services from the United States. The NATO HAWK weapon production program, conducted under an agreement between the United States and five other NATO countries, was virtually complete at the end of fiscal year 1966. As a part of the agreement, the United States accepted NATO-produced HAWK missiles in payment for several million dollars worth of goods and services purchased from the United States.

As the year ended, West Germany was considering the acquisition of approximately 150 CH-47A (Chinook) and CH-53A (Sea Stallion) medium transport helicopters. It appeared, however, that none of these aircraft could be made available for a final German evaluation until July 1967 at the earliest.

One of the major elements of the U.S. cooperative logistics program is the provision, under supply support arrangements, of logistic support for U.S. equipment used by the military forces of friendly countries. Repair parts and related services are furnished to a participating country through the U.S. Army logistics system on a continuing basis, with reimbursement to the United States for all costs incurred. As of the end of fiscal year 1966, arrangements had been made with 11 countries, of which 9 were actively receiving support. Negotiations were also underway with six other countries and one international organization. Program value of the support being furnished amounted to \$211.8 million against which \$197.4 million had been deposited for orders to meet increased stock levels and estimated consumption requirements. During the coming year, emphasis will be placed upon improving inventory management and supply performance and upon negotiating for support of other items of equipment purchased by friendly foreign countries.

In the case of West Germany, the United States delivered approximately \$15 million worth of follow-on repair parts for conventional equipment. Approximately 58 percent of the repair parts came from U.S. Army, Europe, stocks.

Characteristic of this supply support program during the past year was close liaison between U.S. Army and German military personnel, with periodic joint meetings held in Europe in September and December 1965 and March 1966. This liaison and the formal

working conferences served to resolve operating and procedural matters and to maintain essential close ties at the operating level. Virtually all U.S.-manufactured materiel in the German inventory was supported on a day-to-day basis. The support of newly procured materiel was phased in accordance with the original supply support agreement and deliveries were expected to increase between \$5 million and \$8 million during fiscal year 1967 to an annual rate of from \$20 million to \$23 million.

The United States and West Germany have undertaken the development of a plan for a U.S.-German combat logistics support system based on an agreement of August 1963, between the U.S. Secretary of Defense and the German Minister of Defense. During the past year, conceptual differences that had arisen during the developmental stages were resolved and a mutually acceptable basic plan, to be modified in light of future events, was completed on June 30, 1966.

XII. Summary

During fiscal year 1966 the Army expanded to over a million men and women and was increasingly preoccupied with military operations in Vietnam. These operations constitute the first extensive test under combat conditions of the Army's organization, doctrine, and techniques since the major reorganization of 1962. The departmental structure has functioned well in both the staff and major command areas.

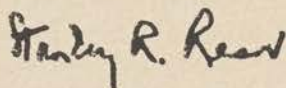
The Vietnam conflict has also provided the first large-scale operational test since the Korean war of the weapons, equipage, signal communications, and logistical system of the Army. From the lessons learned, new developments have been stimulated in every facet of military affairs. Attention has been centered on improving the soldier's existing weapons, equipment, and techniques, and in developing new methods and means of fighting the jungle war more effectively. Significant advances applicable to conditions in Vietnam have been made in weaponry, radar, night vision, target detection and acquisition, and similar areas of concern to the soldier. The Army's tactical mobility has been enhanced, especially in the new airmobile division and in other units employing the helicopter. New and improved techniques and organizational patterns in the combat and logistical areas in the field have been developed.

The rapid expansion of the Army and increasing requirements for data bearing on command and control, personnel, accounting and supply, and scientific and technological operations, have led to a greater dependence on automatic data processing and the use of computer technology. The Army has augmented its existing capability and created new data processing installations to provide the required support, and is thus able to operate more efficiently and effectively while meeting demands for data resulting from the buildup at home and operations in the combat zone.

The Army expansion and the buildup in Vietnam during the past year have been accomplished without calling reserve component units to active duty. This sets the current expansion apart from the Berlin crisis of 1961. The rapid buildup of the regular forces presented some major problems, particularly in training. These, however, had been largely overcome by the end of the year. In the opening months of the 1967 fiscal year the training base as well as ready units at home

will acquire an infusion of veterans of the Vietnam fighting as the result of the initial major rotation under the Southeast Asia buildup.

Although the influence of the war in Vietnam extended across all of the Army's operations in fiscal year 1966, the broad range of activities that go on even without a combat situation were carried out at the same time. The prospect is that this wartime-peacetime combination will continue in the coming year.

A handwritten signature in dark ink, reading "Stanley R. Resor". The script is cursive and fluid, with the first name "Stanley" and last name "Resor" clearly legible.

STANLEY R. RESOR,
Secretary of the Army.

Annex
ANNUAL REPORT
of the
OFFICE OF CIVIL DEFENSE
July 1, 1955, to June 30, 1966

Summary Statement

In addition to substantial operational progress of the Office of Civil Defense during fiscal year 1966, several events of importance to the civil defense program occurred. Three principal ones were:

First, the President, in his annual budget message to the Congress included civil defense as one of the major programs within the Continental Air and Missile Defense Forces by stating:

"Interceptor aircraft, surface-to-air missiles, warning and control systems, and the civil defense program all contribute to the capability to limit damage to the United States in the event of an attack. The basic objective is to provide a balanced force which will reduce damage from various possible kinds of attack and make the problem of attacking the United States as complicated as possible * * *."

Second, the Secretary of Defense aptly defined the importance of fallout shelters. On May 7, 1966, in a letter to the Chairman, Independent Offices Subcommittee on Appropriations, U.S. Senate, the Secretary wrote:

"I have in my recent appearances before Congressional Committees emphasized the importance of fallout shelters as the foundation of any sound Damage Limiting program. The Chairman of the Joint Chiefs of Staff has agreed in this position, stating that: 'I regard a full fallout shelter program as being coequal, if not preeminent, in relation to the whole damage limiting program * * * all of our studies show that a fallout shelter program would be more effective in terms of lives saved than any other program we could buy * * *.'"

Third, the Office of Civil Defense began to provide financial support and guidance for local planning to assure effective use of available fallout protection in all communities of the United States and to identify those areas in need of further shelter development. Known as Community Shelter Planning (CSP), this innovation opened a new phase in civil defense preparation. During fiscal year 1966, the Office of Civil Defense began to place CSP contracts for work in large local planning areas, utilizing the services of local urban planners or professional planning firms. For smaller communities, the Office of Civil Defense began placement of CSP contracts with the States to provide professional urban planning services.

A summary of fiscal year 1966 major accomplishments associated with the principal components of the national civil defense program is presented in this part of the report.

Nationwide Fallout Shelter System

1. Public fallout shelter for nearly 14 million persons was located in more than 10,700 facilities. This increased the nationwide shelter inventory to nearly 166,000 facilities, with an aggregate capacity for almost 150 million people.

2. More than 11,000 shelter facilities were licensed. The net total of more than 93,000 licensed facilities had an aggregate capacity for more than 89 million persons.

3. More than 7,500 facilities were marked. The grand total of more than 95,000 marked facilities had a total capacity for more than 85 million persons.

4. Survival supplies issued to more than 11,600 shelter facilities increased the total number of stocked facilities to nearly 75,000. Survival supplies in these shelters would be sufficient to take care of 68.8 million persons for 8 days or 41.3 million for 14 days.

5. Community Shelter Planning (CSP) contracts were executed to cover 28 large local planning areas in 21 States; CSP contracts to cover smaller planning areas were executed with 31 States.

6. Expansion techniques were used to increase available shelter space. These techniques included (a) surveys of small structures, (b) surveys of fallout protection in homes, (c) prototype distribution of packaged ventilation kits, and (d) use of architectural and engineering design—"slanting" to incorporate shelter in new buildings.

7. As a result of professional and technical support of the nationwide fallout shelter system, nearly 2,000 fallout shelter analysts were certified, making a net total of more than 11,000 qualified analysts. Architectural and engineering development centers were operated at 8 universities.

8. Net gain in number of State and local emergency operating centers completed or in process of completion was 642, or 33 percent, making a total of 2,585. Of this number, 772 were financed with the help of Federal matching funds.

Complementary Civil Defense Systems

1. The National Warning System (NAWAS) was strengthened by increasing the number of warning points from 685 to 761; 69 extension or alternate warning points were placed in fallout protected emergency operating centers, and 235 warning points were covered by OCD funding agreements to provide this protection.

2. The Civil Defense Telephone and Teletype System (NACOM 1) was strengthened by installation of facilities for conducting voice conferences between OCD headquarters and all its regional offices; teletype circuits were installed to permit rapid communication between four points of adjoining Canadian and U.S. regions.

3. The Civil Defense Radio System (NACOM 2), serving as a back-up system to NACOM 1, was extended to 13 additional States, making it operational in 37 States as well as in the District of Columbia, Puerto Rico, and the Canal Zone.

4. Of 2,547 broadcast stations in the Emergency Broadcast System, 587 selected radio stations participated with the OCD in a protection program to assure operational capability in emergencies. This was an increase of 47, and 370 had completed construction for fallout protection.

5. The nationwide radiological monitoring network was strengthened by a net gain of 2,888 monitoring stations, increasing the grand total to 58,062. Shelter radiological monitoring capability was strengthened by placement of monitoring

equipment in nearly 10,000 additional public fallout shelters, making a total of more than 77,000 so equipped.

6. Damage assessment capabilities were strengthened by further improvement in survival resources data as well as by distribution of aids and dissemination of information on damage assessment techniques.

Federal Assistance

1. In addition to the 50 States, the District of Columbia, Puerto Rico, Guam, and the Virgin Islands, more than 4,000 local governments covering about 89 percent of the national population, participated in the civil defense program through some form of Federal assistance. In many of these governments, State and local civil defense organizations were staffed by more than 5,400 civil defense personnel, paid with the help of Federal matching funds; in addition, many times this number of State and local government employees and volunteers had emergency assignments and training.

2. The net gain of key civil defense personnel and instructors trained at OCD schools was 2,877, making a total of nearly 29,000 so trained since fiscal year 1960. More than 53,000 State and local civil defense personnel participated in training administered through the Civil Defense University Extension Program (CDUEP), making a total of more than 133,000 participants since CDUEP was started in fiscal year 1963.

3. Radiological monitors trained during fiscal year 1966 by the Army, in the CDUEP, and through the Civil Defense Adult Education Program (CDAEP) totaled more than 37,000, including more than 3,000 instructors.

4. Shelter managers trained in fiscal year 1966 totaled more than 10,000 including almost 2,000 instructors.

5. In public education, more than 350,000 were trained in personal and family survival, increasing the cumulative total to approximately 1.5 million; more than 1.7 million persons were reported trained in medical self-help, making a cumulative total of 3.6 million, plus an estimated half million persons informally exposed to the subject by television and other media.

6. Rural civil defense information and education programs continued to operate in all the States and in Puerto Rico. Civil defense information was presented by 57,000 local leaders to approximately 1.1 million persons. Rural civil defense information was featured on more than 9,000 television and radio programs, by more than 4,000 exhibits, and in 2.5 million copies of publications distributed in rural areas.

Research

1. Research continued to produce information needed for the realistic planning and practical operation of the civil defense program.

2. Shelter ventilation criteria were developed for operational use in establishing a prototype system of procurement and distribution of packaged ventilation kits for public fallout shelters.

3. Improved methods were developed for calculating the amount of fallout protection provided by basements in residences.

4. More realistic criteria were developed to evaluate the hazard of food and water contamination by radioactive fallout; earlier estimates of this hazard were found to be too severe.

5. Evidence was developed that indicates growing crops may be more susceptible to damage by radioactive fallout than previously believed.

6. Strategic studies indicated the usefulness of placing greater emphasis on preparation for improving civil defense capabilities during crises in contrast to earlier emphasis on preparation for surprise attack.

Supporting Activities

1. Plans were developed for coordinated action at all levels of government in disseminating authoritative emergency information to the public; experience in peacetime disasters proved helpful in strengthening these plans.

2. Maximum use of community resources in support of local civil defense programs was encouraged through liaison with Federal agencies and with selected national associations and organizations. Guidance was also extended to local governments and community organizations.

3. Civil defense information was addressed to the public in numerous publications and periodicals, in four new motion pictures, in spot radio and television announcements, through a series of weekly radio programs, and by wide use of exhibits and posters.

4. Participation of industry in the civil defense program was strengthened by liaison with major national organizations, industrial firms, and Federal agencies dealing directly with industry. Activities included conferences, seminars, and workshops, as well as dissemination of guidance information by exhibits, motion pictures, and distribution of about 400,000 copies of civil defense publications.

5. Labor support of the civil defense program was strengthened by continuous liaison with the labor and trade unions, principally through the American Federation of Labor and Congress of Industrial Organizations (AFL-CIO). Activities included adoption of supporting resolutions, training participation of leadership groups, assistance during disasters, and dissemination of civil defense information with the cooperation of the labor press.

6. Participation in international activities strengthened civil defense in several ways. Communication lines between adjoining United States and Canadian civil defense regions were established. Work with the North Atlantic Treaty Organization and the Central Treaty Organization helped provide worldwide perspective to the civil defense effort.

Program Structure and Support

Development of the civil defense program during fiscal year 1966 was continued within the framework of the balanced program established by the Department of Defense in fiscal year 1962. The major components included: (1) A nationwide fallout shelter system; (2) complementary civil defense systems that include nationwide warning, communications, radiological monitoring and reporting, and damage assessment; (3) Federal assistance to State and local governments; (4) research; and (5) various supporting activities.

Major Emphasis

Federal support of the program coordinated by the Office of Civil Defense included resources of the Department of Defense and those of other Federal agencies. An important element of this support was a new phase in civil defense operational planning titled Community Shelter Planning (CSP). It became the foremost program element of civil defense in fiscal year 1966. CSP is designed to help every community utilize the best available fallout protection for its people and to identify those areas that need further shelter development.

The OCD continued the nationwide architect-engineer survey of large buildings that meet minimum protection standards and have a capacity for 50 or more persons. Several techniques were used to locate additional protected space in areas with unfilled requirements for standard fallout shelters; i.e., shelters inside which the radiation would be reduced to one-fortieth or less of that existing outside and therefore designated as having a protection factor (PF) of 40 or higher.

Organization and Management

The Office of Civil Defense (OCD) is primarily responsible for the civil defense program at the Federal Level. The Director of Civil Defense heads the OCD and is directly responsible to the Secretary of the Army. Under continuing civilian direction and control, the OCD at the end of fiscal year 1966 was organized as shown in figure 1. The number of OCD permanent employees was reduced to comply with the 800-position ceiling set by the Congress. This was done primarily by attrition and by closing two training centers. Some personnel and their assigned functions were transferred to other components of the Department of Defense. The year-end strength consisted of 347 at OCD headquarters, 337 at the eight OCD regional offices (see fig. 2), and 43 at the OCD Staff College and other field locations.

Federal Support

The resources of the Department of Defense, including those of the armed forces, were widely used in developing and operating the civil defense program, as were those of numerous other Federal agencies. For the fifth consecutive year, the OCD continued to develop and coordinate this support at the Federal level.

Revised policy direction and guidance on the subject military support are given in DoD Directive 3025.10, issued by the Secretary of Defense on March 29, 1965. In effect, the directive implemented a plan to provide each State with a military headquarters for planning and controlling military support operations during civil defense emergencies. A joint monitoring team, consisting of representatives from the U.S. Army, Navy, and Air Force, the National Guard Bureau, and the OCD, visited each continental U.S. Army Command and a representative number of State Adjutants General and State civil defense officials to evaluate the effectiveness of work accomplished in executing the military support plan. The team concluded that the role of the State Adjutants General in carrying out the plan is feasible and sound and that substantial progress had been made in executing the plan. Joint action was taken to solve the problems identified by the team.

The OCD continued to coordinate the civil defense work of Federal agencies to assure that functions were carried out in consonance with civil defense responsibilities assigned to the Secretary of Defense by Executive Order 10952, July 20, 1961. Much of this coordination was achieved within the framework of several other Executive orders that have assigned civil defense responsibilities and emergency preparedness functions to various departments and agencies. Effective coordination and progress were also achieved through contractual arrangements with several departments and agencies, which enabled the OCD to use their special competence in coordinating and expediting many of its functions in accordance with Executive Order 10952.

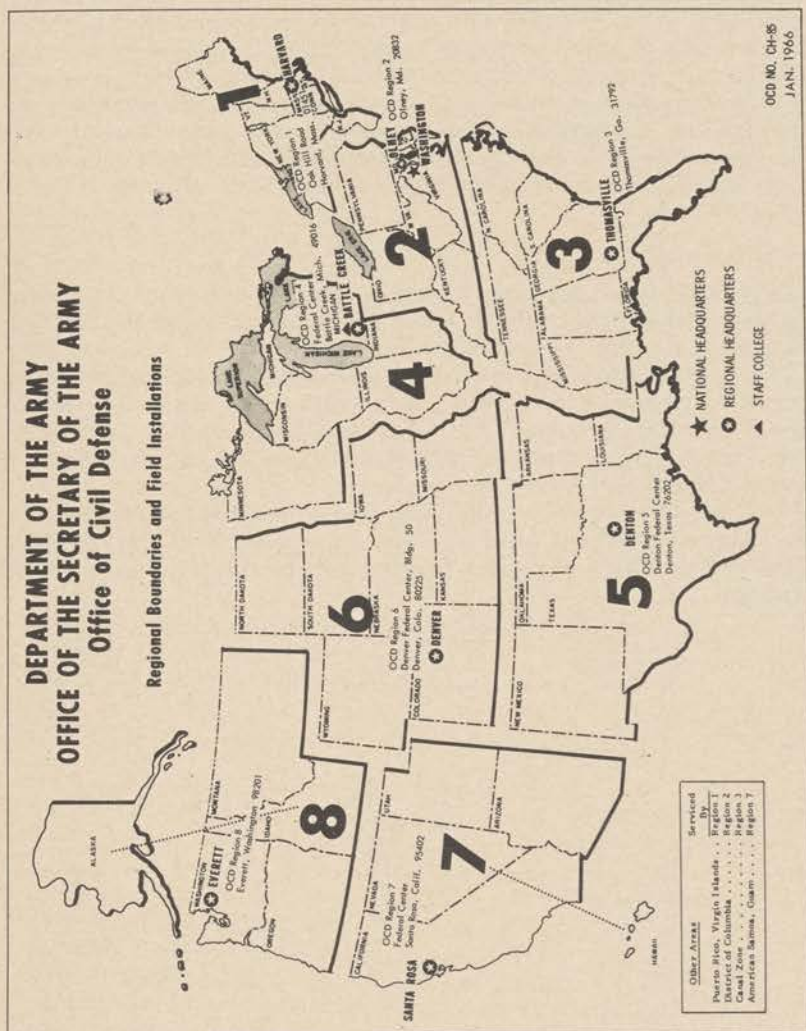


Figure 2. OOD regions.

State and Local Participation

At the end of fiscal year 1966, the 50 States, the District of Columbia, Puerto Rico, Guam, the Virgin Islands, and more than 4,000 local political subdivisions had active official civil defense programs that were documented by formal program papers submitted to and approved by the OCD. More than 5,400 full- or part-time civil defense personnel, paid with the help of Federal matching funds functioned as part of State and local civil defense organizations that are legally an integral part of civil government under the authority of elected officials. Under OCD guidance, these organizations also relied upon many additional State and local government employees and volunteers trained to carry out specific civil defense assignments. As in past years, the performance readiness of many State and local civil defense organizations was tested in dealing with the effects of peacetime disasters.

Financial Summary

Funds available during fiscal year 1966 for carrying out civil defense operations totaled approximately \$130.4 million: \$106.8 million of new fiscal year 1966 appropriations, \$0.2 million in reimbursable orders from other agencies, and \$23.4 million carried over into fiscal year 1966 from prior year appropriations. Of the total amount available, \$119.8 million was apportioned by the Bureau of the Budget for execution of the fiscal year 1966 program, making these funds available for obligation during fiscal year 1966; \$10.6 million was reserved for carry-over and obligation in subsequent fiscal years.

The table below shows the planned application of the funds available for obligation in fiscal year 1966 and the actual obligations for specific budget activities. The OCD obligated \$94.6 million, or 79 percent, of the \$119.8 million available for obligation.

FINANCIAL SUMMARY FOR FISCAL YEAR 1966

(In thousands of dollars)

Budget activity	Funds available for obligation	Funds obligated
Grand total.....	119, 775	94, 645
Operation and maintenance, total.....	64, 216	62, 541
Warning and detection.....	5, 803	5, 473
Warning systems.....	683	648
Detection and monitoring systems.....	1, 207	1, 093
Warehousing and maintenance.....	3, 913	3, 732
Emergency operations.....	21, 919	21, 059
Emergency broadcast system.....	1, 680	1, 621
Damage assessment.....	1, 386	1, 384
Training and education.....	13, 921	13, 233
Emergency operations systems development.....	1, 633	1, 602
Public information.....	2, 347	2, 277
Other emergency operations.....	952	942
Financial assistance to States.....	23, 958	23, 865
Survival supplies, equipment and training.....	4, 044	4, 003
Emergency operating centers.....	4, 485	4, 448
Personnel and administrative expenses.....	15, 429	15, 414
Management.....	12, 536	12, 144
Research, shelter survey and marking, total.....	53, 463	31, 900
Shelters.....	41, 958	¹ 21, 631
Shelter survey and marking.....	16, 720	9, 020
Smaller structures.....	10, 247	5, 879
Shelter stocking.....	3, 513	2, 750
Shelter development.....	10, 634	3, 519
Improvement of shelters.....	844	463
Research and development.....	11, 505	10, 269
Construction of facilities, total.....	2, 096	204

¹ Excludes an adjustment of \$5,114,000 recovered from prior year obligations for shelter stocking.

Nationwide Fallout Shelter System

Operational Gains

Public fallout shelter space for nearly 14 million additional persons was located during fiscal year 1966. This increased the nationwide shelter inventory to almost 150 million spaces and exceeded the planned 6-million fiscal year objective by 8 million spaces, or 133 percent. Gains were also made in licensing, marking, and stocking public fallout shelters. A summary of fiscal year 1966 progress is given in the table on page 265.

These accomplishments are the results of a program started in September 1961. It includes (1) a continuing nationwide survey to locate public fallout shelter space in existing structures, (2) the marking and licensing of acceptable shelter space for public use, and (3) the stocking of licensed shelters with survival supplies.

Survey operations.—Each public fallout shelter included in this program contains space for at least 50 persons and has a minimum protection factor (PF) of 40. Continued during fiscal year 1966, mainly as an updating operation, the nationwide survey increased the shelter inventory by 10,775 facilities with an aggregate capacity for nearly 14 million persons, and boosted the grand total to 165,839 facilities with an aggregate capacity for almost 150 million persons.

Additional shelter space located included that in new or modified construction and structures previously omitted from the survey because they were estimated to have marginal capacities or protection factors.

Supplemental information collected as part of the updating survey included data needed to help local governments plan for the effective use of shelters under emergency conditions and to assist in alleviating storage problems by reducing the number of water drums and other shelter supplies that need to be stocked. Updating operations were concentrated in active community shelter planning areas. Special shelter surveys and other techniques were also used to help locate additional shelter space where needed.

Licensing and marking operations.—During fiscal year 1966, property owners and local governments signed fallout shelter license or privilege forms for 11,243 facilities with an aggregate capacity for more than 12 million persons. This increased the grand total to 93,032 licensed facilities with an aggregate capacity for more than 89 million persons. The OCD requires that local government officials and property owners sign a shelter license for each public fallout shelter facility before stocking it with survival supplies.

More than 7,500 facilities, with an aggregate capacity for more than 9 million persons, were marked with interior and exterior standard fallout shelter signs during the fiscal year 1966. This increased the grand total to 95,419 marked facilities with an aggregate capacity for more than 85 million persons.

Stocking operations.—Survival supplies were issued to 11,626 shelter facilities during fiscal year 1966, increasing the grand total of stocked facilities to 74,667. The survival supplies issued during the fiscal year would be sufficient to take care of more than 12.5 million persons for 8 days or almost 7.5 million for 14 days. At the end of the fiscal year, the cumulative quantity of survival supplies placed in stocked facilities would be sufficient to take care of their rated capacity of 68.8 million persons for 8 days or 41.3 million for 14 days. In addition, 9,742 shelters were furnished with at least one radiation kit, increasing the total number so equipped to more than 77,300.

An OCD objective is to assure that survival supplies available to each licensed public fallout shelter would be sufficient to take care of shelterees for a 14-day

SUMMARY OF PROGRESS IN PUBLIC FALLOUT SHELTER PROGRAM, FISCAL YEAR 1966

Program action	Number of facilities (in thousands)				Number of spaces (in millions)			
	End of fiscal year 1965, total	End of fiscal year 1966, total	During fiscal year 1966		End of fiscal year 1965, total	End of fiscal year 1966, total	During fiscal year 1966	
			Gain	Percent gain			Gain	Percent gain
Located-----	155.1	165.8	10.7	7	135.6	149.6	14.0	10
Licensed-----	81.8	93.0	11.2	14	77.2	89.3	12.1	16
Marked-----	87.9	95.4	7.5	9	75.9	85.3	9.4	12
Stocked-----	63.0	74.7	11.7	19	33.8	41.3	7.5	22
Rated capacity of facilities stocked-----	-----	-----	-----	-----	56.2	68.8	12.6	22

period. The number of shelterees in each case is the rated capacity of the shelter; i.e., the number of persons for whom the shelter can provide protected space, as determined by the survey. Shelterees in many places would have access to water, food, and medical supplies normally available in buildings where shelters are located. These and other survival assets, such as sewage sanitation facilities, are important in determining the amount and kind of supplies issued to each shelter.

Many public fallout shelters have been stocked for 100 percent of their rated shelteree capacity. For various reasons, other shelters have been stocked for less than their rated capacity. The aggregate shelter space stocked during the fiscal year 1966 averaged 60 percent of the total rated shelteree capacity of the facilities stocked.

Food, sanitation kits, and medical kits procured and delivered to Federal warehouses since inception of the program in fiscal year 1962 would be sufficient to take care of 63 million shelterees for 2 weeks; water containers were procured for only 50 million, since trapped water is available in many shelters for emergency use. No additional procurement of general shelter supplies was initiated during fiscal years 1965 and 1966 because of lack of funds. About 12 percent of these supplies were placed in shelters during fiscal year 1966; 54 percent were placed in shelters in prior years and, at the end of fiscal year 1966, the remaining 34 percent, for use in filling requisitions, were at warehouses. Radiological kits were also procured and had been furnished to more than 77,300 shelters by the end of fiscal year 1966.

During fiscal year 1966, procurement of 2,400 packaged ventilation kits was initiated at a cost of \$436,000. At the end of the fiscal year, 2,082 of these kits had been delivered to warehouses for distribution to selected fallout shelters in community shelter planning areas.

Community Shelter Planning

Community shelter planning is a key aspect of the nationwide fallout shelter system, and the CSP is the foundation of local emergency readiness. Objectives of community shelter planning are to:

1. Match the people in the CSP area to the best protected space currently available, so that available fallout protection is used with maximum effectiveness.
2. Provide a realistic movement plan that will allow the most efficient use of available fallout protection.
3. Insure that all of the people know where to go and what to do in case of nuclear attack.
4. Define precisely areas with unfilled requirements for standard fallout shelters so that efforts to develop new shelter are applied to them.
5. Provide for updating shelter allocation plans as the population distribution and the shelter inventory change.
6. Provide a basis for updating local civil defense plans so that State and local governments and their forces and nongovernmental organizations, plus any military support forces which can be made available, will be ready to support the shelter-based local civil defense system.

During fiscal year 1966, the OCD established a national community shelter planning program designed to assist each community in the United States in developing a CSP. The principal nature of this assistance is the use of Federal funds to provide all communities with professional urban planning services. For large local planning areas, this service is financed directly with Federal funds in accordance with contractual arrangements for employment of local

urban planners or professional urban planning firms. Administered for the OCD by the U.S. Army Corps of Engineers, the contracts are signed by district representatives of that organization or of the U.S. Naval Facilities Engineering Command and representatives of the planning area. For small local planning areas, the service is furnished by a State community shelter planning officer whose employment is financed by a contract between the OCD and the State.

By the end of fiscal year 1966, substantial progress had been made toward attaining nationwide community coverage by CSP contracts. Contracts covering 28 large local planning areas located in 21 States had been executed and 15 were being processed; an additional 125 planning areas had formally indicated an interest in negotiating contracts. Funds obligated for local CSP contracts totaled nearly \$1.4 million.

Contracts covering small CSP areas had been executed with 31 States at the end of the fiscal year, and contracts with 15 States and the District of Columbia were being processed. Funds obligated for State contracts totaled more than \$760,000.

Expansion Techniques

Several techniques were used to locate or develop additional protective space in areas with unfilled requirements for standard fallout shelters. These included the incorporation of fallout shelter design techniques in new construction at little or no additional cost, special surveys to locate fallout protection in homes and small buildings, and the provision of ventilation to increase the capacity of public fallout shelters already located.

Design techniques.—Since the development of "slanting" techniques in fiscal year 1964, information on these techniques for incorporating radioactive fallout protection features into building designs has been widely disseminated among architects and engineers. These techniques enhance the fallout protection inherent in new construction with little or no increase in cost and without adversely affecting the appearance of the building or its intended use.

An OCD objective is to develop slanting for fallout radiation protection as a normal practice in the design of all Federal construction. Professional consulting services for this purpose are made available to Federal agencies responsible for the design and construction of new buildings. Fiscal year 1966 appropriations authorized the incorporation of fallout protection in 19 specific Federal buildings: 16 for the General Services Administration, two for the Department of the Interior, and one for the Department of Agriculture. These buildings, as well as 16 Federal buildings for which similar appropriations were authorized for fiscal year 1965, were included in those covered by OCD advisory service on slanting techniques.

Upon request of State and local civil defense officials, the OCD provides the services of qualified shelter analysts to local architectural and consulting engineering firms on the use of slanting in designing new buildings, or remodeling or expanding existing buildings. This excludes actual analysis and design services, but guidance and advice are offered on how firms can achieve fallout protection through their own efforts. The service is provided through seminars, by recommendations based on review of design plans, or by personal consultation.

During fiscal year 1966, about 30 certified shelter analysts performed this service for the OCD under contractual arrangements, as needed, in 217 cases. This increased to nearly 280 the number so helped since this service was started in fiscal year 1965. These analysts are associated with architectural or engineer-

ing schools and departments of universities and colleges or with well-established architectural or engineering firms throughout the Nation. As a result of the growing demand for this service, plans were made during fiscal year 1966 to make it available through the facilities of selected universities and colleges.

Small Structures Survey.—The Small Structures Survey (SSS) operations were limited to community shelter planning areas having unfilled requirements for standard fallout shelters. Begun during fiscal year 1965, the primary purpose of the SSS is to locate acceptable shelter space in buildings too small to meet the 50-person-capacity minimum requirement of the regular nationwide survey. During fiscal year 1966, SSS operations were completed in the 57 areas that had community shelter planning projects underway before the CSP program was announced.

These operations located additional fallout shelter space with a protection factor of 40 or more for 412,360 persons. Of this amount, 187,532 spaces were in facilities having a capacity for at least 10 but less than 50 shelterees. The other 224,828 spaces were in facilities of greater capacity and were added to the regular public fallout shelter inventory. As anticipated, the SSS operations added to the regular inventory many facilities that had originally been estimated to have marginal capacities.

SSS operations were also extended to community shelter planning areas covered by fiscal year 1966 CSP contracts. Although OCD plans do not call for licensing and stocking fallout shelters of less than 50-person capacity, identifying and locating them will provide local governments with additional fallout shelter space for allocation where needed in the CSP.

Before beginning the SSS operations in fiscal year 1965, operation of the regular nationwide shelter survey had incidentally located shelter space for more than 2 million persons in facilities too small to meet the 50-person-minimum capacity requirements. This shelter space will become part of the SSS inventory and can also be used where available and needed.

Home Fallout Protection Survey.—During the latter half of fiscal year 1966, a Home Fallout Protection Survey (HFPS) was conducted in Rhode Island. At the end of the year, about 73 percent of approximately 223,000 home occupants had returned questionnaires giving data as requested for analysis. The results revealed that about 22,000 basements with a PF of 40 or higher contained shelter space for about 84,000 home occupants, and about 110,000 basements with PF 20 to PF 40 contained shelter for about 400,000 occupants.

At the end of fiscal year 1966, similar surveys were planned for other States, especially those with a high percentage of home basements. The results of the HFPS of Rhode Island and of a sample survey conducted in fiscal year 1965 have confirmed that many home occupants in areas with unfilled requirements for standard fallout shelters can use their home basements for fallout protection available in their basement and how they could improve it, if necessary, would have a choice of taking shelter there or going to a public shelter.

Home occupants covered by the survey were informed of the fallout protection available in their basements and how they could improve it, if necessary. Householders without basements were sent the OCD manual, *Personal and Family Survival*, SM 3-11. This publication includes information on constructing home fallout shelters and improvising fallout protection by home occupants to whom public fallout shelters may not be accessible.

Military construction.—The Military Construction Authorization Act of 1966 (Public Law 89-188) made provisions for including fallout protection in military construction. A Department of Defense Directive issued on June 20, 1966, pro-

vided uniform guidance on objectives, policies, and criteria for determining the nature of fallout shelter requirements, and for developing fallout shelter plans at all Department of Defense installations.

During fiscal year 1966, the OCD conducted 1-week shelter analysis courses for military personnel at U.S. oversea military installations in West Germany, Korea, and Okinawa. This was done at the request of the Army Deputy Chief of Staff for Military Operations and was a continuation of the Military Overseas Shelter Survey (MOSS) started during fiscal year 1965.

Shelter ventilation.—During fiscal year 1966, the OCD initiated a prototype system for procurement and distribution of 2,400 packaged ventilation kits. Most of the kits had been delivered to Government warehouses at the end of the fiscal year and will be distributed to selected public fallout shelters in community shelter planning areas having unfilled requirements for standard shelter.

A survey of certain shelter facilities in the 57 community shelter planning areas was conducted to determine the most effective placement of the kits. During fiscal year 1966, more than 1,200 facilities were surveyed for this purpose. In future survey or resurvey of facilities, ventilation data will be part of the standard information collected. Fallout shelter space can be obtained economically for many additional people by providing packaged ventilation kits for use in inadequately ventilated public shelters.

Protective Structures

Equally important to protecting the public from radioactive fallout is the need to protect people responsible for warning the public and carrying on emergency communications or directing and controlling civil defense emergency operations. Protection of these people is critical to effective use and operation of the nationwide fallout shelter system.

Protection of warning points.—In fiscal year 1964, the OCD began to provide financial assistance to State and local governments, as necessary, for furnishing warning points with fallout protection, emergency power generators, and ventilating equipment. During fiscal year 1966, this operation was limited to warning points for which agreements had been signed before the end of fiscal year 1965. By June 30, 1966, agreements in effect covered 235 warning points; fallout construction and installation of equipment had been completed for 146 of these points. In addition to the 235 warning points covered by funding agreements, OCD requirements for 22 warning points had been met without use of Federal funds. Instead of expanding this operation further, extensions or alternate warning points and duplicate NAWAS equipment were installed in many local emergency operating centers that provide fallout protection.

Protection of radio stations.—Construction of fallout protection for 151 radio stations was completed in fiscal year 1966 with OCD financial assistance. This increased to 361 the number of stations provided this protection by means of Federal funds. In addition, nine stations either already had fallout protection or acquired it without the use of Federal funds.

These arrangements are made to provide for continuous operation of selected radio stations under fallout conditions that may exist after nuclear attack. Their operation would be necessary for disseminating information to the public and to conduct emergency operations. Since commercial stations are not normally equipped to operate under these conditions, they are provided Federal funds for this purpose. Participants are required to agree to provide and maintain fallout protection and emergency power equipment in their installations as well as special communication links to local emergency operating centers.

OCD regional operating centers.—Each OCD regional office is an operating center at the Federal level and would be the site of civil defense emergency operations in the case of nuclear attack. The Region Five Center, Denton, Tex. has been operational at a permanent protected site since February 1964. It houses the peacetime operational staff of the OCD and the Office of Emergency Planning. In wartime it would be the headquarters for regional emergency operations and would also serve as an alternate national civil defense operational headquarters. Funds available for construction of OCD regional operating centers total approximately \$9.9 million. By the end of fiscal year 1966, the design for Region One Center, to be located near Harvard, Mass., had almost been completed. Where sites permit, this design will be used as a prototype for construction of other OCD regional centers.

State and local emergency operating centers.—Federal matching funds obligated during the year to assist State and local governments in establishing protected emergency operating centers totaled nearly \$4.5 million. As necessary, these funds were used for designing and constructing new centers, modifying existing buildings, and acquiring equipment. During fiscal year 1966 an additional 149 State and local centers were financed by Federal matching funds, increasing the number to 772; 387 of these have been completed. State and local governments reported an additional 493 centers that had been established without the use of Federal funds, increasing this number to 1,813, of which 1,679 had been completed.

Professional Support of Architects and Engineers

In further developing the nationwide shelter system and the protective structures used in its support, the OCD continued to rely heavily upon the professional and technical assistance of architects and engineers. Their cooperation and technical knowledge have made possible the continuing shelter survey, started in September 1961, and the development of slanting and other techniques that show promise of providing fallout protection to an ever-increasing percentage of the population.

Professional Training.—During fiscal year 1966, nearly 2,000 architects and engineers were certified as fallout shelter analysts, increasing the number qualified to more than 11,000. The architectural and engineering schools and the departments of architecture and engineering of several universities and colleges offered the course in fallout shelter analysis on a semester basis and through traveling instructor teams where the demand existed. It was also taught at the U.S. Navy Civil Engineers Officers School and the U.S. Army Engineer School, and the University of Wisconsin continued to offer the instruction by correspondence.

An extension of the fallout shelter analysis course, with special emphasis on the immediate effects of nuclear detonations on structures, was attended by 460, and 327 engineers completed a course on unique problems of shelter environmental control engineering. Work during fiscal year 1966 also included development of new courses for instruction in planning shelters and protective construction. Certified fallout shelter analysts were kept informed of the latest techniques in radiation shielding and OCD policies and plans.

University projects.—These projects were conducted through contractual arrangements with various universities and included:

1. Architectural and engineering development centers.—Established in fiscal year 1965, these centers completed their first full year of operation during fiscal year 1966. They are located at the Universities of Colorado, Florida, and Washington, and at Pennsylvania State University, Purdue University, San Jose

State College, Texas Agricultural and Mechanical University, and Worcester Polytechnic Institute. The program of each University Architectural and Engineering Development Center is an activity designed to integrate all the technical capabilities of the institution to serve civil defense requirements.

2. Student fellowships.—During fiscal year 1966, the OCD, in cooperation with the American Society for Engineering Education, announced the establishment of graduate student fellowships for study of radiation shielding and architectural designs related to radiation protection. All students awarded these fellowships will study under the direction of faculty members certified by the OCD as instructors in fallout shelter analysis. The fellowships are designed to stimulate the interest of outstanding graduate students and to encourage them to specialize in studies of interest to civil defense.

3. Faculty development.—A total of 116 faculty members from 40 architectural and engineering schools participated in faculty development activities during fiscal year 1966. This increased to 150 the net number of institutions eligible to conduct fallout shelter analysis and design courses and to 381 the number of qualified instructors at these institutions. Six summer institutes on nuclear defense design were conducted with the cooperation and support of the American Society for Engineering Education, the Association of Collegiate Schools of Architecture, the Engineers Joint Council, the American Institute of Architects, and other technical and professional societies. At Denver, Colo., preceding the national convention of the Association of Collegiate Schools of Architecture and the American Institute of Architects, the University of Colorado conducted a meeting of deans and department heads of architectural schools. In May 1966, about 30 deans of engineering schools participated in a civil defense symposium at Pennsylvania State University.

Technical information and design competition.—Eight new technical publications on protective construction were issued during fiscal year 1966, making a total of 46 distributed on this subject. In addition to disseminating technical information through professional advisory service and publications, the OCD accomplished much of this work through seminars and symposiums.

Through fiscal year 1966 contractual arrangements, the OCD developed automatic data processing methods for evaluating the effectiveness of incorporating fallout protection in proposed building designs. These methods will enable the OCD to disseminate technical information on slanting techniques more rapidly and effectively to architects and engineers engaged in designing new buildings.

During fiscal year 1966, the American Institute of Architects (AIA) conducted the third nationwide fallout shelter architectural design competition for the OCD. Results of this competition will be included in a publication of the award winning designs incorporating dual-use public fallout shelter space in community center facilities.

A student architectural design competition was cosponsored by the OCD and the Brooklyn Chapter of the AIA. The competition featured the incorporation of dual-use public fallout shelter in a community center at a specific site in a residential area of Brooklyn, N.Y., and architectural students from the entire New York City area were eligible to participate.

Complementary Civil Defense Systems

Complementary civil defense systems are essential to preattack planning and postattack operations and help make possible the effective use of fallout shelters. Functionally, these systems are civil defense alerting and warning, communications, monitoring and reporting, and damage assessment.

Civil Defense Alerting and Warning

The alerting of Federal agencies and State governments to developments that require actions to strengthen the Nation's readiness posture is a responsibility of the Office of Civil Defense. As a part of military or civil defense exercises, or separately, procedures established for this purpose are tested quarterly at the regional level and at least weekly at the national level.

Under OCD policy control, the U.S. Army Strategic Communications Command (USASTRATCOM) maintains, operates, and tests Federal warning systems designed to disseminate warning to strategic points from which State and local governments are responsible for warning the public. The National Warning System (NAWAS) serves the continental United States, including Alaska. From 3 USASTRATCOM-continental U.S. National Civil Defense Warning Centers, continuously manned and operated by attack warning officers, warnings can be sent to OCD regional offices and to 761 warning points. The primary National Warning Center is at the Combat Operations Center of the North American Air Defense Command (NORAD), Colorado Springs, Colo. Alternate ones are located at Federal centers at Denton, Tex., and near Washington, D.C. Using a special voice communications system, they can directly and simultaneously alert the OCD regional offices and the 761 warning points within a few seconds. These warning points are at key Federal locations and in State capitals and numerous other cities from which warnings can be sent to the public via State and local warning systems. Hawaii, American Samoa, Guam, Puerto Rico, and the Virgin Islands are served by separate warning systems.

Improvements during fiscal year 1966 included the addition of 76 warning points to NAWAS, making a total of 761. Of these, 57 are at U.S. Weather Bureau stations. Direct access to Weather Bureau stations on NAWAS is significant for two reasons: (1) It augments the coverage, since the Weather Bureau is prepared to disseminate attack warning information over its communication systems; and (2) it provides an immediate source of severe weather information to all levels of civil defense.

Installation of duplicate NAWAS equipment or extensions in local emergency operating centers that provide fallout protection made it unnecessary to use Federal funds to provide fallout protection for many warning points. By the end of fiscal year 1966, 69 extensions or alternate warning points of this type had been installed.

At the end of fiscal year 1966, the analysis of a proposed radio warning system was underway; preliminary studies for its development were completed in fiscal year 1965.

Communications

Communications systems of primary interest to the OCD are those required for conducting civil defense operations and for addressing the public during emergencies. Under OCD policy control, USASTRATCOM is responsible for maintenance and operation of civil defense communications systems at the Federal level.

The Civil Defense Telephone and Teletype System (NACOM 1) is the primary system for transmitting OCD operational communications. It is designed for the speed, flexibility, and continuity of service required for civil defense emergency communications between OCD national and regional headquarters and between OCD regional headquarters and State civil defense offices. Trunkline circuits of the Department of Defense Automatic Voice Network are used for NACOM 1 connections between OCD national and regional headquarters. Leased

full-time private lines for voice and teletype transmissions are used for communicating between OCD regional and State civil defense offices. NACOM 1 connections also extend to emergency relocation sites of selected Federal agencies and can be interconnected with commercial as well as military and other Federal teletype communications systems.

Improvements to NACOM 1 during fiscal year 1966 included the installation of (1) transmission facilities for conducting voice conferences between OCD headquarters and all its regional offices, (2) facsimile communications equipment at OCD national and Region Five headquarters, and (3) teletype circuits to provide a rapid means of communication between the four Canadian and the four U.S. regional offices that represent areas adjoining the boundary line between the two countries.

The Civil Defense Radio System (NACOM 2), the backup system of NACOM 1, is a high frequency radio network for transmission of voice, code, or radio-teletype messages. During fiscal year 1966, NACOM 2 was extended to 13 additional States, making it operational at 37 State installations, the District of Columbia, Puerto Rico, and the Canal Zone. Contractual arrangements were made to extend its operations to 8 additional States.

The Emergency Broadcast System (EBS), designed for communicating with the public during civil defense emergencies, is managed by the Federal Communications Commission to meet requirements of the White House, the Office of Emergency Planning, and the Office of Civil Defense. The OCD continued to help selected EBS radio stations in making preparations for remaining operational under civil defense emergency conditions. At the end of fiscal year 1966, of the 2,547 EBS stations, 587 had signed agreements to participate in this effort, a net increase of 47 during fiscal year 1966. Of the 587 participating stations, 370 had completed construction for fallout protection, and 269 of the 370 had also provided required equipment.

Radiological Monitoring and Reporting

A controlling influence on all aspects of civil defense emergency operations would be the extent, intensity, and duration of radioactive fallout hazards following a nuclear attack. Basic to rendering sound decisions for conducting these operations is the collection, evaluation, and dissemination of this information to all levels of government. A nationwide radiological monitoring system has been designed for this purpose. Major operational elements of this system include radiological monitoring staff and equipment in public fallout shelters and at strategically located monitoring sites, as well as personnel at emergency operating centers to process and evaluate the data, and personnel and facilities to maintain and calibrate radiation instruments.

A grand total of 58,062 Federal, State, and local radiological monitoring stations was operational by the end of fiscal year 1966. This included 10,206 Federal and 47,856 State and local stations. The net gain for the year was 2,888 State and local stations.

Radiological defense instruments distributed during fiscal year 1966 totaled more than 263,000, making a cumulative total of over 3.2 million. This included (1) those in operational sets furnished to monitoring stations and those in radiation sets issued for use in public fallout shelters, (2) more than 1.6 million dosimeters and more than 71,000 dosimeter chargers for use by emergency civil defense workers, and (3) instruments issued to State and Federal agencies for training and other purposes, including nearly 95,000 maintenance and calibration instruments issued to States.

At the end of fiscal year 1966, the OCD had established a federally funded inspection, maintenance, and calibration program in 48 States, the District of Columbia, and Puerto Rico..

Damage Assessment

The OCD Damage Assessment System is designed to provide certain information on resources that would be necessary in carrying out survival and recovery actions following nuclear attack. Damage assessment systems would be needed to provide readily available information upon which to base decisions for conducting emergency operations.

Some major developments and accomplishments in damage assessment and related planning during fiscal year 1966 included:

1. A cost effectiveness study of possible alternative shelter programs.—A comparison of their damage-limiting capabilities for various combinations of hypothetical attacks produced information basic to making civil defense policy decisions and for use in civil defense operational planning.

2. Distribution of manual damage assessment aids.—Instructions for using the Lattice Assessment Program (LAP) and associated materials were completed and made ready for distribution. LAP is a rapid method for manually estimating postattack damage to resources in standard metropolitan areas.

3. Postattack population estimates.—Under OCD sponsorship, the Bureau of the Census completed development of a statistical sampling technique for post-attack use to obtain estimates of the postattack population of each State and OCD region as well as of the entire Nation.

4. Inventory of chemical and biological laboratories by the U.S. Public Health Service.—Data obtained from this work will be used to develop a network of epidemiological laboratories for use in postattack diagnostic work.

5. Collection of data on electric power industry.—In its periodic survey of this industry, the Federal Power Commission included several items of information for use in postattack damage assessment.

6. Progress in data processing.—The fabrication of an electronic scanning system was approximately 75 percent complete by the end of fiscal year 1966. This system will automatically translate data from original documents of special design into machine readable form and store them on magnetic tape.

7. Vulnerability analysis of municipal water systems serving large metropolitan areas.—A pilot study of selected cities was started to test the feasibility of using automatic data processing equipment for conducting damage assessment studies of major water supply systems.

8. Survival resources planning activities.—The Office of Civil Defense continued to work with the Office of Emergency Planning, other Federal agencies, and State and local civil defense organizations to provide State and local governments with guidance on plans for postattack distribution, use, and conservation of secondary resources; e.g., retail stocks, intra-State wholesale stocks used to meet essential needs within a State, and resources which, by arrangements between Federal agencies and the States, would be subject to local and State control.

Federal Assistance Programs and Activities

Federal assistance to State and local governments is available directly or indirectly in support of practically every element of the civil defense program. Development of the nationwide fallout shelter system, complementary civil

defense systems, and community shelter planning are examples of Federal assistance. Other major forms of Federal assistance are covered in this part of the report.

Technical Assistance and Guidance

Comprehensive guidance on management and control of State and local civil defense was provided by the OCD through the use of annual program papers and the dissemination of information obtained from them and from other sources. Policy and operational guidance was supported by publications and knowledge derived from a series of system development projects. Additional technical assistance and guidance were provided through readiness exercises and several other procedures and arrangements designed to help State and local governments develop and strengthen their civil defense programs.

In addition to the 50 States, more than 4,000 local governments, covering about 89 percent of the national population, submitted annual program papers and related semiannual progress reports in fiscal year 1966. As a prerequisite to obtaining Federal matching funds and surplus property donations for civil defense, each political subdivision must submit these documents. The preprinted program paper contained the specific activities and elements of a balanced civil defense program, with appropriate provisions for reporting on each item quantitatively. In December 1965, the participating local governments were provided a computer-prepared form to simplify reporting of semiannual progress. This form was used to supply information previously reported so that only updating action was needed to make the report entries before returning the form. In May 1966, local governments again were furnished a computer-processed form to be used for reporting on the program progress for the last half of fiscal year 1966 and the planned program for fiscal year 1967.

During fiscal year 1966, the major elements of an Integrated Management Information System (IMIS) were established, using electronic computers. Operation of the IMIS is based primarily upon data obtained from the local program papers discussed in the preceding paragraphs, but other civil defense data are also included. The primary purpose of IMIS is to provide information for program management at Federal, State, and local levels.

Supplemented by individual contacts and group briefings, the *Federal Civil Defense Guide*, with publications keyed to it, remained the principal means of furnishing Federal agencies and State and local governments with guidance on policy and operational procedures pertaining to the civil defense program.

During fiscal year 1966, the OCD, through contractual arrangements, continued a series of emergency operations systems development projects designed to develop realistic civil defense systems in support of effective shelter usage and emergency operational procedures.

Other means used to provide technical assistance and guidance included: (1) Preparations for nationwide civil defense readiness exercises scheduled for participation by governments at all levels; (2) continued use of military Standby Reserve officers in local civil defense; (3) contractual arrangements for American National Red Cross advisory services; (4) continuation of an agreement with the National Defense Transportation Association (NDTA) that helped local governments gain the help of local NDTA chapters in civil defense efforts; and (5) initial offer of technical guidance to State and local organizations in developing a generalized automatic data processing system for managing civil defense operations.

Training and Education

Key Federal, State, and local civil defense personnel and others trained at the OCD Staff College, Battle Creek, Mich., and at two OCD schools that were closed early in the year totaled 2,877 for fiscal year 1966, making a grand total of 28,715 graduates since fiscal year 1960.

A total of 53,198 State and local personnel participated in civil defense training administered through the Civil Defense University Extension Program (CDUEP) during fiscal year 1966. This increased to 133,183 the total number of participants in this program since its inception in fiscal year 1963. A total of 32,450 State and local officials and other community leaders were briefed on civil defense at CDUEP conferences in fiscal year 1966. Instructors trained through the CDUEP conferences in fiscal year 1966. Instructors trained through the CDUEP included 1,867 in shelter management, 3,043 in radiological monitoring, and 60 who received refresher training in radiological monitoring.

Key staff personnel trained through the CDUEP during fiscal year 1966 totaled 2,960 in civil defense management, 1,095 as radiological defense officers, 8,147 as shelter managers, and 3,576 as radiological monitors.

During fiscal year 1966, 25,902 radiological monitors were trained through the Civil Defense Adult Education Program (CDAEP), and 4,535 were trained by the U.S. Continental Army Command (USCONARC). The USCONARC also trained more than 10,000 State and local police in explosive ordnance reconnaissance and more than 3,500 for dealing with explosive and sabotage devices.

In the field of public education, the CDAEP trained 354,078 students and teachers in the 12-hour personal and family survival course, making a cumulative total of 1.5 million. Medical self-help training, under a program developed for the OCD by the U.S. Public Health Service in cooperation with the American Medical Association, was provided for more than 1.7 million persons, making a cumulative total of approximately 3.6 million reported by the U.S. Public Health Service to have completed this training. Including more than half a million additional persons informally exposed to medical self-help training through television and other media, an estimated 4.2 million have benefited from this training.

OCD contractual arrangements with the Field Extension Service of the U.S. Department of Agriculture continued to bring civil defense information and education to people in rural areas and in cities of less than 10,000 population. During fiscal year 1966 this program featured rural civil defense information on more than 9,000 television and radio broadcasts, in more than 4,000 exhibits, and in 2.5 million copies of publications distributed in rural communities. Approximately 57,000 leaders from rural communities participated in rural civil defense training and briefings. Subsequently, by working through Home Demonstration Clubs, 4-H clubs, and other organizations in rural communities, these leaders helped bring civil defense information and education to approximately 1.1 million persons in fiscal year 1966.

Training and education activities included: (1) Work with national education organizations and contractual arrangements that resulted in production of civil defense publications; (2) development and production of training materials; and (3) development of plans for integrating local civil defense training into various local training activities.

Financial Assistance

In accordance with the Federal Civil Defense Act of 1950, as amended, the OCD provided about \$23.9 million to State and local governments during fiscal year 1966. Of this amount, approximately \$4.5 million was obligated for emer-

gency operating centers, more than \$4.0 million for civil defense supplies, equipment, and training, and about \$15.4 million for personnel and administrative expenses. In addition, \$34,512 was used for partial reimbursement of travel and per diem expenses for students attending OCD schools. As a result of this program, course completion certificates totaled 520 for the year.

Surplus Property

Since authorized by Public Law 655, 84th Congress, property having an acquisition value of approximately \$347.4 million has been transferred to State and local governments for use in civil defense. Federal surplus property with an original acquisition cost of \$38.7 million was donated to State and local governments in fiscal year 1966.

Emergency Supplies and Equipment Inventory

Principal components of the emergency supplies and equipment inventory are forty-five 10-mile units of engineering equipment maintained by the OCD for local use to pump water during natural disaster or postattack operations. During the year engineering equipment was loaned to 24 States for use in 91 communities to help overcome drought or flood disasters. Total value of the inventory was approximately \$7.5 million at the end of fiscal year 1966.

Research

For continued development of the national civil defense program on a sound basis, the OCD relies heavily upon information gained through research. Finding and evaluating alternative solutions to various civil defense problems is a major goal of this work. The net effect is a flow of information that is used to make decisions for planning and conducting the civil defense program. This information is also used to improve operational systems and to develop more economical hardware and more effective procedures for its use.

Contractual arrangements with government and private organizations are the principal means of carrying out OCD research. The substantial progress achieved during fiscal year 1966 reflects the care used in selecting potentially productive studies of greatest promise and contractors of proven competence. The percentage of funds committed to various research groups during fiscal year 1966 and the four preceding years was:

	Percent	
	Fiscal years 1962-65	Fiscal year 1966
Department of Defense (DoD).....	19.5	15.3
Federal agencies exclusive of DoD.....	15.6	11.0
Educational institutions.....	3.3	9.0
Private organizations, including industrial laboratories, research institutes and foundations, and quasi-Govern- ment agencies.....	56.6	64.7
Total.....	100.0	100.0

The \$10 million programed for research during fiscal year 1966 was distributed among projects conducted under four major functional categories of research and under management and support services. These services, of a technical advisory nature, were obtained from lead laboratories under contract to assist in managing selected areas of research. The percentage of funds programed for major research categories and services was:

	<i>Percent</i>
Shelter	28.1
Support systems	21.5
Postattack	20.1
Systems evaluation	24.5
Management and support services	5.8
Total	100.0

The latest scientific research information applicable to planning and operating the civil defense program is obtained from each major research category. In addition, research in each functional category is designed to contribute data for the long-term exploration of potential advantages of possible alternative civil defense systems.

A major research effort, started in fiscal year 1965 and continued during fiscal year 1966, is expected to provide guidance in setting future research requirements and priorities as well as to improve methods of analyzing attack effects and civil defense planning. This research includes detailed examination of hypothetical attack effects and effectiveness of civil defense countermeasures. Certain assumed attacks on five selected urban localities are used as a source of technical data that are accumulated through coordinated projects conducted in each of the four functional research categories.

Supporting Activities

The general public and local communities, as well as industry and labor, and national organizations, are among the important participants in the civil defense program. The support of national and community organizations and resources and the efforts of individual citizens are needed to develop and maintain effective civil defense capabilities of Federal, State, and local governments. Some of the activities that help to achieve the required understanding and support are discussed in the ensuing paragraphs; other activities of this nature include liaison with technical and scientific organizations, international activities coordinated with the Department of State, and functions covered by contractual arrangements with the American National Red Cross.

Public Information

Providing the public with authoritative information in times of emergency would require coordinated action of Federal, State, and local governments. Basic plans call for use of NACOM 1 or NACOM 2 and the EBS for this purpose, but other means and systems would also be used, as practicable. Experience in disseminating information during major disasters proved helpful to civil defense information personnel at the OCD as well as at State and local offices. Prime examples were the information activities conducted during Hurricane Betsy in September and the northeast power blackout in November 1965.

Informational support of CSP projects conducted during fiscal year 1966 provided opportunities for improving emergency information procedures. In support of the HFPS in Rhode Island, the OCD assisted State and local officials

in launching and publicizing the project to gain public support. This provided additional opportunities for acquainting the public with emergency survival information. Also, in accordance with OCD contractual arrangements, the U.S. Civil Defense Council developed a pilot emergency information workshop to help local civil defense directors strengthen their emergency information capabilities.

The OCD continued to develop policies, activities, and program materials designed to gain maximum support for civil defense at the community level. During fiscal year 1966, the OCD placed increased emphasis on providing guidance for community organizations in developing and applying their resources to support civil defense, especially in community shelter planning. The OCD maintained liaison with Federal officials and agencies for this purpose and worked with selected agencies, associations, and organizations to achieve and maintain their voluntary support.

Guidance for community organizations and local governments on the use of available resources for civil defense was provided in a series of publications started in fiscal year 1964. *Committees for Community Shelter Planning*, H-11-B, was added to this series in fiscal year 1966. It is designed to help civil defense directors in CSP areas to organize and work with two required elements of their organizations: CSP policy councils and technical advisory committees. Another addition to this series was Volume 3 of *Meetings That Move*, H-11-3. It includes information on warning, emergency communications, and emergency operating centers, and a section on communicating ideas. Volumes 1 and 2 of the same title were published in fiscal year 1965 and cover the use of workshops and related activities to enlist support of community organizations. Other publications in this series are *Community and Family Service for Civil Defense*, H-11, and *Community Involvement in Civil Defense*, H-11-A. More than 500,000 copies of publications in this series were distributed in fiscal year 1966, making a cumulative total of nearly 1.4 million. The OCD also participated in the policy review and development of eight field guidance manuals and other publications involving community relations.

Other issuances of published materials included OCD Information Bulletins, used to transmit statements on civil defense and related military policy, and articles on civil defense prepared or reviewed for publication in newspapers, magazines, and encyclopedias.

New motion pictures released during fiscal year 1966 were: *The A+ School*, featuring the incorporation of slanting techniques in the design and construction of a building; *Memorandum to Industry*, the major OCD motion picture documentary on the civil defense preparation of industry; *The Face of Disaster*, showing how community welfare services were helpful during major disasters such as the Alaskan earthquake of 1964 and the 37 tornadoes which struck in the Midwest on Palm Sunday, 1965; and *The Five Days of Betsy*, covering disaster operations associated with one of the most devastating hurricanes experienced in a decade. The Army Pictorial Center reported that 14,425 requests were received for OCD motion pictures during fiscal year 1966. Of 3,780 military and civilian films, the OCD film *About Fallout* was thirty-first in the number of showings requested; the OCD film *One Week in October* was fortieth.

An estimated 25 million persons learned about civil defense from OCD exhibits during fiscal year 1966. Posters depicting civil defense subjects were shown by transit advertisers throughout the country. Several radio programs featured civil defense on nationwide networks, and spot announcements on civil defense were made available to both radio and television stations.

Industrial Participation

The OCD continued to furnish managers of industrial and commercial enterprises with information and guidance on civil defense preparations in their facilities. The OCD also worked in liaison with Federal agencies and industry to help business and commercial establishments achieve their civil defense objectives. Leadership and guidance were extended to 21 Federal agencies that have been assigned responsibilities by Executive orders for promoting industrial facility preparedness programs. These agencies continued to develop and disseminate civil defense information and guidance materials adapted to the needs of those industries with which they conduct business regularly. Many business and industrial firms continued to publish civil defense information in their magazines and other news media.

Publications, motion pictures, and exhibits were widely used to disseminate civil defense information during fiscal year 1966. Approximately 400,000 copies of civil defense publications applicable to business and industry were distributed through Federal agencies, State and local civil defense offices, business and industrial firms, and national professional and trade associations. A new publication, *Iron and Steel—Industrial Defense Planning*, was distributed in fiscal year 1966. About 62,000 copies were sent mainly to managers of iron and steel facilities. Prepared by the American Iron and Steel Institute in cooperation with the Department of Commerce, Business and Defense Services Administration, and the OCD, it replaced a similar booklet issued in 1954. Another publication distributed for the first time was *Civil Defense Preparedness in the Electric Power Industry*. The Defense Electric Power Administration of the Department of the Interior prepared this 120-page publication in cooperation with the OCD, and more than 30,000 copies were sent to electric power facilities. The documentary motion picture film, *Memorandum to Industry*, was completed for use by local civil defense directors and industrial civil defense coordinators to illustrate civil defense preparations made by some nationally known firms. About 27,000 reproductions of a table-top exhibit, *Industry Prepares for Emergency Operations*, were produced and distributed.

During fiscal year 1966, approximately 5,600 business, professional, and civic leaders obtained civil defense guidance and information through conferences, seminars, and training sessions conducted primarily for civil defense purposes. The OCD continued to work with major national organizations in disseminating civil defense information and guidance to industry. More than 7,000 senior military officers and key civilian leaders, who attended national security seminars conducted by the Industrial College of the Armed Forces in 13 cities, obtained civil defense material provided by the OCD. Courses conducted for executives in government and industry by the U.S. Army Military Police School, Fort Gordon, Ga., continued to provide civil defense guidance materials.

The OCD conducted negotiations with more than 100 multiplant firms to encourage them to adopt corporate fallout shelter policies favorable to expanding and strengthening the nationwide public fallout shelter system. During fiscal year 1966, major firms in most categories of industry and business continued to cooperate with the OCD in these activities. Consequently, licensed public fallout shelter space in industrial establishments was increased, as was also the inclusion of dual-use shelters in new or modified construction.

Labor Support

The American Federation of Labor and Congress of Industrial Organizations (AFL-CIO) reaffirmed support of the civil defense program on December 14,

1965, when the Sixth Constitutional Convention of the AFL-CIO Council adopted Resolution No. 186, civil defense and emergency planning. The New Hampshire State AFL-CIO, the West Virginia State AFL-CIO, and the New Jersey State Building and Construction Trades Department of the AFL-CIO also adopted resolutions in support of civil defense during fiscal year 1966.

Announcements of the new OCD training courses available to AFL-CIO or independent unions for their leadership groups were carried in the monthly journal of the Building and Construction Trades, sent to 3.5 million members, and in the *AFL-CIO News*, mailed to 85,000 key labor officials. The International Labor Press Association of America also sent the announcement to 500 major international, national, State, and local papers.

Many labor organizations and leadership groups throughout 17 States completed the 1¼-hour course, labor's supporting role in State, county, and local civil defense. Based on a questionnaire survey of 3,100 key labor leaders who participated in the course, revised course material was prepared by the OCD for use when the original supply has been exhausted. Several leadership groups completed the 1¼-hour course, labor and the postal worker in civil defense. Plans were also under consideration for offering the 3-hour course, labor's supporting role in national, State, and local civil defense at Labor Extension Divisions of the Universities of California, Minnesota, Missouri, and Ohio. In Puerto Rico, 200 labor leaders completed the course.

Labor organizations supplied free manpower and technical skill to alleviate disaster conditions in many sections of the Nation. Participation in disaster operations following Hurricane Betsy in September 1965 was an outstanding example. In the devastated areas of Louisiana and neighboring regions, more than 3,000 union members provided volunteer emergency help. Many labor organizations made their union halls available for emergency use. Financial donations in support of disaster victims totaled more than \$140,000. The effectiveness of the emergency assistance was enhanced by the mutual efforts of the American National Red Cross and the AFL-CIO.

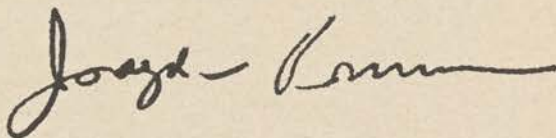
At the AFL-CIO Union-Industry Show, Baltimore, Md., April 29-May 4, 1966, OCD exhibit and program material was displayed to an audience of 203,000 people. The AFL-CIO Public Relations Department featured civil defense in a program that was broadcast over 16 major radio stations of the American Broadcasting Co. network.

Concluding Statement

In discussing the complex subject of defensive systems against nuclear attack, President Johnson has stated:

"It is already clear that without fallout shelter protection for our citizens, all defense weapons lose much of their effectiveness in saving lives. This also appears to be the least expensive way of saving millions of lives, and the one which has clear value even without other systems."

A fallout shelter-oriented civil defense program is a fundamental element in the damage limitation structure of strategic national defense. Active offensive and defensive systems are designed to deter enemy attack or, if this should fail, limit the damage, especially from the immediate weapons effects. The fallout shelter-oriented civil defense program is designed to complement this by providing protection against the radioactive fallout which would result if such an attack were to occur.

A handwritten signature in dark ink, appearing to read "Joseph Romm", with a long, sweeping horizontal line extending to the right.

JOSEPH ROMM,
Acting Director of Civil Defense.

Annual Report
of the
SECRETARY OF THE NAVY
July 1, 1965, to June 30, 1966

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1. The Mission of the Department of the Navy

The mission of the Department of the Navy is to develop and maintain Navy and Marine Corps forces in constant readiness as a powerful, flexible, and economical instrument of national policy.

Purpose of Naval Forces

Forces of the Navy and Marine Corps constitute the maritime elements of national military strength which are maintained and employed, in conjunction with the other armed forces of the United States, for the following purposes:

1. To support and defend the Constitution of the United States against all enemies, foreign and domestic.
2. To insure the security of the United States, its possessions, and areas vital to its interests by timely and effective military action.
3. To uphold and advance the national policies and interests of the United States.
4. To provide assistance in civil defense as an additional task and, as feasible at the time, with forces not required for essential military operations.

Primary Functions of Naval Forces

The Navy and Marine Corps contribute to the support of national policy by providing to the Secretary of Defense and the Joint Chiefs of Staff suitable active combatant forces in the highest possible state of sustained readiness to perform three broad missions, namely:

1. The prevention of general war and the effective execution of such naval operations as may be essential to a favorable outcome for the United States should failure of deterrent measures lead to general war.
2. Prompt, controlled naval reaction in response to limited warfare contingencies and insurgencies in order to protect U.S. interests, stabilize critical political conditions, and forestall the outbreak of hostilities, if possible; or to take such positive and forceful counter-measures against armed forces—regular or irregular—as may be necessary to effect their containment or destruction, in order to achieve the earliest possible restoration of stability to the conflict areas and to implement national policy as may be directed by the President.

3. Preparedness to exploit the ocean environment, control the seas, and to project U.S. power as a readily usable and effective contribution to the total national power. This implies that naval power must be freely adaptable to being used as an integral and independent force, to being used as a component of a unified military force, and to being used in support of other forces.

The principal functions and tasks of the Navy and Marine Corps which stem from the above missions are prescribed by various Executive orders and by statutory regulations pertinent to the organization of the Department of Defense. These functions are summarized below:

1. To organize, train, and equip Navy and Marine Corps forces for the conduct of prompt and sustained combat operations at sea, such operations to include those designed to seek out and destroy enemy naval forces, to suppress enemy sea commerce, to gain and maintain general naval supremacy, to control vital sea areas and protect sea lines of communication, to establish and maintain local sea and air superiority in an area of naval operations, to seize and defend advanced naval bases, and to conduct such land and air operations as may be essential to the prosecution of a naval campaign.

2. To provide Fleet Marine Forces of combined arms for service with the fleet in the seizure and defense of advanced naval bases and for the conduct of such land and air operations as may be essential to the prosecution of a naval campaign; and to provide security forces for the protection of naval property at naval bases.

3. To organize, equip, and provide naval forces for the conduct of amphibious operations. Operating within guidelines defined by the Joint Chiefs of Staff, and in accordance with procedures for inter-Service coordination of joint actions, the Navy exercises responsibility for amphibious training of all forces assigned to joint amphibious operations and acts as the primary agency in developing doctrines and procedures for joint amphibious operations. Similar provisions establish the Marine Corps as primary agency for development of landing force tactics, techniques, and equipment for amphibious operations.

4. To furnish adequate, timely, and reliable intelligence for the Navy and Marine Corps.

5. To organize, train, and equip naval forces for naval reconnaissance; antisubmarine warfare; protection of shipping, minelaying, including the air aspects thereof; and controlled minefield operations.

6. To provide air support essential for naval operations.

7. To provide sea-based air defense and the sea-based means for control of defenses against air attack.

8. To provide naval forces as required for the defense of the United States against air attack, in accordance with the doctrines established by the Joint Chiefs of Staff.

9. To furnish aerial photography as necessary for Navy and Marine Corps operations.

On all matters of joint concern, the Navy and Marine Corps coordinate with the other Services.

II. Programs and Expenditures

Programs

Department of the Navy programs for fiscal year 1966 totaled \$19.5 billion in direct obligational authority. Approximately 93 percent of this amount, or \$18.1 billion, was concentrated in three programs: General purpose forces (67 percent), general support (20 percent), and research and development (6 percent). In terms of the Department of Defense programing system classifications, program allocations for fiscal year 1966 as compared with fiscal year 1965, were as follows:

TOTAL DIRECT OBLIGATIONAL AUTHORITY

Program	Amount (millions)		Percent	
	Fiscal year 1965	Fiscal year 1966	Fiscal year 1965	Fiscal year 1966
Strategic Retaliatory Forces-----	\$911. 7	\$756. 7	6. 0	3. 9
Continental Air and Missile Defense Forces-----	66. 8	7. 4	. 4	(¹)
General Purpose Forces-----	9, 421. 8	12, 996. 7	62. 5	66. 5
Airlift and Sealift Forces-----	53. 6	140. 9	. 4	. 7
Reserve and Guard Forces-----	398. 4	563. 3	2. 6	2. 9
Research and Development-----	1, 097. 9	1, 182. 3	7. 3	6. 1
General Support-----	3, 136. 9	3, 880. 5	20. 8	19. 9
Total-----	15, 087. 1	19, 527. 8	100. 0	100. 0

¹ Less than $\frac{1}{10}$ of 1 percent.

Expenditures

Expenditures in fiscal year 1966 approximated \$16 billion. These expenditures by broad purposes or functions, compared with fiscal year 1965, are as follows:

EXPENDITURES BY FUNCTIONAL TITLE

Title	Amount (millions)		Percent	
	Fiscal year 65	Fiscal year 66	Fiscal year 65	Fiscal year 66
Military Personnel.....	\$4,021	\$4,639	30.0	28.9
Operation and Maintenance.....	3,370	4,057	25.1	25.3
Research, Development, Test and Evaluation.....	1,294	1,407	9.7	8.8
Major Procurement.....	4,933	5,237	36.8	32.8
Military Construction.....	252	452	1.9	2.8
Revolving and Management Funds.....	-470	233	-3.5	1.4
Total.....	13,399	16,026	100.0	100.0

In fiscal year 1966, operation and maintenance costs plus military pay accounted for more than half of the expenditures. Research, development, test, and evaluation expenditures were concentrated primarily on aircraft, missiles, ships, and small craft; equipment related to these major end items; and basic research in the field of military science. Remaining expenditures were largely for the acquisition of new assets such as ships, aircraft, missiles, and major construction.

The Revolving Fund transactions for the year reflect expenditures in excess of receipts for operations of the Navy Stock Fund (\$137 million) and the Navy Management Fund (\$154 million). A large volume of orders were received late in fiscal year 1966 as a result of the supplemental appropriation and the reprogramings of funds to support Southeast Asia operations.

III. Navy and Marine Corps Operations

The conflict in Vietnam continued to be the major focal point for Navy and Marine Corps operations. Requirements in Southeast Asia placed an increasing load on existing resources of the Pacific Fleet and the Fleet Marine Force, Pacific, requiring the activation of additional units and the temporary deployment or rotation of additional ships and units from the Atlantic Fleet to the Pacific. At the same time, the Atlantic Fleet had to support its NATO commitments and maintain overall fleet readiness to meet contingency situations.

The Navy and Marine Corps have continued to demonstrate rapid, controlled response to contingencies and the staying strength of sea power. The operations, exercises, accomplishments, and developments described in the following paragraphs are not all-inclusive, but are representative of the wide range of activities of the Navy-Marine Corps team.

Employment of Forces

The 909 ships of the active Navy list were distributed primarily among four numbered fleets. The First and Second Fleets operated from the west and east coasts of the United States, respectively, and were engaged primarily in maintaining ready forces for the defense of the continental United States and for contingency situations, and in the training and preparation of ships and units for oversea deployment. The 50 ships of the Sixth Fleet operated in the Mediterranean Sea in readiness for quick response to potential trouble areas. The Seventh Fleet, with 210 ships, was concentrated in the South China Sea but maintained a capability to react to situations elsewhere in the Western Pacific and the Indian Ocean.

The primary striking forces of these fleets were built around the attack aircraft carriers, five of which were deployed in the Seventh Fleet and two in Sixth Fleet for the entire year. Additional deployed ships provided anti-air, antisubmarine, and logistic support capabilities to these two fleets.

An amphibious assault force, with a Marine Battalion Landing Team embarked, was deployed as a regular component of the Sixth Fleet and engaged in amphibious landing exercises in the Mediterranean on the average of once each month. A portion of the Second Fleet amphibious force was maintained in the Caribbean area to respond to contingency situations. Marine assault forces in the Sixth

and Second Fleets were provided by the 2d Marine Division and 2d Marine Air Wing. An additional infantry battalion of the 2d Marine Division was maintained ashore at Guantanamo Bay, Cuba, for base security and defense.

In the Pacific, the Marine Special Landing Force, an integral part of the Seventh Fleet, was employed repeatedly in amphibious landings in South Vietnam. This force is a part of the 9th Marine Amphibious Brigade, which is the Pacific Command Reserve for contingency operations in the Western Pacific.

Marine Corps combat forces in Vietnam, which comprise the III Marine Amphibious Force, increased to a year-end strength of 55,000 personnel including the entire 1st and 3d Marine Divisions and the 1st Marine Air Wing (Reinforced).

One force flagship and two destroyers were maintained in the Persian Gulf area as the Middle East Force.

Under an agreement between the Treasury and Navy Departments, transfer of the Navy's five icebreakers to the Coast Guard was commenced in December 1965. Coast Guard operation of the icebreakers has continued to be responsive to Navy requirements as well as to the requirements of commerce and the needs of national research programs.

Tempo of Operations

Activation of some 43 ships in the Navy and National Defense Reserve Fleets was ordered during fiscal year 1966 to augment the Pacific Fleet. These ships included one fleet oiler, two attack cargo ships, 17 tank landing ships, three gasoline tankers, 16 utility landing craft, three rocket, medium landing ships, and one inshore fire support ship. In addition, various ships and units from the Atlantic Fleet were temporarily deployed, rotated, or otherwise assigned to the Pacific Fleet (one attack carrier, one antisubmarine warfare carrier, eight destroyers, one ammunition ship, one landplane patrol squadron plus a relatively small number of other type aircraft assets, i.e., transports, airborne electronic warfare, and some attack and fighter aircraft).

The average percent of time underway of all ships assigned to the Pacific Fleet was 40 percent. For Seventh Fleet the averages were 65 percent for all ships and 75 percent for attack carriers assigned.

The average percent of time underway for all ships assigned to the Atlantic Fleet was 30 percent. For the Sixth Fleet the averages were 50 percent for all ships (including attack carriers) and 57 percent for submarines.

For the majority of ships in both the Atlantic and Pacific Fleets, the length of deployments increased and the amount of time between such deployments decreased in fiscal year 1966. As an associated matter,

the underway time increased and the time spent in home ports decreased for ships in all Fleets. Pacific Fleet units were affected more in this manner than those in the Atlantic Fleet and carriers, destroyers, and logistic support ships were generally affected more than other types in each Fleet.

Southeast Asia

As the weight of the overall U.S. effort in Southeast Asia increased during the year, the naval effort increased apace.

Three of the five deployed attack carriers were maintained almost continuously on the line and engaged daily in air strikes against military targets and lines of communication in North and South Vietnam. Carrier-based aircraft of Task Force 77 flew a total of more than 100,000 day, night, and all-weather air strike and support sorties. Of these, some 69,000 were attack sorties and included about half of all U.S. attack sorties in North Vietnam. During the same period, shore-based Marine aircraft flew more than 43,000 attack and supporting sorties and 349,000 helicopter sorties.

The amphibious capability of the Navy-Marine Corps team was effectively employed in Southeast Asia on 16 occasions during fiscal year 1966. The ability to strike the coastline at any point from the sea was demonstrated by the Amphibious Ready Group/Special Landing Force of the Seventh Fleet. This force conducted seven unilateral amphibious operations under the code names of DAGGER THRUST and BATTEN DOWN and also participated in larger operations ashore.

The III Marine Amphibious Force engaged in operations ashore in the Republic of Vietnam consisting primarily of large unit operations, defending two major airfield complexes, fighting an intensive counter-guerrilla campaign, and execution of a vigorous civic action program.

To date, more than 125 operations of battalion size or larger have been conducted by the Marines. In August 1965, Operation STAR LITE gave the United States its first major victory. A Viet Cong regiment was destroyed. There have been many similar actions since that time. As of June 30, 1966, the III Marine Amphibious Force had killed 7,162 Viet Cong/North Vietnamese Army soldiers. The enemy has thus been forced to avoid contact on the part of any of his larger formations if he is to remain effective.

During each 24-hour period, Marine units normally conduct between four and five hundred small unit actions, in addition to the larger and more publicized operations. Though smaller, these actions are essential in the separation of the Viet Cong from the populace and in the denial of his free movement through the countryside.

The increasing rate of operations has produced significant results. In March of 1965, Marines controlled no real estate in South Vietnam.

The III Marine Amphibious Force now includes over 1,185 square miles, with more being added, inside its tactical areas of responsibility. More than 800,000 Vietnamese civilians live in these areas, occupying 144 separate villages. This creates an ever-improving environment in which the peasant can work and live, in which the Saigon government can assume its proper function, and in which the Viet Cong has been essentially defeated.

Naval gunfire support of anti-infiltration operations and U.S.-Republic of Vietnam operations ashore in South Vietnam commenced in May 1965. These operations continued throughout the year under rigid coordination between U.S. and Republic of Vietnam officials to minimize possible casualties to allied forces and noncombatants. Targets included known or suspected infiltration points as well as specific Viet Cong facilities, installations, troop concentrations, water craft, and lines of communication. The level of effort varied with requirements but generally increased during the year. Over 225,000 rounds of 3-inch and larger caliber ammunition were expended in these operations.

Cruisers armed with 6- and 8-inch guns and destroyers with 5-inch guns provided the majority of naval gunfire support. In addition, four fire support ships, three medium landing ships, rocket (LSMR), and one inshore fire support ship (IFS) were effectively utilized. The destruction, neutralization, harassing, interdiction, and illumination fire provided by units of the Seventh Fleet have become highly important elements of effective actions against the Viet Cong.

Operation GAME WARDEN was initiated in the last quarter of the fiscal year and consisted of a patrol force in the major rivers of the Mekong Delta. In November 1965, a contract was let for the construction of a militarized version of a stock 31-foot fiberglass boat for the Navy. By the end of the fiscal year, 120 of these boats had been completed and 60 were in operation in Vietnam. The boat has shallow draft and a speed of 25 knots. In the short time this operation has been in progress, contact with the enemy resulted in over 60 fire fights with no losses to our boats or personnel. Reports indicate that these operations have been successful in protecting vital waterways for the passage of legitimate traffic and reducing Viet Cong taxation or confiscation of goods.

The counter sea-infiltration patrol (Operation MARKET TIME) was maintained by U.S. and Vietnamese Navy forces off the coast of South Vietnam and was increased in force level and effectiveness. In addition to the destroyer escorts and minesweepers, more than 50 shallow-draft PCF (Swift) boats were placed into the operation during the last half of the fiscal year. Additional Coast Guard patrol craft

were added to the force in February, bringing the total Coast Guard contribution to 26 boats. Patrol aircraft flew surveillance tracks off the coast continuously for the entire year. Results of this operation during the past year were 240,103 ships and junks boarded and searched, 682 junks detained for suspicious activity or cargo, and 6,712 persons detained for further investigation by Vietnamese authorities. In addition, three major attempts at infiltration by steel hull vessels of trawler size were thwarted.

The Seventh Fleet Underway Replenishment Group, composed of some 20 ships, provided logistic support to the attack carrier striking groups, destroyer screen units, patrol units, gunfire support ships, MARKET TIME off-shore patrols, and amphibious ready groups. New techniques in simultaneous refueling and helicopter ammunition transfer were employed.

The civic action programs of military forces in South Vietnam received added impetus from the Navy's Project HANDCLASP. This program provided the Vietnamese people with some 2,500 tons of clothing and other material donated by U.S. citizens and organizations and collected, packaged and transported to South Vietnam by the Navy. Project HANDCLASP is a worldwide Navy program.

Contingency Operations

Dominican Republic

The situation in the Dominican Republic was cyclic and variable throughout the year in its effects upon tension in the Caribbean area. During July 1965, six combatant and four support ships of the U.S. Navy stood by as part of Task Force 124, which was created specifically to respond to any requirements in support of national interests that might be affected by the Dominican crisis. After demilitarization of the rebel zone during the latter part of September, naval task force support of Dominican Republic operations was no longer required and Task Force 124 was dissolved. However, on October 20, amphibious forces stood by once again while the Inter-American Peace Force units ashore secured the rebel zone of Santo Domingo. Normal task group training operations were conducted while the units were standing by. A normal readiness posture was resumed on November 23. On February 17, 1966, it became necessary once again to alert the ready force and it remained on alert during the strike crisis until April 18. Normal operations were conducted until June 1, when national elections were considered to be a possible source of trouble in the area and an alert status was resumed. On June 5 the units returned to a normal readiness posture.

Pakistan

In September 1966, Commander Middle East Force, in U.S.S. *Gearing* (DD-170) with the U.S.N.S. *Chepatchet* (TAO-78), stood by for possible evacuation of 1,225 U.S. personnel from Karachi, Pakistan, during the Pakistani-India dispute.

Indonesia

In October, several Seventh Fleet major combatants, with escorting destroyers and logistic support forces, stood by during the Indonesian crisis for a possible emergency evacuation of about 2,100 personnel. Evacuation was completed by airlift, without incident, and the ready forces were returned to normal operations.

Noteworthy Accomplishments

Palomares Bomb Recovery

On April 7, 1966, a naval task force successfully recovered an unarmed nuclear weapon in 2,850 feet of water off Palomares, Spain. The weapon had been lost in January as a result of an in-flight collision between a U.S. Air Force B-52 bomber and a KC-135 tanker during a high-altitude refueling operation. The naval task force involved in locating and recovering the weapon included 17 ships, four submersibles, and 3,000 men. Key equipment used in the search included the submersibles *Alvin* and *Aluminaut*, and Navy Scuba and "hard-hat" divers. The weapon was sighted by *Alvin* on March 15 in 2,550 feet of water. *Alvin* and *Aluminaut* made their first underwater rendezvous at approximately 2,500 feet in the course of the relief of the watch over the weapon. Several recovery attempts were made between March 15 and April 7, during which the dislodged bomb slid down the steep ocean floor to a greater depth. The fourth attempt was successful when the weapon was brought aboard U.S.S. *Petrel*, using an unmanned tethered vehicle named CURV (Cable Controlled Underwater Research Vehicle), which has previously been used to recover torpedoes from depths of 2,500 feet.

Satellite Communications Relay

A significant step forward in naval communications was taken on April 17, 1966, when the guided missile cruiser *Canberra* (CAG-2) became the first U.S. Navy ship to make operational use of a satellite communications relay. Messages were passed from *Canberra* operating in the South China Sea, via SYCOM III satellite, to a shore station in Hawaii.

Satellite Weather Pictures

U.S.S. *Constellation* (CVA-64) became the first U.S. Navy ship to receive a picture directly from an operational weather satellite, the

ESSA 2. *Constellation* has been receiving a dozen pictures a day which cover 490,000 square miles. A study of this new capability is being made with a view toward installing the system in all fleet ships.

Helicopters as Firefighters

A new system for using a helicopter as a self-sufficient firefighting and rescue craft was developed. Fires have often prevented rescue of downed pilots, but weight limitations have previously precluded the use of firefighting equipment in helicopters. The Navy Research Laboratory has developed a lightweight synthetic firefighting foam which is 15 times more efficient than previous liquids. It will cut a 12-foot wide flame-free path through JP-4 fuel fires in less than 15 seconds. Sixty gallons of the liquid will cover 2,000 square feet of a fire area. Vietnam applications are underway.

Special Projects

The following are representatives of the more significant special projects which the Navy participated in or conducted during the year.

Project SEALAB.—On August 28, 1965, 10 divers, including astronaut Comdr. M. Scott Carpenter, USN, as team leader, descended to a depth of 205 feet on the ocean bottom near La Jolla, Calif., and entered *SEALAB* for a period of 15 days. They were the first of three such teams to spend consecutive periods of 15 days duration in *SEALAB*. Various underwater physiological studies, human engineering tests, and salvage experiments were conducted during this 45-day period. *Project SEALAB* is a joint operation of the Navy's Special Projects Office and the Office of Naval Research.

Project AUTEU (Atlantic Undersea Test and Evaluation Center) was dedicated this year. This project is a continuing program designed to provide the Navy with a multipurpose underwater laboratory for oceanographic research and testing of antisubmarine weapons. The test range location, about 125 miles east of Miami, Fla., was selected in order to take advantage of the ideal oceanographic environment existing in that area. Elaborate electronic equipment will provide acoustic measurements, underwater tracking, communications and navigation, monitoring, and data processing.

DEEPSTAR 4000.—In June 1965, the U.S. Navy Electronics Laboratory, San Diego, Calif., began a new series of deep ocean dives for research using *DEEPSTAR*. Manned by a pilot and two scientists, *DEEPSTAR* is an underwater vehicle capable of being precisely maneuvered in confined areas such as undersea canyons and trenches to a depth of 4,000 feet, for period of up to 6 hours.

Seismic Tests were conducted off the coasts of Virginia and California by exploding large quantities of TNT in the hulls of old Liberty

ships. The underwater tests are part of a continuing research program VELA UNIFORM designed to study the techniques of and to improve the methods for detecting and locating underground and underwater explosions.

Alvin—On July 20, the Navy's first deep-diving research submarine *Alvin* made a record-breaking dive to a depth of 6,000 feet off the Bahamas. *Alvin* is a research tool which will enable oceanographers to make more complete observations of deep water conditions than could be made with "deep sea elevator" bathyscaphs like *Trieste*. Temperature structure, underwater currents, magnetic field, gravity field, and various other properties of the ocean environment will be studied. The vehicle can remain submerged 8 to 10 hours and has a maximum range of 25 miles at a speed of 2.5 knots.

DEEP FREEZE.—The 11th annual DEEP FREEZE operation began on October 1, 1965. The arrival of a ski-equipped C-130 aircraft marked the end of a 7-month period of isolation for over 280 Navy men and scientists at five U.S. stations in Antarctica. The Navy supported 55 research programs to obtain scientific descriptions on the Antarctic continent through investigations in geology, meteorology, biology, botany, atmospheric, glaciology, and paleontology. A new airlift record was set on December 28, when four C-130 aircraft delivered more than 267,000 pounds of cargo to Antarctica stations in a single day. The aircraft averaged 21.5 flying hours each during the 24-hour period.

Space Flight Operations

The Navy's contribution to space exploration in fiscal year 1966 was primarily in recovery operations, in a manner similar to the support given Projects MERCURY and GEMINI in previous years. Astronaut recovery operations were completed without serious incident. During these operations, naval ships and aircraft were on station in the Atlantic and the Pacific. The greater effort was centered in the Atlantic, although contingency forces played a major role when a premature re-entry was required and a successful recovery was made in the Pacific.

In addition, the Navy made notable contributions to aerospace medicine, bioastronautics, communications, astronaut training, and hardware development.

Several staff studies of NASA and DoD space flight programs for the next several years concluded that the requirement for Navy recovery forces would decrease during calendar year 1967 and would increase sharply during 1968 and 1969. NASA officials were highly pleased with the recovery support provided by the Navy.

Major Exercises

General

U.S. Navy forces participated in a variety of exercises unilaterally and with various friendly nations. The significant exercises were categorized as either joint (more than one Service), combined (more than one country), inter-Service, or uni-Service. The purpose of these exercises was to enhance U.S. readiness and that of our allies. Problem areas and new ideas were discussed at the annual NATO, SEATO, JCS, and Fleet Commanders Training Conferences. Exercise scheduling at these conferences incorporated concepts and ideas to improve readiness of all units concerned.

Multilateral Force Manning

The mixed-manning concept evaluation, conducted aboard U.S.S. *Ricketts* (DDG-5), ended in December 1965 at Norfolk. For 18 months *Ricketts* operated successfully with crewmen from the United States and five other NATO nations (Greece, Germany, Italy, the Netherlands, and the United Kingdom) and demonstrated the feasibility of the mixed-manning concept.

Latin America

UNITAS VI was a 3½-month multilateral exercise wherein units from the United States, Argentina, Brazil, Chile, Colombia, Ecuador, Peru, Uruguay, and Venezuela participated in antisubmarine warfare exercises at various times. The total commitment of combined forces was approximately 56 ships, 62 aircraft, and 21,000 personnel. U.S. ships traveled approximately 18,000 miles and visited 16 South American cities. The exercise successfully fulfilled its objectives of enhancing inter-American naval proficiencies and friendships. A *UNITAS* exercise is scheduled and conducted each year.

Southeast Asia

SEA IMP, conducted in May of 1966, was a SEATO maritime exercise on convoy escort and coverage, convoy and antisubmarine measures, and naval interception. The exercise took place in the southern portion of the South China Sea from Manila to Bangkok. U.S., Philippine, Australian, and United Kingdom forces participated. Thailand acted as host nation. Over 50 ships and five aircraft squadrons, including two antisubmarine carriers and six submarines, participated in selected SEATO and national exercises. The exercise was evaluated as an unqualified success at the recent SEATO training conference, and will be repeated.

Mediterranean

Numerous bilateral and multilateral exercises involving antiair, antisubmarine, mine, and amphibious warfare were conducted throughout the year with the military forces of Spain, France, Italy, Greece, and Turkey. These exercises are conducted on a periodic basis from year to year and serve to enhance allied military cooperation as well as to improve the readiness of the Sixth Fleet.

U.S. Exercises

A large-scale amphibious warfare exercise was concluded on December 14, 1965, by some 50 ships and 12,000 men of the U.S. Atlantic Fleet and Fleet Marine Force, Atlantic. The Fleet exercise, held in the Atlantic and Caribbean area, was part of the continuing training of Fleet units to maintain peak efficiency in both assault landing operations and defense against submarine, air, and surface threats. An additional amphibious exercise was conducted on Vieques Island in June 1966, and progressed from a landing to protect and evacuate U.S. nationals into a full-scale counter guerrilla exercise.

Operation Springboard commenced in January 1966 and marked the start of 3 months of land, sea, and air exercises for units of the U.S. Atlantic Fleet. Over 10,000 U.S. and allied military personnel converged on Roosevelt Roads for this annual winter training exercise, including 200 ships and countless numbers of aircraft.

Clove Hitch was a large-scale U.S. joint Army, Navy, Marine, and Air Force amphibious and airborne assault exercise which was conducted on the U.S. east coast in March. Similar exercises are conducted annually.

Gray Ghost was a First Fleet exercise conducted during April in the San Diego operating areas. The purpose of this exercise was to increase combat readiness to conduct air strikes, aerial mine, aerial reconnaissance, surface, antisubmarine, antiair, and electronic warfare. Three aircraft carriers, three cruisers, 24 destroyers, 12 minesweepers, four service force ships, seven amphibious ships, and three patrol squadrons participated. Approximately 300 civilian and military observers assisted in obtaining data for evaluation of existing electronic and antiair warfare equipment, procedures, and tactics.

Swampex 65, in North Carolina, was a large-scale counter guerrilla exercise involving a Marine Expeditionary Brigade.

IV. Naval Warfare Capabilities

Fleet Ballistic Missile System

The funded program through fiscal year 1966 provided for 41 fleet ballistic missile submarines (SSBNs).

Operational Status

At the end of the fiscal year a total of 32 SSBNs had attained deployable status since the program began. Of these, 27 were deployed for operational patrols and 5 were in overhaul. Five additional SSBNs were undergoing shakedown.

Of the 27 deployed submarines, 12 were equipped with POLARIS A-2 missiles and 15 with the improved A-3 missiles.

Shipbuilding, Conversions, and Overhauls

Six SSBNs and the FBM tender *Canopus*, the fifth tender to be completed, were delivered during the fiscal year.

The U.S.N.S. *Victoria* (TAK-281) was delivered on October 11, 1965, and on December 3 commenced resupply runs to the FBM replenishment site at Rota, Spain.

One SSBN, *George Washington*, completed a 2-year overhaul and was redeployed. Three others, *Theodore Roosevelt*, *Abraham Lincoln*, and *Ethan Allen*, entered overhaul after completing 17 to 18 successful patrols each. Overhauls include replacement of nuclear cores, installation of submarine safety packages, and conversion to fire the A-3 missile where applicable.

Labor strikes caused numerous delays in new construction delivery and overhaul completion dates. A strike at the Electric Boat Division, General Dynamics Corporation, Groton, Conn., resulted in delays of as much as 60 days in the completion of the three SSBNs under construction and two SSBNs in overhaul at that yard.

Development and Demonstration

Tests of the complete weapon system—missile, navigation, fire control, and launcher subsystems—continued through demonstration and shakedown operations and fleet operational tests of the POLARIS A-3 and follow-on operational tests of the POLARIS A-2.

The POLARIS A-3 demonstration and shakedown operation from *Benjamin Franklin* on December 6, 1965, was successfully coordinated with the GEMINI-7 space capsule orbit, and the astronauts observed the POLARIS flight.

The contract definition phase for POSEIDON (C-3) system development continued. Contract proposals based on an accelerated operational availability date in the 1970's were solicited. Project approval was granted for facilities at the Naval Weapons Industrial Reserve Plant at the Lockheed Missile and Space Company, Sunnyvale, Calif. These facilities are required for the design, production, assembly, and testing of the POSEIDON missile.

Carrier Strike Warfare

Attack Carriers

The force level for attack carriers stood at 15 at the end of fiscal year 1966, with the force comprised of one *Enterprise*, seven *Forrestal*, two *Midway*, and five *Hancock* class carriers. *Intrepid* (CVS-11) also performed in a limited CVA role after joining the Seventh Fleet in April 1966.

New Construction

CVA-67 *J. F. Kennedy*, under construction by the Newport News Shipbuilding & Dry Dock Co., was approximately 40 percent completed at the end of this fiscal year.

Modernization and Overhauls

An extensive modernization and overhaul of *Midway* began in February 1966 and will include installation of new catapults, new arresting gear, a larger flight deck, and the Naval Tactical Data System (NTDS).

The fiscal year 1966 fleet improvement plan provided regular overhauls for three CVAs, *Bon Homme Richard*, *Shangri La*, and *Forrestal*.

Bon Homme Richard received an overhaul-in-depth, providing increased accommodations, interim intermediate-level aircraft maintenance facilities, automatic data processing, and numerous other alterations to improve offensive and defensive combat capabilities.

Shangri La overhaul was less extensive but provided catapult, arresting gear, and ordnance handling improvements, improved habitability, improved aircraft maintenance and air traffic control facilities, and improved communications and radar capabilities.

Forrestal was equipped with NTDS and Integrated Operational Intelligence Center (IOIC), and numerous other less extensive improvements.

Cost increases and heavy shipyard workloads reduced the scope of each overhaul, although all items mandatory for Southeast Asia operations were accomplished.

Employment

Two CVAs were deployed in the Sixth Fleet in the Mediterranean throughout the year and five were continuously deployed in the Seventh Fleet in support of U.S. operations in Southeast Asia. The remaining eight CVAs were attached to the First and Second Fleets, engaged in training and readiness exercises or in upkeep and overhaul.

Marine Corps fighter and attack aircraft squadrons continued their periodic deployments aboard Navy carriers along with Navy attack carrier air wings. A Marine all-weather fighter squadron operated from *Oriskany* for the full period of her deployment in the Western Pacific. A similar squadron completed a Mediterranean deployment aboard *Forrestal*. A Marine A-4 attack squadron is assigned to *Independence* and an A-4 detachment operated aboard the CVS *Hornet*. Other Marine units routinely qualified in carrier operations during training.

Carrier Aircraft Program

The F-111B development program continued, and flight tests of the aircraft proved the validity of the variable-sweep wing concept for high performance aircraft. Weight problems of the F-111B are still causing concern, and a rigorous weight reduction program is being pursued.

The F-4J Phantom II program moved into the final phases of its development, with the first flights of a trial aircraft in May 1966. First fleet deliveries are scheduled for fiscal year 1967. Production of F-4B fighter aircraft and RF-4B reconnaissance versions proceeded on schedule. The last F-4B model will be delivered in the fall of 1966, as production transitions to the F-4J model.

The first flight of the A-7A Corsair II occurred in September 1965. The program has progressed satisfactorily with nine test aircraft flying at the end of the year. Initial delivery of A-7 aircraft to Fleet units is programmed for the second quarter of fiscal year 1967.

Modernization of the reconnaissance version RF-8A Crusaders to RF-8G proceeded on schedule. The RF-8G had its first flight in September 1966.

The RA-5C Vigilante reconnaissance aircraft conversion from A-5A attack planes proceeded on schedule.

The E-2A Hawkeye program progressed satisfactorily with Fleet introduction of the aircraft and deployment of two detachments in CVAs to Southeast Asia. In addition to their normal role of airborne

early warning and intercept control, the E-2A detachments in the Tonkin Gulf instituted a strike command control procedure, which reduced the navigational burdens upon strike pilots while insuring that the "blips" on the radar screen were friendly.

The A-6A Intruder production continued generally on schedule. Combat proved the validity of the A-6A weapon system. The maintainability and reliability of the system steadily improved as more squadrons deployed. The fifth squadron deployment to the Western Pacific will occur in the fall of 1966.

The VFAX program reached a point well into the study phase. In October the specific operational requirements were written and in February the technical development plan was issued. At the end of the fiscal year the Navy and Air Force were conducting joint meetings to determine whether a common version of the VFAX/VAX could fulfill the requirements of both Services.

Antisubmarine Warfare

In order to protect shipping against submarine attack and counter the continuing threat of far-reaching, inertially guided missiles launched from silent, fast, long-range and deep-running aggressor submarines, the antisubmarine warfare program continued to receive major attention in fiscal year 1966.

Surface Ship Antisubmarine Systems

Advances were made in the AN/SQS-23 and AN/SQS-26 sonars, Drone Anti-Submarine Helicopter (DASH), Anti-Submarine Rocket (ASROC), and a family of versatile torpedoes.

The original AN/SQS-23 sonar installation program was virtually completed, and modification kits to improve performance, reliability, and maintainability were installed in several ships in fiscal year 1966. Each AN/SQS-23 equipped ship is programed to receive retrofit improvements.

The operational need for a sonar with greatly increased detection ranges and greater search area coverage led to the development of the AN/SQS-26 sonar. Performance results achieved by the first ship to receive a fully capable AN/SQS-26 sonar confirmed the anticipated performance gains. This sonar is entering the fleet in increasing numbers in all new construction destroyer types.

A new variable depth sonar designed to exploit acoustic propagation paths in depth utilized by submarines to avoid detection by conventional hull-mounted sonars also was ordered in fiscal year 1966. This sonar will be installed in new construction destroyer escorts.

Two antisubmarine weapon delivery devices, DASH and ASROC, have increased the potential of attacking a submarine while at a

considerable range. The ASROC was designed as a quick reaction weapon which has torpedo and depth charge capabilities. A development program was set forth to double the ASROC's present range. The DASH is being produced as scheduled to meet fleet needs. The remote control capability permits the drone to deliver weapons in the immediate vicinity of the enemy submarine at extreme detection ranges. DASH has been deployed in units of all fleets.

The present payload for the DASH is the MK-43 and MK-44 torpedo; ASROC uses the MK-44. The planned torpedo replacement which began entering the fleet in fiscal year 1966 is the MK-46 torpedo, which was designed to combat high-speed, deep-diving submarines. The MK-46 goes deeper, faster, and detects targets at greater range than previous ASW torpedoes. This torpedo will be delivered by aircraft and surface ships as well as DASH and ASROC.

Antisubmarine Aircraft Carriers

Four antisubmarine carriers (CVS) were assigned to the Pacific Fleet in addition to *Intrepid* (CVS-11) which was performing in a limited CVA role in the Seventh Fleet at the end of fiscal year 1966. Four were assigned to the Atlantic Fleet, reduced to three by deactivation of *Lake Champlain* at the end of the year.

Essex and *Bennington* received overhauls which included installation of Automatic Data Processing (ADP), intermediate aircraft maintenance facilities, ASW-oriented CIC spaces, and additional air conditioning.

Aircraft Antisubmarine Weapon Systems

The modernization of Navy ASW aircraft squadrons was continued by equipping additional units with new models of aircraft. As squadrons received new aircraft and improved weapon systems, their capability for detection, localization, and destruction of submarines improved markedly. In patrol aircraft squadrons, the P-3A Orion land-based patrol plane provided a long-range aircraft with improved sensor equipment and improved capabilities in search rate, range, speed, and better flight crew performance through improved habitability. The carrier-based S-2E Tracker, with improved navigation and detection systems, provided valuable enhancement in Fleet ASW tactical operations. The SH-3A Sea King ASW helicopter with a new airborne sonar further enhanced the operational capability of ASW carrier forces.

Two squadrons received the S-2E model of the Tracker aircraft and one helicopter squadron received the SH-3A Sea King, completing the transition of carrier-based ASW squadrons to these advanced aircraft. Three additional patrol squadrons transitioned to the P-3A Orion.

Post Exercise Evaluation and Data Analysis

The increasing capabilities of both submarines and the ASW systems designed to combat them have generated a greater need for accurate ASW exercise data for post exercise analysis and at the same time have increased the difficulty of obtaining such data. This requirement has led to the development of an underwater acoustic tactical range which will permit surface ships, submarines, and aircraft to conduct ASW exercises in a realistic environment while all participating units and their weapons are accurately tracked. Post exercise analysis of data recorded on such a range will provide the means for effective evaluation of ASW systems and weapons. Approximately \$14 million was programed for the installation of an instrumented, three-dimensional tactical range in a 50-square-mile instrumented sea area off Kauai Island, Hawaii. The range is scheduled for completion in January 1967.

To meet the need for obtaining more definitive knowledge of our ASW capabilities and deficiencies, ASW analysis teams have been established on the staff of each of the Fleet ASW and submarine-type commanders. These commanders have begun collecting raw data from free-play and controlled exercises for the development of vital ASW command and control summarized data. These same raw data will be used in the Fleet ASW Data Analysis Program (FADAP), which was conceived primarily to establish an analytical base for the determination of required force levels and the development and procurement of new equipments and weapons to meet current and predicted submarine threats.

Inshore Undersea Warfare

In Southeast Asia, the two Inshore Undersea Warfare Groups and their component elements, the Mobile Inshore Undersea Warfare Surveillance Units, demonstrated a readily deployable capability for the defense of vital inshore areas. Four units were deployed to four South Vietnamese ports for defense against covert attack by small boats, swimmers, and submarines or submarine-launched sneak craft. These units will remain until relieved by a specially tailored force of personnel and equipment which will provide the four ports a semi-permanent harbor defense capability.

ASW Submarine Warfare

Four nuclear attack submarines, *Haddock*, *Sturgeon*, *Queenfish*, and *Ray* were launched, and contracts were let for six more.

Substantial emphasis continued to be placed on the evaluation of the capabilities of the latest nuclear attack submarines under conditions closely duplicating their planned wartime ASW role. The results of

hundreds of trials at sea indicate that the ASW effectiveness of these submarines is significantly greater than that of their conventional and nuclear predecessors.

Antiair Warfare

The fleet antiair warfare capability was strengthened during fiscal year 1966 by the commissioning of the first of a new class of TARTAR-equipped destroyer escorts. Two new TERRIER frigates also joined the fleet. An increasing effectiveness in the AAW posture of deployed units has been noted and is attributed primarily to the improved capability offered by the Naval Tactical Data System. Marked improvement has been achieved when it has been possible to employ two or more NTDS ships in mutual support.

Increased missile system availability aboard individual ships is now being realized through priority assignment of surface missile system technicians. This has resulted in a general increase in surface-to-air missile ship readiness. Management improvement continues under the centralized control of the surface missile systems project.

Successful tests were conducted on the SEA SPARROW system. This weapon is currently in process of installation aboard *Enterprise* as a basic point defense system. The advanced point defense study progressed on schedule during the fiscal year with completion of extensive analytical work. The report and recommendation will be submitted in January 1967.

The Marine Corps continued its development and improvement of the integrated antiair warfare program. Surface-to-air missile battalions equipped with HAWK surface-to-air missiles, fighter squadrons employing 20-mm. cannon and air-to-air missiles, and the ground control facilities to coordinate the overall effort comprise the essential elements of this integrated system. The flexibility of this system is illustrated by the integration of the 1st Marine Air Wing antiair warfare team with other U.S. forces in Vietnam.

Amphibious Assault Warfare

Amphibious assault forces were increased in strength and modernized during the past year. The addition of one new LPD, *Duluth*, has contributed to the ultimate attainment of fast, modern ships for the entire Amphibious Assault Force. By late 1972, the proposed program will provide amphibious assault ships in sufficient numbers to embark the assault echelons of two Marine division/wing teams. Seventy-five percent of these ships will be modern, 20-knot types.

The activation of 23 World War II LSTs has filled the immediate requirement for shallow-draft shipping in Southeast Asia. The four

rocket-firing ships activated during the early part of the year have demonstrated devastating firepower in numerous combat missions in Vietnam.

The building of the large, multipurpose amphibious assault ship, LHA, has been approved by the Secretary of the Navy and is included in the amphibious modernization program. The LHA is an optimized ship carrying a balanced load of troops, equipment, vehicles, landing craft, and helicopters. The LHA gives the option of landing over the beach or by vertical envelopment and is designed to replace AKA, LSD, LPH, and LPD.

Amphibious warfare combat readiness was maintained at a high level by numerous training exercises during the past year in which both Army and Marine Forces have participated.

Combat requirements have kept more than one-third of the Pacific Fleet amphibious assault ships deployed continuously. Combat missions have ranged from regimental-size to company-size assault landings.

Mine Warfare

During the past year, mine warfare forces in the Western Pacific have been engaged in the antisea infiltration operation. The number of deployed MSOs has been doubled to meet this operational commitment.

Twelve minesweeping boats have been deployed to South Vietnam to provide assistance to the Vietnamese Navy in sweeping the Saigon River.

A recently completed mine study confirmed the need for new ASW mines and established the inventory objectives which will improve the stockpile. Program change requests are being submitted which, with the presently approved program, will provide a stockpile that will support a flexible response. Fit tests of new high-density bomb racks in Air Force B-52 aircraft have been conducted with all aerial mines, and drop tests are scheduled in the near future. Carrier-based attack squadrons are being utilized more extensively in mining operations during fleet exercises.

Plans have been completed for modernization of the current inventory of mine countermeasure ships. This modernization will commence in fiscal year 1968. In combination with the authorized new construction ships, the modernization will enhance significantly our capability to counter the sea mine.

A Mine Warfare Training Center for the Pacific Fleet was established at Long Beach, Calif.

Strategic Mobility Forces

Fast Deployment Logistic Ship

The Fast Deployment Logistic (FDL) ship project, utilizing the project management concept, was established in October 1965.

The FDL ship will enhance U.S. military strategic mobility capability by providing a high-speed, flexible, sealift force capable of rapid oversea deployment of tactical land force units in conjunction with airlift. FDLs will store embarked land force equipment and supplies in a controlled environment for protracted periods in readiness for immediate use. In times of emergency, equipment will be unloaded either at established ports or over-the-beach in the absence of port facilities. Airlifted personnel will then marry-up with this equipment.

The FDL ship program is being used as a trial application of a new approach to ship design and construction. Under this approach, the Navy is, for the first time, applying the contract definition process to ship design and the "total package" approach to ship procurement. The Navy hopes to realize the following advantages from these new methods:

1. Added impetus to the modernization of shipbuilding facilities.
2. Lower average costs of ships.
3. Increased standardization of ships.
4. Increased industry input into naval ship design and construction.

Under the contract definition process, firm FDL characteristics will be determined by competition based on operational concepts developed jointly by the Army and Navy.

The request for proposals was issued to prospective contractors on April 1, 1966. Proposals have been received from Litton Industries, Inc., Lockheed Shipbuilding & Construction Corp., and General Dynamics Corp. FDL contract definition began July 30, 1966, and will be completed January 30, 1967. The "total package" contract is planned for award in May 1967.

Restricted Water Warfare

With the increased requirements of our effort in Vietnam, the development of the Navy's coastal/river warfare capability increased significantly. In addition to the interim shallow-draft fleet assets for restricted water coastal patrol, Navy has entered into a construction program for 104 50-foot, shallow-draft, high-speed boats designated PCF and nicknamed "Swifts." The U.S. Coast Guard has provided an excellent source of additional assets for restricted water warfare. Sup-

port ships such as ARLs were activated, and AKLs were given a new mission in support of patrol forces.

River warfare capabilities were expanded in patrol operations in the rivers of the Mekong Delta. The pleasure boat industry was utilized as the source of a new class of shallow water patrol boats. More than 120 fiberglass boats, of a 160-boat program, were produced by one manufacturer between November 1965 and the end of the fiscal year. Support ships were produced by activation of LSTs and conversions of YFNBs. Through these means, an extensive river patrol operation was implemented in less than one year from statement of the operational requirement.

A study panel of Marine officers was convened at the Marine Corps Landing Force Development Center, Quantico, Va., in December 1965. The first report produced an interim doctrine for riverine operations. This was approved by the Commandant of the Marine Corps and published as "Tentative Fleet Marine Force Manual 8-4" in April of this year. This is the first Service-approved doctrinal manual on riverine operations and is specifically related to the problems being encountered in the Republic of Vietnam. The study panel is continuing to refine the doctrine and will ultimately produce a Marine Corps doctrinal publication for general riverine operations in any area.

The experience and skills being developed in these operations have enhanced the ability of the Navy and Marine Corps to implement restricted water operations on short notice anywhere in the world. The past year has seen a steadily improving capability in counterinsurgency through small craft procurement and increased personnel training. Countless personnel were provided counterinsurgency training prior to deployment to Southeast Asia, and orientation in counterinsurgency was reemphasized in officer and enlisted training courses and schools.

Support Forces

Underway Replenishment

Pacific Fleet Underway Replenishment (UNREP) ships were fully committed in support of Southeast Asia operations. To augment them, an ammunition ship (AE) and a fleet oiler (AO) were activated, and an additional AE is in progress of activation. In addition, an AE was provided from the Atlantic Fleet. Two AE and an AO that had undergone extensive conversion rejoined the fleet.

Sacramento, the first fast combat support ship (AOE), joined the fleet and quickly demonstrated the advantages of the multipurpose underway replenishment vessel concept. Providing fuel, ammunition, and stores to receiving ships, including the use of large helicopters for

cargo delivery, this ship has greatly reduced alongside time requirements and effectively replaces three support ships of conventional type.

To further improve our UNREP capability, the Navy completed its evaluation of probe fueling and approved it for service use. This alongside fueling method, which is similar in concept to the aircraft probe refueler, is safer and more rapid than the open trunk and Robb coupling systems now in use in most of the fleet.

Mobile Support

The most noteworthy event was the return of the hospital ship *Repose* to the active forces. She is now supporting operations in South Vietnam. A second hospital ship, *Sanctuary*, is undergoing activation to join the fleet in fiscal year 1967. A gasoline tanker (AOG) was activated to provide POL transport for the Marines in South Vietnam, with two more to complete activation during first quarter of fiscal year 1967. A landing craft repair ship (ARL) to support MARKET TIME craft is in an advanced state of activation.

The Navy established Harbor Clearance Unit 1 in December 1965. This unit is stationed at Subic Bay. Its mission is the rapid clearance of sunken ships or other obstructions in the channels leading to the major logistic terminals in Southeast Asia. The unit is equipped with a variety of craft suitable for clearance of hulks, including four 750-ton capacity lift craft leased from the Royal Navy.

Naval Communications

Naval Communications is tasked to serve not only the communications between Naval forces afloat and military forces and supporting activities ashore, but also the worldwide military command and control system and the Defense Communications System. Primarily because of increased requirements in support of Southeast Asia operations, and in spite of the best efforts of commanders at all echelons to reduce message traffic volume, the communications volume handled by Naval Communications in fiscal year 1966 exceeded the previous year by 22.7 percent for the Defense Communications System and by 66.4 percent for Navy tactical operations.

In order to meet these requirements, existing communications facilities have been expanded and procurement programs have been accelerated with emphasis on tactical communications. New communications facilities are being provided at Cam Ranh Bay and Danang, South Vietnam, to support fleet operations and local communications requirements. *Annapolis*, the Navy's first major communications relay ship, arrived on station in the Western Pacific in October 1965. This ship, with her capability to handle approximately 30 percent of the

ship-shore communications for local fleet units and to relay fleet broadcasts, has provided significant relief to overtaxed naval communications stations in the Philippines, Guam, and Japan. In January 1966, the multichannel broadcast was inaugurated for 61 major combatant ships equipped with new frequency-division multiplex equipment, thereby providing eight teletype channels on one high frequency, single sideband circuit. Additional ships will be equipped with frequency division equipment as it becomes available.

Also during fiscal year 1966, a cryptographic, secure voice radio capability was inaugurated between Seventh Fleet attack carriers and the Second Air Division headquarters at Tan Son Nhut airfield in Vietnam. A total of seven attack carriers and the flagship of the Commander, Seventh Fleet, was equipped for secure voice communication.

Navy's participation in research and development of satellite communications has continued throughout fiscal year 1966 with marked operational success. Terminals were installed at various times in four ships, successfully establishing communications links via SYNCOM II and SYNCOM III satellites. In addition to the significant research and development contributions of these tests, operational message traffic in support of the fleet was transmitted. At present, terminals are installed in U.S.S. *Annapolis* and at the Naval Electronics Laboratory, San Diego, Calif.

Naval Manpower Resources

Military Manpower

Navy and Marine Corps personnel summaries for fiscal year 1966 are shown below:

	Programmed strength	End-year strength
Navy.....	740, 598	745, 205
Marine Corps.....	257, 418	261, 716
Total.....	998, 016	1, 006, 911

End-year distribution, by type, was as follows:

	Navy	Marine Corps
Officers.....	79, 805	20, 512
Enlisted.....	660, 518	240, 911
Midshipmen USNA.....	4, 331	-----
Aviation Cadets.....	551	-----
Marine Cadets.....	-----	293
Total.....	745, 205	261, 716

The programed increases above the preceeding year amounted to 66,349 additional personnel for the Marine Corps and 66,482 for the Navy. Increased requirements were generated primarily by operations

in Southeast Asia. Year-end overshoots in actual versus programed strength resulted from increased retention and lower than estimated losses. Significant manpower increases were experienced in the Operating Forces, Pacific, in the Overseas Field Activities, Pacific, and in training activities. Decreases occurred in the Operating Forces, Atlantic, Overseas Field Activities, Atlantic, and Support Forces, U.S. Despite the overall manpower increase, the Navy and Marine Corps continue to be adversely affected by understaffing in the shore (field) activities, shortages in critical skill groups, shortages of officers, and unfavorable sea-shore rotation requirements.

The Naval Reserve consisted of 556,000 military billets, of which 88,000 were on active duty at the beginning of the fiscal year. This number increased by June 30, 1966, to 576,000, including 96,600 on active duty. The increase was a direct result of a highly successful recruiting program.

Drill pay strength of the Selected Reserve has been maintained near the authorized ceiling of 126,000 officers and men, and quality has improved by more effective inactive duty training.

Petty officer strength continued to increase during the year, and the retention of post-active duty personnel continued to improve.

The Civilian Substitution Program, Phase I, approved by the Secretary of Defense in September 1965, is intended to replace military billets with civilians, as follows, by December 31, 1966:

	<i>Navy</i>	<i>Marine Corps</i>
Military billets deleted.....	15, 000	2, 800
Civilian replacement positions.....	12, 500	2, 500

Implementation of the program commenced March 1, 1966. By June 30, 9,219 Navy billets had been identified for conversion to 7,831 civilian positions, but budget reprogramming and the tight labor market had reduced the number of civilians recruited well below the desired goal. About 43 percent of the scheduled conversions in the Marine Corps had been completed.

Civilian Manpower

Civilian personnel employed by the Department of the Navy increased from 333,271 in fiscal year 1965 to 356,744 in fiscal year 1966. Support of Southeast Asia operations accounted for a major portion of the increase. Other contributing factors were the Civilian Substitution Program and contract technician conversions. Naval activities were engaged in the highest level of civilian recruiting since the Korean war, effecting approximately 96,000 accessions during the fiscal year as compared to a pre-1966 annual average of about 40,000. Geographical distribution of employees was as follows:

	1965	1966	Change
United States.....	309, 296	327, 948	+18, 652
Territories and possessions.....	5, 571	6, 236	+665
Foreign countries.....	18, 404	22, 560	+4, 156
Total.....	333, 271	356, 744	+23, 473

Placement of employees affected by base closures continued to receive major effort. During fiscal year 1966, the Navy completed the closing of the New York Naval Shipyard; the Naval Ordnance Plant, Macon, Ga.; the Supply Annex, Stockton, Calif.; and the Naval Ammunition Depot, Hastings, Nebr., satisfying the job offer obligation to more than 11,000 employees.

As of the end of fiscal year 1966, 162 agreements had been negotiated between naval activities and 22 employee organizations. Of these, 153 are currently in effect, including 29 agreements renegotiated after the expiration of originally negotiated agreements. These agreements encompass 114,128 employees.

The program for training key management officials in labor-management relations was continued by conducting the ninth seminar on negotiating agreements. The seminar was attended by representatives of 47 naval activities and included participation by authorities in the labor-management field from industry, government, labor, and the academic community.

The Navy continued to issue schedules of wages for ungraded employees annually or when significant changes occurred in private industry wage levels. In the United States, 110 revised schedules were issued affecting 165,409 employees with an average increase of 3 percent. Outside the United States, five schedules were issued affecting 3,704 U.S. citizen employees in 22 areas, giving an average increase of 4.7 percent; 27 schedules were issued affecting 13,980 non-U.S. citizen employees in 13 areas.

Personnel Training

Increasing commitments in Southeast Asia necessitated considerable expansion and acceleration of military training programs. Marine Corps recruit training has been cut temporarily from 12 to 8 weeks, although the total time for basic training remains at 4 months. Extra time was allotted for specialty training and training specifically oriented toward operations in Vietnam. The Navy basic training class A schools were expanded to maximum capacity, with a fivefold increase in Construction Battalion (SeaBee) training being the most significant. New schools were established for damage controlmen and commissarymen.

The selective electronics training program was implemented to alleviate the shortage of experienced technicians in the Fleet. Basic Electricity/Electronics Schools were established at Great Lakes, Ill., and San Diego, Calif., adjacent to the recruit training centers. This arrangement is designed to reduce attrition, reduce travel costs, and effect economies in the use of training materials, devices, and space.

An expanded antiair warfare training capability became operational at San Diego, Calif., in the Navy's first large-scale application of digital computer simulation to fixed-based tactical training. In addition, a Mine Warfare Training Center, Pacific, was established in Long Beach, Calif.

The college degree program was established, to bring baccalaureate degrees within the reach of Naval officers who have the equivalent of three full years of college study.

Twenty-two applications for units of the naval junior ROTC program were received from secondary school systems. One unit was activated in New Orleans, La. Evaluation of other applicants was initiated.

Multichannel, closed circuit instructional television systems were installed at the Amphibious School, Coronado, Calif., and the Mine Warfare School, Charleston, S.C., bringing to 13 the total in Navy training activities.

The Marine Corps Basic School for newly commissioned officers has been reduced temporarily from 26 to 21 weeks. The Amphibious Warfare School for majors and captains has been reduced temporarily from 42 to 21 weeks by reduction of time devoted to those subjects which are nontactical in nature. This has approximately doubled the number of professionally trained officers per year available for duties in the Fleet Marine Forces.

Civilian manpower training also has been expanded. Due to shortage of skilled manpower, particular emphasis has been placed on skill development programs for entrance-level positions and updating the skills of other employees. New apprentice training programs were established, and training in 20 trades was authorized at activities not previously conducting training in those categories. The number of employees assigned to long-term educational programs in fiscal year 1966 was increased by 35 percent over 1965 and 115 percent over 1964. These included full-time attendance at colleges by grades GS-7 through GS-15, attendance of senior grades at service colleges and Defense systems analysis programs, and research by scientists at technical institutes.

Personnel Services

Medical and Dental

The hospital ship *Repose* entered service in Vietnamese waters, providing a modern, 800-bed hospital with 30 doctors and 286 medical personnel for on-scene service to combat casualties. Most patients are received by helicopter, direct from the combat area. A second hospital ship, *Sanctuary*, is being refitted to go into action early in 1967.

Frozen blood banks were established aboard *Repose* and at Da-nang, South Vietnam. The purpose was to explore the feasibility of using frozen blood as a life saving measure under combat conditions and to provide a back-up for the existing fresh blood supply system.

The primarily basic research program of prior years was expanded to include major programs in exploratory and advanced development covering four project areas: Human effectiveness; personnel protection, safety, and survival; operational medicine; and clinical medicine.

The new oral vaccine to protect against adenovirus type 4 (a respiratory tract infection) proved quite effective in tests at Camp Lejeune. Three new drug combinations—*Diaminodiphenylosulfone* (DDS), *Fanasil*, and *Pyrimethamine*—proved promising in the treatment of difficult malarial cases. The latter were returned, when practicable, from Vietnam (or Guam and Yokosuka) to the Great Lakes and Bethesda hospitals for special treatment.

Dental equipment in the Navy continued to be modernized with new equipment which meets current dental practice standards.

For the 1963-65 period there was a 9-percent increase in dental procedures performed per dental officer. There were increases in dental repair and correction procedures, a decrease in extractions, and a very large increase in caries prevention. Conservative treatment of carious teeth to protect dental pulp and avoid extractions was stressed. Development of the stannous fluoride treatment program caused a large reduction in the number of cavities. Dependents received 2 percent of the total care in the United States and 3 percent overseas.

Legal Services

Significantly increased requirements for the services of uniformed lawyers in the Navy have been generated by statutes or regulations relating to conflicts of interest, the protection of civil rights, individual due process as recognized in recent Supreme Court decisions, lawyer representation for those being considered for administrative-type discharges, and claims against tortiously liable third parties for the cost of medical care furnished to military personnel and their dependents. At the same time, the overall strength of experienced

officers is decreasing. While total personnel requirements can be met by recruiting lawyers who are subject to draft and desire to discharge their military obligation by serving in a legal capacity, the retention level of these individuals is inadequate to offset the voluntary and involuntary retirements of regular officers. As a result, the on-board regular officer lawyer strength has steadily declined from an authorized level of 390 to 246.

Unless a change in the present trend can be effected, the Navy will find it increasingly difficult to discharge its statutory functions which depend on uniformed lawyers.

Material

As was also reported last year, the Navy and Marine Corps continued in fiscal year 1966 to experience certain temporary shortages of equipment and supplies, as a result of the combined effect of combat operations and incremental modernization of forces. As a consequence, rigorous reprograming and procurement policies were required throughout the year.

Inventory Trends

The table below illustrates a decrease in inventories of secondary items over the 3-year period ending with fiscal year 1966:

SECONDARY ITEM INVENTORY TRENDS

(Millions of dollars)

By Account	30 June 63	30 June 64	30 June 65	30 June 66
NSA-----	1, 195. 3	935. 9	796. 3	751. 6
APA-----	5, 090. 7	4, 904. 2	5, 045. 3	4, 989. 1
Total-----	6, 286. 0	5, 840. 1	5, 841. 6	5, 740. 7

The largest decline was in the Navy Stock Account (NSA) inventories, while the Appropriation Purchases Account (APA) inventories remained relatively stable. The reasons for changes included reclassification of former NSA items to APA and transfer of other items to control of the Defense Supply Agency and General Services Administration. The Navy now owns considerably smaller retail levels for these items. At the same time, the value of end items supported (ships, aircraft, etc.) increased from \$33 billion to \$41 billion—an increase of 24 percent.

Material Availability

A steady decline in material availability has occurred in most categories of material, from an overall percentage of 80.1 in fiscal year 1963 to 73.7 in fiscal year 1966. The decline is particularly severe in the electronics and ships repair parts programs. For example, in the ships parts segment of the supply system, a system availability standard of 85 percent was last attained in December 1963 and has declined steadily since then to a level of 61 percent. The rapid buildup of deployed forces and their activity rates exceed normal material procurement leadtimes and taxed the supply system's ability to provide needed material when requested. The emphasis on sales-to-inventory relationship in the Navy supply system stock investment has impeded budget justifications for items which, though required because of their insurance nature, do not have an experienced usage basis to support the requirements. Limited Navy Stock Fund dollars, for example, could only be applied to those items having a comparatively high assurance of demand.

In fiscal year 1966, in response to demonstrated increased needs for repair parts, additional obligational authority was granted at reapportionment review. However, procurement leadtime—a critical element in maintaining inventory levels of technical repair parts—has been lost. These effects cannot be rapidly overcome, but an upswing in availability is predicted by mid-fiscal year 1967. Comprehensive action to review levels and predicted demand against funding requirements is underway at the time of this report.

The Marine Corps concept of pre-positioning protected war reserve supplies and equipment for the support of combat forces has been validated by the Marine commitment in Southeast Asia. Units deployed to Vietnam effectively used these protected stocks to enhance their ability to conduct numerous offensive operations which, by their very nature, draw heavily on material and equipment. Although temporary shortages have been experienced, at no time were combat operations restricted due to an inability of the support system to respond.

Material Condition of Ships

A decline in average material condition of Navy ships became apparent in 1965, resulting from the accelerated tempo of operations and a stretching out of overhaul and maintenance efforts due to overriding operational requirements. The decline was arrested to a considerable extent during fiscal year 1966. Continuing and detailed inspections performed on selected ships show the fleet to be maintaining a barely satisfactory level of material condition.

Equipment casualties restricting the availability of ships for operations also have increased, as has the time required to correct the casualties because of longer leadtime for supply support. The several corrective actions instituted during the past year are expected to improve this situation early in calendar year 1967.

An upward trend in maintenance achievement commenced in fiscal year 1966 and is expected to continue in fiscal year 1967. Steady improvement in the overall material condition of ships is predicted for the next several years. While this improvement is expected to be less than optimum, any truly significant improvement is severely constrained at present by a shortage of skilled labor in the shipwork industry, the high level of national economic activity, current restraints on non-priority Government expenditures, and a Navy shortage of experienced personnel.

Facilities

Construction

Construction put in place in fiscal year 1966 amounted to \$569 million as compared with \$375 million in fiscal year 1965.

In Southeast Asia, where the Navy is the single Department of Defense construction agent, developments were as follows:

	<i>Fiscal year 1965</i>	<i>Fiscal year 1966</i>
Construction Assigned:		
Vietnam.....million..	\$160	\$800
Thailand.....do.....	\$130	\$350
Contractor Work Force, Vietnam.....	13,300	48,400
Contractor Equipment Inventory, Vietnam.....million..	\$18.1	\$94
Work-in-place Rate, Vietnam.....million/month..	\$6	\$27.1

Naval construction battalions landed with the first contingent of Marines at Chu Lai and Danang, and the number has grown steadily to the year-end level of seven battalions producing construction at the rate of \$7 million per month.

The Naval Support Activity, Danang, was established in October 1965 to provide for logistic support of U.S. and attached third country military forces from Chu Lai to the demilitarized zone. Construction of port facilities, roads, and storage complexes transformed this small coastal port into a major facility supporting approximately one-fourth of U.S. forces in Vietnam. Further development is proceeding to meet future requirements and to provide a margin of safety for severe weather.

At Northwest Cape, Australia, work is continuing on a \$76 million major communication facility. The first \$30.5 increment was 90 percent completed by June 30, 1966. The second increment of \$31.8 million was 70 percent complete, and various facilities funded in the third incre-

ment, \$10.5 million, varied from 15 to 55 percent complete. The \$3.4 million housing program is 40 percent complete.

The fiscal year 1965 increment of facilities, authorized at \$4.9 million, for the Atlantic Underseas Test and Evaluation Center (AUTEC) in the Bahamas was completed. This completes the initially programed development of AUTEC.

In the United States, the scope of facilities construction is illustrated by the following examples:

- Norfolk, Va., Naval Shipyard—deepening of dry dock (\$5.3 million)
- Puget Sound, Wash., Naval Shipyard—erection of 50-ton portal crane (\$1 million)
- San Diego, Calif.—pier extension at submarine support facility (\$1.2 million) and completion of a tactical combat training facility at the Fleet Anti-Air Warfare Trainning Center (\$1.1 million)
- Naval Training Center, Great Lakes, Ill.—barracks and heating plant construction (\$12.9 million)
- David Taylor Model Basin, Carderock, Md.—Structural Mechanics Laboratory (\$3.8 million).
- Flight training facilities at Pensacola, Fla., Corpus Christi, Tex., and Meridian, Miss (\$15.9 million)
- Charleston, S.C.—additional POLARIS support facilities, including \$2.3 million improvement program at the Charleston Naval Ammunition Depot.

Work was initiated on a \$15.9 million program for facilities in the Pensacola, Fla.; Corpus Christi, Tex., and Meridain, Miss., areas to support an increased pilot training program.

In the construction of new barracks and bachelor officer quarters it has become virtually impossible to meet current habitability standards within the statutory cost limitations. Efforts are being made to obtain relief in this area.

Significant effort was expended on master plans and planning studies of major naval installations. Examples are: For bases in WESTPAC such as Danang, Chu Lai, and Phu Bai; for a proposed Recruit Training Center at Orlando, Fla.; for improvements to submarine base at New London, Conn., and Pearl Harbor; for a proposed airfield and harbor development in Okinawa; for a proposed naval hospital at Charleston, S.C.; for redevelopment of naval stations at Treasure Island, Calif., and Washington, D.C.

Management, Operations, and Maintenance

During fiscal year 1966, \$154.8 million was expended for maintenance and repair of real property, \$79.2 million for utilities genera-

tion and procurement, and \$69.3 million for other operating expenses such as custodial work and furnishings and equipment for personnel support facilities. Validated savings totaling \$14.4 million were realized in facilities management.

The increased tempo of operations at many naval activities as a result of the Southeast Asia operations placed extremely heavy demands upon available resources. For example, the recommissioning of four mobile construction battalions required the reactivation of the SeaBee Center at Gulfport, Miss., to provide homeport and training facilities for at least two battalions. A rehabilitation program costing approximately \$500,000 is in progress to reactivate some 40 buildings and structures at this center.

The amount of funding in facilities maintenance was increased from a level of \$135 million annually to \$154.8 million through improved management techniques and pay-offs in the utilities and transportation management programs. In spite of this increase, the backlog of essential maintenance has risen from \$98 million at the end of fiscal year 1965 to \$103 million at the end of fiscal year 1966.

During the past fiscal year, the Navy's record in utilities management has been above average when compared to national trends:

	<i>Navy performance Percent</i>	<i>National average Percent</i>
Electricity Consumption, total.....	+2	+6.7
Electricity Consumption, per capita.....	(¹)	+2.3
Water Consumption.....	+1	+4.5

¹ No change.

Thirty-two major administrative telephone systems have been converted to CENTREX or similar modernization. At the end of the first year of operation, the new Public Works Center at Great Lakes, Ill., and those at Pensacola, Fla., and Yokosuka, Japan, reported one-time savings of \$205,000 and recurring annual savings of \$279,000. Close management of Navy real property resulted in the lease of over 206,000 acres of land and 20 million square feet of buildings with an annual return to the Government in rentals and timber harvest fees of over \$3 million. Over 2 million acres of Navy lands and waters were open to public access for hunting, fishing, and other recreational activities. Naval activities placed first and second in the Secretary of Defense Conservation Award competition.

An estimated 50 percent of the water and air pollution deficiencies at naval installations in the United States have been identified and corrective projects totaling \$76 million have been developed. Execution of these projects is currently programed over a 5-year period, commencing in fiscal year 1968.

The occupancy rate for the Navy's 62,000 units of family housing met the prescribed goal of 98 percent, despite an increased turnover rate. Family housing accounted for \$90 million in expenditures during fiscal year 1966. The maintenance and operation cost per unit increased from \$846 to \$876 per unit, due primarily to increased labor and material costs. The domestic leasing program for family housing was increased from 50 to 1,212 units in fiscal year 1966. Successful negotiations with the Federal Housing Authority resulted in a \$650,000 reduction in mortgage insurance premiums on outstanding balances for Wherry and Capehart projects.

Military Sea Transportation Service

Military Sea Transportation Service (MSTS) operated a nucleus fleet of 167 ships (augmented by 180 chartered ships and 101 ships operating under General Agency Agreement). Ships under MSTS control totaled 448, compared with 201 in the previous fiscal year. In fiscal year 1966, MSTS operations included lift of 20.8 million measurement-tons of cargo, 309 thousand passengers, and 19.8 million long-tons of petroleum products.

Operating expenses were \$836.1 million. Of this total, \$690.3 million (83 percent) was paid to commercial interests for shipping and other services provided. Activation of ships, maintenance and repair to ships, and the tanker upgrading program cost \$51.6 million. Of this amount, \$48 million was spent in the United States, primarily with 72 private ship repair firms, and \$3.6 million in the Far East.

Personnel assigned to MSTS increased from 11,796 in fiscal year 1965 to 12,847 in fiscal year 1966.

The increase in workload, expenses, and resources reflected the increased tempo of operations in Southeast Asia. Operations of special interest included Southeast Asia Express Service (air eligible shipments of fast commercial service), Operations HARD LOOK and DEEP FREEZE, "Special Express" (a systemized movement of specially stowed ammunition to Southeast Asia), a variety of special operations including charter of towing service in South Vietnam, expansion of container operations, and extensive tows in support of Southeast Asia.

Transportation, Construction, and Mobile Utility Support Equipment

Expenditures in fiscal year 1966 for transportation equipment maintenance and operations amounted to \$50.7 million. The annual motor vehicle report for all U.S. activities, issued by the General Services Administration in February 1966, shows that during the latest report-

ing fiscal year (1965) the Navy out-performed all other military Services in cost per mile for transportation.

Over 11,000 items of transportation and construction equipment and 237 units of mobile utilities support equipment and fleet moorings, amounting to \$58.9 million, were obtained and distributed. The average age of transportation equipment has been reduced from 5.3 years to 4.1 years, in the 2-year period since 1964. Equipment downtime has been reduced from 9 percent to 6.7 percent. Maintenance personnel have been reduced by 400, and number of units has been reduced from over 65,000 to less than 62,000.

Over 2,700 units of transportation equipment, valued at \$14.5 million, were provided on an emergency basis to Southeast Asia.

Validated savings in the noncombat vehicle management program were \$4 million against a goal of \$2.2 million.

Research and Development

Programs

Congressional appropriations for Department of the Navy research, development, test, and evaluation (RDT&E) in fiscal year 1966 amounted to \$1.6 billion. With these funds the Navy pursued its own RDT&E interests, and monitored related efforts of industry and the other armed Services.

Undersea Warfare

Major effort continued in developing concepts, materials, equipment, instrumentation, and energy sources for deep ocean application. Acoustics studies were emphasized. In October 1966 the Atlantic Undersea Test and Evaluation Center (AUTECE) was commissioned. It has already begun to contribute vital knowledge to advancement of the undersea warfare capability.

Progress is being made on the submarine safety program and the submarine rescue project. Development was completed on an escape suit for submarine crewmen. Evaluation of a prototype submarine rescue vehicle is scheduled for completion in 1968.

Aircraft and Missiles

The EA-6A electronic countermeasures aircraft and the E-2A early warning aircraft have been introduced into the fleet. The air-to-surface SHRIKE, WALLEYE, ROCKEYE, and SNAKEYE missiles have become operational, as have improved versions of the air-to-air SPARROW and SIDEWINDER.

In addition to continued effort in the development of advanced missile systems, further improvements of existing surface missile systems, i.e., TARTAR, TERRIER, and TALOS, have been evolved.

The all-weather carrier landing system now in systems development has progressed to the point where operational evaluation is planned for fiscal year 1967. It will provide safe, reliable, and fully automatic ("hands off") approach and landing capability for jet aircraft on attack carriers in every type of weather, day and night.

Ships and Guns

The Fast Deployment Logistic ship project was established. Requests for the proposal were distributed and the proposal evaluation team is currently analyzing three responses.

Development of the 5"/54 lightweight naval gun is progressing on schedule. The first digital gunfire control system is ready for operational evaluation. Increased range and lethality of rounds will be provided by rocket-assisted and antipersonnel projectiles.

Astronautics

Application of space technology to the fields of communications, navigation, and ocean surveillance has continued. The Navy navigation satellite system, the most accurate worldwide navigation system known, is nearing the end of its RDT&E phase. All POLARIS submarines have been or are being equipped to utilize the system. Attack carriers operating in Southeast Asia have also been fitted for this capability.

Ocean Sciences

Two Navy deep sea research vehicles played vital roles in the recovery of the "H" bomb off the coast of Spain. The *Alvin* successfully located the bomb, and the CURV brought it to the surface.

The SEA LAB II experiment, part of the man-in-the-sea program, was completed. The underwater habitat, placed in 205 feet of water off La Jolla, Calif., was utilized for a total of 45 days by three 10-man teams. Plans are now being completed for SEA LAB III which will use a habitat at a 430-foot depth.

In long-range oceanographic telemetering buoy development, a milestone was reached when Buoy Bravo, designed to transmit oceanographic and meteorological data, anchored on the axis of the Florida current in 1,000 feet of water, provided continuous measurements of meteorological and oceanographic conditions during Hurricane Betsy in September 1965.

Biomedical Sciences

The feasibility of using the newly developed frozen blood bank system in a forward combat area was demonstrated in South Vietnam. It has increased the life-saving capability and flexibility of the existing blood bank system. It provides reconstituted frozen blood which is essential where other existing blood is not compatible with the blood of certain individual casualties.

An experimental medical R&D support unit was activated at Danang, South Vietnam, to give civilian and Navy scientists direct access to combat medical problems.

The Bureau of Medicine and Surgery began development of a meningitis control system. Special attention is being focused on recruit training center populations in the effort to eliminate this deadly disease from the military Services.

Personnel and Training

Tests of Project COMPASS resulted in operational installation of the COMPASS system at the San Diego recruit center. COMPASS applies computer technology to the complex problem of matching men and jobs at the recruit assignment level. It thus achieves significant gains in efficiency through better assignment of recruits.

A group successfully demonstrated the feasibility of the man amplification concept; i.e., that a man could wear an outer structural jointed suit like an outer garment which could be powered and linked to his own sensors and muscular system, thus affording increased strength and endurance far beyond ordinary human capability. In addition, this year saw the introduction of a number of weapon systems trainers that enhance the training capability and scope. One is a tactical trainer for training ASW helicopter teams; another is a weapon system trainer for the new A-6A and A-7A aircraft. Also recently introduced are the helicopter instrument simulator and the radar land mass presentation simulator.

Materials and Design

In the computer-aided ship design program, a destroyer feasibility design computer program was utilized in developing techniques for conducting feasibility studies on various types of ships.

Computer techniques were applied to the FDL ship project enabling engineers to determine quickly the effect of changing a parameter, such as endurance range, on ship size and cost.

A number of achievements in materials development were brought to fruition. The first large diameter titanium wire rope was fabricated reducing by 60 percent the mass and weight of line to be used for deep submergence work. Three new alloys were developed which show promise for marine applications, including a high-yield strength alloy steel, a high-yield strength titanium alloy, and a high-strength copper base alloy.

Marine Corps RDT&E Projects

Studies were completed on satellite-borne information systems, feasibility of on-site fabricated helicopter pads, Marine amphibious

transportation, mobility of the Marine Expeditionary Force, feasibility of on-site fabricated beach matting, and civil affairs.

Studies continuing in progress include: Artillery fire support systems, the seismic location of artillery and mortar firing positions, digital transmission and switching system, manpower control system, support requirements for a composite Marine aircraft group, ammunition and fuel distribution systems, Marine tactical data system improvement program, advanced Marine tactical command and control system, tactical aircraft survivability, and integrated landing force position location and navigation system.

Equipment development programs were initiated which included a new landing force assault amphibian vehicle, a 1½-ton payload marginal terrain vehicle for use in areas which do not possess adequate road networks, and a new air surveillance radar.

The Marine Corps participated in the Director of Defense Research and Engineering-sponsored PROVOST program to provide priority research and development in support of Vietnam operations. Programs being pursued by the Marine Corps include a new fuze for 90-mm. Beehive ammunition, modifications to the counter-mortar radar, improved radio batteries, improved high frequency radio antennas, modification of the AN/PRC-41 radio, development of a man-portable multishot flame weapon, an improved naval gunfire radar beacon, and an airdroppable beacon for use with helicopters.

Two developments which the Marine Corps made operational in 1966 are the Seismic Intrusion Detector (SID) and the lightweight battlefield surveillance radar, AN/PPS-6. SID provides excellent assistance in detecting the approach of enemy personnel during poor conditions of visibility. The device is in use by Marines in Vietnam. The AN/PPS-6 is a 35-pound man-portable device, presently on the way to Vietnam in limited numbers for troops tests.

V. Economy and Efficiency

Management Improvements

Reorganization of the Department of the Navy

A major reorganization of the Department of the Navy was effected on May 1, 1966. The reorganization increased the breadth of authority and responsibility of the Chief of Naval Operations and strengthened the management of the Navy's material support organization. The principal elements of the reorganization are as follows:

1. A restructuring of the bilinear Navy organization into a unilinear framework by placing the Navy's material, medical, and personnel supporting organizations under command of the Chief of Naval Operations.

2. A reconstitution of the Naval Material Support Establishment as the Naval Material Command.

3. A restructuring of the components of the new Naval Material Command into six functional commands (vice four material bureaus) as follows: The Air Systems Command, Ship Systems Command, Electronic Systems Command, Ordnance Systems Command, Supply Systems Command, and Facilities Engineering Command.

The reorganization did not affect the internal organization of the Marine Corps nor disturb the traditional relationship between the Chief of Naval Material and the Commandant of the Marine Corps.

Under the reorganization, the office of the Chief of Naval Operations was not affected directly; however, the CNO, in addition to having the operating forces of the Navy under him, now exercises command over the Chief of Naval Material, the Chief of Naval Personnel, and the Chief, Bureau of Medicine and Surgery.

In addition to improving the overall coordination of the Navy's support activities in the area of material, medicine, and personnel by assigning responsibility for these total functions to the Chief of Naval Operations, the reorganization is expected to accomplish the following purposes:

- Affirm and strengthen the systems management approach to weapons development and acquisition.
- Reinforce the management strength of the functional organizations under the Chief of Naval Material; achieve more balanced

and efficient spans of control; and give more emphasis to ordnance and electronics.

- Centralize and improve the coordination of RDT&E management.
- Place more emphasis on the logistic support and maintenance of weapon systems.
- Increase the efficiency and economy of the Navy's material organization by exploiting opportunities for consolidation of common services.

Project Management

Expansion of the project management concept was continued and has been strengthened under the centralized control of the Chief of Naval Material. During fiscal year 1966 project offices were established for the Spanish Ship Support Project, the Deep Submergence System Project, and the Fast Deployment Logistic Ship Project.

Management Information

A comprehensive plan has been implemented to provide centralized coordination of major management information systems development in the Department. As a result of this procedure, the major components developed, for the first time, 5-year plans covering their overall information needs and the plans to satisfy these needs. Specific central guidance was provided on actions which should be taken between components to coordinate and integrate interrelated information systems. Such actions should result in greater efficiency in the processing of information, reduction of duplicate data, and more accurate and complete information to management.

An updated policy and guidance directive was issued to provide for better management and control of the selection, acquisition, application, and release of automatic data processing equipment (ADPE). The directive encompasses resource sharing and cooperative utilization of ADPE by Government agencies. A net increase of 71 has occurred in the number of digital computers in use by the Navy and Marine Corps during fiscal year 1966. Total costs for the automatic data processing program increased from \$155.1 million in 1965 to \$172.6 million in 1966. While the increase in the number of computers was large, the increase in cost was dampened by the heavy capital investment in computer purchases in 1964 and 1965, which continues to reflect significant reductions in rental payments during 1966.

Marine Corps Integrated Information System

The Marine Corps' major management improvement effort this past year concentrated on a comprehensive review of information flow and processing procedures. The review aimed at developing design concepts

and implementing procedures for a total information system which would provide management information, with sufficient frequency and relevance, to decision-making centers at all levels of command.

The concept of a total or integrated information system recognizes that the information collected or to be collected by Marine Corps functional operational systems provides the most complete and economically accessible source of data. Using these sources of information, the integrated information system will provide a coordinated data base accessible to all decision-making centers, while at the same time maintaining the integrity and primary usefulness of the unique operational systems. Thus, commanders at all levels within the Marine Corps will have information that will help them assure that resources are obtained and used effectively and efficiently in the accomplishment of Marine Corps objectives.

Logistic Support

Two major undertakings by the Navy to improve logistic support were the implementation of the Navy Logistic Support Improvement Plan and the expansion and refinement of the Navy Maintenance and Material Management System.

The Navy Maintenance and Material Management System is comprised of two parts—the Planned Maintenance Sub-System and the Maintenance Data Collection Sub-System. The objective is to improve operational readiness of material by performing maintenance as close to the point of action as possible and at minimum cost. During the last fiscal year the Planned Maintenance Sub-System was expanded to 67 percent of ships of the fleet to all aviation units. The installation of the Maintenance Data Collection Sub-System was completed in 65 percent of the ships and in 70 percent of aviation units.

The Navy Logistic Support Improvement Plan was the result of a broad study which identified areas for improvement and developed specific objectives and milestones to be accomplished. The plan, approved by the Secretary of the Navy in June 1965, set up 11 projects, comprising 19 objectives. Of these, nine have been completed, five are nearly completed, and the remainder are considered to be continuing programs.

Commissaries and Exchanges

In several geographic areas Navy commissary stores are being consolidated under one activity. Small main stores are redesignated as branches and are satellites of a large main store. This permits increased economies in volume buying, standardization of items on prices in an area, consolidated automatic data processing, and manpower savings in procurement, stock control, and accounting functions.

The Marine Corps Exchange Service Division completed a revision of its exchange accounting system which streamlined accounting procedures and provided uniformity in all exchanges.

Manpower Utilization

Reduction of Requirements

A Navy Task Group was activated and a Manpower Reduction Review Group of senior Navy officials has been established to provide vigorous top level management support to reduce requirements for Navy manpower. The Navy's present manpower reduction effort is producing tangible reductions through such on-going programs as the manpower validation program, staffing criteria development, standard Navy maintenance management system, standardization (Systems/Equipments/Components) incentives, and the cost reduction program. In reviewing these current programs, it can be observed that an iterative process of development and refinement in new designs, new procedures, and new practices will result in certain reductions in manpower requirements. Major breakthroughs, though not presently foreseen, will be sought out consistent with the requirement that operating units maintain the flexibility and capability to accomplish their wartime missions.

The Navy Manpower Validation Program, which was established to determine the minimum manpower requirements of all ships and stations of the Navy, has been expanded to include two Navy Manpower Validation Offices (Atlantic and Pacific), 22 Manpower Validation Teams (10 fleet and 12 ashore), and a Manpower Validation Support Activity. The support activity to be established July 1, 1966, will provide for a more rapid processing of the data developed by the manpower validation teams.

Marine Corps manpower criteria were revised during fiscal year 1966 for messes and clubs, food services, data processing, and Marine Air Reserve training detachments. Completely new instructions were issued on Fleet Marine Force organic supply, subsistence supply, transportation services, aviation operations, and aircraft maintenance support equipment.

Productivity Measurement Studies

Navy and Marine Corps productivity measurement studies were completed on the subject of warehousing operations. An additional Marine Corps study of laundry operations was completed. The result of these studies will provide a statistical basis for improving overall manpower utilization in these functions.

Automatic Data Processing

Improvements in manpower utilization continue to be realized through the use of computer programs in manpower management. Examples are: The Navy Personnel Requirements and Inventory System, which is an integrated system for military manpower planning and control, including the projection of personnel requirements for new weapon systems; the Marine Corps Manpower Requirement Process (Distributive and Predictive); the Marine Corps Officer Population Forecasting System (IBM contract); and the Navy Computer-Aided Ship Design Project. The latter is aimed at achieving cost improvement in ship design and construction totaling \$1,500 million over a 20-year period—with manpower accounting for about 80 percent of the savings.

Contracting

Contract Awards

The Navy's fiscal year 1966 performance in the below listed areas of procurement are noteworthy:

Area		Fiscal year 1965	Fiscal year 1966
Total Obligation.....	billion..	\$8. 7	\$10. 0
Price Competition.....	percent..	41. 7	38. 4
Formal Advertising.....	do.....	19. 6	14. 2
CPFF Contracts ¹	do.....	9. 4	14. 2
Small Business.....	do.....	16. 5	19. 3

¹ Objective is reduced usage of CPFF contracts. Almost 10 percent of our fiscal year 1966 obligations were for SEA procurements which were generally required to be made under circumstances which compromised our performance in the foregoing areas.

Cost-Plus-Award-Fee Contracting

To further avoid the use of cost-plus-fixed-fee contracts, emphasis was placed on using the award-fee type when it was impracticable to use the more preferred types. As a result, over \$700 million were obligated in the award-fee type of contract in fiscal year 1966.

Advance Procurement Planning

During this fiscal year the Office of the Chief of Naval Material completed a study on improving advance procurement planning and made recommendations which have now been implemented. One of the major recommendations of the study group was the preparation and publication of a comprehensive Advance Procurement Planning Guide. A preliminary outline was completed by NAVMAT personnel and submitted to Harbridge House for professional editing. The first draft has now been submitted to NAVMAT for review.

Financial Management

Cost Information System Refinements

The basic Navy Cost Information System has been in use since 1962. During fiscal year 1966 it has been significantly expanded by developments which will now permit direct computer-to-computer interfacing of several other Navy management information systems and enlarge its scope of usefulness to management. This extended interface coverage will provide a greatly increased capability to respond to user requirements. It has become a more valuable management tool in the decision-making process by bridging the gap from budgeting to progress evaluation and from progress evaluation to objective analysis. In effect, it closes the management control loop.

DoD Resources Management System

Early in the year, the Secretary of Defense set forth the basic concepts of a Defense Resources Management System. These concepts envision a completely integrated planning, programing, budgeting, and accounting system to fit the needs of planners and managers alike. This system is described as being the total body of recurring quantitative information used by management at all levels in the process of assuring that resources are obtained and used effectively in the accomplishment of objectives. It is expected that the system will involve all levels of management in the Department of the Navy.

Based on these concepts, the Navy designed and installed an expense operating budget system at the Naval Air Station, Quonset Point, R.I., and is currently conducting an evaluation test of the system. Accrual accounting with a general ledger providing a double entry system is being used at the activity thus providing an improved relationship between the usage of resources (civilian and military personnel, material and services) and the recording of related expenses. The guiding principle of the test is resources control through one or more expense operating budgets which, when approved by higher authority, will be the fund limitation authorized for financing activity operations. The inclusion of all resources in the expense operating budget provides the long-standing objective of a cost-based budget and eliminates the necessity for issuance of allotments to activities and the performance of allotment accounting by the activity.

As the year ended, an intensive effort was underway to orient programing and budgeting throughout the Department of the Navy to the DoD Resources Management System. This includes a complete overhaul of the Navy budget structure and almost complete reduction of "free issue" material; the extension of stock fund procedures; the treatment of military personnel costs as an expense to the user; and

a significant realignment of organizational responsibilities for management of programs. These improvements will result in consistent correlations between costs reflected in programs and fund requirements in budgets; they will provide the means to more adequately measure performance by the inclusion of expenses for military personnel and consumable items; and they will assign concurrent resource management responsibility to the principals involved in major program decisions.

Naval Audit Organization

A reorganization of the Navy's internal audit organization established the Naval Audit Service on February 1, 1966, with a headquarters directorate and six major field offices. The Naval Audit Service was established to strengthen the internal audit function in the Navy Department.

Audit Policy

Audit field offices were given firm policy direction to expand the scope of auditing and emphasize management analysis rather than limiting coverage to fidelity and compliance type audits. Plans were developed to place major emphasis on Service-wide audits. These audits will appraise the overall business management of programs or functions as these affect the operations of the Navy and Marine Corps as a whole. At year end, other studies were being made to determine the optimum frequency of making audits at activities. Planning factors reflecting man-hours required to audit the different types of naval activities were also under development. The objectives of these endeavors is to provide more comprehensive audit coverage as well as ensuring adequate coverage of all naval activities.

Audit Operations

In fiscal year 1966, the Audit Service issued 519 formal reports incorporating savings recommendations totaling \$100.9 million. These recommendations represent savings in excess of \$18.00 for each dollar invested in auditing.

About 11 percent of the total audit effort was directed to the DoD cost reduction program. Navy auditors examined 12,992 reports amounting to \$2.4 billion and validated 11,147 of these reports which totaled \$2.0 billion in cost reductions.

Nearing completion was a Service-wide audit of the Navy's ammunition supply system. Service-wide audits of fixed pricing at naval shipyards; reimbursable expenses incurred in the preparation and sale of certain scrap, salvage, and excess property; support of the A-6 aircraft; and the Military Assistance Training Program were also underway.

Resident staffs were placed in the Aviation Supply Office and the Electronic Supply Offices to provide continuous audit coverage to all of the Navy's inventory control points. As the year ended, resident audit staffs were being placed in the major procurement organizations such as the newly formed Naval Systems Commands.

Advance Payment Financing of Contractors

At June 30, 1966, the Navy had interest free advance payments with a dollar balance of \$16,041,286 in actual use by 24 contractors. Advance payment financing is used sparingly, except for experimental, research, or development type nonprofit contracts with nonprofit educational or research institutions.

Interest at 6 percent per annum is customarily charged on advance payments. However, under Defense regulations those granted to nonprofit institutions on nonprofit contracts are interest free. The interest free feature dictates administrative practices designed to tailor the amount of Government funds advanced to the closest practicable tolerances necessary to finance contract costs during the cost reimbursement cycle. To accomplish this, a new contractual agreement was developed in fiscal year 1966. The essential elements of the newly developed technique are to authorize a maximum advance as before but release amounts in weekly increments directly to the contractor based upon estimates of need for 1 week. The estimate is prepared 10 days prior to the week to which it is applicable. It is passed to the resident Navy representative, who approves it as reflecting the best estimate of funds needed to supplement available funds of the contractor. Approved estimates are forwarded to the Navy disbursing office for the drawing of a check which is to be released so as to reach the contractor on the first day of the week to which the advance applies. The procedure further provides for the application by the disbursing officer of all or such amount of each regular cost reimbursement billing as is necessary to liquidate any outstanding weekly advances.

With approval of the Department of Defense Contract Finance Committee, a pilot test of the newly devised procedures was conducted. It was applied to one contractor having an advance payment of \$3,300,000. After 6 months the results revealed that on an average daily basis, \$500,000 remained in the U.S. Treasury, which, under the conventional procedure, would have been withdrawn. At the present high cost of money for servicing the public debt, this would, in the course of a year, approximate \$20,000 to \$25,000 in savings of interest. While the savings may vary in future periods, there is reason to believe that this magnitude of saving will continue on this case for the foreseeable future.

Consideration is being given to extending the procedure to the remaining 23 outstanding Navy advances as rapidly as feasible under the terms of the contractual arrangements. Possible yearly savings of interest to the Government could be quite substantial when broader application is realized.

Shipboard Supplies and Equipage Accounting and Reporting

The task of accounting and reporting for shipboard supplies and equipage funds was successfully transferred ashore to the Navy Regional Finance Centers at San Diego, Calif., and Norfolk, Va., effective July 1965. This procedure removed the majority of the supplies and equipage accounting effort from the fleet ships.

Disbursing Consolidations

Additional consolidation of disbursing functions was accomplished in fiscal year 1966. Nine independent disbursing offices were absorbed by six Navy Comptroller field finance activities, with an estimated annual savings of \$120,000, including 18 personnel. This program of consolidation resulted from a continuing review of the efficiency of pay administration throughout the Navy.

Mechanization of Military Pay

During the past year, the Navy and Marine Corps have been engaged in the development of a mechanized system for the maintenance of pay accounts for military personnel. The new system will make possible the accounting for military pay and allowances on an accrual basis in accordance with the provisions of Sec. 2(b) of the act of August 1, 1956, 31 U.S.C. 66a(c). It will provide more detailed and timely information to management and will meet all requirements of the General Accounting Office and the Department of Defense. Detailed procedures are now being written for use in the new system, which will be thoroughly tested prior to final installation. The target date for complete implementation of the system is July 1, 1969.

Cost Reduction

During fiscal 1966 a special effort was made to encourage the individual employees at 137 Navy and Marine Corps activities to support the cost reduction effort by identifying and recommending ways to reduce the cost of doing their assigned and related tasks. As a result of this effort, which was identified as Campaign WOW (War on Waste), 40,000 more cost-cutting beneficial suggestions were submitted in fiscal 1966 than in an average prior year. These additional suggestions increased the measurable benefits reported from the Beneficial Suggestion Program by nearly \$7.5 million to a record high total of \$19.9 million.

The continued search for better and less expensive ways of carrying out the mission of the Navy and Marine Corps has increased the fiscal year dollar benefits reportable under the DoD cost reduction program to a total of \$2.0 billion, an increase of \$200 million over the previous year.

The Marine Corps, with a fiscal year 1966 cost reduction goal of \$22 million, reported actual reductions of over \$59 million.

VI. Conclusions

The events of fiscal year 1966 have borne out in full measure the value of naval forces to the security of the United States. The readiness of the Navy and Marine Corps to wage conventional war and their capabilities in combat have been demonstrated to an increasing degree in Southeast Asia. There and elsewhere, the use of naval forces to apply politico-military pressure in support of our national policy has also been demonstrated. Naval forces are deployed and alert throughout the world as tangible evidence of American determination and capability to defend our freedom and that of our allies. The multipurpose forces of the Navy and Marine Corps are selectively available for rapid, effective, and decisive employment whenever the need arises. Similarly, the sea-based strategic retaliatory forces of the Navy are maintained in a high state of readiness for rapid response if required.

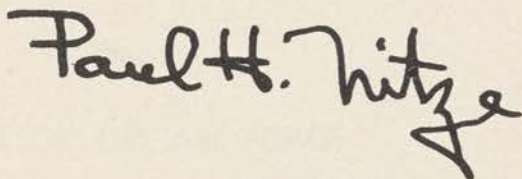
The war in Vietnam has again demonstrated, in another sense, the importance of seapower to the United States. Although our large and indispensable national airlift capability has responded superbly to our requirements for rapid transportation of personnel and high priority cargo, 98 percent of all material sent to Southeast Asia in support of U.S. forces has been transported by sea. The immense quantities of materials required to support modern land, air, and naval forces demand the massive capabilities of sealift.

Although the conflict in Southeast Asia has involved an increasing proportion of Navy and Marine Corps operational efforts, the requirements of our worldwide commitments have not diminished. The maintenance and training of adequate forces have necessitated a fleetwide increase in the tempo of operations. Similarly, our requirements to ensure the development of advanced weapon systems and capabilities for the future have not diminished, and these continue to receive high priority.

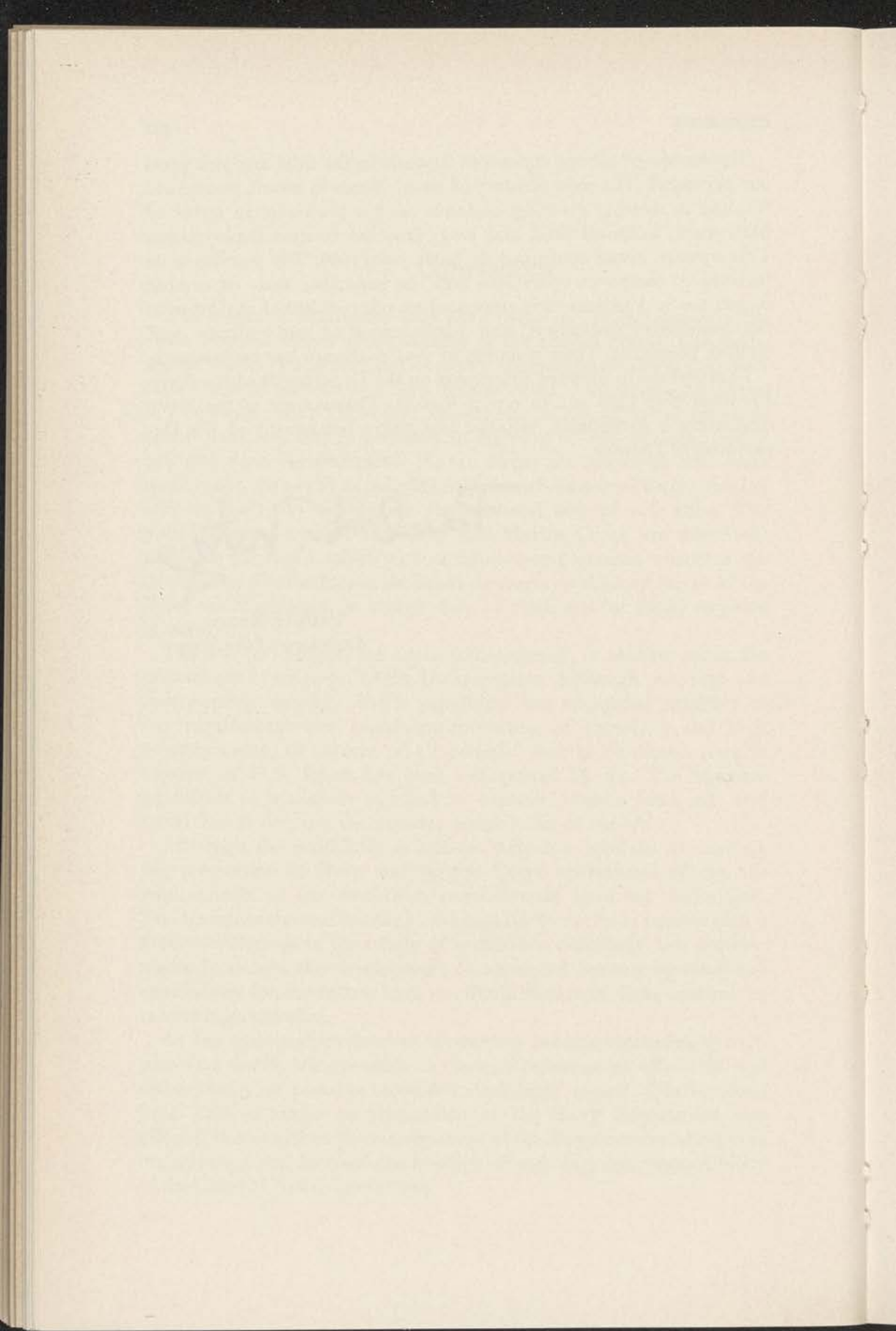
As the tools and techniques of warfare become increasingly complex and costly, the necessity to manage resources as efficiently and economically as possible becomes increasingly urgent. During fiscal year 1966, a major reorganization of the Navy Department was effected to strengthen the management of the Navy's material support organization and increase the breadth of authority and responsibility of the Chief of Naval Operations.

The success of all our endeavors depends in the final analysis upon our personnel. The commitments of naval forces in recent years have resulted in steadily growing demands on our personnel in terms of hard work, technical skill, and long, frequent oversea deployments. This upward trend continued in fiscal year 1966. The Service-wide increase in tempo of operations and the expanded scale of combat operations in Vietnam have presented an unprecedented challenge to the leadership, dedication, and performance of our military and civilian personnel. Their response to that challenge has been superb.

I am pleased to forward this report on the Department of the Navy for fiscal year 1966 and to report that the Department of the Navy constitutes a formidable, reliable, and ready component of the Department of Defense.

A handwritten signature in dark ink, reading "Paul H. Nitze". The signature is written in a cursive, slightly stylized font. The "P" is large and loops around the "a". The "N" is also large and loops around the "i". The "t" is simple, and the "z" has a long, sweeping tail that extends downwards and to the right.

PAUL H. NITZE,
Secretary of the Navy.



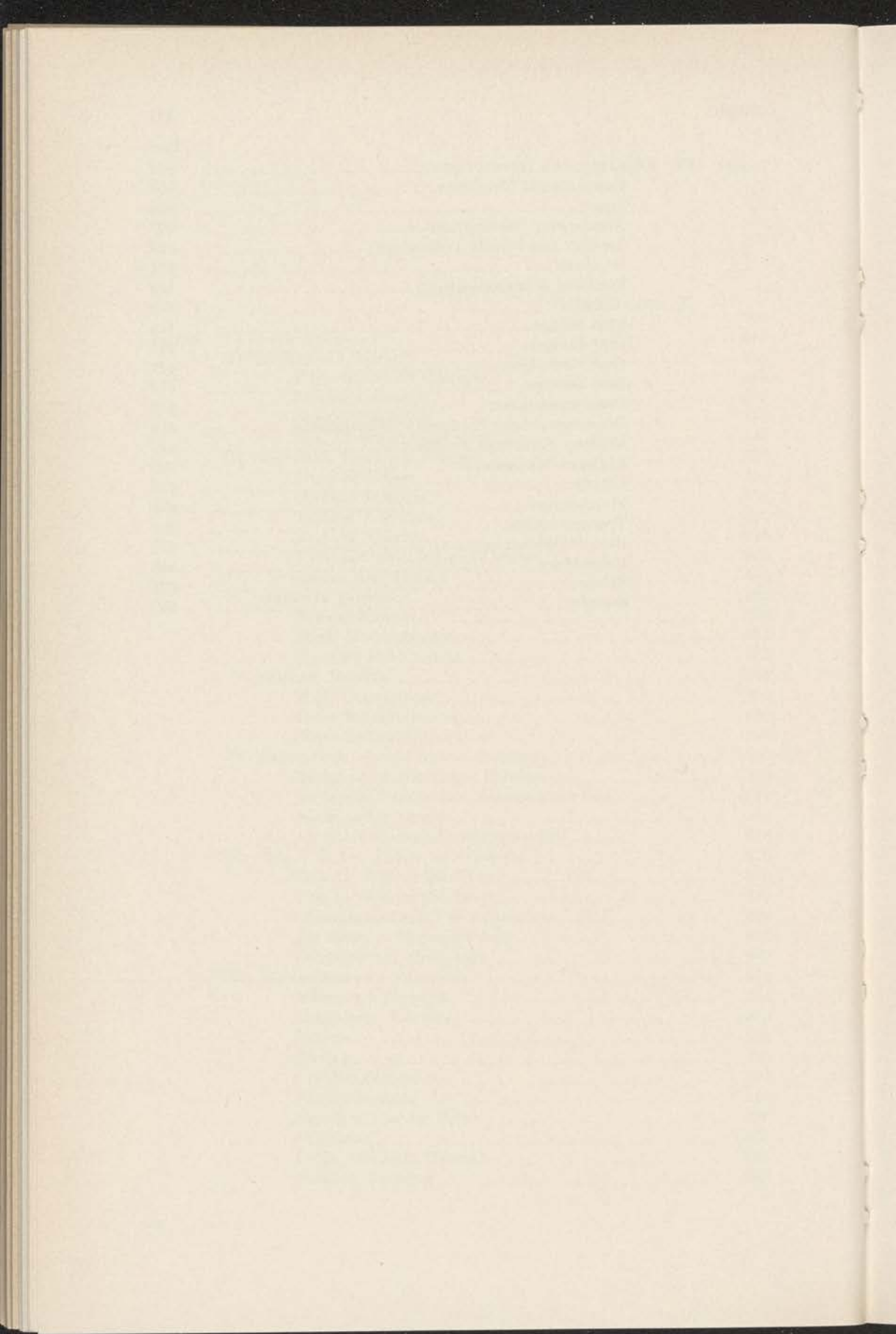
Annual Report
of the
SECRETARY OF THE AIR FORCE

July 1, 1965, to June 30, 1966

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I. Introduction

The U.S. Air Force continued during fiscal year 1966 to compile an impressive record of progress in many areas, from research to combat. Understandably, operations in Vietnam tended to overshadow some other achievements of the Air Force. This report provides a summary of progress in all major Air Force operational and support functions which contributed collectively to national defense and to the achievement of national objectives.

Our most important defense task has remained that of deterring general nuclear war. We have improved the capability of our strategic offensive forces by replacing older intercontinental missiles with the advanced MINUTEMAN II missile, by phasing out older strategic bombers which will be replaced by the FB-111, and by continuing developmental work on the engine and other components for a still more advanced bomber (the AMSA) if it is needed. In the strategic defensive area, our warning and control systems have been improved and we have developed and tested a revolutionary interceptor, the F-12, which could be put into production quite rapidly if there proves to be a requirement.

Our success in breaking the enemy's major offensive of 1965 in South Vietnam was the outstanding achievement of the year. It was the result of the best air-ground teamwork in the history of warfare and the superb close air support provided to allied ground forces by Air Force, Navy, Marine, and South Vietnamese tactical air units. Close air support, together with Air Force reconnaissance operations, interdiction of enemy supply routes, B-52 "spoiling" attacks, and airlift contributions to Army mobility made the cost of sustaining large-scale offensive operations too high for the Viet Cong and North Vietnamese. Allied forces gained the initiative in South Vietnam during the past year, and we have kept it.

The bombing campaign in the North, conducted with a degree of precision unheard of in World War II or in Korea, contributed to the success of our operations in South Vietnam by reducing and making more expensive the movement of war materiel from North Vietnam to Communist forces in the South. The enemy also was forced to divert substantial manpower and materiel resources to the task of repairing, maintaining, and defending his supplies, transportation system, and communication net.

Airpower provided by the U.S. Air Force also demonstrated its ability to operate a 10,000-mile-long air line of communication from the continental United States to the immediate battle area in Vietnam. Long-range four-engine transports of the Military Airlift Command (MAC) maintained a constant flow of men and supplies from the United States to Southeast Asia. Tactical and assault transports provided a volume of intratheater airlift exceeding that of the Korean war. Again, military airlift was used to help rebuild the economy of areas that had been ravished by the enemy and to assist the people of South Vietnam in reestablishing civil functions that had been disrupted by war.

Air Force people and equipment deployed to Southeast Asia performed many other operational missions: Air-to-air combat with enemy fighters; air rescue and recovery; electronic warfare; defoliation of jungle areas; psychological warfare; forward air control operations; air evacuation of sick and wounded; and night illumination of battlefields. All of these accomplishments demonstrated once more that airpower is indispensable to the success of ground operations.

Statistical summaries of sortie rates, munitions expenditures, cargo deliveries, and similar measures of the effectiveness of Air Force operations are published periodically, many of them in this report. Behind these statistics lies a half century of Air Force expertise in the organization, application, and support of airpower. Tactical units in the field or bombers, missiles, and interceptors on alert are the apex of a pyramid, resting on a broad base of support functions. In the many support areas—research and development, logistics, training, personnel management, intelligence—progress has been equal to that in operational areas, though perhaps less evident to the public.

In the field of technical training, for example, the Air Force has continued in the past year to adapt new techniques, such as a programmed learning, to the job of providing skilled personnel for support and operational assignments. It has conducted or sponsored basic and applied research in a variety of fields related to weapons, conventional munitions, and electronic devices and techniques. The products of research are bringing us closer to the goal of a truly all-weather, day-night operational capability. In the management of its resources, the Air Force continued to perfect the application of computer technology to logistics, personnel and financial planning, and operations. Techniques of systems analysis were applied with increasing success to decisionmaking processes. A wholly new field of application is emerging in the scientific measurement and prediction of the effects of air actions on a military campaign as well as their interactions with political factors.

The men and women of the Air Force have carried out their duties with courage, dedication, and a determination to find still better ways to do their jobs. We have the people, the weapons, and the supporting systems to meet any requirements that may be placed on the Air Force—in Southeast Asia or wherever else aerospace power may be needed to achieve our national objectives.

II. Strategic Forces

During fiscal year 1966 the Strategic Air Command (SAC) maintained its powerful retaliatory force of missiles and bombers in a high state of readiness, capable of surviving a first strike against the United States and assuring the destruction of enough enemy targets to discourage attack in the first instance. At the same time, SAC demonstrated its ability to support ground forces in a limited conflict by flying B-52 missions against tactical targets in Vietnam.

At the end of June 1966 the strategic deterrent force consisted of 934 intercontinental ballistic missiles and 680 bombers. For the first time, SAC's operational inventory included more missiles than bombers, after the B-47 medium bombers and early model B-52 heavy bombers were retired and new MINUTEMAN II units were activated. The B-52 continuous airborne alert was reduced in November 1965 because of an improved alert system and the increased capability of the growing missile force. Airborne alert indoctrination flights were authorized, however, within limitations established by the Joint Chiefs of Staff (JCS). About half the bomber force continued on ground alert.

Force Structure Changes

In the spring of 1966 the Air Force dropped two older B-52B squadrons, reducing the B-52 force to 40 squadrons with 600 aircraft. The B-58 force of 80 aircraft remained unchanged, as did the KC-135 tanker force of 620 aircraft organized into 40 squadrons. On March 31, 1966, SAC retired its last B-47 to storage at Davis-Monthan AFB, Ariz. At one time during the late 1950's, there were 27 B-47 wings with 1,367 aircraft. Earlier, on December 21, 1965, SAC retired the last of its KC-97 air refueling aircraft. The KC-97 fleet had once consisted of 36 squadrons with 780 tankers. These changes in the bomber force led to the inactivation or transfer of several SAC bases to other missions and relocation of a number of units.

In June 1966 the SAC ICBM force consisted of six TITAN II squadrons with 54 missiles and 20 MINUTEMAN squadrons with 880 missiles. The TITAN II squadrons were positioned at Davis-Monthan AFB, Ariz., McConnell AFB, Kans., and Little Rock AFB, Ark. The MINUTEMAN missiles were located at Ellsworth AFB,

S. Dak., Francis E. Warren AFB, Wyo., Malmstrom AFB, Mont., Whiteman AFB, Mo., and Minot AFB and Grand Forks AFB, N. Dak.

The first squadron of improved MINUTEMAN II missiles was turned over to SAC at Grand Forks AFB on April 25, 1966. By the end of the fiscal year 80 MINUTEMAN II missiles had been emplaced. When the remaining 120 new missiles are added, the total MINUTEMAN force will reach the authorized 20 squadrons and 1,000 missiles. The MINUTEMAN II and, at a later date, MINUTEMAN III missiles will be emplaced in modernized MINUTEMAN I silos, replacing all 800 of the older MINUTEMAN I missiles over a period of several years. Silo modernization began at Whiteman AFB, Mo., on April 23, 1966, when the Air Force turned over the first MINUTEMAN I silos to contractors for modification.

Strategic Aircraft

The B-52 force consisted of 345 B-52C through F and 255 longer range B-52G and H aircraft, which have a larger fuel capacity; the H also uses turbofan engines. If there is no significant increase in B-52 sortie rates, the structural life of the B-52G and H aircraft can be extended to 1975 by making certain modifications.

While some B-52C through F aircraft might also be modified and kept in service until the early 1970's, the cost of retaining them would be excessive. Accordingly, in June 1965 the Air Force formally proposed the purchase of 210 FB-111's to replace all B-52C through F aircraft. The Secretary of Defense approved the proposal in December 1965. The Air Force planned to begin this replacement program in 1969 and to complete it by June 30, 1971.

The FB-111 will be the first twin-engine strategic bomber with intercontinental range. Penetrating enemy airspace at high speeds and low altitudes, the FB-111 has been designed to deliver either nuclear or conventional ordnance as well as the short-range attack missile (SRAM).

Contract work on the FB-111 began in February 1966. Flight tests were scheduled to begin in early 1967, with the first operational aircraft delivered in 1968 and the first squadron equipped in 1969. To prepare for the conversion, SAC began detailed planning to insure that trained crews and support facilities would be available when the aircraft were delivered and that its combat capability would not be degraded during the conversion period. In connection with the decision to purchase the new bomber, the Secretary of Defense in December 1965 announced that all B-58's would be phased out by June 1971, when the FB-111 force is scheduled to be operational.

The Air Force expected that SRAM would be available for use with the FB-111 in 1970. Delivered from a low altitude, SRAM would permit its carrier—whether B-52, FB-111, or advanced manned aircraft—to attack targets from points sufficiently distant to avoid exposure to enemy surface-to-air missiles. In July 1965, contractors were requested to submit SRAM proposals, and subsequently two were selected for contract definition.

In October 1965, the Air Force began modifying a number of B-52's to carry a greater load of nonnuclear weapons. Their capacity to carry 500-pound bombs in the bomb bay was increased from 27 to 84; capacity for 750-pound bombs was increased from 27 to 42. The B-52's also can carry an additional 24 500- or 750-pound bombs under the wings. The maximum load of the modified B-52's is now 64,356 pounds as compared to a previous 46,248. By April 1966 the first two squadrons of modified B-52's were serving on Guam.

On January 7, 1966, the Air Force accepted a trainer version of the SR-71 long-range strategic reconnaissance aircraft, and crews of the 4200th Strategic Reconnaissance Wing, Beale AFB, Calif., began familiarization flights shortly thereafter. Powered by two J-58 engines that can attain a speed of mach 3, the SR-71 carries a variety of photographic, radar, and infrared systems.

On January 17, 1966, a B-52G and a KC-135 collided off the southeast coast of Spain during an aerial refueling. Debris from both planes fell on land and sea near the town of Palomares. Some nuclear materials were released on shore and contaminated the soil and vegetation, which were subsequently removed. One nuclear weapon could not immediately be found, but after an intensive land and sea search, the Navy on March 15 located the weapon about 5 miles off shore at a depth of 2,550 feet. The weapon was successfully retrieved on April 7, ending an extensive effort by several thousand people, 20 ships, and three submersibles.

Strategic Missiles

During the year the Air Force continued operational tests to confirm the reliability and accuracy of the MINUTEMAN I missile. In February 1966 SAC combat crews from Malmstrom AFB launched two MINUTEMAN I missiles simultaneously from test silos at Vandenberg AFB, Calif. This salvo launch successfully demonstrated multiple countdown and launch techniques which might be used at operational sites under combat conditions.

Research and development flight testing of MINUTEMAN II, begun in September 1964, continued at both the Eastern and Western Test ranges and, by June 30, 1966, 23 launches had been conducted. These flights proved highly successful, with results consistently within

specified requirements for accuracy. The first launching of an operational MINUTEMAN II from an underground test silo took place at Vandenberg AFB on August 18, 1965, and was completely successful.

In late 1965 the Secretary of Defense announced that additional improvements on the MINUTEMAN during fiscal years 1969 through 1971 would so increase its accuracy, range, and payload as to warrant a new designation—MINUTEMAN III. This model will consist of the MINUTEMAN II with an improved third stage and an advanced reentry vehicle. Both the MINUTEMAN II and III use more complex computer and console equipment and make much greater demands on the missile crews. SAC therefore began to employ three men on the first MINUTEMAN II crews rather than two. As missile modernization proceeds, three-man crews will phase into all units, each crew assuming primary responsibility for a flight of 10 MINUTEMAN II or III missiles.

Modification of TITAN II launch facilities continued on schedule until August 9, 1965, when a silo fire at Searcy, Ark., took the lives of 53 contractor employees. After this tragedy, the Air Force halted all work until it devised a more detailed safety plan. Work was resumed in November 1965 with the Air Force Systems Command serving as overall project manager.

SAC conducted 15 operational readiness inspections of its TITAN and MINUTEMAN wings during the year. All units passed these inspections, which required crews to conduct simulated unit exercises to demonstrate their readiness and the operational status of their missiles and launch facilities.

The Air Force continued to dismantle 113 excess missile complexes representing a monetary investment of about \$5.5 billion. Substantial savings were realized by using surplus missiles for special research and development purposes. Equipment valued at about \$731 million was redistributed to other Government agencies in lieu of their purchasing similar items. Contractors also paid about \$2.3 million for surplus items.

During the fiscal year SAC replaced the H-19 helicopter and the U-6A light aircraft with the UH-1F helicopter as the vehicle to transport men and equipment to dispersed missile sites. At the end of June 1966, SAC had received 73 of the 90 UH-1F's scheduled.

SAC Command and Control

The Air Force continued to work toward a fully operational automated, pre-attack strategic communication and control system. In November 1965 SAC successfully tested several control programs and

19 displays associated with them. An additional 65 displays were expected to be operational by March 1968. Initial tests showed that the basic hardware and support elements functioned satisfactorily.

The Air Force also continued to develop a post-attack command control system to insure control of strategic weapons by the highest levels of authority during a general war. On February 3, 1966, SAC's airborne command post, which would control the retaliatory force should SAC headquarters and alternate ground command posts be destroyed, completed 5 years of continuous and accident-free operations. The airborne command post consists of an EC-135C, a modified version of the KC-135 tanker, with advanced communication and aerial refueling capabilities. It has a general officer aboard at all times, ready to serve as emergency action officer.

An airborne launch control center for launching MINUTEMAN missiles is now operational.

On February 28, 1966, SAC started limited use of a data transmission subsystem. It will replace the SAC teletype net in the United States, beginning in fiscal year 1967. When completed, the system will permit planners to display such data as planned flight paths of bombers and tankers, observe discrepancies, and direct changes. During the year the system's computers were also used to help revise the Single Integrated Operations Plan (SIOP).

III. General Purpose Forces

USAF general purpose forces are assigned to four major commands—the Tactical Air Command (TAC) in the United States, U.S. Air Forces Southern Command (USAFSO) in the Canal Zone, U.S. Air Forces in Europe (USAFE), and Pacific Air Forces (PACAF). Their principal mission is to conduct tactical air operations. Each is assigned to a unified command in its area—TAC to the U.S. Strike Command (STRICOM), USAFSO to the U.S. Southern Command, USAFE to European Command, and PACAF to Pacific Command—and each operates jointly with ground and sea forces.

The air war in Vietnam (see ch. VII) had a major impact on USAF general purpose forces. To meet the demands in Southeast Asia, the Air Force began to acquire additional aircraft and manpower. TAC air and ground crew training were expanded and the ability of tactical fighter wings to operate from underdeveloped or "bare" bases was improved. Modern lightweight shelters, electric power and sanitation equipment, and other items were developed and purchased for rapid air shipment as integrated, self-sufficient units.

Force Structure

Forces in the United States

On June 30, 1966, the USAF tactical fighter force consisted of 23 wings, eight in the United States and 15 overseas. The war in Southeast Asia placed a heavy burden on the United States-based force. Of 27 squadrons deployed during the year, 24 went to Southeast Asia and the Western Pacific and three to Europe. Two more squadrons were activated in Southeast Asia. To replace aircraft lost in Vietnam, the Air Force drew upon the resources of units remaining at home. Eighteen home-based squadrons served as replacement training units for aircrews being sent to Southeast Asia.

Modernization of the USAF reconnaissance force with RF-4C's continued on schedule. On January 1, 1966, the Air Force activated a second tactical reconnaissance wing at Mountain Home AFB, Idaho. With the deployment of three tactical reconnaissance squadrons to Southeast Asia, the size of the force in the United States was reduced from four to three operational squadrons (two RF-4 and one RF-101).

Two other squadrons (one RF-4 and one RF-101) were used for replacement training.

The tactical airlift force based in the United States also declined from 20 squadrons (10 C-130E, six C-130B, and four C-130A) at the beginning of the year to 13 (eight C-130E, two C-130B, and three C-130A), including a new C-130E squadron activated during the year. Eight of the original 20 squadrons were deployed to the Pacific.

The four special air warfare squadrons in the United States could not train all the replacement crews needed, so the Air Force on December 1, 1965, activated the 4410th Combat Crew Training Wing with 63 aircraft at Hurlburt Field, Fla. Four additional air commando squadrons (composite fighter, fire support, and psychological operations) were activated in Southeast Asia to carry out missions there.

TAC's three specialized centers—Tactical Air Warfare, Tactical Air Reconnaissance, and Special Air Warfare—maintained close liaison with operational organizations, especially the Seventh Air Force (formerly the 2d Air Division) in Southeast Asia. These centers devised new tactics and techniques for use in the field while incorporating into their own operations the lessons learned from combat.

In the event of mobilization, the Air Force also could call on the Air National Guard (ANG) and the Air Force Reserve (AFRes). ANG units committed to TAC included seven tactical fighter wings with 23 groups, three tactical reconnaissance wings with 12 groups, two air refueling wings with five groups, four air commando groups, and two tactical control groups. TAC also would receive 10 AFRes troop carrier wings.

Forces Overseas

At the request of the French Government, the United States made plans to withdraw its military forces from France. On June 9, 1966, the Secretary of Defense directed the relocation by September 1 of two C-130 squadrons from Evreux AB, France, to Mildenhall AB, England, and the movement of Headquarters, 322d Air Division, from Chateauroux AB, France, to High Wycombe Air Station, England. Other pending decisions concerned disposition of Chateauroux, the status of bases in France with respect to wartime reentry rights, the North Atlantic Treaty Organization (NATO) pipeline through the country, and transit and overflight rights for transport aircraft.

In another significant development, the 16th Air Force, with headquarters at Torrejon AB, Spain, was reassigned from SAC to USAFE on April 15, 1966. Thus, it joined the 3d Air Force in England, the 17th Air Force in Germany, and the U.S. Logistic Group in Turkey

as a major subordinate command of USAFE. The first line of air defense for NATO in Central Europe included the fighter-interceptors and ground electronic environment equipment of USAFE's 86th Air Division (Defense) in Germany.

USAFE wing strength rose from eight to 10 while modernization of the force continued. The first unit in Europe to receive F-4C's was the 81st Tactical Fighter Wing at Bentwaters, England. They replaced F-101's, which are to be converted to a reconnaissance role and assigned to ANG units in the United States. On May 16, 1966, the first F-4D also entered the USAFE inventory. Three wings will be equipped with this aircraft. Also in the USAFE inventory are F-100's, F-101's, F-102's, RF-4C's, and the MACE A and B surface-to-surface tactical missiles. USAFE plans to inactivate the MACE A squadrons and retain the B squadron.

Air operations in Southeast Asia caused PACAF to become one of the largest USAF commands, second only to SAC in size. During the fiscal year it grew from three to 14 wings and from 67,000 to 130,000 men. About a thousand additional aircraft, primarily fighter-bombers, were deployed to the Pacific. Operating from more than 30 bases, PACAF directed USAF activities over an area covering nearly 40 percent of the earth's surface.

In addition to the 7th Air Force and the 315th Air Division, which carried out or supported Vietnam operations, PACAF controlled three other major subcommands. The 5th Air Force, with headquarters in Japan and units in Korea and Okinawa, was responsible for air defense along the northern portion of the Pacific perimeter. In carrying out its mission, the 5th Air Force worked with the Japanese Air Self-Defense Force and the Republic of Korea Air Force. The 13th Air Force in the Philippines coordinated its activities with the air forces of that country and those of the Republic of China and Thailand. Two bases in the Philippines, Clark AB and Mactan AB, supported air operations in Vietnam. The 6486th Air Base Wing at Hickam AFB, Hawaii, assisted the trans-Pacific movement of USAF aircraft.

The Air Force continued to study the vulnerability of oversea tactical aircraft to enemy attack and sought Congressional support for aircraft shelters, covered revetments, and means for rapid repair of runways. To reduce costs, the Air Force proposed that the shelters emplaced at European bases be manufactured without doors since these could be built and installed later. In April 1966 the Air Force also proposed the installation of 15 shelters with doors in Southeast Asia.

Combat Training

Combat units participating in Southeast Asia operations required a steady flow of aircrews to relieve personnel completing their tours of duty. The supply of replacements, as well as the deployment of fighting units to the Pacific on a permanent basis, was a TAC responsibility. However, USAF studies made it clear that TAC's current training base could not support the level of effort required for an indefinite period of time.

In peacetime, TAC employed 12 percent of its aircraft for advanced flying training, enough to support oversea rotation of aircraft, provide replacement aircrews to PACAF and USAFE, and maintain units ready to join strategic forces in a major nuclear conflict. To fight a long conventional war, however, TAC would need to devote at least 25 percent of the force to training, and an increase in the proportion of TAC aircraft allocated for advanced flying training was accordingly undertaken. To expand F-100 training, TAC assigned resources of a fighter wing at Cannon AFB, N. Mex., to the combat crew training wing at Luke AFB, Ariz. Each of four F-4 squadrons of the TAC fighter wing at MacDill AFB, Fla., received 30 pilots for tactical training. TAC also expanded F-105 training at Nellis AFB, Nev. To increase the tactical airlift forces, the Air Force gave C-130 transition training at Sewart AFB, Tenn., to SAC crews reassigned from deactivated B-47 and KC-97 squadrons.

TAC also trained two 400-man civil engineering Red Horse squadrons at Cannon AFB, N. Mex., for quick repair of badly damaged airfields and maintenance of hurriedly constructed air bases. These units were deployed to Southeast Asia in February. At the end of the fiscal year TAC was organizing and equipping four additional Red Horse squadrons at Forbes AFB, Kans.

Since the training bases were operating at full capacity, TAC conducted individual replacement training at bases where its combat-ready wings committed to STRICOM were stationed.

To simulate hunt-and-kill missions against surface-to-air missiles and radar-directed antiaircraft guns, the Air Force established a range in the northeastern portion of the White Sands Missile Range. An agreement with the U.S. Forest Service added 18,000 acres of forest land to the Claibourne range, near England AFB, La., for joint use by both agencies. Construction of a tactical air-to-surface range in Dare County, N.C., for use by both the Air Force and the Navy, was completed in October 1965.

Tactical Exercises

During May and June 1966 STRICOM conducted exercise RAPID STRIKE at Pope AFB and Fort Bragg, N.C., to devise ways to drop more paratroopers into drop zones to permit rapid assembly. TAC airdropped heavy equipment and men, using 45 C-130's, while Military Airlift Command (MAC) participated with six C-141's. During the exercise AFRes units demonstrated a slingshot drop method for ejecting cargo quickly from C-119's.

In September 1965 a force of almost 4,000 men and more than 100 aircraft deployed to Greece and Turkey to take part in DEEP FURROW, an exercise conducted by NATO. The highlight of this exercise was a parachute assault supported by F-100's against an objective near Adapazari, Turkey. In November STRICOM provided a TAC fighter squadron and an Army infantry battalion for a joint U.S.-Norway exercise, BRAVE CAT. F-4C's flew close support and interdiction missions for ground operations while Norwegian Air Force units provided air defense. In May 1966, SOUTHERN ARROW, one of the largest airborne exercises held in Europe since World War II, tested the versatility of U.S. forces committed to NATO and demonstrated the rapid deployment of airborne ground forces. USAFE and TAC provided nearly every form of air support of ground operations. More than 2 million pounds of equipment and 2,500 troops were airlifted. During the assault phase, 44 C-130's airdropped 1,800 troops and 561 tons of cargo. USAFE RF-4C's provided reconnaissance support.

The ANG participated in 12 exercises, eight of them overseas. In support of TAC, 832 ANG tactical aircraft flew 163,833 hours. In exercise TROPIC LIGHTNING II, an ANG fighter wing deployed to Hawaii where during October and November it flew 296 sorties in close support of the 25th Infantry Division. During the year the ANG employed a variety of aircraft, including 234 F-84's and 205 F-100C's. ANG reconnaissance aircraft, primarily 124 RF-84's, took over a large portion of TAC's reconnaissance tasks in the United States, relieving regular crews for duty elsewhere.

AFRes units joined TAC in exercises that improved their readiness and provided essential support. During CLOVE HITCH I, 80 C-119 aircraft joined 32 TAC C-130's in airlifting 1,682 members of the Army's 101st Airborne Division from Kentucky to North Carolina. AFRes units flew 11,412 missions totaling 53,363 hours in support of TAC and other commands. They carried 10,038 tons of supplies and equipment and 43,119 passengers, airdropped 392 tons and 117,251 troops, and landed 13,077 tons and 2,531 troops.

Tactical Aircraft

In March TAC received the first F-4D, an improved version of the F-4C, which carries a weapon delivery computer, stabilized gunsight, and new radar equipment. By the end of June TAC had accepted 68 F-4D's. Seeking still better performance, the Air Force studied a proposed F-4E version with a J-79-19 engine and a nose gun. The last of 583 F-4C's was delivered to the Air Force in April.

In July 1965 the first RF-4C with APQ-99 forward-looking radar and KA-55 high-altitude panoramic cameras was delivered. By the end of June 1966 the contractor had delivered 184 RF-4C's. Increased reconnaissance activity in Southeast Asia required the Air Force to order additional RF-4C's to cover anticipated RF-101 and RF-4C attrition.

The newest and most versatile aircraft, the F-11A, was expected to perform a wide range of limited war missions. Flight tests were begun in January. The aircraft's variable-sweep wings were moved on nearly every flight and numerous takeoffs and landings were made in less than 3,000 feet. The Air Force also participated in studies to reduce the F-111's weight, improve its ability to fly at low speeds, and make other desired modifications.

In October the Secretary of Defense approved development of a reconnaissance module for the F-111A. This RF-111A will be built with only limited changes to the original configuration. Photographic, radar, thermal, and electronic sensors will be located in the plane's bomb bay on a removable pallet.

On March 22, 1966, the United Kingdom ordered 10 complete F-111's together with certain long leadtime components for an additional 40. The British F-111 will have design features of both the tactical F-111A and the strategic FB-111, plus U.K.-furnished equipment. The Royal Australian Air Force also worked with the Air Force on the configuration of 24 F-111's on order.

The tri-Service OV-10A light armed reconnaissance aircraft (LARA) made its first flight in July 1965, and in late 1965 157 were approved for purchase, with production scheduled to start in May 1967. Tests showed this plane to be potentially more useful to forward air controllers than the O-1 currently used in Southeast Asia.

A decision in June 1966 to produce the USAF version of the OV-10 called for an aircraft with a gross weight of approximately 10,000 pounds. Fixed guns will permit the controller to attack fleeting targets when strike fighters were not available. The cargo version will carry 3,200 pounds, five paratroopers or six infantrymen.

The Air Force also needed an improved close support aircraft for use in limited wars. As part of a study of various possibilities, a

squadron of 12 F-5C lightweight fighter aircraft was deployed to Vietnam in October 1965. Similar to the T-38 trainer, the F-5C was originally procured for Allied nations under military assistance programs. In March 1966, after 5 months of intensive combat evaluation, the squadron was redesignated as a fighter-commando squadron and retained in South Vietnam. Its aircraft will be transferred to the Vietnam Air Force (VNAF) at a future date.

Meanwhile, an Air Force-OSD study group defined the characteristics of a lower cost tactical aircraft to complement the F-4C and the F-111A and concluded that the Navy's single-place subsonic A-7 with afterburner would be best from a cost/effectiveness standpoint. In November 1965 the Air Force decided on "an interim buy." The USAF configuration for the A-7 was settled in April 1966, but by the end of June the Air Force had not yet determined which of two engines was better in terms of performance, cost, and scheduling.

As part of the continuing program to improve safety, reliability, and combat effectiveness, the Air Force selected a firm in Spain to modify 158 F-105's in Europe. All but 11 were modified during the fiscal year. The selection of a European firm avoided tying up planes in a pipeline to and from the United States and resulted in considerable savings.

The twin-engine, propeller-driven C-123 proved highly effective for assault airlift in Southeast Asia. To improve C-123 takeoff, climb, and landing characteristics, as well as to increase its weight-carrying capacity, the Air Force augmented the reciprocating engines with two jet engines. Modification of 120 C-123's began in April 1966 and was scheduled for completion in December 1967.

On April 6, 1966, the Air Force and the Army signed an agreement governing use and control of helicopters and fixed-wing aircraft to prevent duplication in the employment of Army and USAF tactical airlift aircraft. The Army would turn over to the Air Force all CV-2 and CV-7 aircraft; the Air Force was to assume intratheater airlift responsibilities requiring the use of fixed-wing aircraft and forego the use of rotary-wing aircraft for intratheater movement, fire support, or supply of Army forces. The Air Force could retain helicopters, however, for special air warfare, search and rescue, and administrative missions. The agreement will free Army helicopters for greater battlefield use and increase the USAF role in cargo delivery.

The twin-engine, all-weather CV-2A carries about the same load as the C-47 and has short takeoff and landing characteristics which make it useful for airlift in forward battle areas. The Air Force Systems Command will continue engineering evaluation of the service-test CV-7A's to determine their capabilities for the USAF assault airlift mission.

In October 1965 the Air Force approved a modification of the MGM-13A MACE tactical missile for use as a target drone by TAC and Air Defense Command crews. During the fiscal year the Air Force also doubled the procurement of BQM-34A FIREBEE target drones to meet new training requirements. A test program was also started to determine the proper number of peacetime firings of the AIM-7 SPARROW missile, the primary armament on F-4's, for unit and aircrew training.

Tactical Command and Control

In May 1966 the Air Force selected a contractor to begin development of the light and highly mobile three-dimensional TPS-43 radar for ground control intercept (GCI). This was an important step toward acquiring a full operational 407L Tactical Air Control System (Mobile). Packaged in two shelters weighing no more than 3,500 pounds each, the TPS-43 will be carried by helicopter. It is expected to enter the inventory late in 1968.

The 412L Air Weapons Control System, part of the air defenses of central Europe, consists of a seven-site net (six American and one German) which can detect and direct the interception of enemy aircraft and air-breathing missiles. On December 15, 1965, the West German Air Force assumed full responsibility for an additional site at Freising, Germany. The computers located there remain the property of the USAF, which will also provide maintenance spares.

On March 4, 1966, the Secretary of Defense authorized the Air Force to replace its manual air defense system in Okinawa with the semiautomatic 418L Ryukyu Air Defense System. Addition of a computer and console equipment will permit automatic tracking and computer-assisted interception of intruder aircraft.

Special Air Warfare

USAF special air warfare forces continued to train friendly air forces in Southeast Asia, Latin America, and Europe to counter insurgent movements. In South Vietnam, USAF air commando units were engaged in combat operations against the Viet Cong.

Air and ground commando crews were trained at the Special Air Warfare Center, Eglin AFB, Fla., with emphasis on military civic action as well as combat operations. The Air Force also recommended and supported programs of social and economic development to assist friendly air forces in meeting the needs and aspirations of their own peoples. Early in 1966 the Air Force sponsored a symposium at Eglin AFB, Fla., attended by representatives of 15 Latin American countries to discuss civic action, employment of aircraft, and guerrilla tac-

tics. Mobile training teams of the 605th Air Commando Squadron (Composite) in Panama also trained Latin American air forces in the tactics and techniques of counterinsurgency.

The Air Force also trained foreign nationals in such technical military skills as meteorology, aerial mapping, and communications, which are useful in civil affairs. A medical training program taught individuals from friendly countries to detect and prevent disease and to transport doctors and other experts to remote communities. On December 29, 1965, for example, an Air Force helicopter flew a team of American and Panamanian doctors to Chiman, Panama, to combat an epidemic of measles. There, the team discovered a rare type of malaria which is also found in South Vietnam. Research under laboratory conditions has produced encouraging results in finding a means of eliminating this disease. As a result of all these USAF training programs, friendly air forces were enabled to expand their air service to otherwise inaccessible areas throughout Latin America.

IV. Defense Forces

The Air Defense Command (ADC), a component of the North American Air Defense Command (NORAD), operates from 548 locations and supplies a major portion of NORAD's resources. ADC has a capital investment of \$8 billion and a complement of 100,000 USAF personnel.

On April 1, 1966, NORAD and its Air Force, Army, and Canadian component commands were reorganized to reflect the changing threat from manned bombers to ballistic missiles. The six U.S.-based regions were realigned into four geographically designated areas. Both the Alaskan NORAD Region with headquarters at Elmendorf AFB, Alaska, and the Northern NORAD Region with headquarters at North Bay, Ontario, Canada, were retained.

On April 1 the Air Force reorganized the ADC structure to parallel the NORAD organizational changes inside the continental United States. ADC established four numbered air forces to replace its numbered air divisions and redesignated its geographic sectors to coincide with NORAD's geographic areas. The new numbered air forces, which controlled 15 air divisions within the United States, were the 4th, established at Hamilton AFB, Calif.; the 10th at Richards-Gebaur AFB, Mo.; the 1st at Stewart AFB, N.Y.; and the 14th at Gunter AFB, Ala. In this reorganization, ADC reassigned training and operational activities in the southeast portion of the country to the 14th Air Force, thereby allowing inactivation of the 73d Air Division at Tyndall AFB, Fla.

Force Structure

During fiscal year 1966 the size of the regular interceptor forces continued to decrease both in numbers of squadrons and aircraft, with further reductions planned. Retirement of F-102's continued at a reduced tempo as the Air Force rescinded plans to inactivate two squadrons. F-102's of the 82d and 64th Fighter Interceptor Squadrons were modified for inflight refueling and the units were transferred to the Pacific theater. In March 1966 the 82d deployed from Travis AFB, Calif., to Naha AB, Okinawa, with overnight stops at Hickam AFB, Hawaii, and Wake Island. It was the first time the F-102's had flown the Pacific. The unit joined the 51st Fighter Interceptor Wing at Naha as part of the air defense of the Ryukyu Islands. In June the

64th went to Clark in the Philippines from Paine Field, Wash., augmenting F-102 detachments responsible for the air defense of the islands and Southeast Asia.

Three F-102 fighter interceptor squadrons, the 482d at Seymour-Johnson AFB, N.C., the 325th at Traux Field, Wis., and the 460th at Portland International Airport, Oreg., were deactivated, and their aircraft transferred to the ANG to replace F-89's. In support of ADC, the ANG force of 397 F-89's and F-102's flew some 126,000 hours in more than 15,000 sorties and attempted over 39,000 interceptions. Five ANG squadrons were scheduled to be equipped with F-102's. Only one regular F-102 unit, the 326th Fighter Interceptor Squadron at Richards-Gebaur AFB, Mo., remained in the United States.

EC-121's were the first ADC aircraft committed to the war in Southeast Asia. The EC-121 "Big Eye" task force, now part of the 4th Air Force's 552d Airborne Early Warning and Control Wing, helped USAF fighter pilots make their first Communist MIG fighter "kills" in July 1965. Throughout the year the unarmed "Big Eye" crews, flying 12-hour sorties with 5 tons of delicate radar equipment on board, kept monitoring MIG fighter activity in North Vietnam while also forming a vital link in the air defense of South Vietnam.

Force Modernization

Pending the outcome of studies of an improved interceptor such as an operational version of the YF-12A or an interceptor version of the F-111, the Air Force sought to upgrade its existing manned interceptor force. It improved the radar acquisition range and electronic countermeasures capabilities of the F-101's and F-106's. Fifty-two F-102's were modified for inflight refueling, and similar modifications were approved for the F-106's. In addition, the Air Force awarded a \$6.2 million contract for production of F-106 tactical air navigation (TACAN) systems. The TACAN system, the first to use microelectronic circuits, will be one-third the size and weight of the current F-106 navigation system. It is designed to provide 450 hours of maintenance-free operation.

During the year one third of the home-based interceptor force was maintained on alert at all times. To insure survivability, ADC planned to position two-thirds of the alert force at dispersal bases. A \$30 million construction project on airfields involved in the dispersal program in the United States was almost completed during the period.

In October 1965, ADC held the annual William Tell meet at Tyndall AFB, Fla., to test the effectiveness of the interceptor force. USAF officials evaluated the performance and capabilities of aircrews, aircraft, support personnel, and radar intercept controllers. For the first time, a Royal Canadian Air Force team participated in the meet.

Annual firing of one operational BOMARC B missile by each of the six USAF and two Canadian BOMARC squadrons was continued. These annual launchings reaffirmed the effectiveness of this long-range, surface-to-air missile system, but further reduced the number of BOMARC B's in each squadron.

Warning and Control

To broaden the ICBM detection capabilities of the Ballistic Missile Early Warning System (BMEWS), the Air Force began installing a permanent complex of over-the-horizon radars at oversea locations. Although testing was not entirely completed by June 1966, the preliminary results were so satisfactory that the Office of the Secretary of Defense (OSD) approved expansion of the original complex. These radars are capable of detecting ICBM launchings several thousand miles away within seconds after liftoff.

Completion of the tracking radar at Clear, Alaska, in June 1966 further improved BMEWS warning reliability. The \$16 million radar, housed in a 10-story radome, is capable of detecting and tracking satellites and missiles with low reentry angles. The Air Force also took a significant step in December 1965 to provide warning of a sea-launched ballistic missile attack when it awarded a contract to modify selected SAGE radars to enable them to detect such a strike.

Considerable progress was made in modernizing the air defense command and control system. In September 1965 the first automated backup interceptor control (BUIC) center was activated for control and direction of air defense weapons against enemy bombers. The entire BUIC II system, consisting of 14 operational centers, was completed in April 1966. One center at Tyndall AFB, Fla., was used exclusively for training. BUIC, coupled with the semiautomatic ground environment (SAGE) system, increased the flexibility of air defense forces. Smaller and less costly than the SAGE centers, the BUIC centers performed essentially the same functions, although they could not handle as many targets or interceptions. In January 1966 the Air Force awarded a \$14 million contract to improve the BUIC II system and to increase the number of BUIC centers to 19. Other planned modifications and refinements will provide a more capable backup system, to be known as BUIC III.

Completion of BUIC II enabled ADC to phase out the SAGE centers at Stead AFB, Nev., and Norton AFB, Calif. Further reorganizations eliminated the SAGE centers at Truax Field, Wisc., and McChord AFB, Wash. As a result, the Air Force made available \$65 million worth of excess data processing equipment to the Defense Supply Agency (DSA) for screening and redistribution.

On January 1, 1966, the automated NORAD Combat Operations Center inside Colorado's Cheyenne Mountain achieved an initial operational capability. In April and May NORAD transferred some of the functions previously performed at nearby Ent AFB to the hardened underground center. The Cheyenne complex consists of 11 steel buildings, most of them three stories high, mounted on huge steel springs to protect sensitive electronic equipment against the shock of nuclear detonations. It will be fully operational by January 1967 and will also serve the Civil Defense National Warning Center and the Defense Communications Agency (DCA). On June 30, 1966, the Secretary of Defense approved a proposal to build an alternate hardened NORAD Combat Operations Center.

The Spacetrack system, a major component of NORAD's Space Detection and Tracking System (SPADATS), continued to provide information on an ever-growing number of earth-orbiting vehicles and debris. The Space Defense Center, operated by ADC's 1st Aerospace Control Squadron, catalogued all the data. By the close of the period the center was keeping track of approximately 1,000 orbiting objects. The Air Force estimated that by 1970, manmade objects in space could number between 5,000 and 7,000.

V. Airlift Forces

The Air Force is responsible for furnishing rapid airlift for the armed forces of the United States and its allies throughout the world. On January 1, 1966, the Military Air Transport Service (MATS), which had performed this function since June 1948, was renamed the Military Airlift Command (MAC). Concurrently, the Eastern and Western Air Transport Forces, which since 1958 had divided MAC's airlift responsibilities, were redesignated the 21st and 22d Air Forces, respectively. The 1254th Air Transport Wing, Andrews AFB, Md., became the 89th Military Airlift Wing, Special Missions; the 1707th Air Transport Wing, Tinker AFB, Okla., became the 443d Military Airlift Wing, Training; and the 1405th Aeromedical Transport Wing at Scott AFB, Ill., became the 375th Aeromedical Airlift Wing. All transport and troop carrier squadrons were redesignated as military airlift squadrons, including the AFRes units that MAC would gain during mobilization.

In April 1966 the Secretary of Defense approved a joint recommendation by the Secretaries of the Air Force and the Navy that Naval participation in MAC be discontinued. The partnership had begun in 1948 when the Air Transport Command and the Naval Air Transport Service were merged to create MATS. The three Navy airlift squadrons, equipped with 48 C-130's, and the maintenance squadron will be deactivated, and the 3,000 Naval personnel reassigned, by July 1968.

MAC Operations

The war in Southeast Asia had a great impact on MAC operations. Project FAST FLY was inaugurated to meet the growing demand for logistic support. The daily utilization rates for C-130E's and C-135's were raised from 5 to 8 hours, for C-124's from 2½ to 3 hours, and for MAC Navy C-130's from 5 to 6 hours. The rate for the C-141 was set at 5 hours 6 months after a squadron received its first aircraft, rising to 8 hours after a full year's operations. These rates, however, did not apply to the first three C-141 squadrons.

MAC concentrated about 75 percent of its activity in the Pacific area. Using an average of 230 aircraft per day to support operations in Vietnam, during fiscal year 1966 MAC and its reserve-augmented forces moved 673,655 troops and 211,242 tons of cargo in channel

traffic to Southeast Asia. This was an increase of 80 percent for passengers and 106 percent for cargo over the previous year.

On December 8, 1965, MAC adapted the Red Ball Express concept made famous by the U.S. Army in Europe during World War II, to insure the availability of parts for Army equipment in Vietnam. The Air Force delivered items from Travis AFB, Calif., to South Vietnam within 168 hours of the time they were requisitioned. MAC flew at least one Red Ball mission each day, moving an average of approximately 22 tons. The record for Red Ball cargo handled in a single day was 105 tons.

Operation BLUE LIGHT demonstrated MAC's airlift capability and the close cooperation between the U.S. Army and the U.S. Air Force. In this massive 26-day airlift, C-141's and C-133's moved more than 3,000 combat troops and 4,600 tons of equipment of the Army's 25th Infantry Division from Hawaii to Pleiku AB, South Vietnam, 6,000 nautical miles away. A C-133 or C-141 transport took off from Hickam AFB every 3 hours, making two refueling stops enroute. C-133's averaged 45 hours for the transpacific flights and C-141's 26 hours. This was the first military airlift operation for the C-141, which had entered service the previous year. Operation BLUE LIGHT was completed on January 22, 1966, 8 days ahead of schedule.

In April 1966 MAC responded to a special request to airlift 10 Army M-41 tanks from Saigon to Danang. Since intratheater aircraft could not handle the 52,000-pound tank, four C-133's were diverted to carry out this assignment. In one sortie, a MAC transport airlifted 104,560 pounds.

MAC gave special emphasis to increased aeromedical evacuation from the Pacific area. Evacuation control centers were established in the Philippines and Okinawa, and more flight crews were assigned. The casualty staging facility at Travis AFB, Calif., was also enlarged to take care of patients enroute from Southeast Asia to various hospitals within the United States. During the fiscal year MAC airlifted 16,182 patients and attendants from the Pacific area, many of them by C-141's. After their cargoes were unloaded at Clark AB in the Philippines, the C-141's were quickly converted to accommodate litter patients. On August 1, 1965, ANG started supplementing regular MAC evacuation flights within the United States. In September this support was expanded to Alaska and in October to short-haul destinations in the Atlantic and Caribbean areas. By the end of June 1966 ANG had flown 334 such missions, airlifting 6,691 patients and 4,272 attendants.

In November and December 1965 the Continental Air Command (CONAC) coordinated the efforts of AFRes and ANG units participating in Operation CHRISTMAS STAR. This special airlift was organized to collect the vast number of gifts donated by the American people following President Johnson's public comments concerning the Nation's gratitude to servicemen fighting in Southeast Asia. Pickup in the United States was done primarily by AFRes C-119's. ANG flew 75 trips to South Vietnam in C-97's and C-121's and AFRes flew 10 trips in C-124's. By Christmas Day, more than 400 tons of packages were airlifted in this operation.

Increased airlift required more maintenance and traffic control personnel in the Pacific. Reserve personnel helped satisfy some of these requirements, and MAC adopted a system of quick fixes to take care of certain maintenance problems. Air-transportable maintenance kits and personnel were flown from Clark AB to South Vietnam to repair aircraft grounded for safety reasons. During the last 6 months of 1965, MAC lowered its accident rate from 0.76 to 0.71 per 100,000 hours flown, despite the fact that flying time increased to more than half a million hours to and from South Vietnam and other distant points.

The following comparative data reflect the increase during fiscal year 1966 in commercial and military activities of MAC cargo, mail, and passenger services over the previous year:

TON MILES FLOWN (CHANNEL TRAFFIC)
(In millions)

	Passengers			Cargo-mail			Totals	
	1965	1966	Percent change	1965	1966	Percent change	1965	Percent change
Military-----	105	78.5	-25	617.6	897.5	+45	722.6	+35
Commercial-----	379.7	706.7	+86	341.6	584.9	+71	721.3	+79
Total-----	484.7	785.2	+62	959.2	1,482.4	+55	1,443.9	+57

TONS CARRIED (SPACE ASSIGNED CHANNEL TRAFFIC)
(In thousands)

	Passengers			Cargo-mail			Totals	
	1965	1966	Percent change	1965	1966	Percent change	1965	Percent change
Military-----	34.4	18.8	-45	187.4	236.3	+26	221.8	+15
Commercial-----	90.8	160.7	+77	66	102.1	+55	156.8	+67
Total-----	125.2	179.5	+43	253.4	338.4	+34	378.6	+37

Force Modernization

In the fall of 1965 the Secretary of Defense approved an increase in the C-141 production rate from seven to nine aircraft per month and authorized procurement of an additional 19 aircraft above the total of 265 previously programmed. As a result, the Air Force expected to receive all C-141's by March 1968. By the end of June 1966, MAC had equipped six C-141 squadrons, five of them during the year. Three were at Travis AFB, Calif., two at Dover AFB, Del., and one at Charleston AFB, S.C.

C-141 testing had been completed by the end of June. As part of a grueling test of six C-141's, two had flown a total of 6,800 hours, the equivalent of almost 4 million miles.

In May 1966 a C-141 flew a MINUTEMAN II missile from Hill AFB, Utah, to the operational site at Grand Forks AFB, N. Dak. This C-141 was the first of 32 such aircraft specially modified to perform this mission.

In October 1965 the Air Force awarded a contract for 58 C-5A transports. Production was scheduled to begin in late 1966 or early 1967, with the first flight in 1968. The C-5A will be the largest transport ever built and is designed to carry bulky loads weighing over 110 tons more than 3,000 miles, and loads weighing over 50 more than 6,000 miles. The cargo deck at 120.1 feet will be longer than the total distance of the Wright brothers' first flight at Kitty Hawk in 1903. Despite its weight and size, the C-5A will be able to operate from relatively unimproved airfields.

The number of turbine-powered cargo aircraft in the Civil Reserve Air Fleet (CRAF) reached 88, an increase of 70 in 3 years. Total aircraft in the CRAF inventory rose to 356, with 274 committed to international operations and 82 to domestic flights. In late October 1965 MAC conducted a command post exercise, MIXED DOUBLE, to test the control procedures and communications which would be used to operate CRAF during emergencies. As of May 4, 1966, all 22 participating airlines had signed contracts committing their company managements, aircraft, and other resources to the CRAF program.

Other Airlift Support

Despite extensive commitments in the Pacific, MAC participated in joint exercises in other areas, preparing for operations in every type of environment. POLAR SWEEP, a U.S. Alaskan Command maneuver held in early January, was the first field exercise in which the C-141 participated. Three C-141's airlifted 200 Army special forces troops and 14 tons of equipment from Pope AFB, N.C., to Elmendorf AFB, Alaska.

During paradrop tests at Fort Campbell, Ky., in early 1966, troops of the 101st Airborne Division, USAF combat controllers, and C-141 test personnel made 180 jumps from a C-141 flown by a MAC crew.

For the ninth consecutive year, MAC supported the Navy's Operation DEEP FREEZE in Antarctica, flying nearly 80,000 miles and airlifting over 300 passengers and almost 160 tons of cargo between the United States and New Zealand and from there, to and from McMurdo Station. Every other day during the month of November, a ski-equipped C-130 made the 2,300-mile overwater flight from Christchurch, New Zealand, to Williams Field, McMurdo Station's sea-ice runway.

Reserve units also participated in some of the joint exercises. Most of these, such as KING CRAB X and ARCTIC SHORE, were under the operational control of the Alaskan Command. Excluding aeromedical flights, ANG and AFRes airlift units flew over 175,000 hours and accomplished 3,327 missions, 2,226 of which—handled by the ANG—were overseas. In sum, they transported more than 87,000 passengers and almost 37,000 tons of cargo.

As in the past, a large portion of AFRes airlift support involved humanitarian and good will missions. In September 1965, following Hurricane Betsy, 13 troop carrier wings flew 157 airlift missions in the southeastern United States, transporting 660 passengers and over 638 tons of cargo. In January, C-119 units airlifted 9,000 pounds of cots and blankets to aid flood victims in Eureka, Calif., and some 90,000 pounds for 6,000 flood evacuees in Phoenix, Ariz.

Commercial airlines under contract carried 90 percent of the passengers moved by MAC during fiscal year 1966 as compared to 75 percent during the previous year. As a result of the growing use of commercial carriers and the increase in airlift requirements, the amount allocated for MAC airlift contracts was raised from \$192.5 million to \$410 million. During the year, however, MAC obtained an adjustment of carrier rates from the Civil Aeronautics Board and estimated that renegotiating fiscal year 1966 contracts would save almost \$50 million. By the end of June, the command had spent \$394.2 million for commercial airlift.

VI. Specialized Operational Forces

The Air Force has four specialized organizations to perform photographic, rescue, weather, and communication functions. Three of these—the Aerospace Audio-Visual Service (AAVS), the Aerospace Rescue and Recovery Service (ARRS), and the Air Weather Service (AWS)—are subordinate elements of the Military Airlift Command. The fourth, the Air Force Communications Service (AFCS), is a separate command reporting directly to the Chief of Staff, USAF.

Aerospace Audio-Visual Service

Formerly the Air Photographic and Charting Service, AAVS assumed its new name on January 1, 1966, after an organizational realignment which placed carto-geodetic functions and the 1370th Photo Mapping Wing under the direct command of MAC. AAVS retained responsibility for USAF motion picture production, distribution and storage, documentary and instrumentation photography, commercial motion picture production contracting, and video-tape recording. Television film production was made an additional task.

AAVS with headquarters at Orlando AFB, Fla., controlled 34 units at 30 permanent locations and many temporary sites around the world. In December 1965 AAVS assumed responsibility for all USAF combat photography in Southeast Asia except that related to tactical reconnaissance. The command activated the 600th Photo Squadron at Tan Son Nhut AB on February 8 and assigned the 400-man unit and its nine detachments to the 1352d Photo Group. Films processed by AAVS personnel have proved invaluable in assessing the effectiveness of combat operations and in developing new tactics and weapon delivery techniques.

The 1370th Photo Mapping Wing continued aerial electronic surveys—called HIRAN triliteration—in several regions of the world. In Africa aerial geodetic and photomapping surveys of a 400,000-square-mile area in Ethiopia were ahead of schedule despite poor weather which hampered operations. In South America a team of 70 equipped with three RC-130's photomapped 275,000 square miles of Colombia and Ecuador. In Brazil another team operating from Sao Paulo between April and October of each year since 1964 has photo-

graphed almost one-half of the more than 2 million square miles scheduled for coverage.

A Southwest Pacific survey, begun in 1962, was completed in March 1966. Using three RB-50's, one C-118, two Navy LST's with helicopters, and 170 personnel in this project, the Air Force covered 4,000 miles from Australia to Eniwetok in the Marshall Islands and to the Fijis. Numerous islands and land masses were thus tied together geodetically for the first time.

Aerospace Rescue and Recovery Service

At the beginning of fiscal year 1966 the Air Rescue Service, (renamed ARRS on January 1, 1966) operated with 3,443 men at 83 bases in 23 different countries. By June 30 ARRS had increased by some 1,000 personnel and its units were deployed to 97 locations, partly because of the increasing demands of the conflict in Southeast Asia.

In January the Air Force activated the 3d ARR Group at Tan Son Nhut to direct all USAF rescue operations in the theater. The group assumed control of the 37th and 38th ARR Squadrons which had deployed to Vietnam in 1964. During the year these rescue units, employing 38 helicopters, four HC-130's, and five HU-16's, chalked up a remarkable record, retrieving 230 combat personnel from hostile areas and coastal waters in Southeast Asia. In the last half of the year Air Force and Navy rescue forces succeeded in 90 percent of their rescue attempts. ARRS aircraft also evacuated wounded and carried medical supplies to battle zones.

ARRS also supported the national space program. In March 1966 more than 400 personnel, including 49 pararescuemen, and 30 aircraft and helicopters were deployed to 11 locations between Bermuda and Australia in support of the GEMINI 8 flight. When on March 16 the astronauts experienced maneuvering difficulties and were ordered to return to earth, ARRS aircraft and pararescuemen assisted in their recovery. They reached the capsule 20 minutes after the emergency splashdown in the Pacific Ocean, 500 miles east of Okinawa. Although ARRS supports all manned space flights, this was the first time USAF rescue forces participated in the actual recovery of a GEMINI spacecraft.

In April 1966 two helicopter pilots, members of the Atlantic Aerospace Rescue and Recovery Center, received the Air Force's Cheney Award for their daring rescue of 37 persons from floods that ravaged a part of northern Italy in September 1965.

As its workload increased, ARRS delegated a larger share of its duties in the United States to Reserve rescue forces. Five AFRes squadrons equipped with 19 HU-16B's, four KC-97's, and two HC-

97G's flew more than 1,800 hours on 297 rescue missions. In March 1966 these squadrons were authorized an increase in strength from 565 to 825 personnel. Pilots of the Civil Air Patrol, the civilian auxiliary of the Air Force, also assisted, flying more than three-fourths of all hours expended on air search and rescue within the United States.

The Air Force continued to modernize the ARRS force. In November 1965 ARRS received its first HH-3E long-range recovery helicopter, a modification of the standard twin-turbine CH-3C. The modifications included armor plating to protect crew members and vital aircraft components, drop tanks, additional navigational and communication equipment, and more powerful engines. By the end of June eight HH-3E's were in Vietnam, where they recovered nine downed crew members in less than 6 weeks.

After Marine Corps and USAF teams demonstrated the feasibility of refueling a helicopter in flight at the Marine Air Station, Cherry Point, N.C., the Air Force initiated a modification program to provide 17 HH-3E's with an air-to-air refueling capability. This will extend the range of the HH-3E several times beyond its current 700 nautical miles.

Delivery of the HC-130H's to ARRS continued on schedule and 42 of 63 on order were in the inventory by the end of the fiscal year. The HC-130H, a modified C-130 transport specifically equipped for search, rescue, and recovery operations, is replacing such fixed-wing aircraft as the HC-54 and HU-16. With a range of 2,000 miles, the HC-130H can loiter for long periods at low altitude and can retrieve two persons simultaneously from land or sea using a recently developed recovery system.

In the course of the year, the Air Force installed a palletized materiel recovery system in the HC-130H so that ARRS crews could retrieve packets sent aloft as part of the atmospheric sampling program conducted by the Air Weather Service and the Atomic Energy Commission. The balloon-borne sampling packages soar to more than 125,000 feet before parachuting back to earth, where they are recovered by helicopter crewmen or ground recovery parties. The new recovery system in the HC-130H will facilitate airborne recovery at altitudes below 15,000 feet and should reduce the number of packages lost or destroyed.

Air Weather Service

The 11,000-man AWS provides timely weather predictions to the Defense Department and other Government agencies from some 400 worldwide locations. During fiscal year 1966 AWS made 2.6 million surface and 52,000 upper air weather observations. Forecasters provided 2.8 million briefings for aircraft operations, an increase of

400,000 over the previous year, 7.6 million planning and other specialized briefings, some 460,000 pilot-to-forecaster reports, and about 50,000 weather warnings.

In Southeast Asia the demand for AWS support increased substantially. To facilitate USAF and Army tactical air operations, AWS deployed seven transportable weather observation stations, which can be placed at temporary airfields and are completely self-supporting. AWS also set up additional long-range radars in the area to provide advance information of rainfall and other weather phenomena over potential battle zones. In addition to providing USAF and Army units with weather data, AWS submitted monthly climatology reports to the U.S. 7th Fleet and the Marine Aircraft Wing and compiled sea and surf reports for the Military Sea Transport Service.

Twenty-four WB-47's covered the Pacific area to provide aerial weather reconnaissance data for TAC units deploying from the United States to Southeast Asia and for SAC B-52's operating from Guam. Because of the increasing tempo of military activity in South Vietnam, AWS tripled the number of personnel—from 144 to 405—assigned to the 30th Weather Squadron at Tan Son Nhut AB. The Air Force planned to reorganize the squadron and its 19 detachments into a weather group and three weather squadrons in July 1966.

On September 1, 1965, the AWS Global Solar Observing and Forecasting Net (SOFNET) went into continuous operation. With this net, observatories in the United States and overseas can quickly transmit optical and radio observations of the sun to the SOFNET center in Cheyenne Mountain. Information on solar flares, detected and reported by satellites, also reach the center in minutes. From this mass of data, AWS issues solar forecasts thrice daily to more than 40 users.

The AWS weather reconnaissance and aerial sampling force was modernized considerably with the addition of 10 WC-135B's and one additional RB-57C. During the same period, the last four WB-50's in the inventory were retired, leaving the service a total of 63 aircraft.

As the fiscal year ended, AWS operated 17 fixed and 11 mobile television stations which could receive cloud pictures and other atmospheric data from orbiting weather satellites and 24 cloud radar sets which could indicate the height and depth of clouds up to 60,000 feet. An Automated Weather Network, which became fully operational during the year, provided a high-speed weather data link between overseas theaters and Global Weather Central at Offutt AFB, Nebr., where computers processed the incoming data and returned forecasts over the same network.

Air Force Communications Service

AFCS, a major USAF command with 50,000 personnel at some 500 sites around the world, operated and maintained communications, air traffic control services, and air navigational aids for Government and civilian agencies. In fiscal year 1966 a substantial portion of its resources supported USAF combat forces in Southeast Asia. Personnel and equipment of the 1st Mobile Communication Group were moved from Clark AB, the Philippines, to Vietnam and mobile communication complexes—including control towers, air navigation equipment, radar approach control (RAPCON), and ground control approach (GCA) facilities—were erected at Cam Ranh Bay, Phan Rang, Bien Thuy, Pleiku, Danang, Qui Nhon, and other locations. At Tan Son Nhut AB, AFCS personnel were responsible for controlling a major portion of the air traffic, which exceeded that of Chicago's O'Hare International Airport, the highest density air traffic control operation in the world.

AFCS established seven Military Affiliate Radio System (MARS) stations in South Vietnam, with the approval of the Saigon Government. The first station became operational on December 14, 1965, and sent more than 2,100 Christmas teletype and telephone messages during the 10 days before Christmas. By supplementing the limited civil communication channels, the MARS station helped maintain the morale of American servicemen.

Seven ANG squadrons (including the ANG "Talking Bird") and three AFRes mobile communication units helped AFCS carry out its worldwide commitments. During the year the ANG squadrons were reorganized into 29-man communication flights for possible oversea deployment. On June 30, 1966, with OSD approval, the three AFRes squadrons were eliminated from the force.

Major advances were made in the long-term modernization of the Air Force Communications System (AIRCOM). Interim operations began on the European-Mediterranean Communications System's trunkline from Spain to Eastern Turkey which has been developed over the past 4 years. When fully operational, this system will greatly improve command control and communication with units assigned to Europe and the Middle East. The Johnston Island-Hawaii Communications System—the second of three major subsystems of the Pacific Communications System—became operational in March 1966. The first subsystem, a communication link between South Vietnam and the Philippines, has been operating since December 1964.

During the year a major segment of the Northern Area Communications System (489L) became operational. Construction of this frequency modulation tropospheric scatter system, using huge, supersen-

sitive antennae, was completed in less than 2 years, despite severe weather conditions. The 489L system provides a 600-mile communication link between Canada and Thule AB, Greenland. AFCS also operates the Alaska Communications System, which serves both as a military system and as the major commercial communication network for the State.

The Air Force completed installation of three ground relay stations during the year to increase the capability of the SOFT TALK system (484L), which provides teletype and secure voice communications between the White House, the National Military Command System, other designated agencies, and the Special Air Mission aircraft fleet. In addition, microminiaturized secure voice and secure teletype devices were installed in two of the fleet's aircraft.

Expansion of the Automatic Digital Network (AUTODIN) into a Department of Defense worldwide common-user message communication network began during the fiscal year. The U.S. Army Strategic Communications Command was responsible for the expansion in overseas areas and AFCS for work in the continental United States. In late 1965 AFCS opened the first of eight new AUTODIN switching centers in the United States at Hancock Field, N.Y. It was subsequently turned over to the Navy for operation. Traffic handled by five Air Force-operated AUTODIN switches increased from approximately 5 to 9 million messages per month, reflecting the integration of Army, Navy, and Defense Supply Agency's new tributary stations and the impact of the conflict in Southeast Asia.

VII. The U.S. Air Force in Vietnam

During fiscal year 1966 the Air Force accelerated its operations in Southeast Asia. USAF aircraft flew close support missions against Viet Cong and North Vietnamese regular army units in the South and conducted an air campaign in North Vietnam to impede the southward flow of men and materiel.

The Air War in the North

In a carefully coordinated effort with the Navy and the Vietnamese Air Force, the U.S. Air Force applied constant pressure against selected military targets in North Vietnam. Except for the 37-day pause which ended on January 31, 1966, USAF pilots struck almost daily during the year. Targets included ammunition depots, military barracks, supply depots, petroleum storage areas, powerplants, railroad yards, port facilities, roads, bridges, airfields and, radar and air defense sites.

The Air Force won its first aerial victories on July 10, 1965, when two F-4C crews shot down two MIG-17 jet fighters over North Vietnam with SIDEWINDER missiles. A total of nine MIG-17's and one MIG-21 were shot down during the year, with no USAF planes lost in aerial combat.

The enemy's primary defenses included more than 2,000 antiaircraft artillery positions plus a number of surface-to-air missile (SAM) sites. Veteran airmen described antiaircraft flak over North Vietnam as heavier than any they had experienced in World War II or Korea. During the year they destroyed or damaged some 270 flak posts, 20 SAM sites, and one missile support facility. The target area was gradually expanded to cover most of the country, except for certain specified areas such as the Hanoi-Haiphong complex. Among significant targets during the year were the Ban Thach hydroelectric powerplant 80 miles southwest of Hanoi, hit in mid-August, the Uong Bi thermal plant 14 miles north of Haiphong, hit on December 1, and a major military storage depot at Yen Bay, hit on May 31.

In its interdiction effort, the Air Force hit many points along the intricate road system of North Vietnam. During the January 1966 lull, the enemy made a special effort to repair bombed-out bridges,

build new roads, disperse storage areas, and reinforce his defense network. When bombing was resumed and the Air Force again struck many of the key interdiction points and the vital northwest rail line, the North Vietnamese reacted with large-scale launchings of surface-to-air missiles. This missile threat was, however, somewhat neutralized with the successful introduction of electronic countermeasures and newly devised aircraft flight tactics.

After the bombing lull that began on Christmas Eve, there was an over-all increase in air strikes against North Vietnam. On June 29 heavy but precise USAF-Navy raids were directed to specifically pinpointed targets in the Hanoi-Haiphong complex, an area not previously bombed. The attacks on Hanoi fuel depots alone were believed to have destroyed as much petroleum as all earlier strikes combined.

During the year the Air Force launched about 1,000 attacks against Communist staging and supply areas in the North. Pilots reported more than 4,240 buildings destroyed or damaged. Against routes of travel, they estimated that they had wrecked about 1,300 structures, cut roads in more than 2,340 places and rails in about 300, and struck ferry complexes and river fords more than 400 times. They also claimed destruction of, or damage to, more than 1,000 trucks, 650 barges, and 320 rail cars.

Air strikes reduced the military and logistical effectiveness of the enemy, making movement of men and materiel into the South far more costly and dangerous and forcing him to limit much of his travel to the hours of darkness. Thousands of workers were diverted to repair and rebuild damaged bridges and roads or to build new lines of communication.

The Air War in the South

Air power proved indispensable to the prosecution of the war in South Vietnam.

Tactical Strikes

The Air Force flew more than 50,000 strike sorties during the year in support of ground troops conducting search and destroy operations or engaged in major battles at such places as Phu Cu pass, Plei Me, Chu Phong mountain, Du Co, Chu Lai, Bong Son, and A Shau. During the Plei Me battle in October 1965, the prompt arrival and continual support of USAF fighters and transports saved friendly forces from being overwhelmed. The fighters flew 604 close support sorties including 95 night strikes made possible by 26 flareship sorties. Similar air power successes were scored in other battles, including one provoked by Operation HAWTHORNE, a search and destroy op-

eration set in motion in June 1966 about 65 miles north of Pleiku. In an 18-day battle, USAF pilots logged 392 close support sorties.

In their interdiction missions, USAF crews reported destroying or damaging more than 2,500 sampans, a large number of enemy-occupied fortifications and buildings, and setting off explosions at about 1,500 Viet Cong ammunition and fuel storage dumps.

B-52 Strikes

B-52 missions over South Vietnam began on June 18, 1965. By the end of June 1966 the heavy bombers had flown more than 390 strike missions and dropped more than 70,000 tons of bombs. The major objective of these raids was to prevent the enemy from concentrating his forces within virtually impenetrable jungle "sanctuaries." The B-52's harassed the enemy, keeping him on the move and forcing him to use valuable supplies to build field fortifications at even more remote bases, which then were also attacked.

Prisoner interrogations, captured documents, and evidence found by friendly ground forces indicated that the B-52 attacks not only caused wide-spread damage but affected enemy morale. Large quantities of supplies were abandoned, hidden tunnels, caves, and storage facilities were destroyed or exposed, and enemy defections increased.

Aside from pounding Viet Cong strongholds, the B-52's also flew close support and interdiction missions. Their first tactical mission, on November 16, 1965, supported the U.S. Army's 1st Cavalry Division (Airmobile) in the battle against North Vietnam regulars and Viet Cong forces near Chu Phong mountain. During Operation HARVEST MOON in December, B-52 strikes caused the enemy to abandon prepared positions in confusion. Combined with ground attacks, B-52 bombardment was credited with either breaking up enemy dispositions or limiting attacks once in motion.

Although B-52 bombers were used primarily against targets in South Vietnam, they also bombed the approaches to Mu Gia pass in North Vietnam on April 12 and 26, 1966, in an effort to block or slow infiltration of enemy troops who crossed over into Laos and traveled the Ho Chi Minh trail.

Organization and Force Structure

In July 1965 the 2d Air Division, which was responsible for all USAF combat operations on the Southeast Asia mainland, was elevated to the status of a major subcommand reporting directly to Headquarters, PACAF. Its tactical groups were redesignated wings and placed on permanent assignment to the division. On April 1, 1966, the Air Force further raised the stature of its combat arm in South Viet-

nam by reactivating the Seventh Air Force of World War II fame to assume the functions of the 2d Air Division.

In fiscal year 1966 USAF strength in Southeast Asia rose from 10,700 men to more than 36,400 and the number of aircraft from about 500 to more than 1,000 in 35 different squadrons. New units deployed to or activated in South Vietnam included four tactical fighter, one tactical reconnaissance, and two air commando wings.

In addition, B-52 crews and aircraft from six wings in the United States, on temporary duty at Andersen AFB, Guam, took part in operations. Supporting the B-52 missions, as well as fighter and reconnaissance operations, were aircraft from 28 KC-135 refueling squadrons.

A variety of aircraft were used against North Vietnam, including F-4C, F-100, and F-105 tactical fighters. The F-105 carried out more strikes against the North than any other aircraft, but the F-4C also played a significant role. Almost all USAF tactical fighter sorties to the North were refueled by KC-135 tankers.

In the South, the propeller-driven A-1E proved highly useful because of its endurance and sizable load. The Vietnamese Air Force flew the H version of this plane. USAF F-100's also were used extensively in the South.

In November the 4th Air Commando Squadron (Fire Support) arrived in Vietnam equipped with the AC-47, a modified version of the oldest active USAF plane. Armed with three side-firing 7.62-millimeter miniguns, each capable of firing 6,000 rounds a minute, the AC-47's helped defend outposts and hamlets, supported friendly forces, supplemented strike aircraft, and escorted convoys.

The 5th Air Commando Squadron, a psychological warfare squadron also arrived in Vietnam in November. Flying C-47 and U-10 aircraft, this squadron broadcast messages and dropped leaflets to Viet Cong insurgents. Broadcasts by the units totaled 380 hours and pilots dropped millions of leaflets during the bombing pause in January. By the close of the fiscal year, the squadron had dropped more than 508 million leaflets and conducted 3,175 hours of loudspeaker broadcast operations.

Two other special-purpose aircraft, C-47 and C-123 flareships, were placed on airborne alert over certain areas to paradrop flares, each with about 2 million candlepower of light. The 2½ minutes of illumination provided by a single flare assisted friendly forces to ward off night attacks and eased the task of supporting aircraft. Other specially modified C-123's spread chemicals to defoliate dense jungle growth and facilitate the search for Viet Cong staging areas, supply depots, and possible ambush sites.

Reconnaissance

The 460th Tactical Reconnaissance Wing was activated in February 1966 to administer and control the widely dispersed USAF reconnaissance squadrons in Southeast Asia. By June 30 these squadrons were supplying the bulk of U.S. photographic intelligence. Aircraft used included RF-4C's, RF-101's, and EB-66's.

Four tactical air support squadrons equipped with O-1 E, F, and G aircraft provided visual reconnaissance and air support control. Painstaking aerial search by the O-1's was one of the most effective ways to locate targets concealed by jungle foliage. The O-1 pilot or forward air controller (FAC) and his Vietnamese observer sometimes spent as much as 6 hours a day examining an area to spot suspicious changes or movements. They also had the hazardous job of marking targets with smoke bombs and checking the effects of air strikes. The Air Force planned to increase the number of airborne FACs from 354 to 493 and the number of ground FACs attached to Army units from 46 to 53 by the fall of 1966.

Intratheater Airlift

The United States would have been hard pressed to support the allied forces in South Vietnam without airlift, since surface transportation was severely hampered by terrain, weather, and Viet Cong harassment of rail and road traffic. Intratheater airlift, operated by the 315th Air Commando Wing, provided about 75 percent of all deliveries within the country. It also served as the country's lifeline, delivering all types of commodities to the people.

Intratheater delivery of materiel and airlanding or airdropping of troops were handled by C-130's and C-123's. Of more than 265,000 tons of cargo moved by airlift within the country during January-June 1966, C-130's carried about 65 percent. Many aircraft landed at rough forward airstrips where ground fire was a constant hazard.

In December 1965 the 20th Helicopter Squadron, the only USAF combat airlift helicopter unit, was assigned to Vietnam to support the Tactical Air Control System. Its CH-3 helicopter crews also joined the airlift force in supplying remote sites and moving troops and equipment to forward areas. They flew medical evacuation missions, airlifted refugees, recovered downed aircraft, and carried artillery. U.S. Army and Australian CV-2's and Vietnamese Air Force (VNAF) C-47's also participated in the airlift.

There were several improvements in the handling and unloading of cargo. The automated and mechanized equipment of the 463L materiel handling support system, fitted to the C-130, permitted the rapid unloading of cargo in combat areas. The C-123 began using a new low altitude parachute extraction system, which jerked the cargo from

aircraft at an altitude of about 50 feet but still allowed safe delivery on precise locations.

Command and Control

Close support of ground forces required centralized control of air-ground activities. A Defense Department survey had concluded that the USAF-Army system in Vietnam, which was somewhat similar to that employed in World War II and Korea, was still highly effective. When an Army commander stated a need for air support, the ground FAC attached to his unit determined what type of aircraft and ordnance could best fill the requirement and radioed the USAF tactical air support center at Tan Son Nhut AB. This center, which controlled all strike aircraft flying from Vietnamese bases except Marine air units supporting Marine operations, would quickly order the necessary sorties.

An important command and control system introduced into South Vietnam in March 1966 improved the accuracy of USAF aircraft strikes in bad weather and at night. Known as the Sky Spot radar system, it provided a targeting accuracy that compared favorably with pilot-directed or radar bombing. A Sky Spot controller, operating a mobile radar set, directs the strike aircraft along a designated course to the bomb release point, corrects direction and speed, and signals the pilot when to drop his bombs.

Air Bases in Southeast Asia

One of the major obstacles to increased air operations in Southeast Asia was the limited base facilities in the area. To help resolve this problem, Congress appropriated \$345 million during the year—\$145 million for base construction in South Vietnam, \$101 million for Thailand bases, and the balance for various support facilities.

These funds permitted the Air Force to expand and improve existing bases and to begin construction of six new bases—four in South Vietnam and two in Thailand. With the Navy serving as construction agent, contractors built a new base at Cam Ranh Bay, 165 miles northeast of Saigon, completing a 10,000-foot AM-2 aluminum mat runway in 70 days. Limited operations began at Cam Ranh in November 1965. Army engineers completed a second major air base, at Phan Rang, about 150 miles northeast of Saigon, in March 1966. Other important airfield construction took place at Danang, Chu Lai, Qui Nhon, Nha Trang, Bien Hoa, Bin Thuy, and Pleiku.

Because of the urgent need for other bases, the Air Force on May 31, 1966, awarded a contract initially amounting to \$25 million for construction of the Tuy Hoa AB, about 75 miles north of Cam Ranh Bay, and a port facility nearby. The contractor was given responsibility for

the entire job, including his own logistical support, with U.S. Government furnishing only the real estate, matting, and certain special equipment. This approach permitted other construction in South Vietnam to proceed without interruption and avoided placing an added burden on the limited Vietnamese resources. In all, the Air Force was engaged in more than 500 construction projects in Southeast Asia during the year.

For quick repairs to bases damaged by enemy actions or natural causes, the Air Force activated two Red Horse (civil engineering heavy repair) squadrons. After training at Cannon AFB, N. Mex., in January and February 1966, one of the 400-man squadrons deployed to Phan Rang and the other to Cam Ranh Bay. Initially they engaged in construction of interim facilities such as combat centers, wing headquarters, and shops. The Air Force activated four additional squadrons early in 1966, and these were undergoing training at the close of the year.

The Air Force also organized several Prime Beef (Base Engineering Emergency Force) teams that could be deployed anywhere in the world to help restore a base to normal operations. In August 1965 three 25-man teams went to South Vietnam for 120 days to erect dirt-filled steel revetments that would protect aircraft against mortar and automatic weapons fire.

A number of other defensive measures were taken to guard against guerrilla attacks. In July 1965 the Air Force brought sentry dogs to guard both USAF and VNAF military installations. The dogs were taught to detect and hold intruders attempting to penetrate protected areas. More than 450 sentry dogs were in the country at the close of the fiscal year. In addition, air police personnel assigned to the base defense mission took special combat preparedness courses and by June 30 more than 450 had received this training.

Conventional Munitions

During fiscal year 1966 the consumption of air munitions in Southeast Asia by USAF forces ran about 2½ times the average monthly rate expended during the 3 years of the Korean war. Munitions expended against North Vietnamese targets included all nonnuclear ordnance in the USAF inventory, particularly the 750-pound bomb. The Air Force also used 3,000-pound bombs effectively against bridges and 2.75-inch rockets on armed reconnaissance missions.

The Air Force in conjunction with the Army and the Navy took steps during the year to open additional manufacturing facilities and to accelerate production of critically needed munitions. These included

2.75-inch rockets, 20-mm. cartridges, and 250-, 500-, and 750-pound bombs. Contracts were also placed for several new items such as dispenser-type bombs and more advanced fuzes.

VIII. Manpower and Training

Military personnel requirements during fiscal year 1966 reflected a number of changes in the composition of USAF forces, particularly those in Southeast Asia. Manpower increases for the conflict in Vietnam more than offset decreases obtained through economies and the contraction of other activities. The growth of general purpose forces and the modernization of tactical fighter units, plus training and logistical support for units in Southeast Asia, generated a demand for additional manpower and skilled technicians.

Civilian personnel requirements followed a similar trend. Initially, base closures and more efficient USAF management resulted in reductions, but these were counterbalanced by additional commitments to Southeast Asia as well as the program to substitute civilian for military personnel in certain support functions.

Manpower Strength

During this fiscal year active military manpower increased by 62,691—from 824,662 (131,578 officers and 693,084 airmen and cadets) on June 30, 1965, to 887,353 (130,724 officers and 756,629 airmen and cadets) on June 30, 1966. Of these, 30,148 officers and 215,248 airmen for a total of 245,396 assigned overseas.

Ready Reserve manpower strength grew from 269,918 to 289,345—an increase of 19,427. Of this total, 79,883 were serving in the Air National Guard; the remaining 209,462 in the Air Force Reserve. At the end of June 1966, there were 145,440 in the Standby Reserve, a gain of 4,099 during the year. Ready Reserve growth resulted from increased manning of five AFRes groups converting from C-119 to C-124 aircraft and from the USAF effort to achieve full manning for 11 AFRes military airlift groups, nine ANG tactical fighter groups, four ANG tactical reconnaissance groups, and one ANG tactical control squadron. A few of these units reached full strength by June 30, 1966, and the rest were expected to do so in fiscal year 1967.

The number of direct-hire civilians increased from 291,500 to 306,900—a rise of 15,400. The percentage of salaried (white collar professional and technical) as compared to Wage Board (blue collar) employees, which had risen steadily in previous years, reversed itself in fiscal year 1966. Salaried personnel dropped from 54 to 51 percent

of the total as most civilian replacements for military personnel were in Wage Board categories. The number of workers hired indirectly through contracts or agreements with foreign governments declined—from 30,350 to 29,500. The turnover of full-time civilian employees increased significantly, the average monthly accession rate rising from 1.7 to 2.7 percent and the separation rate from 1.7 to 2.3 percent.

Manpower Controls

The Air Force continued to use automatic data processing and management engineering standards to match people with jobs more accurately and to calculate the number needed to do a given amount of work more precisely. Management engineering teams prepared 895 additional work standards, bringing the total adopted since 1961 to 3,659. Application of these standards allowed the transfer of 7,086 additional manpower spaces to higher priority work.

In November 1965 the Air Force installed a large computer at the Military Personnel Center, Randolph AFB, Tex., to collect, store, and process the great amounts of information needed to assign manpower effectively. This "data bank" was limited initially to information about officers, but the same technique will be applied to airmen when enough feeder computers have been installed at base level. Meanwhile, the method for collecting and processing the data was standardized and has already proven more accurate and efficient than the current system.

In order to release more military personnel for combat and direct combat support duties, the Secretary of Defense in September 1965 authorized the Air Force to replace 3,000 officer and 17,000 airmen positions with a total of 17,000 civilians. This mix-fix program got under way in January and during the next 6 months the Air Force recruited more than one-third of the civilians.

Manpower forecasts indicated there would be some shortage of pilots in fiscal years 1967, 1968, and 1969. The Air Force established strict controls over the number occupying staff positions. Rated officer positions were limited to certain functions and a maximum overall ceiling was established. The Air Force also assigned to non-commissioned officers (NCOs) an additional 430 positions formerly restricted to commissioned officers. This action was expected to save about \$3 million annually and, at the same time, improve NCO morale.

By exercising stringent manpower controls, the Air Force was able to keep most of its military personnel in operational and training

activities. Utilization of authorized military manpower by function at the end of June 1966 was as follows:

	<i>Percentage</i>
Operations -----	67.9
Support -----	16.8
Training -----	15.2
Miscellaneous -----	.1
	100.0

Officers

As an interim measure to meet the immediate requirement for more pilots in Southeast Asia, the Air Force returned many older pilots, who had previously been relieved from flying, to operational cockpit duty. For the longer term, the Air Force sought OSD approval to increase the rate of flight training.

The temporary legislation which allowed the Air Force 4,000 more lieutenant colonels than authorized by the Grade Limitation Act of 1954 had expired at the end of fiscal year 1965. The Air Force would have been forced to halt temporary promotions in field grades and to demote many officers if Congress had not enacted into law on August 31, 1965, a USAF proposal for temporary authorization of an additional 1,100 colonels and 5,500 lieutenant colonels. The Department of Defense transmitted to the Congress in March 1966 a USAF proposal to increase the permanent authorization for colonels and lieutenant colonels and to provide a temporary (6-year) authorization for additional lieutenant colonels and majors. This legislation would permit the Air Force to adopt a method of officer advancement similar to that employed by the other Services and help eliminate the field grade officer shortage that had been a problem for more than a decade. The OSD bill was accepted by the House on June 28, 1966, and awaited Senate action as the fiscal year closed.

The Air Force still faced serious problems in attracting and retaining personnel, especially competent, young officers. A growing number of officers were leaving the Air Force at their own request—3,289 in fiscal year 1965 and 3,483 in fiscal year 1966. Some of the reasons given for leaving were inadequate pay, despite the \$1.7 billion pay raise effective in September 1965, substandard housing, poor promotion opportunities, separation from families, and eroding fringe benefits.

Airmen

In fiscal year 1966 the Air Force enlisted 165,707 airmen—159,581 without previous service and 6,166 with previous service. This substantial increase—about 81,595 above last year—was due largely to the buildup in Southeast Asia. By June 30, 1966, about 48,450 airmen

had been assigned to Southeast Asia to fill emergency operational requirements.

As increasing numbers of skilled men went to Vietnam, the proportion in this country declined. In several specialties—munitions, aircraft maintenance, photography, and command and control—the Air Force gave further instruction to personnel not fully trained and waived other assignment criteria. In some commands, on-the-job training was seriously overloaded.

The expansion of airman strength during the year permitted the Air Force to make more promotions than at any time since the end of the Korean war. OSD raised the ceiling for the top six grades from 418,000 to 437,831, allowing 159,905 instead of 106,930 promotions and 84,581 NCO positions instead of 48,540. The Air Force stopped making spot promotions for qualified airmen in SAC and the USAF Security Service, deeming it in the best interest of the Service to make all promotions from a common pool.

Airman proficiency pay was started in 1959 with a budget of \$2.5 million. Since then it has grown into a \$40 million program, with \$42.6 million approved for fiscal year 1967. During 1966 more than 70,000 airmen received proficiency pay—about half getting P-1 (\$30 per month) and half P-2 (\$60 per month). One new skill (automatic flight control) was added to the list of skills authorized proficiency pay, and the Air Force was seeking to add several more.

The size of the variable reenlistment bonus, under the plan adopted in January 1966, depended on the technical nature and complexity of the skill possessed by the man reenlisting. Payments were based on multiples (up to four) of an individual's basic reenlistment bonus and paid in equal yearly installments. About 5,000 men in 136 specialties received bonus awards totaling about \$2.6 million. Preliminary analyses showed that reenlistment rates were consistently higher for men who had skills which entitled them to receive these bonuses.

Airman reenlistment rates for fiscal year 1966 averaged 54.3 percent—21.0 percent for first term airmen (including extension) and 88.0 percent for career airmen.

Civilian Personnel

The average grade among civilian employees dropped to GS-7.02 on June 30, 1966, as against GS-7.21 a year earlier. This drop was due partly to the fact that 5,289 new employees were hired at grades GS-1 through GS-3, and partly to the transfer of 192 high grades (GS-14 and above) to other Department of Defense agencies. These actions more than offset the grade level increase that occurred when

contract technical representatives were brought into the civil service system, most of them at grades GS-9 through GS-11.

On June 30, 1966, the Air Force had 4,234 positions at GS-14 and above and was authorized 4,462 for June 30, 1967. These positions were distributed largely to employees in scientific and technical fields. Only about 16 percent of the salaried employees were assigned to scientific and technical functions but they filled 48.6 percent of the high grades in fiscal year 1966 and would reach 50.1 percent in 1967.

Executive Order 11246, signed on September 24, 1965, had abolished the President's Committee on Equal Employment Opportunity and assigned its functions to the Civil Service Commission. The Air Force held conferences at Hamilton AFB, Calif., on January 18-19, 1966; at Carswell AFB, Tex., on February 8-9; at Orlando AFB, Fla., March 8-9; and at Wright-Patterson AFB, Ohio, on March 29-30, to clarify the Civil Service Commission's new role in administering this program.

Special emphasis was placed on the Summer Youth Opportunity Campaign. The Air Force also continued its leadership in the employment and utilization of the physically handicapped.

During the fiscal year the Air Force closed five major bases and planned to close seven others. More than 48,800 career and career-conditional employees had been or would be affected by the closings. Of this total, 19,000 were placed in other jobs, 82 percent of them at their same or higher grades. About 70 percent remained with the Air Force. Many received their new positions through the DoD Centralized Referral Activity, and at the end of the fiscal year, more than 3,000 were registered for placement assistance. The previous record of finding a position for every employee who requested assistance still stood. No employee who lost a job because of a base closure was separated without being offered employment elsewhere.

Family Housing

During fiscal year 1966 the Air Force underlined the importance of military family housing by emphasizing better designs, concentrating on selection of sites, and attempting to obtain equal housing privileges for all uniformed personnel. In May 1966 OSD required every military installation in the United States with more than 500 officers and enlisted men to report each instance where a community denied equal rights to military personnel and their dependents. OSD also asked base commanders to describe their efforts to oppose discrimination and to foster equality of treatment.

The Air Force prepared plans and specifications for 4,990 new family housing units at 25 bases. Congress authorized 4,590 at 24 bases and appropriated money to build 3,390 at 18 bases. Although the Secretary of Defense temporarily deferred construction, the Air Force anticipated eventual reinstatement and continued design work for the housing.

The Air Force let contracts for construction of 894 fixed units at a cost of about \$15.5 million in fiscal year 1965 funds. Two of the largest projects were for SAC—one at Beale AFB, Calif., and the other at Offutt AFB, Nebr. Of the 2,643 units (including movable) approved in fiscal year 1965, 349 were completed and occupied by the end of June 1966, 1,420 were scheduled for occupancy by the end of the summer, and 874 were to be completed and occupied in 1967. The fiscal year 1964 fixed housing program, consisting of 1,530 units at 10 bases, was completed by the end of June 1966.

The fiscal year 1965 USAHOME III oversea program was placed under contract on October 29, 1965. The Air Force was responsible for buying these units—180 for itself, 66 for the Army, 56 for the Navy—and transporting them to oversea sites. Fabrication of all the USAHOME III houses was scheduled for completion in the fall of 1966. Of the 652 units in the USAHOME II program approved in 1964, 276 were completed by the end of June 1966. The largest project in this program, 250 units at Clark AB in the Philippines, was scheduled for completion in November 1966.

Fabrication and delivery of the 800 units in fiscal year 1964's relocatable housing program neared completion. About 760 had been finished and 486 occupied by the end of June 1966; the remainder were scheduled for July. These houses were built at Minot and Grand Forks AFB's, N. Dak., and Malmstrom AFB, Mont.

In fiscal year 1966 Congress authorized the Department of Defense to lease 7,000 family units in the United States, 2,000 more than the previous year. The Air Force share was 1,918 units. By June 1966 the Air Force had leased 1,639 units.

The rental guarantee program covering 3,386 USAF housing units in France and Morocco was terminated. About 1,580 units in Spain were transferred to the surplus commodity category before construction was completed. Current legislation still authorized the Department of Defense 5,000 units under the rental guarantee program, and OSD expected to have these built in West Germany and the United Kingdom.

Health in the Air Force

During fiscal year 1966 the Air Force met a new health challenge arising from the Southeast Asia conflict. The general state of health of USAF military personnel for fiscal years 1965 and 1966 follows:

	1965	1966
Average USAF personnel strength.....	840, 913	841, 942
Medical facility admission per year (per 1,000 average strength):		
All causes.....	181	181
Disease.....	159	160
Nonbattle injury.....	22	21
Battle injury.....		0.11
Noneffective ratio (per 100).....	0.70	0.72
Hospitalized ratio (per 100).....	0.54	0.56
Average number of USAF personnel occupying beds in medical facilities.....	4, 536	4, 697
Average number of patients occupying beds in USAF facilities.....	8, 264	8, 109
Air Force.....	3, 819	3, 881
Other military.....	345	392
Nonmilitary.....	4, 100	3, 836
Number of births in USAF facilities.....	61, 189	53, 131
Outpatients visits in USAF facilities.....	16, 352, 277	16, 843, 475
Flight physical examinations in USAF facilities.....	200, 320	202, 373
Other complete physical examinations.....	543, 766	688, 811
Immunization done at USAF facilities.....	8, 551, 529	9, 852, 654

Medical Personnel

Each year since 1961 the USAF Medical Service has had to obtain physicians through Selective Service. It was becoming increasingly difficult to meet the demand for physicians in Southeast Asia without seriously affecting the quality of medical care elsewhere. To meet the immediate requirements, a special draft call brought in 310 physicians. At the same time, two long-term plans were adopted to help overcome this chronic shortage of physicians. Under the first, the Air Force pays for advanced medical training for 1 percent of the graduates of the Air Force Academy and the Officers Training School, distinguished ROTC graduates, and four Regular officers. The second plan underwrites the same training for 50 Reserve officers each year. Each participant incurs an active duty service commitment of 3 months for each month that he attends medical school. Both plans are under the supervision of the Air Force Institute of Technology.

The medical technician school at Brooks AFB, Tex., was placed on a maximum training schedule to meet the need for trained technicians to staff new medical treatment facilities and casualty staging units in the Pacific area and to assist in provincial hospitals in Vietnam. In September 1965 the Secretary of Defense directed the Services

to establish 21 teams to provide critically needed health and medical service for Vietnamese civilians. The Air Force formed seven teams, each consisting of three doctors, one Medical Service Corps officer, and 12 Medical Service enlisted men. In addition, it dispatched two medical-surgical teams to South Vietnam.

Despite the general shortage of nurses, and the growing demands of Southeast Asia, the Air Force had no difficulty in filling its quota of 201 above fiscal year 1965. The Nurse Corps increased its call for new personnel to 970 and easily recruited them.

The Medical Service sponsored residency training for 367 physicians, including 321 in clinical specialties, 45 in aerospace medicine, and one in occupational medicine. The Air Force sponsored 10 residencies for dental officers and graduate and undergraduate training in civilian institutions for 35 other dentists, 43 Medical Service Corps officers, 68 Biomedical Science Corps officers, and 54 nurses. Of the nine residencies for veterinarians, five were in laboratory animal medicine and four in pathology.

The USAF Medical Service furnished physiological training for 53,176 aircrews of the three Services. It also provided similar support to all USAF high-altitude projects that required the use of pressure suits.

The increase in the number of medical personnel assigned to the Air Force over the previous year is reflected in the following table:

	June 30, 1965	June 30, 1966
Officers (Corps):		
Medical.....	3,637	3,780
Dental.....	1,915	1,937
Veterinary.....	330	354
Medical Service.....	1,427	1,477
Nurse.....	3,488	3,760
Biomedical.....	856	863
Total.....	11,653	12,171
Airmen:		
Medical.....	22,084	22,394
Dental.....	3,278	3,223
Total.....	25,362	25,617

Before the buildup in Southeast Asia, the Air Force maintained in the theater only two class A and eight class B dispensaries with a total of 16 beds. Facilities at Clark AB in the Philippines and Tachikawa AB, Japan, provided more definitive care. Aeromedical evacuation for the entire Pacific theater was handled by the 9th Aeromedical Squadron at Tachikawa. During fiscal year 1966 the Medical Service expanded its activities overseas considerably. By year's end, it had one hospital with 200 beds (at Cam Ranh Bay), five class A dispensaries

with 62 beds, and eight class B dispensaries operating in South Vietnam and Thailand, as well as 100 beds added to the Clark and Tachikawa facilities. The increasing need for aeromedical evacuation facilities also required establishment of a 50-bed casualty staging unit at Tan Son Nhut AB, Vietnam, and one each at Clark and Tachikawa with an overall capacity of 500 beds.

Medical Facilities

The table below provides data on USAF medical treatment facilities at the end of fiscal year 1966:

UNITED STATES		
	<i>Facilities</i>	<i>Beds</i>
Hospitals.....	88	7, 883
Class A Dispensaries.....	17	112
Class B Dispensaries.....	18	0
Total.....	123	7, 995
OVERSEAS		
Hospitals.....	26	2, 295
Class A Dispensaries.....	34	339
Class B Dispensaries.....	23	0
Total.....	83	2, 634
Grand total.....	206	10, 629
Dental Facilities and Mobile Clinics.....	424	

The aeromedical evacuation of patients by PACAF and MAC during fiscal year 1966 is shown below:

	<i>PACAF— Intra- pacific</i>	<i>MAC— Intra- pacific</i>	<i>MAC— Trans- pacific</i>	<i>MAC— Intra- USAFE</i>	<i>MAC— Trans- atlantic</i>	<i>MAC— Domestic</i>	<i>Total</i>
July–December 1965.....	18, 640	1, 353	5, 027	8, 882	1, 629	23, 372	58, 903
January–June 1966.....	27, 898	908	8, 405	9, 314	1, 700	25, 633	73, 858
Total, fiscal year 1966..	46, 538	2, 261	13, 432	18, 196	3, 329	49, 005	132, 761

Medical Service

USAF physicians at Clark and Tachikawa performed most of the neurological and thoracic surgery operations and treated complicated malaria infections for patients out of Vietnam. They also handled all cases requiring hemodialysis, a procedure which the Air Force teaches medical personnel of the other Services.

The more important activities in environmental and preventive medicine included: A tuberculosis testing program that discovered 130

new cases of the disease; immunization of all U.S. personnel in Iran following a cholera outbreak; research in support of the USAF traffic safety program; and a review of occupational health programs which revealed that 95 percent of USAF civilian personnel now have access to emergency medical facilities where they work.

Early in February 1966 nine cases of meningococcus meningitis occurred at Lackland AFB, Tex., resulting in one death. Routine health measures halted this local epidemic.

Drug-resistant falciparum malaria was a significant danger to U.S. troops in Southeast Asia. USAF personnel who lived primarily in fixed installations where good antimosquito measures were possible, suffered much less (only 13 cases) than the troops of other Services. Special preventive measures were taken to insure that returning veterans did not introduce this form of malaria into the United States. The Tactical Air Command's Special Aerial Spray Flight and the USAF Epidemiological Laboratory (Lackland) furnished guidance and recommended measures for control of mosquitoes in Southeast Asia and Alaska. The Medical Service also continued to administer gamma globulin to military personnel in Southeast Asia to prevent infectious hepatitis.

In March 1966 the Chief of Staff, USAF, requested that a flight surgeon or flight medical officer be assigned to each aircraft used in astronaut recovery operations. The value of this precaution was demonstrated during the emergency splashdown in the Western Pacific on March 16, 1966, of GEMINI 8.

In preventive dentistry the Air Force began controlled fluoridation of water at the Johnson and Grant Heights housing areas in Japan, bringing to 148 the number of USAF areas which enjoyed this health benefit. Topical anticariogenic (tooth decay preventive) treatment by using a fluoride rinse developed by the Dental Science Division, School of Aerospace Medicine, gained wide acceptance throughout the Air Force. Dental research ranged from investigation of digestible dentrifices to a palliative and durable restorative material. An extremely lightweight do-it-yourself emergency treatment kit, developed for astronauts, could also be carried by a combat medic.

Civic action in several foreign countries highlighted the Veterinary Service's activities during fiscal year 1966. In the Azores it supplied Nubian goats to improve local herds, helped control the Mediterranean fruit fly, and provided additional artificial insemination equipment for breeding cattle. It also furnished books, pamphlets, and veterinary and agricultural supplies to help combat plant and animal disease. In Southeast Asia, veterinarians helped local farmers improve animal husbandry methods. In Latin America, they cooperated with U.S. mis-

sions to develop local sources of meat, eggs, poultry, and fresh fruit for military use, and stimulated local farmers to increase agricultural production.

Chaplains

At the end of June 1966 there were 1,139 chaplains on active duty, a net increase of 40 over the previous year. Included were two generals, 41 colonels, 262 lieutenant colonels, 273 majors, 523 captains, and 38 first lieutenants.

On June 30, 1966, there were 441 religious facilities at Air Force installations in the United States and 228 overseas. These included 366 chapels and 303 chapel annexes. New facilities authorized by Congress included 15 chapels (11 with annexes), six annexes, one hospital chapel, and various other additions and alterations. Appropriations for chapels totaled \$6.8 million.

The following table gives attendance at Air Force religious services:

	Protestant		Catholic	
	No.	Attd.	No.	Attd.
Sunday and Sabbath.....	40, 340	4, 231, 855	41, 453	7, 944, 624
Weekday.....	5, 720	281, 877	81, 967	1, 369, 350
Holy Day.....	834	65, 163	3, 562	601, 952

	Jewish		Total	
	No.	Attd.	No.	Attd.
Sunday and Sabbath.....	1, 985	45, 831	83, 778	12, 222, 310
Weekday.....	850	17, 904	88, 537	1, 669, 131
Holy Day.....	329	15, 813	4, 725	682, 928

Twenty Protestant and 18 Catholic clergymen conducted missions for USAF personnel and their families throughout the world. In October-December 1965 Torah Convocations were held for members of the Jewish faith in Alaska, four countries of Western Europe, and Turkey. Two Roman Catholic Bishops administered the Sacrament of Confirmation to troops and their families in the Far East, Western Europe, and the Middle East. Two Protestant Episcopal Bishops and a Methodist Bishop conducted worship services in most of the same areas. Retreats for chaplains and Spiritual Life Conferences for USAF personnel and their families were held in the United States. Family life conferences for military personnel and their families were held in November 1965 at bases in Alaska, Hawaii, and the Far East. Lectures on "Moral Aspects of the Cold War" were presented in West Germany during July and August 1965.

Four Catholic and four Protestant professional development seminars were conducted in the United States. One for Jewish chap-

lains assigned to installations in the United States was held in New Jersey. The Chief of Chaplains sponsored a conference October 19-21, 1965, in Washington, D.C., for all major command chaplains, all chaplains in the grade of colonel, and representatives of ecclesiastical endorsing agencies.

The 24 USAF chaplains serving in South Vietnam during the year represented the Roman Catholic Church and nine Protestant denominations. They served an average workweek of more than 75 hours, conducting religious services and engaging in humanitarian activities among the troops and local populace. During January-March 1966 chaplains organized projects to distribute food, clothing, and toys to 24 orphanages. They also supplied 16 hamlets with building materials, food, and money. Many churches and private organizations in the United States furnished chaplains with items for refugees in the Saigon and Pleiku areas, assisted missionaries caring for wounded Vietnamese, and helped mission schools for homeless children increase their charitable activities.

Judge Advocate General

The Air Force JAG had no difficulty obtaining new officers largely because of the draft. Out of 1,302 applications for legal positions, JAG selected and commissioned its full quota of 140. The problem of keeping lawyers beyond their obligated tours of duty remained acute, however, and at the end of June 1966 JAG had a shortage of 82 field grade officers. The department closed the fiscal year with a strength of 1,229, an increase of 72 from last year.

The USAF court-martial rate continued to decline. Military justice activities for the year are summarized below:

	<i>Fiscal year 1965</i>	<i>Fiscal year 1966</i>
Decisions rendered by Boards of Review	637	453
Cases forwarded to U.S. Court of Military Appeals	202	152
Petitions granted by U.S. Court of Military Appeals	33	16
Petitions denied by U.S. Court of Military Appeals	165	133
Board of Review Decisions affirmed by U.S. Court of Military Appeals	12	14
Board of Review Decisions reversed by U.S. Court of Military Appeals	21	10
Cases pending in U.S. Court of Military Appeals as of 30 June 1966	25	19

During fiscal year 1966 JAG received or reopened 1,530 claims amounting to approximately \$7.5 million. Last year there were 3,296

totaling \$8.0 million. A statistical summary of claims, including those in favor of and against the Air Force, appears below:

	Number	Amount (millions)
Claims on hand, July 1, 1965.....	981	\$3.7
Received or reopened, fiscal year 1966.....	1,530	7.5
Closed, fiscal year 1966.....	2,001	8.1
On hand, June 30, 1966.....	510	3.1

The Air Force collected almost \$2.6 million from carriers and warehousemen for loss and damage to household goods and other personal property, and from third parties whose negligence destroyed or damaged Government property or injured USAF personnel. This sum was about 69 percent more than the \$1.8 million collected in fiscal year 1965.

The Litigation Division received 494 cases during the fiscal year, closed 756, and had 1,012 on hand on June 30, 1966—a reduction of about 260 from the number pending a year earlier.

Military Training

The war in Southeast Asia placed a heavy burden on USAF training programs. The commands expanded their training programs considerably to provide skilled replacements for units in Southeast Asia and other areas of the world, as well as for those in the United States.

Flying Training

In fiscal year 1966, the Air Force trained 2,321 new pilots, as compared to 2,373 pilots graduated the previous year. The new pilots were assigned as follows: 1,969 for the Air Force, 187 for ANG, and 175 for MAP. All were trained in jet aircraft except 80 USAF helicopter and 57 MAP pilots.

To meet the sharply increasing requirement for pilots, OSD authorized the Air Force to increase undergraduate pilot training for fiscal year 1967 to 2,760 pilots plus 196 for the ANG and MAP.

Since the forecast requirements for young pilots continued to increase, the Air Force requested authority to further raise the USAF rate to 3,360 by fiscal year 1969, plus an increase of 312 for ANG, AFRes, and MAP.

In July 1965 the Air Force shortened the course in order to make possible an increased pilot training rate without increasing the number of bases. A civilian contractor provided 30 hours of light plane (T-41) flying and the Air Force provided 90 hours in the T-37 instead of the previous 132, plus 120 hours in the supersonic T-38 instead of the previous 130. In September 1965, the United States agreed to train 170 pilots annually for the West German Air Force, a rate expected to be achieved by fiscal year 1968.

On October 5, 1965, the Air Force inaugurated a 32-week undergraduate navigator course at Mather AFB, Calif. Five weeks shorter than the course previously given at James Connally AFB, Tex., it placed greater emphasis on flight skills and deleted academic instruction on outdated techniques. In the same month, the Air Force prepared a new navigator-bombardier curriculum that combined the old training with qualification courses specifically oriented toward B-52 operations. To further streamline training programs, in December 1965 Headquarters USAF approved a reduction in the electronic warfare officers course from 105 to 90 hours. The revision became effective early in 1966 when the ET-29D aircraft replaced the TC-54 as the training craft. The modified ET-29D, coupled with new electronic warfare ground simulators, was expected to produce a better trained graduate.

The Air Force trained 936 new navigators during the year (838 for the Air Force, 75 for ANG, and 23 for MAP), qualified 282 navigator-bombardiers for B-52 service, and provided various types of upgrading training for an additional 366 navigator-bombardiers. Also, 188 students graduated from electronic warfare officer training and an additional 109 from specialized electronic warfare courses.

In May 1966 the USAF Survival School moved from Stead AFB, Nev., to Fairchild AFB, Wash. Stead became inactive with graduation of the last class on May 19, and the first class began training at Fairchild on June 27. This training reflected the growing number of assignments to Southeast Asia. More than 4,750 flyers entered the survival course during 1966; 6,000 were planned for fiscal year 1967; and by January 1967 the school will be enlarged to accommodate 8,000 students per year.

Technical Training

During the year 4,543 officers were enrolled in a variety of technical training courses. About half of them were new graduates from Officer Training School, Reserve Officers Training Corps (ROTC), and Service academies. There were still not enough new officers, however, to fill training quotas in meteorology, communications, aircraft maintenance, and other specialties, and about 200 officers were transferred to these technical training courses from less critical specialties.

The 1-year tour of duty in Southeast Asia required a substantial number of replacements each year. This required accelerated instruction in the maintenance of various aircraft, the handling of conventional munitions, and certain armament skills not previously stressed. Technical training schools graduated about 145,000 students in the necessary skills, nearly 41,000 more than last year.

The quality of newly assigned airmen was generally higher than in previous years. The number of high school graduates, for example, increased from 91 percent in fiscal year 1965 to 92.2 percent in fiscal year 1966. Failures in basic military training dropped from 5.9 percent in fiscal year 1965 to 3.1 percent, while failures in technical training were only 5.9 percent, in contrast to an expected rate of 7.2 percent. As a result, more airmen were available for duty or further technical training.

A number of emergency measures were taken to relieve the load on the overburdened training centers. A second basic military training program was opened at Amarillo AFB, Tex., in March 1966. In addition, basic military and technical training centers went on a 6-day workweek, with some critical training courses on three and four shifts. From April to July 1966, the basic military training course was reduced from 30 to 24 days, eliminating 48 hours of instruction.

The deployment of many tactical units to Southeast Asia made it impractical to conduct weapon system qualification training directly with operational units. In December 1965, TAC and ATC set up joint procedures for simultaneous field detachment and on-the-job training of maintenance technicians who would go to Southeast Asia or serve as replacements in stateside units.

Nearly 153,000 airmen participated in on-the-job training. The Air Force also prepared 110 instructional publications for 176,000 airmen enrolled in career development courses at the end of the year.

The Air Force provided an M-16 rifle combat training course for men going to Southeast Asia, which included instruction in Viet Cong tactics, combat procedures, and field exercises in cover and concealment. A concentrated 2-day M-16 rifle course was given at Hamilton AFB, Calif., for those who were unable to attend the full course. And, beginning in May 1966, ATC gave a 5-day refresher course at Lackland AFB in combat preparedness and self-defense to all Air Police personnel bound for Vietnam.

Professional Education

Air Force ROTC training was under way at 182 colleges and universities. Of these, 133 offered the basic four-year program on an elective basis, and 29 on a compulsory basis, while 20 provided only the 2-year program. Three colleges discontinued the training in June 1966, and two more intended to do so a year later.

AFROTC enrollment in fiscal year 1966 was as follows:

	<i>Fall term</i>	<i>Spring term</i>
Freshmen.....	40, 895	34, 918
Sophomores.....	23, 846	21, 101
Juniors.....	6, 426	6, 752
Seniors.....	7, 524	6, 733
Total.....	78, 691	69, 504

The Air Force commissioned 4,790 AFROTC graduates during the year. Another 5,471 advanced cadets in the 4-year program completed their AFROTC field training, and 915 students received their prerequisite 6 weeks of field training for enrollment in the 2-year program. The Air Force distributed its first 1,000 ROTC grants to college detachments in proportion to the number of officers they had graduated in recent years. The ROTC Vitalization Act of 1964 provided that Junior ROTC units be expanded at the rate of not more than 200 per year, beginning in 1966. A maximum of 1,200 schools may receive units to be administered by retired officers and noncommissioned officers, as well as active duty personnel. Initially, the Air Force decided to establish Junior AFROTC in only nine high schools because it lacked enough instructors, instructional materials, and small size uniforms. However, OSD proposed that the starting number be increased to 30 for fiscal year 1967, and by July 1966 the Air Force had approved 22 schools for the junior units.

The Officer Training School (OTS) commissioned 2,596 graduates in fiscal year 1966, 986 fewer than the previous year. Of these, 332 were former airmen who had completed their college education through the Airman Education and Commissioning Program. The original objective for fiscal year 1967 was set at 4,589 graduates, but on June 22, 1966, the Air Force raised the goal to 6,092. Since the limited OTS facilities will make it difficult to handle so large a student body, the training week will be increased from 5 to 5½ days, the number of classes raised from 8 to 9, and the necessary instructional and base personnel will be added as quickly as possible.

The Air Force Academy graduated 469 cadets in 1966; 463 were commissioned in the Air Force and one in the Army; 263 were assigned to pilot training and 48 to navigation training; the remainder, including 19 who won scholarships, continued academic education or entered some type of technological training. Two failed to receive a commission for medical reasons. For the first time, the Academy graduated foreign cadets—a total of three. In addition to its own Academy graduates, the Air Force also commissioned 17 West Point and four Annapolis graduates.

A \$40 million program is underway to expand and modify facilities at the Academy to accommodate an enrollment of 4,417 students by 1971. By July 1965 design had been completed on the first portion of the cadet quarters and the new field house. In fiscal year 1966 the Air Force completed the designs of the academic building and built the first section of the addition to the physical education building.

Continuing a trend started last year, the Air War College gradually shifted its emphasis from study of such subjects as international relations toward more purely military matters. This revised curriculum

more properly reflected the role of the military in national policy. In March 1966 the Air University (AU) Board of Visitors approved this change but at the same time cautioned against giving too little attention to national and world affairs. Noting greater demand of the Air War College curriculum on the students' time, the Board of Visitors doubted that the George Washington University graduate program should continue to be offered to these students. However, the Air University decided to continue to offer the program but only to those students who could meet certain standards of both courses.

The Air Force Institute of Technology (AFIT) continued to emphasize science, engineering, and technical management. The number of students scheduled to attend civilian colleges and universities remained at 1,200. The number that will study at its School of Systems and Logistics for a masters degree will increase from 45 in fiscal year 1966 to 100 in fiscal year 1967, with an additional 20 spaces for the other Services, Government agencies, and allied nations.

AFIT's Civil Engineering Center had nine courses, either in residence at Wright-Patterson AFB, Ohio, or under contract, for its 681 students. The Departments of Advanced Engineering and Engineering Orientation shared teaching responsibilities. Oversea training for 200 students will meet the needs of USAFE and PACAF. The Department of Nonresident Studies prepared course materials for the Extension Course Institute, operated a professional licensing program, maintained a library, and published a quarterly professional journal called the *Air Force Civil Engineer*. The Department of Research Studies conducted research on the current and future professional needs of the Air Force in the field of civil engineering.

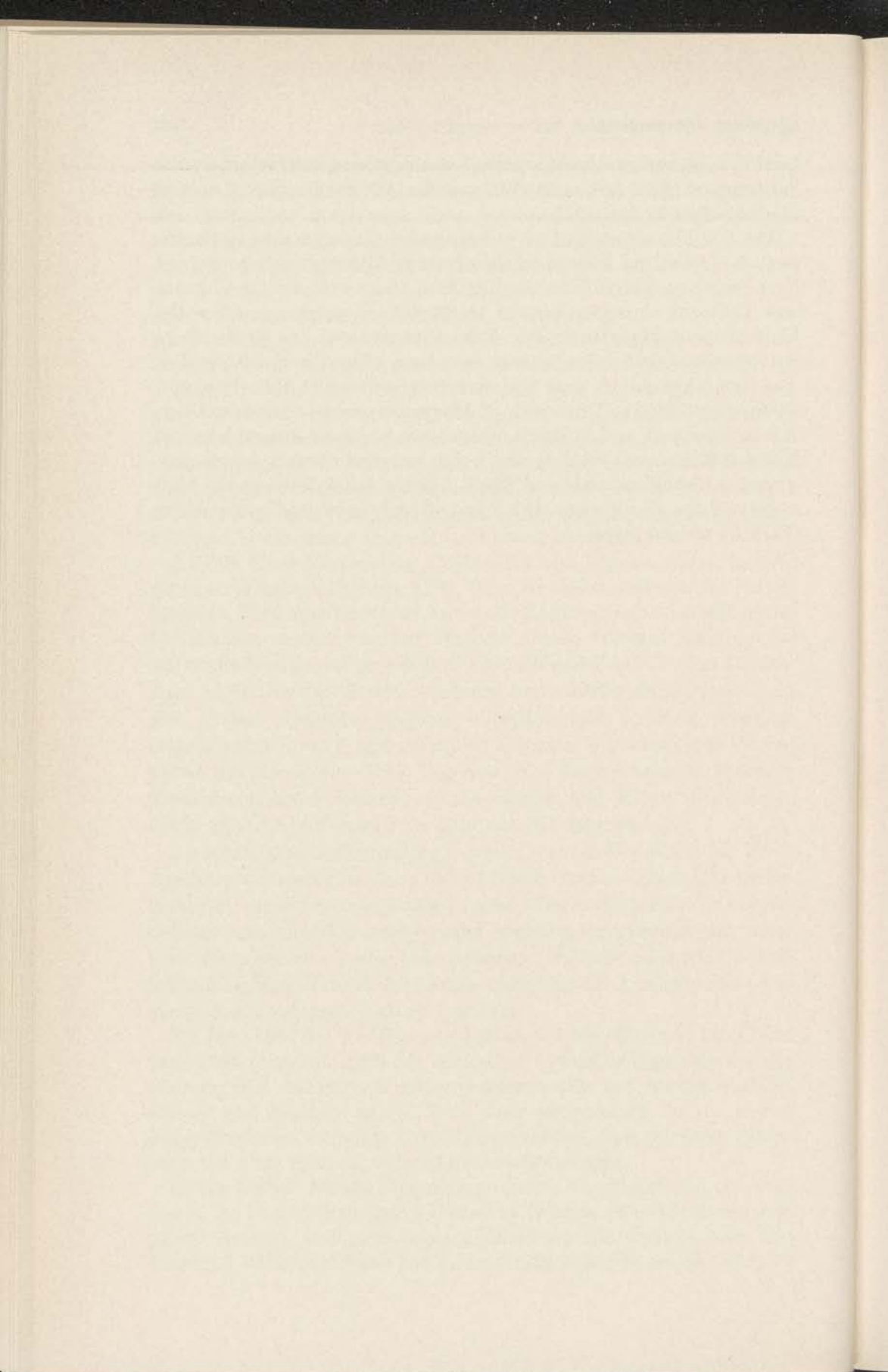
An accelerated mathematics program for graduates of the Air Force Academy was started in June 1966 at North Carolina State University. Similiar courses for some Academy graduates working on their masters degrees were offered in international relations, engineering, and industrial management. Under this program, students completed a substantial amount of extra work while attending the Academy and could earn a masters degree in about 7 months.

By June 1966 the Air Force had selected 1,443 officers to fill a fiscal year 1966 quota of 1,685 for education toward college degrees and training with industry. A major problem was to find enough qualified officers who could be spared from their assignments. At the end of June, 43 officers, including 15 studying overseas, were pursuing graduate work after winning fellowships or scholarships.

In the USAF foreign language program, 17 colleges and universities in the United States gave courses at 22 bases. Several courses were given overseas, and more were planned for the coming year. The Secretary of the Air Force had directed that a plan be devised whereby

USAF personnel stationed overseas could receive instruction in the language of their host countries, and the Air Staff expected to put this into effect by July 1967.

The Air Force arranged to widen opportunities for men in Southeast Asia to attend college while off duty. Although college courses have long been available in the Far East, there were few in Vietnam and Thailand. A beginning was made about 3 years ago, when the University of Maryland's Far East Division sent one professor to Saigon. Since 1963 a few courses have been offered in Saigon and at Tan Son Nhut AB. A year ago, some were offered at Bien Hoa AB. In January 1966 the University of Maryland started courses at Ubon AB in Thailand, and in April others were begun in Bangkok and at Korat AB. Planned off-duty study also included masters degree programs at Tachikawa AB and Clark AB, the latter through the University of the Philippines which has offered undergraduate work at Clark for several years.



IX. Research and Development

During fiscal year 1966 Air Force research and development efforts centered on AFSC's Aeronautical Systems Division. To meet immediate combat needs, AFSC sent a unit to South Vietnam to work closely with the 7th Air Force. Air Force Logistics Command (AFLC), TAC, and SAC assisted in testing new weapons, equipment, and techniques to improve combat effectiveness.

A new procedure called SEAOR (Southeast Asia Operational Requirement) was adopted to speed the development of new equipment or the correction of deficiencies. As combat units identified immediate requirements, the 7th Air Force transmitted them directly to Headquarters USAF, where they were promptly reviewed. If approved, each SEAOR was sent to the appropriate technical units for followup action. More than 60 SEAOR projects were initiated during the year. Twelve were completed, 26 were in process, and the remainder were cancelled or disapproved.

SEAOR projects were financed by a small fund (Project 1559), which totaled \$7.4 million in fiscal year 1966. Three other small, rapid response funds financed priority research and development: FAST COIN to evaluate aircraft modifications, FAST PHOTO to accelerate promising reconnaissance projects, and QUICK REACTION to improve electronic intelligence and countermeasure equipment.

Two "manpack" radars were tested and evaluated at Eglin AFB, Fla., for use in Vietnam. One of these, carried in seven backpack units each weighing about 35 pounds, can be assembled in 30 minutes. With a range of about 50 miles, it is used to control air traffic at bases awaiting more complex and permanent equipment.

In June the Air Force shipped to Southeast Asia a lightweight air-inflatable antenna to increase the range of ground-to-air radios. The inflated antenna can be raised to a height of 60 feet. When deflated and packaged, the unit weighs only 17 pounds and occupies 1 cubic foot of space.

To improve air support of ground forces at night, the Air Force investigated two battlefield illumination techniques. The first involved a flare which used a ballute instead of a parachute to let it down. The ballute provided a slower rate of descent to match the flare's longer burning time—twice as long as other flares. This equipment was scheduled for deployment in the field by the fall of 1966. The other

involved modification of the C-123 aircraft to carry a bank of lights powered by their own generators. The illumination from this aircraft at 12,000 feet would permit a man on the ground to read a newspaper.

Another idea studied during the year was the use of a reflecting satellite to illuminate battle areas at night. Air Force and the National Aeronautics and Space Agency (NASA) scientists concluded that the idea was feasible. At the end of the year NASA initiated a detailed study.

Conventional Munitions

New nonnuclear weapons and components flowed into the inventory during the year. Among 19 new weapons and items of equipment delivered or committed to production during fiscal year 1966 were bomblets and dispensers, retarded (high drag) bombs, fuzes, mines, rocket warheads, gun pods, and incendiary weapons.

The Air Force developed and tested a number of techniques for suppressing antiaircraft fire and investigated methods that would permit bombs to penetrate thick foliage before they exploded. Development of an improved electronic fuze for bombs delivered from supersonic aircraft against roads, bridges, and other targets was also initiated during the year.

In May 1966 contract definition was approved for the AGM-65 MAVERICK air-to-surface missile, which the Air Force has studied for some time. MAVERICK will complement WALLEYE, the free-fall glide bomb with terminal homing guidance, used in strikes against large, hard targets such as bridges or dams. The newer missile will be employed against smaller and harder targets.

Space

Manned Orbiting Laboratory

On August 25, 1965, President Johnson approved development of a manned orbiting laboratory (MOL) to determine more about what man can do in space and how that knowledge can be used for defense purposes. Two astronauts would be carried aloft in a modified GEMINI capsule attached to the laboratory, both vehicles launched into orbit by a modified TITAN III-C. The laboratory would remain in orbit for about 30 days and provide sufficient room for experiments. Once in space, the astronauts would enter the laboratory through a hatch cut in the GEMINI's heat shield and work in a "shirtsleeve" environment. The GEMINI would be used for the return trip to earth. In November 1965 eight military test pilots and graduates of the Aerospace Training School, Edwards AFB, Calif., were selected to become the first MOL astronauts. Five others were selected in

March 1966 and all were in training at the end of June. Five contractors were working on the MOL program by then. The Air Force expected to test the spacecraft's heat shield on a TITAN III-C to be launched in late 1966 from Cape Kennedy. The first manned flight was scheduled to be launched from Vandenberg AFB, Calif., in December 1969.

Project GEMINI

The Air Force worked closely with NASA on five GEMINI flights conducted during the fiscal year. Among the astronauts who participated in these flights were four USAF pilots—Lt. Col. Thomas P. Stafford, who flew two missions, Lt. Col. Frank Borman, Maj. Gordon L. Cooper, and Maj. David R. Scott. Hundreds of other Air Force personnel, including medical, communication, launch, and recovery personnel, also supported the GEMINI flights.

The GEMINI pilots conducted 12 experiments for the Air Force. They made repeated measurements of the level and distribution of spacecraft radiation, tracked selected space and terrestrial objects including ground-launched missiles, and demonstrated that visual acuity did not deteriorate in orbit. The astronauts also conducted communication, low light level television, and space navigation experiments. However, several important experiments involving extravehicular activity and determination of the mass of space objects were not conducted due to technical problems.

Space Boosters

In the fall of 1965 the Air Force undertook to modify the TITAN IIIC using seven-segment 120-inch solid strap-on boosters rather than the standard five-segment motor to increase its capability to launch the manned orbiting laboratory. Together with several other improvements to the TITAN core, the solid motor impulse will provide almost a 50-percent increase in booster performance.

The first launch of a TITAN IIIC on June 18, 1965, had been a complete success. During the second and third launchings, on October 15 and December 21, the booster placed multiple experimental satellites into high-altitude orbits. In both cases, however, failure of the TITAN transtage prevented the payloads from achieving the required orbits. Prior to the fourth TITAN IIIC launch, the Air Force carefully examined some 450 critical flight components and rechecked the entire system. The result was a completely successful launch on June 16, 1966, with seven communication satellites placed into their designated orbits by a single booster.

The Air Force planned to purchase between 8 and 12 TITAN IIIC's to launch nearly equatorial orbiting satellites beginning in 1968. During fiscal year 1966 a new booster combination was developed consisting of the TITAN III liquid core vehicle plus an AGENA upper

stage. The first such vehicle was delivered to the Western Test Range (WTR) in May.

In September 1965 the Air Force awarded a \$6.5 million contract for one ground and three flight test models of an inexpensive upper stage for use in orbiting small- and medium-sized unmanned satellites. Designated BURNER, the stage would be used with the THOR vehicles and also be adapted for use with ATLAS and TITAN boosters.

In January 1966 the Air Force ordered 21 newly designed THOR boosters to succeed the thrust-augmented THOR (TATs). The modified THOR, whose tanks are 70 feet long compared to 54 feet for its predecessor, can launch a 20-percent heavier payload into orbit because of a longer burning time.

The Air Force continued to advance the technology of large solid rocket motors. Three firings of the 156-inch-diameter motor were successfully conducted on schedule during the fiscal year. On December 14, 1965, the first flight-weight 156-inch motor attained the planned thrust of 3 million pounds and clearly established the feasibility of large segmented motors. On January 15, 1966, a 156-inch single-segment motor generated a thrust of 1.1 million pounds and demonstrated the feasibility of thrust vector control. In the third static firing, on May 13, 1966, a fiberglass-encased motor produced more than 325,000 pounds of thrust and confirmed certain thrust vector techniques.

Spacecraft Technology

The USAF spacecraft technology and advanced reentry (START) program included four major hardware-oriented projects. The primary objective was to investigate lifting body designs that would enable an astronaut returning from orbit to maneuver and select his landing site.

The first project, ASSET (aerothermodynamic/elastic structural systems environmental tests), had been completed in fiscal year 1965. From six unmanned hypersonic flights, the Air Force had obtained important data to use in the second project—PRIME (precision recovery including maneuvering reentry). A hypersonic SV-5 PRIME spacecraft was scheduled to be launched from Vandenberg AFB by an ATLAS booster in fiscal year 1967. Four test flights were programed, with the vehicle to be recovered in the Pacific.

As a follow-on effort, in January 1966 the Secretary of Defense approved development of the PILOT (piloted low-speed test) vehicle, an enlarged manned craft based on the SV-5 design and capable of investigating the flight regime for lifting bodies up to mach 2. Flight tests of PILOT were scheduled to begin in 1967 with vehicle drops from a B-52 over Edwards AFB, Calif. The Air Force also initiated

studies of an advanced maneuvering reentry vehicle to help determine spacecraft designs for future needs.

Communication Satellites

With the successful orbiting of seven satellites in an equatorial plane on June 16, 1966, the Air Force established an interim worldwide satellite communication system. The Air Force planned to launch additional satellites in fiscal year 1967. Placement of 19 satellites in near synchronous orbit would complete establishment of the space segment for research and development and eventual conversion to a limited operational capability. USAF responsibilities in this program included developing and launching of the satellites, while other Defense Department agencies furnished ground communication facilities.

In April 1965 the DoD assumed responsibility for operating the NASA-developed SYCOM II and III communication satellites. The Air Force was responsible for maintaining precision control, positioning the satellites, and operating the three telemetry and command stations, at Hawaii, Guam, and the Seychelle Islands. The satellites were used experimentally for communications between Washington and South Vietnam and in support of GEMINI flights.

On October 2, 1965, the Secretary of Defense directed joint development of a tactical communication satellite system. The Army and Navy participated in planning the launch of an experimental satellite early in 1967. An executive steering group was formed to approve objectives, technological approaches, and schedules for development of the satellite and ground equipment. Technical planning was well underway at the end of June.

Detection Satellites

On July 20, 1965, an Air Force ATLAS-AGENA launched two 524-pound VELA satellites and a 12-pound piggyback research satellite into orbit from Cape Kennedy. The VELA satellite joined four others orbiting the earth, the first pair having been launched in 1963 and the second in 1964. All were still operating at the close of fiscal year 1966, helping to monitor space for violations of the nuclear test ban treaty.

Engineering Development

XB-70 test flights continued to provide valuable data on the aerodynamics of large, supersonic aircraft. The test program reached its most important milestone on May 19, 1966, when the No. 2 aircraft flew at mach 3 for 32 minutes. The information obtained will be especially applicable to development of large, supersonic transports.

On June 8, after the Air Force had achieved the major objectives of the test program, XB-70 No. 2 was lost in a tragic mid-air collision with an F-104 chase aircraft near Edwards AFB, Calif. This phase of testing had been scheduled to end on June 15, with a new series of tests to follow during the next 18 months. Since only the No. 1 XB-70 was now available, the Air Force and NASA had to revise these plans.

The Air Force during fiscal year 1966 launched a number of ABRES (advanced ballistic missile reentry system) research vehicles in a continuing study of strategic missile penetration capabilities. Surplus ATLAS boosters launched three full-scale experimental reentry vehicles from Vandenberg AFB. In another phase of this study, ATHENA boosters fired 32 subscale vehicles from Green River, Utah, to the White Sands Missile Range, N. Mex.

In a related effort, the Air Force supported the Army's NIKE-X antimissile program by firing 10 special reentry vehicles from Vandenberg to the Kwajalein radar net along trajectories specified by the Army. The Air Force also began design and development of a follow-on series of reentry vehicles for these tests.

Aircraft and Missile Technology

Missiles

In the MINUTEMAN II development program, 14 missiles were launched down the Eastern Test Range and nine down the Western Test Range. Studies of advanced ICBM technology which might lead to an improved system in the 1970's included survivable radio guidance systems and silos that could withstand massive attacks.

The Air Force also began tests of the self-aligning boost and reentry (SABRE) inertial guidance system, and selected two contractors to build production prototypes. SABRE was planned as a possible "building block" for an advanced ICBM.

Advanced Manned Strategic Aircraft

The Air Force continued to study the advanced manned strategic aircraft (AMSA) and other designs of possible successors to the B-52G and H aircraft. During the year work proceeded on both the avionics and the engine development programs which could be applied to a future intercontinental bomber.

Experimental Aircraft

Since 1959 the X-15 high-altitude research vehicle has provided the Air Force and NASA with a wealth of aerodynamic, structural, and physiological data on manned flight at hypersonic speeds and at altitudes equivalent to space. During the past year the two agencies

examined proposals to employ the craft as a ramjet testbed and to modify its wings to a highly swept delta shape to permit study of hypersonic cruising.

The Air Force continued to manage the \$113.6 million XC-142 vertical/short takeoff and landing (V/STOL) program. Tests of the first tilt-wing transport aircraft began in July 1965, and during the year pilots from the tri-Service test force logged over 76 flying hours in 100 flights. They flew in XC-142's from prepared surfaces such as concrete, pierced aluminum plank runway, aluminum matting, and sprayed-on plastic rapid site preparation material and from unprepared surfaces such as sod, gravel, sand, and bare desert. The XC-142 demonstrated its ability to operate from Navy aircraft carriers in crosswinds up to 37 knots. Air drop tests included live jumps by 10 paratroopers and cargo drops of loads up to 4,100 pounds. The program, however, suffered two major accidents, one in October 1965 and another in January 1966, which reduced the XC-142 inventory to four aircraft. Completion of the evaluation program and analysis of the aircraft's cost and alternative production schedules were planned for October 1966.

In October 1965 the Air Force discontinued flight testing of the X-21A, used for several years to study the laminar flow concept, and the two test models were turned over to NASA. However, the Air Force continued some in-house research on laminar flow for possible application to the C-5A.

In January two contractors began design studies on the CX-6 V/STOL assault transport for intratheater operations that would carry about 17½ tons of payload, cruise at 500 miles per hour, and have a combat radius of 250 miles. Large fans in the wing and fuselage would lift the CX-6 vertically, and separate thrust engines would fly it horizontally. In June 1966 the Air Force awarded contracts totaling \$41,750,000 to three engine contractors for development of a vectored-thrust cruise propulsion system that is expected to advance considerably the engine thrust-to-weight ratio. In the first phase, each contractor will build a life-cruise engine to demonstrate engineering technology. In the second, one or more contractors will be selected to build a full-sized lift-cruise engine.

Late in the fiscal year, a tri-Service team began evaluating the British-built P-1127 VTOL aircraft, redesignated the XV-6A. Six test aircraft were obtained through an agreement with the United Kingdom and the Federal Republic of Germany.

In accordance with a 1964 agreement, the United States and the Federal Republic of Germany undertook joint system definition of an advanced V/STOL tactical fighter. In April 1966 two German and four American airframe contractors completed a 6-month design study.

Both Governments were evaluating these studies to determine whether a single design could satisfy their objectives. They also agreed to exchange flight test engineers to work at Edwards AFB and Manching, Germany.

Propulsion Systems

In October 1965 the United States and the United Kingdom agreed on a joint work effort to develop an advanced jet lift engine for use in V/STOL aircraft. Each country will pay its own expenses in a project expected to cost \$100 million. A Joint Project Board with equal representation from both Governments will manage the project. Day-to-day supervision will be exercised by the U.S. project officer, in close consultation with the U.K. project officer. In March, after each had selected a contractor, U.S. and U.K. representatives met to prepare a work plan.

The TF-39 turbofan engine for the C-5A transport entered the system acquisition phase. This engine has a takeoff thrust in the 41,000-pound class. It will be the largest in the USAF inventory. The Air Force also continued work on a demonstrator engine for aircraft of the AMSA type.

Air Force-NASA studies of solar power concluded that a Mars orbit could be achieved in 1977 by using a SATURN IB-CENTAUR or an ATLAS-CENTAUR vehicle augmented by electric propulsion.

The concept of using a colloidal-core nuclear reactor for space propulsion emerged from USAF research on supersonic swirl and ultramicroscopic particle separation at Wright-Patterson AFB, Ohio. The potential performance and cost-effectiveness of this approach is being compared with chemical and nuclear solid-core propulsion systems.

Avionics

In November 1965 the Air Force completed evaluations of guidance subsystems related to advanced avionic systems at Holloman AFB, N. Mex. After further study of three subsystems by a source selection board, the Air Force on June 23, 1966, awarded a contract for a Mark II system compatible with the F-111A. This system will improve the accuracy of the aircraft in strikes against heavily defended targets. Also under environmental testing by the Central Inertial Guidance Test Facility at Holloman was the stellar inertial doppler system (SIDS). At the end of the year, Holloman was designated the focal point for all DoD aircraft inertial guidance and navigation system testing and evaluation.

In late 1965 the Air Force terminated work on the stellar acquisition feasibility (STAFF) system, begun originally in 1963. The fourth and final flight test of the STAFF equipment on November 12

aboard a Navy POLARIS successfully demonstrated an ability to acquire stars and provided data on background illumination phenomena. The project was originally part of the medium-range ballistic missile program, cancelled last year.

In October tests were completed of a laser range finder to determine if it could improve the strike accuracy of fighter-bombers. Test results warranted continuous planning to evaluate production prototypes.

Several low light level television components were flight tested at Elin AFB, Fla., to determine their value in detecting and recognizing various tactical targets. Daylight tests were flown during the summer of 1965 and night tests in December.

During fiscal year 1966 the Air Force began development of a stability augmentation system to dampen aircraft oscillation and to ease maneuvering loads. Exploratory studies using a B-52E indicated that, by making flights more stable during low-altitude high-speed operations, such a system might extend the life of an aircraft by as much as 70 to 100 percent. Final results of these tests will be applied to the C-5A and other advanced aircraft.

Materials

USAF scientists at Wright-Patterson AFB, succeeded in synthesizing a new thermally stable polymer known as "BBB" in limited laboratory quantities. The fibers appeared to possess superior heat-resistant characteristics, and potential applications were being studied. A refractory coating developed under USAF contract proved its usefulness in the first linking of two space vehicles on March 15, 1966. The tin-aluminum coating successfully protected the AGENA engines during the docking maneuvers by GEMINI 8.

Research

In December 1965 the Air Force was designated manager of the national sonic boom evaluation program. In cooperation with other Government agencies and industry, it began studying the reaction of people and structures to sonic booms set off by 165 supersonic flights over Edwards AFB during June 3-20, 1966.

During the year the Air Force began construction of a new vacuum tower telescope at the Sacramento Peak Observatory, N. Mex., designed to achieve the sharpest possible image of the sun in order to analyze physical and magnetic characteristics of flares and sunspots. This telescope, enclosed in a vacuum tube extending from 193 feet below the surface to 136 feet above, should be operational by 1968-69, when solar flare activity will be at a peak.

The 6570th Aerospace Medical Research Laboratories, Wright-Patterson AFB, Ohio, continued to investigate the toxic characteristics

of missile fuels, chemicals, and other potential sources of danger to USAF personnel and facilities and inhabitants of nearby communities. Data obtained from these studies permit the Air Force to devise positive controls and limit hazards.

In September 1965 the Air Force salvaged materials and equipment from the B-17E aircraft "My Gal Sal," which crash landed on the Greenland icecap during the World War II (June 1942). Items recovered included hydraulic fluid, transparent materials, hydraulic components, aircraft instruments, and various aircrew equipment. They have been evaluated for performance and condition following the 23-year period of exposure to arctic weather. One item of navigational equipment was of specific interest to the Aerospace Medical Research Laboratory and Tennessee Technical University because it carried microbiological growths indigenous to the Greenland area. Test data developed on long-term storage characteristics of materials and equipment has proved useful in the design of future equipment.

On December 13, 1965, four USAF officers completed the longest space cabin test ever conducted at the Aerospace Medical Division, Brooks AFB, Tex. They spent 68 days in a simulator 30 feet long and 9 feet in diameter, breathing an atmosphere of 70 percent oxygen and 30 percent helium. Information obtained from such experiments will help determine the most suitable atmosphere for use in the MOL and other space vehicles.

The Air Force also began constructing a facility to test the response of missile and space electronic systems to transient radiation. Located at the Air Force Special Weapons Center, Kirtland AFB, N. Mex., the facility will contain two flash X-ray machines that can produce high-intensity radiation, plus instrumentation and diagnostic equipment. It is scheduled for completion in mid-1967.

Project BLUE BOOK, the Air Force program to investigate UFOs, has been continuous since 1948. The objectives of this program are to determine whether UFOs are a threat to our national security and whether UFOs exhibit any advanced technical or scientific information which can be channeled into research and development. During fiscal year 1966 a total of 1,178 sightings by U.S. citizens were reported to the Air Force. Of this total, 965 were identified, 175 were unable to be processed due to insufficient data, 21 were unidentified, and 17 cases were still being processed at the end of the fiscal year.

Facilities Management

During fiscal year 1966 the Air Force awarded a \$121 million cost-plus-incentive-fee contract for operating the Eastern Test Range. The incentive feature was expected to save about \$4 million. After review-

ing competitive bids by many firms, the Air Force selected a single contractor to consolidate all Western Test Range technical operations and maintenance, beginning in late 1966.

In March 1966 the Air Force acquired 14,981 acres adjacent to Vandenberg AFB, Calif., and awarded an initial contract of about \$1.2 million to cover the cost of preparing a site for TITAN III launching facilities. Actual facility construction, scheduled to begin in fiscal year 1967, will cost an estimated \$18 million.

Ground-based cameras, which require good weather to photograph launch operations, sometimes forced delays at both ranges. To overcome this limitation, the Air Force developed an automatic, airborne lightweight optical tracking system (ALOTS) which contained a 70-millimeter high-resolution camera with a 200-inch focal length. Carried to an altitude of 40,000 feet by a C-135, ALOTS was able to provide photographic coverage of spacecraft and missiles throughout early launch, staging, and reentry.

In September 1965 the Air Force awarded a contract for a new space communication recording and optics tracking system, the APOLLO Range Instrumented Aircraft (ARIA). Communication relay and telemetry recording instruments will be installed in eight modified C-135A aircraft to meet the support requirements of NASA's APOLLO as well as other future space programs. The modified aircraft should be available in 1967.

The steadily increasing number of objects in orbit necessitated an expansion of the Air Force Satellite Test Center at Sunnyvale, Calif. In June 1966 the center was designated as the focal point for planning all on-orbit support of DoD space operations.

X. Management

The Air Force adjusted its management procedures to meet the growing demands for aircraft, equipment, and other materiel for use in Southeast Asia.

1966 Budget

The proposed USAF budget for fiscal year 1966, as approved by the President, called for \$17,992 million in new obligating authority, or \$1,198 million less than the amount approved the previous year. The new total included \$422 million for military construction and \$85 million proposed for transfer from working capital funds in lieu of new appropriations. The Defense appropriation bill passed by Congress in September 1965 gave the Air Force \$17,474 million. A separate bill passed the same month added \$362 million for military construction, including \$10 million for the Air National Guard and \$4 million for the Air Force Reserve.

In March 1966 Congress provided a supplemental appropriation of \$3,791.7 million to support the buildup in Southeast Asia. This sum included \$274.1 million for military construction. In May 1966 another supplemental appropriation provided \$260.9 million to cover authorized military and civilian pay increases. Transfer of an additional \$778.2 million, including \$581.3 million from DoD's Southeast Asia Emergency Fund, gave the Air Force a total of \$22,666.9 million in new obligating authority or \$3,367.1 million more than appropriations adjusted for transfers for the previous year.

Concurrent with passage of the March 1966 supplemental appropriation, Congress authorized transfer to Service accounts of unexpended military assistance funds provided for support of Vietnamese and other free world forces in Vietnam. The Air Force received \$180.8 million—\$38.6 million for aircraft procurement, \$64.3 million for other procurement, \$47.9 million for operation and maintenance, \$29.8 million for military construction, and \$0.2 million for military personnel.

Including transfer and supplemental funds, the major cost categories for fiscal year 1966 were as follows: Military personnel (including AFRes and ANG), \$5.0 billion; operation and maintenance (including the ANG), \$5.3 billion; aircraft procurement, \$5.3 billion; missile procurement, \$0.8 billion; other procurement, \$2.3 billion; research, development, test, and evaluation, \$3.2 billion; and military construction (including AFRes and ANG, but excluding military housing), \$0.7 billion.

The following table summarizes the total funds available for obligation in fiscal year 1966:

AMOUNTS AVAILABLE FOR OBLIGATION BY THE AIR FORCE DURING
FISCAL YEAR 1966—AS OF JUNE 30, 1966

(In millions of dollars)¹

Department of Defense Appropriation Act 1966-----	17,473.8
Military Construction Appropriation Act 1966-----	362.3
Supplemental Defense Appropriation Act 1966-----	3,791.7
Second Supplemental Appropriation Act 1966-----	260.9
Total New Obligational Authority Enacted-----	21,888.7
Unobligated balance of prior year programs-----	3,213.8
Other New Authorizations-----	40.3
Transfer from Military Assistance, Executive, ² to:	
Operation and Maintenance, AF-----	+39.8
Aircraft Procurement, AF-----	+38.6
Other Procurement, AF-----	+64.3
Military Construction, AF-----	+29.0
Transfer from Emergency Fund, SEA, to:	
Aircraft Procurement, AF-----	+158.8
Missile Procurement, AF-----	+4.0
Other Procurement, AF-----	+360.6
Military Construction, AF-----	+57.9
Transfer from Emergency Fund, Defense to:	
Military Personnel, AF-----	+57.5
Research, Development, Test and Evaluation, AF-----	+85.7
Transfer from Operation and Maintenance, Army, to:	
Operation and Maintenance, AF-----	+3.0
Transfer from Operation and Maintenance, Defense Agencies to:	
Operation and Maintenance, AF-----	+2
Transfer from Military Construction, Defense, to:	
Military Construction, AF-----	+13.5
Transfer to Emergency Fund, Defense, from:	
Reserve Personnel, AF-----	-4.5
National Guard Personnel, AF-----	-2.5
Operation and Maintenance, ANG-----	-3.0
Missile Procurement, AF-----	-24.2
Research, Development, Test and Evaluation, AF-----	-45.5
Transfer to Operation and Maintenance, Army, from:	
Operation and Maintenance, AF-----	-8
Transfer to Operation and Maintenance, Defense Agencies, from:	
Operation and Maintenance, AF-----	-62.7
Aircraft Procurement, AF-----	-3
Research, Development, Test and Evaluation, AF-----	-2
Transfer to Operation Expense, PBS, GSA, from:	
Operation and Maintenance, AF-----	-1
Reimbursements-----	1,520.0
Total Available for Obligation during Fiscal Year 1966-----	27,431.9

¹ Represents nearest rounded figure.

² Of \$180.8 million transferred, \$9.2 million had been previously obligated.

Actual obligations and expenditures for fiscal year 1966 are summarized in the table below. The total of \$23,008.6 million for obligations compares with \$20,036.4 million for 1965 and \$21,370.2 million for 1964. The total of \$20,130.6 million for expenditures compares with \$18,216.0 million for 1965 and \$20,508.6 million for 1964.

USAF ACTUAL OBLIGATIONS AND NET EXPENDITURES FOR
FISCAL YEAR 1966—AS OF JUNE 30, 1966

(In millions of dollars)¹

	Obligations	Net expenditures
Military Personnel, AF.....	\$4,968.7	\$4,884.7
Reserve Personnel, AF.....	58.9	57.1
National Guard Personnel, AF.....	77.9	76.2
Operation and Maintenance, AF.....	5,424.9	4,923.9
Operation and Maintenance, ANG.....	245.8	245.9
Aircraft Procurement, AF.....	4,755.1	4,073.8
Missile Procurement, AF.....	1,320.9	1,813.1
Other Procurement.....	2,123.3	1,027.0
Research, Development, Test and Evaluation.....	3,428.7	2,948.2
Military Construction, AF.....	588.6	516.1
Military Construction, AFRes.....	6.2	2.4
Military Construction, ANG.....	9.6	8.1
Miscellaneous.....	0	54.1
Total.....	23,008.6	20,130.6

¹ Represents nearest rounded figures. Amounts will not necessarily add to total.

HOW THE AIR FORCE DOLLAR WAS SPENT IN FISCAL YEAR 1966

	Percent
Aircraft, Missiles, and Related Equipment.....	32
Aircraft	(21)
Missiles	(6)
Other	(5)
Military Personnel ¹	25
Civilian Personnel ²	11
Military Construction ¹	3
Operation and Maintenance ¹	16
Research, Development, Test and Evaluation.....	13

¹ Includes Reserve and Air National Guard costs.

² Includes direct hire and contract personnel.

1967 Budget

For fiscal year 1967 the President requested \$20,942 million in new obligating authority for the Air Force, including \$256 million for military construction. This was \$1,724 million less than the amount of new obligating authority provided for fiscal year 1966.

The Presidential budget request for aircraft procurement was \$3,961 million to purchase 599 aircraft, including FB-111's, C-5A transports, F-111A's, F-4E's, RF-4C's, and C-141's. Funds were also requested to procure U-17A fixed-wing aircraft and UH-1D helicopters for the South Vietnamese forces. The President also asked for funds to keep the production line open on the SR-71 strategic reconnaissance aircraft.

At the end of June 1966 the House of Representatives had passed the appropriation bill with a \$279.1 million increase for the Air Force, excluding military construction. Most of the added funds were provided for military personnel increases and for retention of the B-52 squadrons and ANG airlift units which had been scheduled to phase out. Action by the Senate was pending at the close of the fiscal year.

Cost Reduction

The Air Force continued to reduce costs by buying only what was needed, buying at the lowest sound price, and cutting operating expenses. Cost reductions during the fiscal year amounted to \$2.433 billion, exceeding the \$2.353 billion goal. The Air Force was able to reprogram these savings to obtain additional weapons and increase military strength.

The following chart shows the major areas in which cost reduction savings were made during fiscal year 1965 and 1966:

AIR FORCE COST REDUCTION PROGRAM

(In millions of dollars)

	Fiscal year 1965			Fiscal year 1966		
	Goal	Savings	Percent	Goal	Savings	Percent
Buying only what we need.....	1. 017	1. 165	115	1. 048	. 797	76
Buying at lowest sound price.....	. 533	. 597	112	. 542	. 718	132
Reducing operating costs:						
Terminating un-needed operations..	. 280	. 331	118	. 382	. 458	120
Consolidation and standardization...	. 074	. 187	253	. 100	. 183	183
Increasing efficiency..	. 248	. 383	154	. 281	. 277	99
Total.....	2. 152	2. 663	124	2. 353	2. 433	103

The cardinal rule in the cost reduction program was that no saving should adversely affect combat capability. The more than 25,000 actions reported in fiscal year 1966 were carefully reviewed by USAF

auditors and managers to insure that they would not reduce mission effectiveness and that they were, indeed, verified cost reductions. As a result of such reviews, only about 46 percent of the total reported dollar savings were validated for reporting in the chart above. This record is especially noteworthy because the year saw a substantial reduction in some previously large savings, particularly in replenishment spares, which reflected the increased level of Southeast Asia support activity.

Both the Air Force and its contractors emphasized a value engineering program. During the year 100 full-time value engineers were assigned to six commands to study their equipment and to devise more economical procedures. Contractors participated by suggesting ways to lower costs and improve performance.

Zero Defects

In the zero defects program, which was designed to raise standards of individual performance, the Air Force presented more than 31,000 awards to individuals and organizations, including certificates of excellence, savings bonds, and 3-day passes. Defense industries also participated in this program. By June 30, 1966, 91 contractors had received the Air Force Participation Award and 31 had won the Air Force Achievement Award.

Data Automation

Automatic data processing has become an essential part of USAF operations, used for virtually every aspect of management, ranging from routine analysis of funding requirements to simulation of ballistic trajectories. By centralizing control over these systems, the Air Force prevented the acquisition of uneconomical equipment and avoided duplication.

A total of 91 computers were installed at major USAF bases during the year for use in controlling inventories. In addition, 142 computers were made available at air bases to replace punched card accounting machines that had been used for other than supply activities. The USAF inventory of electronic data processing computers increased as follows during the fiscal year:

	<i>June 30, 1965</i>	<i>June 30, 1966</i>	<i>Percentage increase</i>
Leased.....	508	600	18
Owned.....	198	295	49
Total.....	706	895	27

In April 1966 the USAF Data Systems Design Center at Suitland, Md., was authorized an additional 163 manpower spaces for fiscal year 1967. This expansion was required as a result of an increased workload, involving design, programing, and maintenance of automated data processing systems at all echelons below Headquarters USAF.

Procurement and Production Management

Industrial Planning

To support the requirements in Southeast Asia, the Air Force adopted a policy of funding aircraft production for immediate needs while retaining an option to accelerate production if hostilities were prolonged beyond fiscal year 1967. It not only tried to provide timely deliveries of aircraft but also delayed purchases not necessarily related to the immediate war effort, thus limiting the impact of the buildup on the national economy as far as possible.

Some facilities were enlarged and new sources of production were contracted for in order to expand the national industrial base. Faced with increasing tactical fighter and transport requirements in Southeast Asia, the Air Force compressed F-4 and C-141 production lead-times and accelerated delivery of these aircraft. Should the need arise, there were also other alternatives for increasing aircraft production. By building additional assembly and flight test facilities, the F-4, F-111, C-141, and A-7 production rates could be expanded, as well as the C-5A rates after that transport enters production.

The production base for conventional munitions and other war consumables was also expanded. In fiscal year 1966, the Air Force increased the purchase of conventional munitions from \$284.7 million to \$1,334.6 million. The ensuing production buildup was carefully managed. Old drawings and specifications for items that had been out of production for years were updated, additional tooling was provided, plants rearranged, and new facilities created. These steps were expected to take care of current needs and requirements for the immediate future.

Various segments of the industrial base were analyzed to identify shortages of skilled manpower, production facilities or machine tools and equipment which might contribute to long leadtime, and the Air Force made improvements wherever necessary. The volume of engineering data required of C-141 contractors was reduced to material absolutely essential to USAF operation, maintenance, supply, and procurement rather than ordering complete sets of data plus revisions and changes for each aircraft. This not only reduced costs but improved the timeliness of data on the C-141, so the Air Force decided to apply it to the F-111, C-5A, and other major systems.

Industrial Resources

Special priority requests from industry for scarce production equipment more than doubled during the first 6 months of 1966. To meet this need, the Air Force set up delivery schedules for 12 large manufacturers of forgings, extrusions, and electronic items. Older equipment was replaced by modern machinery. At one plant, for example, three new machine tools costing about \$500,000 were installed in place of 18 old items and were expected to pay for themselves in cost savings in about 2 years. The USAF industrial equipment replacement program totaled \$32.2 million during the fiscal year.

Modern equipment also reduced manufacturing time, cut the spares inventory and weight of parts and systems, and improved the quality and reliability of the final products. It was more economical to buy new production equipment in bulk and not to replace specific tools unless their cost could be amortized within 3 years. Manufacturers also were encouraged to spend their own funds to replace obsolescent items.

During fiscal year 1966 the Air Force reduced its industrial plants and support facilities from 58 to 52, disposing of eight and adding two. Eight more were scheduled for removal during the coming fiscal year.

Procurement

The Air Force obligated \$9.61 billion in new production orders, an increase of almost \$3 billion in one year. Aircraft and spares obligations in fiscal year 1966 amounted to \$2.75 billion as compared to \$2.38 billion the previous year. Procurement of missiles and spares fell from \$802.4 million in fiscal year 1965 to \$560.6 million. The amount contracted for modification, facilities, components, and other support activities increased from \$3.65 billion to \$4.97 billion. Obligations for communication and electronic equipment totaled \$360 million.

The dollar value of procurement contracts awarded through competitive bidding rose from 25.2 percent in 1965 to 27.5 percent in 1966. This was achieved despite the adverse affect of a project established in July 1965 to provide emergency noncompetitive procurement for Southeast Asia logistics requirements (SEALR), amounting to almost \$90 million.

The Air Force also reduced the use of cost-plus-fixed-fee (CPFF) contracts and redoubled its efforts to substitute fixed-price-incentive (FPI) and cost-plus-incentive-fee (CPIF) contracts. The incentive features of CPIF contracts were given special emphasis. Greater use also was made of a comparatively new multiyear procurement (MYP) method which permits competitive contracting for known supply requirements over a 2- to 5-year period, which avoids certain industrial costs that occur when separate contracts are awarded annually. The

Air Force, on behalf of the Department of Defense, also sponsored legislation which would authorize the use of multiyear contracts in connection with procurements such as MINUTEMAN stage motors, funded by fiscal year appropriations. Substantial additional savings in defense procurement are expected if this legislation is passed.

In October 1965 the Air Force introduced "total package" procurement with the award of two fixed-price-incentive contracts for 58 C-5A transports—one for the airframes and one for the engines. Under this concept, the price is based on system development, production, and lifetime support, including training, spare parts, and ground support equipment. The C-5A contracts also included an option for the Air Force to procure up to 57 additional aircraft and engines at firm prices, plus further pricing formulas to govern the procurement of as many as 200 more aircraft and engines.

Small business procurement increased both in dollars and percentage. Small concerns received \$1.2 billion in prime contracts, as compared to \$1.055 billion the previous year, or 12.4 percent of the \$9.6 billion awarded to business concerns in the United States. Small concerns also received approximately \$905 million, or 33.4 percent, of all subcontracts let by 23 USAF prime contractors.

During the first half of the fiscal year the Air Force accepted and funded, at a cost of \$18.5 million, 319 of the 1,189 unsolicited proposals received from universities, nonprofit research agencies, and industrial firms not normally dealing with the Air Force. These proposals held promise for significant technological advances.

Military Assistance Program

During the 17 years of USAF participation in the Military Assistance Program, U.S. grant aid and allied purchases enabled friendly nations to modernize their air forces. To date, the Air Force has spent \$10.34 billion, of which expenditures for aircraft accounted for \$6.26 billion. By June 30, 1966, the Air Force had delivered about 15,000 planes, including some 10,700 jets. This assistance has outfitted nearly 270 foreign air force squadrons (both jet and conventional).

In fiscal year 1966 USAF grant aid for supplies and services amounted to \$335 million. Deliveries included 120 F-5's, 35 F-104G's, 107 trainers (including 54 jets), and 115 utility aircraft and helicopters. In accordance with a Secretary of Defense decision to transfer MAP support of the Vietnamese armed forces to departmental budgets, the Air Force on March 31, 1966, transferred \$180.8 million from the MAP to the USAF appropriation.

Grant aid to India and Pakistan was suspended in September 1965 for the remainder of the fiscal year. Grant aid deliveries to Argentina,

also suspended, were subsequently resumed. Aid to Belgium, Denmark, France, Indonesia, Italy, Netherlands, and the United Kingdom was terminated, while aid to Greece, Turkey, and other allies continued. Several newly independent countries received aid by Presidential determinations, as provided for under the Foreign Assistance Act of 1961, as amended.

Military assistance sales, which not only bolstered the military strength of allied nations but also eased the U.S. balance-of-payments problem, totaled more than \$600 million during the year. The largest share went to the United Kingdom, which purchased F-111 and C-130 aircraft. Several combination grant-sales arrangements were made and cooperative logistic supply support was expanded.

During the year the European consortium countries (Germany, Netherlands, Belgium, and Italy) completed delivery of the 949 F-104G's in their program. Japan and Canada also completed their F-104 programs (one airplane short at the end of the year). The United States continued TF-104G production to meet orders from three European countries and a 16-plane program with Italy. The United States-Italy agreement, signed in December 1965, called for cooperative production of the F-104S, the model that will employ the SPARROW air-to-air missile. On June 6, 1966, the Air Force Logistics Command assumed responsibility for the MAP F-104G program.

During the past 17 years, 5,333 foreign nationals have received pilot training in USAF schools under grant aid while 9,120 have completed flying courses under other programs. A total of 53,698 technical training courses and 23,971 other courses also was given under grant aid in the United States and overseas. In fiscal year 1966, 1357 foreign nationals received such technical training.

Logistics Management

The Air Force met the demands of the war in Southeast Asia despite a 10,000-mile supply line. Operating with \$8.2 billion and about 144,000 personnel, the Air Force Logistics Command processed nearly 16 million requisitions—a large number of them from Southeast Asia—repaired 10,000 aircraft, overhauled 12,000 aircraft engines, and repaired 1,400,000 accessories and components. At the same time, AFLC continued to improve its management procedures, and terminated and consolidated certain operations. Shutdown of the Rome Air Materiel Area at Griffis AFB, N.Y., was essentially completed. The gradual consolidation of three of the nine remaining air materiel areas progressed, despite the difficulty of transferring operational functions without a significant drop in production.

Supply

A great many managerial innovations were adopted to meet the supply requirements for Vietnam. In July 1965 AFLC established a Logistics Activation Task Force (LATAF) to supervise the buildup. LATAF compiled and maintained data on the status of each base—those on which construction was just beginning as well as those in full operation. This information became the basis for an automatic system of shipping and stockpiling materials. In a related action, AFLC created the BITTER WINE supply system, under which the materials needed to support weapon system requirements and make a base operational were put together and shipped as a unit. Though this system was for those bases becoming operational, it proved so effective that its use was expanded to established bases as well.

Concurrently, complete housekeeping kits or "Gray Eagle" packages, designed to support 4,000 people, were deployed to new bases. In addition, more than 300 AFLC supply depot technicians were formed into Rapid Area Supply Support (RASS) teams and deployed to new bases to assist in organizing accounting, inventory, storage, and other activities. RASS teams also augmented established bases such as Kadena AB, Okinawa, or Clark AB, Philippines, where the buildup of supplies and equipment occasionally exceeded storage capacity.

AFLC adapted a refined Speed Through Air Resupply (STAR) procedure, originally tested during the 1948 Berlin airlift, to the war in Southeast Asia. Tactical combat units were provided with a single point of contact for resupplying their particular weapon systems, thus assuring deliveries in 8 to 10 days and, in urgent cases, in less than half that time. Special packages of spare parts also were assembled for aircraft deployed to bases previously unable to maintain such types of airplanes. This "instant warehouse" consists of a specially designed container 7 feet high, 4 feet wide, and 2 feet deep. Standing on end, after removal of its cover, the crate becomes a supply cabinet, ready to dispense the precalculated spare parts stacked inside.

The Air Force further modernized and standardized its automated base supply accounting procedures. Of 140 bases scheduled to receive the UNIVAC 1050-II computers, 115 had received them by the close of the fiscal year. In early 1966 the Air Force added Cam Ranh Bay to the PACAF base modernization program, and in April the Air Force also decided to install the system at 13 additional bases in Southeast Asia and Taiwan. At the end of June, the Cam Ranh Bay computer was operational, installation at Danang was progressing, and personnel were in training to assure uninterrupted computer maintenance at all bases in Southeast Asia.

Increasing petroleum, oil, and lubricants (POL) requirements in Southeast Asia were met by a pipeline and tanker fleet combination. Limited storage capacity, however, required the occasional holdover of some vessels to serve as floating storage tanks to meet surges in consumption.

The Air Force spent about \$20 million to replace some 8,000 cargo utility vehicles. Included were 1,000 M-series tactical vehicles best suited for use by tactical air control squadrons and mobile communication groups operating over rugged terrain in support of Army elements. The Air Force also replaced 980 special purpose vehicles and some 2,500 passenger vehicles at a combined cost of another \$20 million.

In fiscal year 1966 the aircraft replenishment spares program totaled \$894 million, almost twice that of previous years. The needs in Southeast Asia called for the retention of items which normally would have been discarded, while the number of new items procured far exceeded the number of items discontinued. As of June 30, 1966, there were 1,646,296 different types of items in the USAF inventory—an increase of 46,393 in one year. The value of USAF excess and surplus property decreased from \$1.47 billion to \$1.27 billion.

A Materiel Utilization Control Office (MUCO) was organized during the year in each air materiel area to review all long supply items against other agency requirements. By June 30, 1966, these reviews had resulted in the transfer of \$112 million worth of such items to other Government agencies, while \$93 million worth of needed materiel was obtained. To reduce costs, the Air Force continued to apply long supply assets to current procurement contracts, providing approximately \$25 million of Government furnished materiel to contractors during the year.

Maintenance

Innovations in maintenance support of Vietnam operations paralleled those in the supply field. AFLC Rapid Area Maintenance (RAM) teams of technicians were deployed to make on-site repairs of combat aircraft or to repair damaged aircraft enough so they could be flown to rear area maintenance depots. Necessarily, some of the aircraft overhaul and repair continued to be done in the United States, but contract maintenance in Southeast Asia was significantly increased to retain a maximum number of aircraft in the theater.

Cost of depot maintenance and overhaul totaled almost \$700 million an increase of about \$24 million over the previous year. Increasing flying and heavy maintenance on some older aircraft, required the expenditure of \$260 million for depot maintenance and overhaul of aircraft frames alone. Of this amount, \$123 million was for contract maintenance—an increase of about 30 percent in 1 year. Some \$31 mil-

lion, the same amount as last year, went for maintenance and modification of intercontinental ballistic missiles, one third of it through contracts.

During the year the Air Force established the nondestructive inspection (NDI) program. X-ray, gamma ray, ultrasonic, eddy current, and infrared devices were used on aircraft, missiles, and their components to detect impending failures. With these techniques, the condition of internal engine parts could be checked without disassembling the engine. More than 30 teams were organized and equipped to conduct the inspections which, for example, in the examination of C-130 center wing sections produced savings of \$1,500 per aircraft. Safety inspections of 712 aircraft with these devices produced a net savings of \$1.06 million.

The spectrometric analysis of oil samples from jet engines to detect metallic particles indicating engine wear is another outstanding example of preventive maintenance. In January 1966 the Air Force analyzed more than 31,000 samples—as compared to the modest beginning in 1964 when about 250 samples were analyzed each month. During the year this technique was put into use in Southeast Asia with some 3,000 oil samples analyzed each month at Takhli AB, Thailand. The Air Force was developing a spectrometric analyzer for field units which would eliminate the need to send oil samples to distant laboratories.

A new process to repair worn jet engine components was developed. Molten powdered metal heated to 30,000 degrees Fahrenheit was sprayed onto worn surfaces, restoring them to their original measurements. This repair method is faster and more economical than electroplating. Another innovation: Personnel of the San Antonio Air Materiel Area, Kelly AFB, Tex., devised a modified bomb hoist to remove generators from F-102 aircraft without removing the engine, thereby shortening replacement time by two-thirds.

In the spring of 1966 the Air Force established a maintenance technology office at AFLC's Oklahoma City Air Materiel Area, Tinker AFB, Okla., to develop better depot repair procedures. The Daily Automatic Rescheduling Technique (DART), using computers, was developed to spell out work schedules for maintenance and modification of B-52's and C-135 transports and tankers. This system was expected to be fully operational in fiscal year 1967.

Transportation

The USAF materiel transportation budget rose in fiscal year 1966 to \$340 million, well above the previous year's obligations of \$244 million and largely reflecting the increased requirements for Vietnam. More than \$202 million supported the war effort, including costs of

commercial transportation, Military Sea Transport Service, and airlift service.

The Air Force shipped to Southeast Asia 14 million square feet of airfield landing mats, 10,000 vehicles, 2,000 ground power electrical generators, 500 portable quarters, and 300 prefabricated buildings. The sealift system known as SEA EX, which was initiated in June 1965 to move cargoes of less essential equipment, was used to meet the growing demand for transportation. In addition, the number of "Special Express" munition delivery ships increased to 15. In the spring of 1966 this system was supplemented by a new service which airlifted munitions directly from Hill AFB, Utah.

The Air Force began converting about 200 excess engine handling trailers to move 750-pound bombs over rough ground in Vietnam, to be used until specifically designed vehicles could be manufactured. At the same time, a transporter-loader trailer was developed which could handle the heavier conventional bomb loads and quickly move fully loaded weapon assemblies from the storage area to bombers.

The use of automated and mechanized equipment, particularly the 463L Materials Handling System, was expanded. In March 1966 a new mechanized conveyor system became operational at Clark AB. Capable of handling up to 64 cubic feet of cargo, the new system speeds operations by having packers and sorters process shipments as well. It has proved so efficient that the Air Force considered installing similar systems at other warehousing air terminals. In April, 10 new conveyor platforms were ordered to improve cargo handling and movement at Travis AFB, Calif. A completely automated warehouse has also been undergoing field testing by AFLC at Hill AFB, Utah.

Package engineering is a rapidly growing field. In coordination with the other Services, the Air Force accumulated packaging and preservation information on all DoD items which do not require special containers. This data bank would eliminate costly Service duplication.

Two air bases were connected to commercial aviation fuel pipelines during the year, bringing the total number of bases receiving this service to 50. The pipeline companies also provided 3.5 million barrels of fuel storage capacity for these bases at no cost to the Air Force. Commercial pipelines boosted savings to approximately \$6.6 million a year and raised estimated savings accumulated since 1954 to \$47.7 million.

Although the Air Force continued to favor airlift for transportation of personnel and cargo, in fiscal year 1966 \$2.3 million was spent to transport 6,277 passengers on commercial vessels.

Base Maintenance

The Air Force helped to develop a computerized system to provide information on runway conditions. Though still experimental, it has already saved \$500,000 and cut by half the repair and construction time of one runway.

To assure quality control, USAF engineers monitored \$20 million worth of in-house and contract painting and corrosion prevention work performed at various bases.

There were 2,322 fires reported at USAF bases during fiscal year 1966, 160 less than the previous year. No incidents occurred at CONAC's 14 bases, a record attributed to the command's excellent fire prevention program, the safety consciousness of base personnel, and the assistance of USAF reservists. Overall, there was a significant decrease in fire losses, which totaled less than \$31 million in fiscal year 1966 as compared to \$66.3 million the previous year. The number of fatalities, however, rose sharply, mainly due to a fire in an underground missile silo near Little Rock AFB, Ark., which claimed the lives of 53 contractor employees on August 9, 1965.

As in the past, the Air Force supported DoD's program to improve management and conservation of natural resources at military bases, including abatement of air, soil, and water pollution, and improvement of outdoor recreational facilities.

In line with the Secretary of Defense's announcements of November 1964, and December 1965, the Air Force closed out seven major installations, including: James-Connally AFB, Tex.; Larson AFB, Wash.; Lincoln AFB, Nebr.; Stead AFB, Nev.; and Biggs AFB, Tex., which was scheduled for transfer to the Army in July 1966. On June 30, 1966, Air Force major installations were classified as follows:

	United States		Overseas		Total	
	1965	1966	1965	1966	1965	1966
Operational.....	76	73	46	46	122	119
Operational Support:						
Flying.....	6	6	6	5	12	11
Nonflying.....	12	12	4	4	16	16
Training.....	36	32	0	0	36	32
Research and Test.....	9	9	0	0	9	9
Logistic.....	10	10	0	0	10	10
Southeast Asia Bases (non-U.S. property).....	0	0	4	17	4	17
Total.....	149	142	60	72	209	214

Inspections

In fiscal year 1966 Inspector General teams conducted 55 inspections under revised procedures which, among other improvements, reduced the time span between identification and correction of deficiencies and lowered the inspection cycle from 6 to 3 years. As in the past, the teams evaluated the operational readiness and management of USAF units and support services, with particular emphasis on preparedness for oversea deployments. The inspectors also evaluated the operational readiness inspections of ballistic missile and aircraft units by major commands. Operational readiness inspections of units of different commands located on a single base were held simultaneously.

Safety

For the second consecutive year the number of flying hours increased, mainly due to operations in Southeast Asia. For the same reason, the flying safety trend established in recent years was reversed. Greater exposure to combat and other adverse flying conditions led to increases in both the number and rate of major and minor aircraft accidents.

In fiscal year 1966 USAF aircraft flew 6,811,000 hours, a 2.1-percent increase over the previous year's total of 6,668,000. Excluding combat losses, there were 325 major aircraft accidents—12 percent more than the previous year's total of 291. The accident rate rose from 4.4 percent per 100,000 flying hours to 4.8. Minor accidents increased from 83 to 88. However, fatal accidents and total personnel fatalities both were reduced by 8 percent, decreasing from 111 to 103 and from 400 to 372, respectively. Pilot fatalities showed a 21-percent reduction, decreasing from the fiscal year 1965 total of 153 to 126. Because of a reduction in bomber and tanker crashes, excluding the June crash of the XB-70 No. 2 test vehicle, dollar losses were down by \$33 million although the number of aircraft destroyed rose from 252 to 257.

The Air Force continued to support the President's Mission "Safety 70" Program. Despite a marked increase in operational activity in many parts of the world, the ground accident rate per million man-days exposure declined by 7.6 percent, with a total of 10,739 accidents reported in fiscal year 1966. There were 393 motor vehicle fatalities in fiscal year 1966 as compared to 427 the previous year. Ground safety inspectors visited 29 field organizations to help identify and eliminate potential causes of accidents. For the second time, in recognition of the overall excellence of its 1965 safety program, the Air Force received the President's Safety Award. Having achieved each year a minimum 5-percent reduction in its ground accident rate, the Air

Force also received the National Safety Council's Award for Honor for the 16th consecutive time.

The Air Force gave special attention to the safety aspects of missile and space launches. The importance of incorporating safety in the earliest development stage was recommended for a wide range of new systems, including the Manned Orbiting Laboratory, the C-5A transport, and the AGM-65 tactical missile.

Two missile-space accidents and two other incidents were investigated during fiscal year 1966. Seven missile safety surveys, 42 operational reviews of nuclear weapons systems, 15 research inquiries, and 15 staff briefings were also completed. In May 1966 an investigating team reviewed the safety procedures employed during the modernization of a MINUTEMAN wing at Whiteman AFB, Mo., and deficiencies were promptly corrected. Some 2,400 reports of safety deficiencies were received as an increasing number of MINUTEMAN missiles became operational during the year. Half of these were of negligible importance, but the rest were closely monitored to assure proper correction.

Two nuclear accidents occurred during the year. The first, in which a cargo plane carrying components crashed at Wright-Patterson AFB in October 1965, involved no danger of a nuclear explosion. In the second, a B-52 bomber carrying four nuclear weapons collided with a KC-135 tanker during refueling operations over Spain (see ch. II). Investigations confirmed that the safety devices designed to prevent a nuclear explosion on all four weapons functioned as intended. Safety surveys and operational reviews of nuclear weapon systems were carried out at 33 bases, and 48 other nuclear inspections were conducted. Nuclear safety rules were prepared for seven new weapon systems and changes recommended for two older systems. Safety teams also visited 14 bases to review health aspects of the use of radioisotopes and machine-produced radiation.

The expanded use of conventional munitions in Southeast Asia increased the number of accidents caused by explosion during the year. The Air Force initiated several studies to improve munitions handling procedures. A nonnuclear munitions safety group, including Army and Navy representatives, was formed to review the safety and reliability aspects of these munitions. Inspector General personnel established a safety policy which permitted fuzing bombs prior to loading on bombers—a method which also reduced loading time. The development of "hardened" maintenance facilities to protect personnel from explosive hazards was underway.

Security

USAF security agencies completed 794,000 investigations, an increase of 29 percent over the previous year. Personnel security investigations accounted for 686,500; criminal and procurement fraud cases, 28,000; and counterintelligence activities, 79,500.

Criminal investigations led to the recovery of nearly \$1.2 million, \$400,000 more than in fiscal year 1965. Recoveries resulting from procurement investigations quadrupled, reaching almost \$500,000.

Development of alarm mechanisms, intrusion detection systems, night observation instruments, and radar and similar physical security devices progressed satisfactorily and much of this equipment was sent to bases in South Vietnam. In addition, major commands received specific instructions for dealing with the threat of civil disturbances against USAF installations.

Responsibility for industrial security at contractor facilities was transferred to the Defense Supply Agency, but the Air Force continued to be responsible for those plants located on its installations, as well as for all USAF contractors overseas.

Harold Brown

HAROLD BROWN,
Secretary of the Air Force.

APPENDIX

Appendix

STATISTICAL INFORMATION

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Note: Subtotals in these tables may not add to totals due to rounding.

Table 1

MAJOR FORCES BY DEPARTMENT

	June 30, 1961	June 30, 1964	June 30, 1965	June 30, 1966
DEPARTMENT OF DEFENSE				
Active Duty Personnel.....	2,483,771	2,687,409	2,655,389	3,094,058
Active Aircraft Inventory.....	31,262	30,109	29,864	30,554
DEPARTMENT OF THE ARMY				
Divisions.....	14	16	16	17
Regiments/RCTs.....	6	4	4	4
Armored Combat Commands.....	1			
Brigades.....	2	7	7	9
Battle Groups.....	8			
Special Forces Groups.....	3	7	7	7
Army Missile Commands.....	4	2	2	1
Surface-to-Surface Missile Battalions.....	41½	38	38	36
Air Defense Missile Battalions.....	76¼	58¼	56¼	51¼
Active Duty Personnel.....	858,622	973,238	990,066	1,199,784
Active Aircraft Inventory.....	5,564	6,338	6,933	8,098
DEPARTMENT OF THE NAVY				
Commissioned Ships in Fleet.....	819	859	880	900
Warships.....	(375)	(388)	(407)	(410)
Other.....	(444)	(471)	(473)	(499)
Carrier Air Groups.....	17	17	17	17
Carrier Antisubmarine Air Groups.....	11	11	11	10
Patrol and Warning Squadrons.....	38	35	35	32
Marine Divisions.....	3	3	3	4
Marine Air Wings.....	3	3	3	3
Active Duty Personnel.....	803,998	857,373	861,661	1,006,921
Navy.....	(627,089)	(667,596)	(671,448)	(745,205)
Marine Corps.....	(176,909)	(189,777)	(190,213)	(261,716)
Active Aircraft Inventory.....	8,793	8,391	8,056	8,260
DEPARTMENT OF THE AIR FORCE				
USAF Combat Wings.....	88	83	78	74
Strategic Wings.....	(37)	(33)	(28)	(23)
Air Defense Wings.....	(19)	(14)	(13)	(11)
Tactical Wings (including airlift).....	(32)	(36)	(37)	(40)
USAF Combat Support Flying Squadrons.....	121	130	120	126
Active Duty Personnel.....	821,151	856,798	824,662	887,353
Active Aircraft Inventory.....	16,905	15,380	14,875	14,196

Table 2

MAJOR FORCES BY MISSION

	June 30, 1961	June 30, 1964	June 30, 1965	June 30, 1966
STRATEGIC RETALIATORY FORCES				
Intercontinental Ballistic Missiles				
MINUTEMAN Squadrons.....		12	16	17
TITAN Squadrons.....		12	6	6
ATLAS Squadrons.....	4	13		
POLARIS Submarines.....	5	21	29	37
Strategic Bombers				
B-52 Wings.....	13	14	14	13
B-58 Wings.....	1	2	2	2
B-47 Wings.....	20	10	5	
CONTINENTAL AIR AND MISSILE DEFENSES				
Manned Fighter Interceptor Squadrons.....	42	40	39	33
Interceptor Missile (BOMARC) Squadrons.....	7	8	6	6
Army Air Defense Missile Battalions ¹	49½	26½	23½	18
GENERAL PURPOSE FORCES				
Army Divisions.....	2 14	16	16	17
Army Surface-to-Surface Missile Battalions.....	41½	38	38	36
Army Air Defense Missile Battalions.....	26¾	31¾	32¾	33¾
Army Special Forces Groups.....	3	7	7	7
Warships				
Attack Carriers.....	15	15	16	15
Antisub Warfare Carriers.....	9	9	9	8
Nuclear Attack Submarines.....	13	19	21	22
Other.....	328	322	331	328
Amphibious Assault Ships.....	110	133	135	159
Carrier Air Groups (Attack and Antisub Warfare).....	28	28	28	27
Marine Corps Divisions/Air Wings.....	3/3	3/3	3/3	4/3
USAF Tactical Forces Aircraft Squadrons.....	93	112	117	130
AIRLIFT AND SEALIFT FORCES				
Airlift Aircraft Squadrons				
C-130 through C-141.....	16	34	38	42
C-118 through C-124.....	35	27	19	16
Troop and Cargo Ships and Tankers.....	101	101	100	121

¹ Decrease reflects phaseout of NIKE-AJAX and transfer of NIKE-HERCULES battalions to Army National Guard.

² Includes 3 training divisions not ready for combat.

Table 3

U.S. MILITARY PERSONNEL IN SOUTH VIETNAM ¹

(In thousands)

	Army	Navy ²	Marine Corps	Air Force	Total
FISCAL YEAR 1965					
June 30, 1964.....	9.9	1.0	0.6	5.0	16.5
Sept. 30, 1964.....	11.9	1.1	.7	5.8	19.5
Dec. 31, 1964.....	14.7	1.1	.9	6.6	23.3
Mar. 31, 1965.....	15.6	1.3	4.7	7.5	29.1
June 30, 1965.....	27.3	3.8	18.1	10.7	59.9
FISCAL YEAR 1966					
July 31, 1965.....	39.7	4.7	25.5	11.6	81.5
Aug. 31, 1965.....	48.1	5.3	34.2	12.7	100.3
Sept. 30, 1965.....	76.2	6.1	36.4	13.6	132.3
Oct. 31, 1965.....	92.8	8.5	36.8	15.2	153.3
Nov. 30, 1965.....	104.5	8.9	37.9	18.3	169.6
Dec. 31, 1965.....	116.8	8.7	38.2	20.6	184.3
Jan. 31, 1966.....	122.7	9.8	38.6	25.3	196.4
Feb. 28, 1966.....	129.2	10.6	39.4	28.8	208.0
Mar. 31, 1966.....	137.4	12.8	48.7	32.3	231.2
Apr. 30, 1966.....	148.7	13.8	49.8	33.0	245.3
May 31, 1966.....	154.3	14.8	52.2	33.9	255.2
June 30, 1966.....	160.0	17.4	53.7	36.4	267.5

¹ As reported by MACV.² Beginning in July 1965, includes approximately 400 Coast Guard personnel.

Table 4

REPUBLIC OF VIETNAM FORCES

(In thousands)

	End of fiscal year		
	1964	1965	1966
Regular Forces.....	218.5	265.7	313.6
Regional Forces.....	87.3	107.7	141.4
Popular Forces.....	99.6	149.0	137.7
Other ¹	120.2	103.4	107.8
TOTAL.....	525.6	625.8	700.5

¹ Includes Civilian Irregular Defense Group (CIDG), Armed Combat Youth, and National Police.

Table 5

OTHER FREE WORLD FORCES IN VIETNAM

(In thousands)

Country	Fiscal year 1965— June 30, 1965	Fiscal year 1966			
		Sept. 30, 1965	Dec. 31, 1965	Mar. 31, 1966	June 30, 1966
Australia.....	1. 1	1. 4	1. 5	1. 6	4. 4
New Zealand.....	(¹)	. 1	. 1	. 1	. 2
Philippines.....	. 1	. 1	. 1	. 1	. 1
Republic of Korea.....	2. 1	3. 0	20. 7	20. 7	25. 2
Other.....	(¹)	(¹)	(¹)	(¹)	(¹)
TOTAL.....	3. 3	4. 6	22. 4	22. 6	29. 9

¹ Less than 50.

Table 6

U.S. FORCES DEPLOYED IN SOUTHEAST ASIA

(As of end of fiscal year)

	Fiscal year 1965	Fiscal year 1966
GROUND FORCES		
Maneuver Battalions.....	9	51 $\frac{2}{3}$
Combat Support Battalions.....	4	38 $\frac{1}{3}$
Engineer Battalions ¹	6 $\frac{1}{3}$	30 $\frac{2}{3}$
AIR FORCES		
Fighter-Attack Aircraft.....	599	849
Non-Attack Capable Aircraft.....	397	830
Helicopters ²	505	1687
NAVAL FORCES ³		
River Control Ships.....		64
Coastal Patrol Ships ⁴	35	91
Offshore Ships.....	43	45

¹ Includes construction battalions.² Excludes Navy.³ Navy and Coast Guard ships and vessels normally engaged in South China Sea-Gulf of Thailand area west of 115° East.⁴ Includes DERs, MSOs, and MSCs.

Table 7

U.S. MILITARY PERSONNEL CASUALTIES IN VIETNAM CONFLICT

	Fiscal years 1961-63	Fiscal year 1964	Fiscal year 1965	Fiscal year 1966
From Actions by Hostile Forces				
DEATHS				
From aircraft accidents/incidents.....	50	80	109	319
From ground action.....	20	29	195	3,345
DEATHS				
Killed.....	39	84	191	3,099
Died of wounds.....	4	5	13	341
Died while missing or captured.....	27	20	100	224
TOTAL DEATHS.....	70	109	304	3,664
WOUNDED (Nonfatal)				
Hospital care required.....	112	391	806	11,009
Hospital care not required.....	104	356	774	9,126
Not the Result of Actions by Hostile Forces				
DEATHS				
From aircraft accidents/incidents.....	12	15	62	193
Other than air.....	26	28	95	450
DEATHS				
Died of illness.....	9	13	24	94
Died while missing.....	2	5	39	131
Died from other causes.....	27	25	94	418
TOTAL DEATHS.....	38	43	157	643

Table 8

U.S. AIRCRAFT LOSSES IN SOUTHEAST ASIA

AIRCRAFT TYPE	Fiscal year 1965		Fiscal year 1966	
	Hostile	Operational	Hostile	Operational
Fighter and Attack.....	85	49	302	85
Interceptor.....		1	4	
Reconnaissance.....	8	3	30	5
Bombers.....		2		
Transports.....	1	7	14	14
Trainers.....		1		
Other fixed-wing.....	11	17	59	42
Total fixed-wing.....	105	80	409	146
HELICOPTERS.....	29	58	124	131
TOTAL AIRCRAFT LOSSES.....	134	138	533	277

Table 9

FINANCIAL SUMMARY

(In billions of dollars)

	Fiscal year 1965	Fiscal year 1966	Fiscal year 1967 ¹
TOA BY PROGRAM			
Strategic Offensive Forces.....	5.3	5.1	5.1
Continental Air and Missile Defense Forces.....	1.6	1.7	1.4
General Purpose Forces.....	19.0	29.6	25.7
Airlift/Sealift Forces.....	1.5	1.7	2.1
Reserve and Guard Forces.....	2.1	2.3	2.4
Research and Development.....	4.9	5.3	5.5
General Support.....	14.5	18.0	16.7
Retired Pay.....	1.4	1.6	1.8
Military Assistance.....	1.3	1.2	1.0
TOTAL OBLIGATIONAL AUTHORITY.....	51.4	66.5	61.4
Less Financing Adjustments.....	-.9	-2.9	-1.5
NEW OBLIGATIONAL AUTHORITY.....	50.5	63.5	59.9
Adjustment to Expenditures.....	-3.1	-8.1	-1.6
TOTAL EXPENDITURES.....	47.4	55.4	58.3
TOA BY DEPARTMENT AND AGENCY			
Army.....	12.2	18.4	17.4
Navy.....	15.0	19.4	17.6
Air Force.....	19.6	23.9	21.5
Civil Defense.....	.1	.1	.1
Defense Agencies.....	1.1	1.3	1.5
Retired Pay.....	1.4	1.6	1.8
Defense Family Housing.....	.6	.7	.5
Military Assistance.....	1.3	1.2	1.0
GROSS TOTAL OBLIG. AUTHORITY ²	51.4	66.5	61.4

¹ As estimated in the President's Budget, January 1966.² Excludes cost of nuclear warheads.

Table 10

CHRONOLOGY OF FISCAL YEAR 1966 BUDGET ESTIMATES

(Billions of dollars)

	Printed budget estimates 25 Jan 65	SEA amend- ment 4 Aug 65	SEA supple- mental 19 Jan 66	Pay supple- mental 8 Mar 66	Total ¹
NEW OBLIGATIONAL AUTHORITY REQUESTED...	48.6	1.7	12.3	0.9	63.5
ANALYSIS BY FUNCTIONAL TITLE:					
Military Personnel.....	14.6	-----	1.6	.8	16.9
Operation and Maintenance.....	12.5	-----	2.3	.1	14.9
Procurement.....	11.4	-----	7.0	-----	18.4
RDT&E.....	6.7	-----	.2	-----	6.9
Military Construction.....	1.3	-----	1.2	-----	2.6
Family Housing.....	.7	-----	-----	-----	.7
Civil Defense.....	.2	-----	-----	-----	.2
Emergency Fund, Southeast Asia.....	-----	1.7	-----	-----	1.7
Total, Military Functions.....	47.4	1.7	12.3	.9	62.3
Military Assistance.....	1.2	-----	-----	-----	1.2
TOTAL NOA REQUESTED.....	48.6	1.7	12.3	.9	63.5
CONGRESSIONAL ACTION.....	-.5	-----	-----	-----	-.5
TOTAL NOA ENACTED.....	48.1	1.7	12.3	.9	63.0

¹ Excludes \$525 million of contract authority ultimately utilized: \$225 million for Military Functions and \$300 million for Military Assistance.

Table 11

NEW OBLIGATIONAL AVAILABILITY FOR MILITARY FUNCTIONS AND MILITARY ASSISTANCE FISCAL YEAR 1966

(In millions of dollars)

	Army	Navy	Air Force	Defense- wide activities ¹	Depart- ment of Defense
MILITARY PERSONNEL					
Active Forces.....	5, 151	4, 565	4, 939	-----	14, 655
Reserve Forces.....	534	146	138	-----	818
Retired Pay.....	-----	-----	-----	1, 600	1, 600
Total.....	5, 685	4, 711	5, 076	1, 600	17, 073
OPERATION AND MAINTENANCE					
	5, 054	4, 261	5, 253	771	15, 339
PROCUREMENT					
Aircraft.....	1, 287	2, 780	5, 287	-----	9, 354
Missiles.....	364	438	840	-----	1, 642
Ships.....	-----	1, 522	-----	-----	1, 522
Tracked Combat Vehicles.....	421	13	-----	-----	435
Ordnance, etc.....	1, 391	1, 491	1, 368	1	4, 252
Electronics and Communica- tions.....	365	407	467	1	1, 240
Other Procurement.....	483	644	428	13	1, 568
Total.....	4, 312	7, 296	8, 390	15	20, 013
RDT&E					
Military Sciences.....	156	181	155	101	593
Aircraft.....	100	276	727	6	1, 109
Missiles.....	627	394	753	124	1, 899
Astronautics.....	20	24	1, 030	4	1, 079
Ships.....	2	349	-----	-----	351
Ordnance, etc.....	193	184	-----	-----	377
Other Equipment.....	291	89	312	247	939
Programwide Management.....	75	76	237	11	399
Emergency Fund.....	-----	-----	-----	-----	-----
Total.....	1, 464	1, 574	3, 215	493	6, 746
CIVIL DEFENSE					
	-----	-----	-----	107	107
CONSTRUCTION					
Active Forces.....	968	635	706	225	2, 533
Reserve Forces.....	10	10	14	-----	34
Total.....	978	644	720	225	2, 566
FAMILY HOUSING					
	-----	-----	-----	666	666
MILITARY ASSISTANCE					
	-----	-----	-----	1, 023	1, 023
TOTAL					
	17, 493	18, 486	22, 655	4, 900	63, 533

¹ Includes the Office of the Secretary of Defense, Joint Chiefs of Staff, Defense agencies, Office of Civil Defense, Military Assistance, etc.

Table 12

DEFENSE BUDGET

FISCAL YEARS 1966-67 ¹

(New obligational authority in millions of dollars)

	Fiscal year 1966 ²			Fiscal year 1967
	Amounts requested	Amounts appropriated	Actual new obligational authority ³	amounts re-requested ⁴
BY FUNCTIONAL TITLE				
Military Personnel.....	16,941	16,981	17,073	18,676
Operation and Maintenance.....	14,890	14,911	15,339	15,700
Procurement.....	18,431	18,423	20,013	16,408
RD&E.....	6,860	6,721	6,746	6,905
Civil Defense.....	194	107	107	133
Military Construction.....	2,552	2,329	2,566	593
Family Housing.....	736	666	666	522
Emergency Fund, Southeast Asia....	1,700	1,700	⁵ (1,700)	-----
Total.....	62,304	61,839	62,510	58,938
Military Assistance.....	1,170	1,170	1,023	917
TOTAL.....	63,474	63,009	63,533	59,855
BY AGENCY				
Army.....	16,601	16,505	17,492	17,116
Navy.....	17,837	17,839	18,486	16,952
Air Force.....	22,045	21,889	22,655	20,942
OSD-Defense Agencies.....	5,628	5,500	3,770	3,794
Civil Defense.....	194	107	107	133
Military Assistance.....	1,170	1,170	1,023	917

¹ Excludes funds made available to the Department of Defense for Army civil works and civil functions—\$1,399 million in 1966 and \$1,358 million in 1967.

² Excludes transfers from the revolving funds in lieu of new appropriations. Although, initially, \$470 million of such transfer authority was sought and granted, later unanticipated Vietnam-related demands on the revolving funds made most of these financial resources unavailable and only \$100,000 was actually transferred. To meet the rest of the requirement, new obligational authority was sought and granted in the fiscal year 1966 supplemental.

³ Includes \$525 million of contract authority (for which prior appropriations are not needed) ultimately utilized: \$225 million for military functions and \$300 million for military assistance. Amounts shown reflect actual transfers between accounts.

⁴ Amounts included in budget estimates of Jan. 24, 1966.

⁵ Distributed in the above accounts.

Table 13

OBLIGATIONS FOR MILITARY FUNCTIONS AND MILITARY ASSISTANCE FISCAL YEARS 1965-66

(In millions of dollars)

	Unobligated balance brought forward	New obligational availability	Reimbursements, recoveries, etc.	Total obligational availability	Obligations	Unobligated balance carried forward ¹
DEPARTMENT OF DEFENSE						
Fiscal Year 1965...	11, 431	50, 687	4, 841	66, 959	54, 329	12, 534
Fiscal Year 1966...	12, 534	63, 533	6, 555	82, 622	67, 496	15, 075
BY FUNCTIONAL TITLE						
<i>Military Personnel</i>						
Fiscal Year 1965...	-----	14, 849	154	15, 003	14, 970	-----
Fiscal Year 1966...	-----	17, 073	179	17, 252	17, 226	-----
<i>Operation and Maintenance</i>						
Fiscal Year 1965...	49	12, 603	1, 729	14, 382	14, 267	75
Fiscal Year 1966...	75	15, 339	2, 015	17, 429	17, 337	71
<i>Procurement</i>						
Fiscal Year 1965...	7, 860	13, 836	1, 780	23, 476	14, 672	8, 805
Fiscal Year 1966...	8, 805	20, 013	3, 324	32, 141	21, 796	10, 345
<i>RDT & E</i>						
Fiscal Year 1965...	1, 099	6, 483	657	8, 239	7, 003	1, 224
Fiscal Year 1966...	1, 224	6, 746	685	8, 655	7, 240	1, 414
<i>Civil Defense</i>						
Fiscal Year 1965...	16	105	1	122	95	23
Fiscal Year 1966...	23	107	(²)	130	90	39
<i>Construction</i>						
Fiscal Year 1965...	798	1, 049	450	2, 297	1, 506	791
Fiscal Year 1966...	791	2, 566	483	3, 840	2, 073	1, 768
<i>Family Housing</i>						
Fiscal Year 1965...	138	631	8	777	662	111
Fiscal Year 1966...	111	666	6	783	564	217
<i>Military Assistance</i>						
Fiscal Year 1965...	1, 471	1, 130	63	2, 664	1, 155	1, 505
Fiscal Year 1966...	1, 505	1, 023	-137	2, 392	1, 171	1, 221

See footnotes at end of table.

Table 13—Continued

OBLIGATIONS FOR MILITARY FUNCTIONS AND MILITARY ASSISTANCE
FISCAL YEARS 1965-66—Continued

(In millions of dollars)

	Unobligated balance brought forward	New obligational availability	Reimbursements, recoveries, etc.	Total obligational availability	Obligations	Obligated balance carried forward ¹
BY AGENCY						
<i>Army</i>						
Fiscal Year 1965	2,362	12,052	1,992	16,406	13,999	2,388
Fiscal Year 1966	2,388	17,493	3,293	23,174	21,000	2,156
<i>Navy</i>						
Fiscal Year 1965	4,663	14,908	1,208	20,779	15,630	5,127
Fiscal Year 1966	5,127	18,486	1,768	25,381	18,714	6,666
<i>Air Force</i>						
Fiscal Year 1965	2,634	19,300	1,318	23,251	20,036	3,214
Fiscal Year 1966	3,214	22,655	1,564	27,432	23,009	4,421
<i>OSD and Defense Agencies</i>						
Fiscal Year 1965	285	3,192	260	3,737	3,413	277
Fiscal Year 1966	277	3,770	67	4,114	3,513	573
<i>Office of Civil Defense</i>						
Fiscal Year 1965	16	105	1	122	95	23
Fiscal Year 1966	23	107	(²)	130	90	39
<i>Military Assistance</i>						
Fiscal Year 1965	1,471	1,130	63	2,664	1,155	1,505
Fiscal Year 1966	1,505	1,023	-137	2,392	1,171	1,221

¹ Consists of preclosing balance minus expired funds.² Less than \$500,000.

Table 14

EXPENDITURES FOR MILITARY FUNCTIONS AND MILITARY ASSISTANCE
FISCAL YEARS 1965-66

(In millions of dollars)

	Unex- pended balance brought forward	New ex- penditure avail- ability	Total available for ex- penditure	Expendi- tures	Unex- pended balance carried forward ¹
DEPARTMENT OF DEFENSE					
Fiscal Year 1965.....	31, 959	50, 548	82, 508	47, 401	34, 892
Fiscal Year 1966.....	34, 892	63, 647	98, 539	55, 377	43, 041
BY FUNCTIONAL TITLE					
<i>Military Personnel</i>					
Fiscal Year 1965.....	354	14, 849	15, 203	14, 771	366
Fiscal Year 1966.....	366	17, 136	17, 502	16, 753	717
<i>Operation and Maintenance</i>					
Fiscal Year 1965.....	1, 435	12, 603	14, 039	12, 349	1, 589
Fiscal Year 1966.....	1, 589	15, 480	17, 069	14, 710	2, 300
<i>Procurement</i>					
Fiscal Year 1965.....	19, 990	13, 836	33, 826	11, 839	21, 980
Fiscal Year 1966.....	21, 980	20, 053	42, 033	14, 339	27, 678
<i>RDT&E</i>					
Fiscal Year 1965.....	4, 025	6, 482	10, 507	6, 236	4, 259
Fiscal Year 1966.....	4, 259	6, 746	11, 005	6, 259	4, 746
<i>Civil Defense</i>					
Fiscal Year 1965.....	112	105	218	93	103
Fiscal Year 1966.....	103	107	209	86	117
<i>Construction</i>					
Fiscal Year 1965.....	1, 315	1, 051	2, 366	1, 007	1, 359
Fiscal Year 1966.....	1, 359	2, 610	3, 969	1, 334	2, 636
<i>Family Housing</i>					
Fiscal Year 1965.....	327	631	959	619	334
Fiscal Year 1966.....	334	666	1, 000	647	346
<i>Military Assistance</i>					
Fiscal Year 1965.....	1, 994	1, 185	3, 179	1, 229	1, 949
Fiscal Year 1966.....	1, 949	850	2, 799	968	1, 831
<i>Revolving and Management Funds</i>					
Fiscal Year 1965.....	2, 406	— 193	2, 212	² — 741	2, 953
Fiscal Year 1966.....	2, 953	-----	2, 953	281	2, 670

See footnotes at end of table.

Table 14—Continued

EXPENDITURES FOR MILITARY FUNCTIONS AND MILITARY ASSISTANCE
FISCAL YEARS 1965-66—Continued

(In millions of dollars)

	Unex- pended balance brought forward	New ex- penditure avail- ability	Total available for ex- penditure	Expendi- tures	Unex- pended balance carried forward ¹
BY AGENCY					
<i>Army</i>					
Fiscal Year 1965.....	5,811	12,017	17,828	11,600	6,147
Fiscal Year 1966.....	6,147	17,646	23,793	14,832	8,941
<i>Navy</i>					
Fiscal Year 1965.....	14,143	14,908	29,052	13,399	15,615
Fiscal Year 1966.....	15,615	18,521	34,136	16,026	18,074
<i>Air Force</i>					
Fiscal Year 1965.....	8,688	19,259	27,947	18,216	9,712
Fiscal Year 1965.....	9,712	22,753	32,465	20,131	12,316
<i>OSD and Defense Agencies</i>					
Fiscal Year 1965.....	1,210	3,074	4,284	2,865	1,364
Fiscal Year 1966.....	1,364	3,770	5,134	3,335	1,760
<i>Office of Civil Defense</i>					
Fiscal Year 1965.....	114	105	219	93	104
Fiscal Year 1966.....	104	107	211	86	119
<i>Military Assistance</i>					
Fiscal Year 1965.....	1,994	1,185	3,179	1,229	1,949
Fiscal Year 1966.....	1,949	850	2,799	968	1,831

¹ Net balance after withdrawals and restorations of unexpended balances as provided in Public Law 798.² Reimbursements exceeded expenditures.

Table 15

U.S. DEFENSE EXPENDITURES AND RECEIPTS ENTERING THE INTERNATIONAL BALANCE OF PAYMENTS

(In millions of dollars as of January 1967)

	Fiscal year 1961	Fiscal year 1964	Fiscal year 1965	Fiscal year 1966
DEPARTMENT OF DEFENSE				
EXPENDITURES				
<i>Support of U.S. Forces</i>	2, 452. 1	2, 557. 2	2, 506. 7	3, 075. 2
Expenditures by Military and Civilian Personnel ¹ ...	788. 8	870. 3	922. 3	1, 065. 4
Hire of Foreign Nationals...	366. 6	424. 8	407. 9	436. 8
Procurement:				
Major Equipment.....	61. 6	92. 5	78. 4	86. 8
Construction.....	157. 5	93. 9	103. 7	254. 5
Petroleum Products ²	257. 2	280. 6	270. 1	324. 4
Other Materials and Sup- plies ³	304. 5	193. 0	144. 8	200. 7
Operation and Mainte- nance (Other) ⁴	515. 9	417. 7	401. 6	502. 6
Other Payments ⁴		184. 4	177. 9	204. 0
<i>Military Assistance</i>	311. 9	235. 3	162. 7	158. 9
Offshore Procurement.....	155. 1	117. 5	74. 6	52. 6
NATO Infrastructure.....	105. 2	61. 4	34. 0	50. 5
Other.....	51. 6	56. 4	54. 1	55. 8
<i>Net Change in Foreign Cur- rency Holdings</i>	-2. 0	-8. 0	. 8	10. 8
OTHER AGENCIES' EX- PENDITURES ⁵	343. 3	135. 8	95. 1	50. 5
TOTAL EXPENDITURES	3, 105. 3	2, 920. 3	2, 765. 3	3, 295. 4
RECEIPTS				
Cash ⁶	-318. 9	-1, 203. 9	-1, 253. 7	-1, 038. 0
Barter.....		-23. 5	-68. 9	-139. 5
TOTAL RECEIPTS	-318. 9	-1, 227. 4	-1, 322. 6	-1, 177. 5
NET ADVERSE BALANCE ..	2, 786. 4	1, 692. 9	1, 442. 7	2, 117. 9

¹ Includes expenditures for goods and services by nonappropriated fund activities.

² Beginning in fiscal year 1964, includes expenditures for petroleum procured through Operation and Maintenance accounts as well as through Stock Fund accounts.

³ Beginning in fiscal year 1964, includes primarily expenditure through Operation and Maintenance and Stock Fund accounts.

⁴ Beginning with fiscal year 1964, data previously reported as contractual services have been divided into 2 categories, i.e., "Operation and Maintenance (Other)," which includes all O&M payments not included elsewhere and "Other Payments," which includes expenditures for retired pay, claims, research and development, industrial fund activities, etc.

⁵ Expenditures entering balance of international payments by the Atomic Energy Commission and other agencies included in the NATO definition of defense expenditures.

⁶ Includes only: (1) Sales of military items through Department of Defense; (2) reimbursement to United States for logistical support of U.N. forces and defense forces of other nations; (3) sales of services and excess personal property. Excludes estimates of receipts for military equipment procured through U.S. private sources, except when covered by government-to-government agreements.

Table 16

RESEARCH, DEVELOPMENT, TEST, AND EVALUATION PROGRAMS OBLIGATIONS

(In millions of dollars)

	Fiscal year 1965 (actual)	Fiscal year 1966 (actual)	Fiscal year 1967 (estimated) ¹
RESEARCH, DEVELOPMENT, TEST, AND EVALUATION.....	6,386.9	6,574.6	6,893.3
Military Sciences.....	619.8	602.0	616.4
Aircraft and Related Equipment.....	1,094.9	1,096.7	1,036.8
Missiles and Related Equipment.....	1,955.0	1,964.8	2,314.5
Military Astronautics and Related Equip- ment.....	896.7	975.5	852.7
Ships, Small Craft, and Related Equip- ment.....	257.0	293.1	271.1
Ordnance, Combat Vehicles, and Related Equipment.....	342.2	400.7	360.2
Other Equipment.....	774.6	838.9	865.5
Management and Support.....	446.7	402.9	451.1
Emergency Fund ²	-----	-----	125.0
SUPPORTING ACTIVITIES.....	473.5	519.2	516.9
Military Personnel.....	277.3	288.3	275.8
Procurement.....	81.9	107.9	83.9
Operational and Maintenance.....	34.5	37.6	42.4
Civil Defense.....	11.3	10.0	10.0
Military Construction.....	68.5	75.4	104.8
TOTAL.....	6,860.4	7,093.8	7,410.2

¹ As presented in the President's Budget.² The emergency funds used during fiscal years 1965 and 1966 have been added to the appropriate sub-categories to which they were transferred.

Table 17

ACTIVE DUTY MILITARY PERSONNEL

	Department of Defense	Army	Navy	Marine Corps	Air Force
OFFICERS					
June 30, 1965----	338, 822	112, 120	77, 866	17, 258	131, 578
June 30, 1966----	348, 827	117, 786	79, 805	20, 512	130, 724
<i>Regulars</i>					
June 30, 1965----	168, 338	42, 368	49, 303	11, 674	64, 993
June 30, 1966----	172, 430	43, 456	51, 074	14, 077	63, 823
<i>Reserves</i> ¹					
June 30, 1965----	170, 484	69, 752	28, 563	5, 584	66, 585
June 30, 1966----	176, 397	74, 330	28, 731	6, 435	66, 901
ENLISTED					
June 30, 1965----	2, 304, 929	854, 929	587, 183	172, 640	690, 177
June 30, 1966----	2, 732, 705	1, 079, 682	658, 635	240, 911	753, 477
OFFICER CANDIDATES					
June 30, 1965----	11, 638	2, 017	6, 399	315	2, 907
June 30, 1966----	12, 526	2, 316	6, 765	293	3, 152
TOTAL					
June 30, 1965----	2, 655, 389	969, 066	671, 448	190, 213	824, 662
June 30, 1966----	3, 094, 058	1, 199, 784	745, 205	261, 716	887, 353

¹ Members of reserve components, including National Guard, plus a small number of officers without component in the Army of the United States or Air Force of the United States.

Table 18

DEPLOYMENT OF MILITARY PERSONNEL

(Percentages listed in parentheses)

	Department of Defense	Army	Navy	Marine Corps	Air Force
SHORE ACTIVITIES					
June 30, 1965----	2, 262, 816 (85. 2)	969, 066 (100. 0)	289, 700 (43. 1)	179, 388 (94. 3)	824, 662 (100. 0)
June 30, 1966----	2, 662, 373 (86. 0)	1, 199, 784 (100. 0)	319, 736 (42. 9)	255, 500 (97. 6)	887, 353 (100. 0)
<i>Continental U.S.</i>					
June 30, 1965----	1, 570, 168 (59. 1)	559, 400 (57. 7)	246, 287 (36. 7)	135, 140 (71. 0)	629, 341 (76. 3)
June 30, 1966----	1, 774, 136 (57. 3)	696, 263 (58. 0)	266, 809 (35. 8)	173, 962 (66. 4)	637, 102 (71. 8)
<i>Outside Continental U.S.</i>					
June 30, 1965----	692, 648 (26. 1)	409, 666 (42. 3)	43, 413 (6. 4)	44, 248 (23. 3)	195, 321 (23. 7)
June 30, 1966----	888, 237 (28. 7)	503, 521 (42. 0)	52, 927 (7. 1)	81, 538 (31. 2)	250, 251 (28. 2)
AFLOAT & MOBILE ACTIVITIES					
June 30, 1965----	392, 573 (14. 8)	-----	381, 748 (56. 9)	10, 825 (5. 7)	-----
June 30, 1966----	431, 685 (14. 0)	-----	425, 469 (57. 1)	6, 216 (2. 4)	-----
TOTAL					
June 30, 1965----	2, 655, 389 (100. 0)	969, 066 (100. 0)	671, 448 (100. 0)	190, 213 (100. 0)	824, 662 (100. 0)
June 30, 1966----	3, 094, 058 (100. 0)	1, 199, 784 (100. 0)	745, 205 (100. 0)	261, 716 (100. 0)	887, 353 (100. 0)

Table 19

MILITARY PERSONNEL BY GRADE

JUNE 30, 1966

(Percentages listed in parentheses)

	Department of Defense	Army	Navy	Marine Corps	Air Force
OFFICERS.....	348,827	117,786	79,805	20,512	130,724
Percent of Total.....	(11.3)	(9.8)	(10.7)	(7.8)	(14.7)
Gen. of the Army—Fleet Admiral.....	2	2			
General—Admiral.....	34	13	9	1	11
Lt. General—Vice Admiral.....	125	43	38	7	37
Maj. General } —Rear Admiral.....	{ 1,159	{ 197	{ 274	{ 22	{ 169
Brig. General }					
Colonel—Captain.....	16,703	5,428	4,388	710	6,177
Lt. Colonel—Commander.....	39,241	13,513	8,414	1,452	15,862
Major—Lt. Commander.....	58,923	18,534	14,113	2,891	23,385
Captain—Lieutenant.....	104,378	32,313	23,132	4,736	44,197
1st Lieutenant—Lieutenant (JG).....	61,709	15,824	15,197	3,890	26,798
2d Lieutenant—Ensign.....	49,535	20,353	11,936	5,456	11,790
Chief Warrant Officer W-4.....	3,519	1,197	773	129	1,420
Chief Warrant Officer W-3.....	4,215	2,824	594	143	654
Chief Warrant Officer W-2.....	4,926	4,682	27	212	5
Warrant Officer W-1.....	4,358	2,615	910	833	
ENLISTED ¹	2,732,705	1,079,682	658,635	240,911	753,477
Percent of Total.....	(88.3)	(90.0)	(88.4)	(92.1)	(84.9)
Pay Grade E-9.....	14,764	4,941	2,968	963	5,892
Pay Grade E-8.....	38,582	15,441	8,362	3,264	11,515
Pay Grade E-7.....	129,671	43,185	37,819	7,313	41,354
Pay Grade E-6.....	255,674	89,510	75,178	13,650	77,336
Pay Grade E-5.....	419,245	148,758	96,831	25,626	148,030
Pay Grade E-4.....	508,128	197,198	129,923	29,990	151,017
Pay Grade E-3.....	586,593	212,279	165,334	40,086	168,894
Pay Grade E-2.....	458,466	154,832	115,576	63,628	124,430
Pay Grade E-1.....	321,582	213,538	26,644	56,391	25,009
OFFICER CANDIDATES.....	12,526	2,316	6,765	293	3,152
Percent of Total.....	(0.4)	(0.2)	(0.9)	(0.1)	(0.4)
TOTAL.....	3,094,058	1,199,784	745,205	261,716	887,353

¹ Enlisted are shown by pay grade due to wide diversity of titles. "Proficiency Pay" was being received by 191,202—pay grade E-9, 3,166; pay grade E-8, 8,821; pay grade E-7, 29,216; pay grade E-6, 55,407; pay grade E-5, 68,734; pay grade E-4, 24,378; and pay grade E-3, 1,480.

Table 20

ENLISTED PERSONNEL PROCUREMENT

	Department of Defense	Army	Navy	Marine Corps	Air Force
<i>Inductions</i>					
Fiscal Year 1965-----	102, 555	102, 497	-----	58	-----
Fiscal Year 1966-----	339, 734	317, 509	2, 585	19, 636	4
<i>First Enlistments</i>					
Fiscal Year 1965-----	318, 209	101, 901	94, 301	34, 310	87, 697
Fiscal Year 1966-----	548, 235	170, 113	143, 144	68, 856	166, 122
<i>Immediate Reenlistments</i>					
Fiscal Year 1965-----	226, 117	76, 224	37, 686	9, 520	102, 687
Fiscal Year 1966-----	207, 376	77, 000	37, 442	10, 273	82, 661
<i>Other Reenlistments</i>					
Fiscal Year 1965-----	20, 775	12, 327	6, 329	879	1, 240
Fiscal Year 1966-----	15, 899	6, 598	4, 491	922	3, 888
<i>Reserves to Active Duty</i> ¹					
Fiscal Year 1965-----	34, 029	1, 141	31, 494	1, 187	207
Fiscal Year 1966-----	50, 733	1, 838	34, 894	13, 672	329
TOTAL					
Fiscal Year 1965-----	701, 685	294, 090	169, 810	45, 954	191, 831
Fiscal Year 1966-----	1, 161, 977	573, 058	222, 556	113, 359	253, 004

¹ Includes National Guard.

Table 21

REENLISTMENT RATES ¹

(Percentage of eligibles)

	Department of Defense	Army	Navy	Marine Corps	Air Force
REGULARS					
Fiscal Year 1965.....	50.2	47.9	40.7	32.9	61.5
Fiscal Year 1966.....	49.6	49.5	44.0	33.9	55.6
<i>First Term</i>					
Fiscal Year 1965.....	24.0	25.7	22.8	16.3	25.5
Fiscal Year 1966.....	23.2	28.0	23.7	16.3	18.9
<i>Career</i>					
Fiscal Year 1965.....	87.2	84.1	87.3	84.5	89.3
Fiscal Year 1966.....	87.7	83.4	89.6	88.6	89.7
INDUCTEES (Army)					
Fiscal Year 1965.....	-----	8.4	-----	-----	-----
Fiscal Year 1966.....	-----	10.2	-----	-----	-----
FIRST TERM REGULARS BY OCCUPATIONAL GROUP					
<i>Infantry, Gun Crews, and Allied Specialists</i>					
Fiscal Year 1965.....	30.7	37.4	21.2	15.7	59.6
Fiscal Year 1966.....	30.0	35.1	26.0	15.6	72.1
<i>Electronics Equipment Repairmen</i>					
Fiscal Year 1965.....	25.2	20.3	26.2	18.6	29.4
Fiscal Year 1966.....	22.5	21.7	28.1	18.5	19.2
<i>Communications and Intelligence Specialists</i>					
Fiscal Year 1965.....	18.7	16.4	19.6	13.1	27.2
Fiscal Year 1966.....	19.3	18.9	22.7	14.6	16.2
<i>Medical and Dental Specialists</i>					
Fiscal Year 1965.....	25.2	27.1	23.3	-----	24.0
Fiscal Year 1966.....	24.8	31.1	19.8	-----	21.3
<i>Other Technical and Allied Specialists</i>					
Fiscal Year 1965.....	19.6	14.8	23.3	21.4	22.5
Fiscal Year 1966.....	19.0	17.0	23.4	18.6	17.6
<i>Administrative Specialists and Clerks</i>					
Fiscal Year 1965.....	26.1	20.0	29.0	19.9	36.1
Fiscal Year 1966.....	23.6	23.7	29.2	19.6	22.1
<i>Electrical/Mechanical Equipment Repairmen</i>					
Fiscal Year 1965.....	23.3	24.1	23.0	13.8	25.2
Fiscal Year 1966.....	22.1	25.8	23.2	15.2	19.1

See footnote at end of table.

Table 21—Continued

REENLISTMENT RATES ¹—Continued

(Percentage of eligibles)

	Department of Defense	Army	Navy	Marine Corps	Air Force
FIRST TERM REGULARS BY OCCUPATIONAL GROUP—Con.					
<i>Craftsmen</i>					
Fiscal Year 1965.....	22.0	21.8	21.3	15.2	24.0
Fiscal Year 1966.....	19.3	17.2	23.2	13.3	17.6
<i>Service and Supply Handlers</i>					
Fiscal Year 1965.....	31.1	32.8	46.6	17.5	26.6
Fiscal Year 1966.....	26.0	34.4	40.4	15.6	18.3
<i>Miscellaneous</i>					
Fiscal Year 1965.....	10.1	85.9	13.4	100.0	2.0
Fiscal Year 1966.....	22.4	53.3	15.3	100.0	5.9

¹The definitions of reenlistments used for rate computations were modified during fiscal year 1965, thus the rates for fiscal year 1965 listed above computed according to the new definitions are slightly changed from rates published in the last annual report.

Table 22

DEPENDENTS OF MILITARY PERSONNEL
MARCH 31, 1966

	Department of Defense	Army	Navy	Marine Corps	Air Force
TYPE OF DEPENDENT					
Wives-----	1, 327, 389	446, 144	295, 433	72, 959	512, 853
Children-----	2, 533, 812	843, 044	510, 297	128, 783	1, 051, 688
Parents-----	} 188, 978	{ 85, 444	4, 931	1, 039	} 59, 787
Other ¹ -----		{ 35, 003	2, 774	-- ----	
LOCATION OF DEPENDENT					
Continental					
United States---	3, 452, 990	1, 156, 466	742, 158	194, 393	1, 359, 973
Alaska-----	34, 757	13, 209	1, 671	73	19, 804
Hawaii-----	69, 048	22, 548	21, 996	4, 974	19, 530
U.S. Territories---	49, 116	23, 499	9, 245	449	15, 923
Foreign Countries--	444, 268	193, 913	38, 365	2, 892	209, 098
TOTAL-----					
No. Per Person---	4, 050, 179 1. 37	1, 409, 635 1. 24	813, 435 1. 12	202, 781 . 83	1, 624, 328 1. 12

¹ Consists of all other persons related to the military member and who reside in his household and are dependent in fact on him for over half of their support.

Table 23

WOMEN MILITARY PERSONNEL

	Department of Defense	Army	Navy	Marine Corps	Air Force
OFFICERS					
June 30, 1965.....	10,647	3,806	2,601	140	4,100
June 30, 1966.....	11,293	4,143	2,808	153	4,189
<i>Regulars</i>					
June 30, 1965.....	3,448	1,177	1,189	95	987
June 30, 1966.....	3,316	1,123	1,145	106	942
<i>Reserves</i>					
June 30, 1965.....	7,199	2,629	1,412	45	3,113
June 30, 1966.....	7,977	3,020	1,663	47	3,247
ENLISTED					
June 30, 1965.....	19,653	8,520	4,951	1,441	4,741
June 30, 1966.....	21,048	9,179	5,140	1,679	5,050
OFFICER CANDIDATES					
June 30, 1965.....	310	-----	310	-----	-----
June 30, 1966.....	248	-----	248	-----	-----
TOTAL					
June 30, 1965.....	30,610	12,326	7,862	1,581	8,841
June 30, 1966.....	32,589	13,322	8,196	1,832	9,239

Table 24

CIVILIAN PERSONNEL

	Department of Defense	Defense- wide activities	Army	Navy	Air Force
DIRECT HIRE					
June 30, 1965.....	1, 033, 775	42, 278	366, 726	333, 271	291, 500
June 30, 1966.....	1, 138, 126	68, 923	405, 544	356, 744	306, 915
<i>Salaried</i>					
June 30, 1965.....	547, 122	33, 310	213, 442	141, 473	158, 897
June 30, 1966.....	594, 177	55, 295	231, 211	151, 158	156, 513
<i>Wage Board</i>					
June 30, 1965.....	486, 653	8, 968	153, 284	191, 798	132, 603
June 30, 1966.....	543, 949	13, 628	174, 333	205, 586	150, 402
INDIRECT HIRE					
June 30, 1965.....	130, 451	-----	86, 701	13, 393	30, 357
June 30, 1966.....	128, 549	13	85, 409	13, 638	29, 489
TOTAL					
June 30, 1965.....	1, 164, 226	42, 278	453, 427	346, 664	321, 857
June 30, 1966.....	1, 266, 675	68, 936	490, 953	370, 382	336, 404

Table 25

OSD-JCS PERSONNEL

	June 30, 1965			June 30, 1966		
	Total	Civilian	Military	Total	Civilian	Military
OFFICE OF SECRETARY OF DEFENSE						
Secretary and Deputy Secretary-----	13	9	4	14	9	5
Defense Research and Engineering-----	527	361	166	558	381	177
Administration-----	304	192	112	420	252	168
Comptroller-----	345	329	16	314	306	8
Installations and Logistics-----	287	261	26	286	264	22
International Security Affairs-----	290	205	85	289	210	79
Systems Analysis-----	-----	-----	-----	153	119	34
Manpower-----	196	136	60	172	112	60
Public Affairs-----	175	90	85	189	90	99
General Counsel-----	55	54	1	53	52	1
Special Staff Assistants-----	158	92	66	151	91	60
Total-----	2, 350	1, 729	621	2, 599	1, 886	713
JOINT CHIEFS OF STAFF ORGANIZATION						
Office of the Chairman-----	31	14	17	34	15	19
Joint Staff-----	671	231	440	615	203	412
Other Joint Chiefs of Staff Activities-----	923	179	744	1, 042	235	807
Total-----	1, 625	424	1, 201	1, 691	453	1, 238
TOTAL FULL-TIME PERSONNEL-----	3, 975	2, 153	1, 822	4, 290	2, 339	1, 951
Intermittent Consultants-----	38	38	-----	67	67	-----
Summer Employees-----	106	106	-----	115	115	-----
TOTAL-----	4, 119	2, 297	1, 822	4, 472	2, 521	1, 951

Table 26

OTHER DEFENSE ACTIVITIES PERSONNEL

	June 30, 1965			June 30, 1966		
	Total	Civilian	Military	Total	Civilian	Military
Defense Atomic Support Agency -	6, 864	2, 079	4, 785	6, 621	2, 074	4, 547
Defense Communications Agency -	2, 365	987	1, 378	2, 541	1, 077	1, 464
Defense Contract Audit Agency -	-----	-----	-----	3, 668	3, 662	6
Defense Intelligence Agency -	3, 732	2, 186	1, 546	6, 009	3, 219	2, 790
Defense Supply Agency -	35, 101	34, 203	898	56, 980	55, 851	1, 129
U.S. Court of Military Appeals -	40	40	-----	37	37	-----
Armed Forces Information and Education -	507	420	87	477	417	60
Interdepartmental Activities -	43	9	34	-----	-----	-----
International Military Activities -	134	57	77	138	65	73
TOTAL -	48, 786	39, 981	8, 805	76, 471	66, 402	10, 069

**RESERVE PERSONNEL
JUNE 30, 1966**

Table 27

	Officers	Enlisted ¹	Total
DEPARTMENT OF DEFENSE-----	822, 638	2, 203, 404	3, 026, 042
<i>Department of the Army</i> -----	<i>355, 565</i>	<i>1, 368, 667</i>	<i>1, 724, 232</i>
Army National Guard-----	36, 285	391, 409	427, 694
Army Reserve-----	319, 280	977, 258	1, 296, 538
<i>Department of the Navy</i> -----	<i>231, 910</i>	<i>511, 531</i>	<i>743, 441</i>
Naval Reserve-----	204, 723	371, 715	576, 438
Marine Corps Reserve-----	27, 187	139, 816	167, 003
<i>Department of the Air Force</i> -----	<i>235, 163</i>	<i>323, 206</i>	<i>558, 369</i>
Air National Guard-----	10, 436	69, 672	80, 108
Air Force Reserve-----	224, 727	253, 534	478, 261
ON ACTIVE DUTY ² -----	175, 641	81, 773	257, 414
<i>Department of the Army</i> -----	<i>73, 762</i>	<i>2, 047</i>	<i>75, 809</i>
Army National Guard-----	1, 407	29	1, 436
Army Reserve-----	72, 355	2, 018	74, 373
<i>Department of the Navy</i> -----	<i>35, 166</i>	<i>79, 468</i>	<i>114, 634</i>
Naval Reserve-----	28, 731	67, 877	96, 608
Marine Corps Reserve-----	6, 435	11, 591	18, 026
<i>Department of the Air Force</i> -----	<i>66, 713</i>	<i>258</i>	<i>66, 971</i>
Air National Guard-----	216	9	225
Air Force Reserve-----	66, 497	249	66, 746
NOT ON ACTIVE DUTY-----	646, 997	2, 121, 631	2, 768, 628
<i>Department of the Army</i> -----	<i>281, 803</i>	<i>1, 366, 620</i>	<i>1, 648, 423</i>
Army National Guard-----	34, 878	391, 380	426, 258
Army Reserve-----	246, 925	975, 240	1, 222, 165
<i>Department of the Navy</i> -----	<i>196, 744</i>	<i>432, 063</i>	<i>628, 807</i>
Naval Reserve-----	175, 992	303, 838	479, 830
Marine Corps Reserve-----	20, 752	128, 225	148, 977
<i>Department of the Air Force</i> -----	<i>168, 450</i>	<i>322, 948</i>	<i>491, 398</i>
Air National Guard-----	10, 220	69, 663	79, 883
Air Force Reserve-----	158, 230	253, 285	411, 515
COAST GUARD RESERVE-----	6, 413	27, 925	34, 338
On Active Duty-----	852	182	1, 034
Not on Active Duty-----	5, 561	27, 743	33, 304

¹ Includes officer candidates.² On continuous or extended active duty, and included in count of military personnel on active duty. Excludes reserves undergoing 2-week annual, 4-month minimum basic, etc., reserve training.

Table 28

RESERVE PERSONNEL NOT ON ACTIVE DUTY

	Ready Reserve	Standby Reserve	Retired Reserve	Total
DEPARTMENT OF DEFENSE				
June 30, 1965.....	1, 801, 507	471, 873	303, 025	2, 576, 405
June 30, 1966.....	1, 965, 626	467, 650	335, 352	2, 768, 628
DEPARTMENT OF THE ARMY				
June 30, 1965.....	1, 104, 419	233, 916	176, 212	1, 514, 547
June 30, 1966.....	1, 224, 077	233, 683	190, 663	1, 648, 423
<i>Army National Guard</i>				
June 30, 1965.....	385, 981	-----	-----	385, 981
June 30, 1966.....	426, 258	-----	-----	426, 258
<i>Army Reserve</i>				
June 30, 1965.....	718, 438	233, 916	176, 212	1, 128, 566
June 30, 1966.....	797, 819	233, 683	190, 663	1, 222, 165
DEPARTMENT OF THE NAVY				
June 30, 1965.....	427, 170	96, 616	77, 897	601, 683
June 30, 1966.....	452, 204	88, 527	88, 076	628, 807
<i>Naval Reserve</i>				
June 30, 1965.....	326, 980	71, 941	68, 760	467, 681
June 30, 1966.....	337, 153	64, 219	78, 458	479, 830
<i>Marine Corps Reserve</i>				
June 30, 1965.....	100, 190	24, 675	9, 137	134, 002
June 30, 1966.....	115, 051	24, 308	9, 618	148, 977
DEPARTMENT OF THE AIR FORCE				
June 30, 1965.....	269, 918	141, 341	48, 916	460, 175
June 30, 1966.....	289, 345	145, 440	56, 613	491, 398
<i>Air National Guard</i>				
June 30, 1965.....	76, 410	-----	-----	76, 410
June 30, 1966.....	79, 883	-----	-----	79, 883
<i>Air Force Reserve</i>				
June 30, 1965.....	193, 508	141, 341	48, 916	383, 765
June 30, 1966.....	209, 462	145, 440	56, 613	411, 515
COAST GUARD RESERVE				
June 30, 1965.....	29, 489	2, 624	741	32, 854
June 30, 1966.....	30, 075	2, 428	801	33, 304

Table 29

RESERVE PERSONNEL IN PAID STATUS

	Paid drill training			Paid ac- tive duty training only	Total in paid status
	Drill pay status	Active duty basic training	Total		
DEPARTMENT OF DEFENSE					
June 30, 1965.....	890, 581	41, 888	932, 469	70, 024	1, 002, 493
June 30, 1966.....	929, 204	39, 984	969, 188	84, 907	1, 054, 095
DEPARTMENT OF THE ARMY					
June 30, 1965.....	607, 861	32, 804	640, 665	54, 598	695, 263
June 30, 1966.....	643, 346	28, 552	671, 898	70, 545	742, 443
<i>Army National Guard</i>					
June 30, 1965.....	353, 806	25, 179	378, 985	-----	378, 985
June 30, 1966.....	399, 094	21, 830	420, 924	-----	420, 924
<i>Army Reserve</i>					
June 30, 1965.....	254, 055	7, 625	261, 680	54, 598	316, 278
June 30, 1966.....	244, 252	6, 722	250, 974	70, 545	321, 519
DEPARTMENT OF THE NAVY					
June 30, 1965.....	164, 731	4, 375	169, 106	11, 734	180, 840
June 30, 1966.....	167, 168	5, 228	172, 396	10, 697	183, 093
<i>Naval Reserve</i>					
June 30, 1965.....	122, 596	892	123, 488	9, 109	132, 597
June 30, 1966.....	122, 754	1, 049	123, 803	8, 034	131, 837
<i>Marine Corps Reserve</i>					
June 30, 1965.....	42, 135	3, 483	45, 618	2, 625	48, 243
June 30, 1966.....	44, 414	4, 179	48, 593	2, 663	51, 256
DEPARTMENT OF THE AIR FORCE					
June 30, 1965.....	117, 989	4, 709	122, 698	3, 692	126, 390
June 30, 1966.....	118, 690	6, 204	124, 894	3, 665	128, 559
<i>Air National Guard</i>					
June 30, 1965.....	73, 365	3, 045	76, 410	-----	76, 410
June 30, 1966.....	75, 098	4, 785	79, 883	-----	79, 883
<i>Air Force Reserve</i>					
June 30, 1965.....	44, 624	1, 664	46, 288	3, 692	49, 980
June 30, 1966.....	43, 592	1, 419	45, 011	3, 665	48, 676
COAST GUARD RESERVE					
June 30, 1965.....	16, 578	1, 800	18, 378	2, 990	21, 368
June 30, 1966.....	16, 041	1, 755	17, 796	1, 645	19, 441

Table 30

RESERVE ACTIVE DUTY BASIC TRAINING PROGRAMS ¹

	Enlistments	Entered active duty	Completed active duty
DEPARTMENT OF DEFENSE			
Fiscal Year 1965.....	117, 865	122, 465	157, 674
Fiscal Year 1966.....	204, 673	94, 088	92, 537
DEPARTMENT OF THE ARMY			
Fiscal Year 1965.....	95, 540	99, 877	134, 551
Fiscal Year 1966.....	171, 976	61, 647	64, 085
<i>Army National Guard</i>			
Fiscal Year 1965.....	68, 189	74, 626	92, 851
Fiscal Year 1966.....	109, 939	45, 878	47, 635
<i>Army Reserve</i>			
Fiscal Year 1965.....	27, 351	25, 251	41, 700
Fiscal Year 1966.....	62, 037	15, 769	16, 450
DEPARTMENT OF THE NAVY			
Fiscal Year 1965.....	9, 980	11, 465	10, 943
Fiscal Year 1966.....	15, 961	15, 263	12, 945
<i>Naval Reserve</i>			
Fiscal Year 1965.....	1, 617	1, 665	1, 810
Fiscal Year 1966.....	1, 524	1, 387	1, 332
<i>Marine Corps Reserve</i>			
Fiscal Year 1965.....	8, 363	9, 800	9, 133
Fiscal Year 1966.....	14, 437	13, 876	11, 613
DEPARTMENT OF THE AIR FORCE			
Fiscal Year 1965.....	12, 345	11, 123	12, 180
Fiscal Year 1966.....	16, 736	17, 178	15, 507
<i>Air National Guard</i>			
Fiscal Year 1965.....	8, 618	7, 558	8, 528
Fiscal Year 1966.....	11, 634	12, 063	10, 119
<i>Air Force Reserve</i>			
Fiscal Year 1965.....	3, 727	3, 565	3, 652
Fiscal Year 1966.....	5, 102	5, 115	5, 388
COAST GUARD RESERVE			
Fiscal Year 1965.....	3, 024	2, 957	2, 332
Fiscal Year 1966.....	2, 865	2, 953	2, 878

¹ Four or more months active duty reserve training under provisions of Sec. 511(d), Title 10, U.S. Code. Table includes enlisted personnel only; in addition, 4 Army Reserve officers entered active duty training and 7 completed it during fiscal year 1965, while 2 Army Reserve officers completed active duty training during fiscal year 1966.

Table 31

MEDICAL CARE IN DEFENSE FACILITIES

	Department of Defense	Army	Navy	Air Force
HOSPITAL ADMISSIONS				
<i>Active Duty Personnel</i>				
Fiscal Year 1965..	445, 558	175, 208	138, 413	131, 937
Fiscal Year 1966..	586, 479	270, 276	180, 874	135, 329
<i>Dependents and Others</i>				
Fiscal Year 1965..	657, 514	269, 692	143, 068	244, 754
Fiscal Year 1966..	617, 629	241, 831	140, 689	235, 109
TOTAL				
Fiscal Year 1965..	1, 103, 072	444, 900	281, 481	376, 691
Fiscal Year 1966..	1, 204, 108	512, 107	321, 563	370, 438
OUTPATIENT VISITS				
<i>Active Duty Personnel</i>				
Fiscal Year 1965..	20, 235, 614	7, 509, 273	6, 794, 042	5, 932, 299
Fiscal Year 1966..	22, 012, 893	8, 293, 579	7, 400, 294	6, 319, 020
<i>Dependents and Others</i>				
Fiscal Year 1965..	26, 485, 179	10, 084, 701	5, 980, 500	10, 419, 978
Fiscal Year 1966..	26, 611, 393	9, 890, 288	6, 196, 650	10, 524, 455
TOTAL				
Fiscal Year 1965..	46, 720, 793	17, 593, 974	12, 774, 542	16, 352, 277
Fiscal Year 1966..	48, 624, 286	18, 183, 867	13, 596, 944	16, 843, 475

Table 32

DEPENDENTS MEDICARE PROGRAM ¹

	Department of Defense	Army	Navy	Air Force
PHYSICIANS' CLAIMS PAID				
<i>Number</i>				
Fiscal Year 1965..	348,955	87,479	148,851	112,625
Fiscal Year 1966..	336,960	94,490	145,864	96,606
<i>Amount (in dollars)</i>				
Fiscal Year 1965..	27,018,434	6,804,009	11,484,251	8,730,174
Fiscal Year 1966..	26,008,588	7,287,420	11,160,688	7,560,480
CIVILIAN HOSPI- TAL CLAIMS PAID				
<i>Number</i>				
Fiscal Year 1965..	245,914	69,124	99,789	77,001
Fiscal Year 1966..	244,951	76,439	99,430	69,082
<i>Amount (in dollars)</i>				
Fiscal Year 1965..	41,988,309	11,388,809	17,578,853	13,020,647
Fiscal Year 1966..	44,568,167	13,232,136	18,724,140	12,611,891

¹ As of May 1, 1967. Due to time lag in billings, the above data are not complete.

Table 33

CONTRACT AWARDS BY PROGRAM

(Net in millions of dollars)

	Fiscal year 1965		Fiscal year 1966	
	Amount	Percent	Amount	Percent
MAJOR HARD GOODS				
Aircraft.....	5,964	21.3	8,002	20.9
Missile and Space Systems.....	4,479	16.0	4,395	11.5
Ships.....	1,810	6.5	1,433	3.7
Tank-Automotive.....	865	3.1	1,590	4.2
Weapons.....	304	1.0	521	1.4
Ammunition.....	779	2.8	2,913	7.6
Electronics-Communications Equip- ment.....	3,077	11.0	3,994	10.4
Total.....	17,278	61.7	22,848	59.7
SERVICES.....	2,410	8.6	3,041	8.0
ALL OTHER				
Subsistence.....	702	2.5	1,102	2.9
Textiles and Clothing.....	372	1.3	1,286	3.3
Fuels and Lubricants.....	1,194	4.3	1,342	3.5
Miscellaneous Hard Goods.....	1,189	4.3	2,768	7.2
Construction.....	1,541	5.5	1,856	4.9
Actions of less than \$10,000.....	3,311	11.8	4,000	10.5
Total.....	8,309	29.7	12,354	32.3
TOTAL.....	27,997	100.0	38,243	100.0

Table 34

CONTRACT AWARDS BY TYPE OF CONTRACTOR

(Net in millions of dollars)

	Department of Defense	Army	Navy	Air Force	Defense Supply Agency
INTRAGOVERNMENTAL					
Fiscal Year 1965-----	612	112	278	199	23
Fiscal Year 1966-----	1, 015	159	449	364	43
WORK OUTSIDE U.S.					
Fiscal Year 1965-----	1, 366	575	179	271	341
Fiscal Year 1966-----	2, 530	973	753	386	418
EDUCATIONAL AND NON-PROFIT INSTITUTIONS					
Fiscal Year 1965-----	738	165	179	393	1
Fiscal Year 1966-----	672	172	187	309	4
BUSINESS FIRMS FOR WORK IN THE U.S. ¹					
Fiscal Year 1965-----	25, 281	5, 475	8, 333	8, 796	2, 677
Fiscal Year 1966-----	34, 026	9, 994	9, 075	9, 682	5, 275
<i>Small Business Firms</i>					
Fiscal Year 1965-----	4, 943	1, 339	1, 375	1, 055	1, 174
Fiscal Year 1966-----	7, 269	1, 867	1, 753	1, 205	2, 444
<i>Small Business Percentage</i>					
Fiscal Year 1965-----	19. 6	24. 4	16. 5	12. 0	43. 9
Fiscal Year 1966-----	21. 4	18. 7	19. 3	12. 4	46. 3
TOTAL					
Fiscal Year 1965-----	27, 997	6, 327	8, 969	9, 659	3, 042
Fiscal Year 1966-----	38, 243	11, 298	10, 464	10, 741	5, 740

¹ For military functions only. Data for military and civil functions combined is as follows:

	Fiscal Year 1965	Fiscal Year 1966
Awards to Business Firms for Work in U.S.-----	\$26, 113	\$34, 878
Small Business Firms-----	\$5, 305	\$7, 611
Small Business Percentage-----	20. 3%	21. 8%

Table 35

CONTRACT AWARDS BY PRICING PROVISIONS

(Net in millions of dollars)

	Fiscal year 1965		Fiscal year 1966	
	Amount	Percent	Amount	Percent
FIXED PRICE				
Firm.....	12,857	52.8	19,277	57.5
Redeterminable.....	536	2.2	766	2.3
Incentive.....	4,040	16.6	5,327	15.9
Escalation.....	1,186	4.9	1,181	3.5
Total.....	18,619	76.5	26,551	79.2
COST REIMBURSEMENT				
No Fee.....	578	2.4	734	2.2
Fixed Fee.....	2,289	9.4	3,328	9.9
Incentive Fee.....	2,721	11.2	2,763	8.3
Time and Materials.....	86	.3	112	.3
Labor Hour.....	38	.2	27	.1
Total.....	5,712	23.5	6,964	20.8
TOTAL ACTIONS OF \$10,000 OR MORE				
Actions Less Than \$10,000 ²	3,054	-----	3,713	-----
Intragovernmental Orders ¹	612	-----	1,015	-----
TOTAL	27,997	-----	38,243	-----

¹ Pricing provisions not applicable.² Data on pricing provisions are not obtained for actions of less than \$10,000.

Table 36

CONTRACT AWARDS BY REGION AND STATE ¹

	Fiscal year 1965		Fiscal year 1966	
	Millions of dollars	Percent of U.S.	Millions of dollars	Percent of U.S.
NEW ENGLAND				
Maine.....	69	0.3	51	0.2
New Hampshire.....	53	.2	110	.3
Vermont.....	32	.1	81	.3
Massachusetts.....	1,179	5.1	1,336	4.2
Rhode Island.....	86	.4	132	.4
Connecticut.....	1,180	5.1	2,051	6.5
Total.....	2,599	11.2	3,761	11.9
MIDDLE ATLANTIC				
New York.....	2,230	9.6	2,819	8.9
New Jersey.....	820	3.5	1,090	3.4
Pennsylvania.....	989	4.2	1,665	5.3
Total.....	4,039	17.3	5,574	17.6
SOUTH ATLANTIC				
Delaware.....	38	.2	38	.1
Maryland.....	584	2.5	843	2.7
District of Columbia.....	248	1.0	328	1.0
Virginia.....	469	2.0	426	1.3
West Virginia.....	90	.4	149	.5
North Carolina.....	288	1.2	449	1.4
South Carolina.....	82	.4	176	.6
Georgia.....	663	2.8	799	2.5
Florida.....	633	2.7	767	2.4
Total.....	3,095	13.2	3,975	12.5
SOUTH CENTRAL				
Kentucky.....	43	.2	70	.2
Tennessee.....	197	.8	502	1.6
Alabama.....	165	.7	282	.9
Mississippi.....	152	.7	162	.5
Arkansas.....	39	.2	96	.3
Louisiana.....	256	1.1	303	1.0
Oklahoma.....	120	.5	158	.5
Texas.....	1,447	6.2	2,292	7.2
Total.....	2,419	10.4	3,865	12.2

See footnotes at end of table.

Table 36—Continued

CONTRACT AWARDS BY REGION AND STATE ¹—Continued

	Fiscal year 1965		Fiscal year 1966	
	Millions of dollars	Percent of U.S.	Millions of dollars	Percent of U.S.
EAST NORTH CENTRAL				
Ohio.....	863	3.7	1,589	5.0
Indiana.....	605	2.6	1,068	3.4
Illinois.....	422	1.8	920	2.9
Michigan.....	533	2.3	918	2.9
Wisconsin.....	203	.9	365	1.1
Total.....	2,626	11.3	4,860	15.3
WEST NORTH CENTRAL				
Minnesota.....	259	1.1	498	1.6
Iowa.....	134	.6	248	.8
Missouri.....	1,061	4.6	1,113	3.5
North Dakota.....	49	.2	83	.3
South Dakota.....	21	.1	23	.1
Nebraska.....	43	.2	80	.3
Kansas.....	229	1.0	313	1.0
Total.....	1,796	7.8	2,358	7.6
MOUNTAIN				
Montana.....	69	.3	14	(²)
Idaho.....	12	.1	20	(²)
Wyoming.....	8	(²)	11	(²)
Colorado.....	249	1.1	256	.8
Utah.....	191	.8	170	.5
New Mexico.....	84	.4	86	.3
Arizona.....	177	.8	248	.8
Nevada.....	19	.1	32	.1
Total.....	809	3.6	837	2.5
PACIFIC				
Washington.....	545	2.3	444	1.4
Oregon.....	40	.2	90	.3
California.....	5,154	22.1	5,813	18.3
Total.....	5,739	24.6	6,347	20.0
ALASKA AND HAWAII				
Alaska.....	74	.3	72	.2
Hawaii.....	72	.3	64	.2
Total.....	146	.6	136	.4

¹ Includes supply, RDT&E, services, construction, and facility prime contract awards of \$10,000 or more within the United States, totaling \$23,268 million during fiscal year 1965 and \$31,713 million during fiscal year 1966.

² Less than 0.05 percent.

Table 37

CONTRACT AWARDS BY COMPETITIVE STATUS

(Net in millions of dollars)

	Fiscal year 1965		Fiscal year 1966	
	Amount	Percent	Amount	Percent
COMPETITIVE				
Formally Advertised.....	4,817	17.6	5,283	14.2
Restricted to Small Business and Labor Surplus Areas.....	1,622	5.9	1,751	4.7
Open Market Purchases of \$2,500 or Less within U.S. ²	1,393	5.1	1,705	4.6
Other Price Competition ³	4,052	14.8	7,800	20.9
Total.....	11,884	43.4	16,539	44.4
NON-COMPETITIVE				
Design or Technical Competition....	1,447	5.3	2,062	5.6
Follow-on Contracts after Price or Design Competition.....	7,054	25.8	7,449	20.0
One-Source Solicitation.....	7,000	25.5	11,178	30.0
Total.....	15,501	56.6	20,689	55.6
TOTAL, EXCEPT INTRAGOVERN- MENTAL ORDERS.....	27,385	100.0	37,228	100.0
Intragovernmental Orders ¹	612	-----	1,015	-----
TOTAL.....	27,997	-----	38,243	-----

¹ Competitive status not applicable.² Price competition required on actions of \$250 or more and assumed for actions below \$250.³ Contracts awarded through negotiation after requesting proposals from 2 or more suppliers.

Table 38

DEFENSE-WIDE SUPPLY

	Line items centrally managed	Net inventory investment (\$ millions)	Annual sales (\$ millions)	Annual obligation (\$ millions)
<i>Clothing and Textiles</i>				
June 30, 1965.....	21,900	735.8	363.1	316.8
June 30, 1966.....	22,200	630.6	647.7	1,182.4
<i>Construction Supplies</i>				
June 30, 1965.....	272,800	201.1	125.8	120.1
June 30, 1966.....	321,600	217.9	244.7	590.1
<i>Electronic Supplies</i>				
June 30, 1965.....	555,600	406.5	152.8	127.0
June 30, 1966.....	524,000	403.9	209.2	218.0
<i>Fuel²</i>				
June 30, 1965.....	-----	-----	-----	(3)
June 30, 1966.....	-----	-----	-----	(3)
<i>General Supplies</i>				
June 30, 1965 ²	95,900	160.4	161.2	169.6
June 30, 1966.....	99,400	181.3	328.4	476.5
<i>Industrial Supplies</i>				
June 30, 1965.....	410,700	216.8	109.9	94.7
June 30, 1966.....	354,400	220.3	186.1	276.9
<i>Medical Supplies</i>				
June 30, 1965.....	11,200	164.3	106.0	119.6
June 30, 1966.....	11,400	179.4	164.1	249.3
<i>Subsistence</i>				
June 30, 1965.....	800	92.0	857.0	878.0
June 30, 1966.....	800	160.8	1,141.8	1,252.5

DSA SUPPLY CENTERS

TOTAL

June 30, 1965.....	1,368,900	1,976.9	¹ 1,876.3	1,825.8
June 30, 1966.....	1,333,800	1,994.1	2,923.2	4,245.7

¹ Includes \$0.5 million other miscellaneous income.² The Defense Fuel Supply Center (DFSC) differs from other centers in that the military Services retain ownership of their wholesale bulk fuel (petroleum) stocks. DFSC procures all types of petroleum products, but transferred its residual inventory control functions (for packaged products) to the Defense General Supply Center (DGSC) in March 1965.³ Procurement awards by DFSC for petroleum totaled \$1,167 million in fiscal year 1965 and \$1,302.7 million in fiscal year 1966.

Table 39

EXCESS MATERIEL

(Millions of dollars)

	Fiscal year 1965	Fiscal year 1966
UTILIZATION WITHIN DEPARTMENT OF DEFENSE		
Wholesale Inter-Service Supply Support.....	851	403
Intra-Service ¹	252	1,068
Inter-Service.....	357	388
Total.....	1,460	1,859
OTHER UTILIZATION AND DISPOSAL		
Military Assistance Program.....	162	227
Utilization by Other Federal Agencies.....	233	377
Donations.....	282	285
Sold as Usable Property.....	975	804
Designated for Sale as Scrap.....	2,983	2,614
Other Dispositions.....	219	158
Destroyed or Abandoned.....	129	115
Total.....	4,983	4,580
TOTAL GROSS UTILIZATION AND DISPOSAL	6,443	6,439
CASH PROCEEDS REALIZED.....	121	119

¹ Excludes intra-Service transfers of property by property officers.

Table 40

FEDERAL CATALOG SYSTEM

	Fiscal year 1965		Fiscal year 1966	
FEDERAL CATALOG				
<i>Number of Items at Beginning of Year</i> -----	4, 290, 563		4, 203, 208	
Number of Items Added-----	377, 269		385, 103	
Number of Items Deleted-----	464, 624		405, 395	
Net Change-----	- 87, 355		- 20, 292	
<i>Number of Items at End of Year</i> -----	4, 203, 208		4, 182, 916	
Department of Defense Items-----	3, 838, 767		3, 846, 086	
Other Agency Items---	364, 441		336, 830	
	June 30, 1965		June 30, 1966	
	Number	Per- cent	Number	Per- cent
INTER-SERVICE USE				
<i>Army</i>				
Items in Use-----	1, 122, 632	-----	1, 160, 086	-----
Items Also Used by Other Services-----	377, 014	33. 6	399, 167	34. 4
<i>Navy</i>				
Items in Use-----	1, 366, 280	-----	1, 450, 494	-----
Items Also Used by Other Services-----	333, 409	24. 4	370, 879	25. 6
<i>Marine Corps</i>				
Items in Use-----	263, 104	-----	265, 567	-----
Items Also Used by Other Services-----	176, 146	66. 9	181, 935	68. 5
<i>Air Force</i>				
Items in Use-----	1, 599, 866	-----	1, 646, 296	-----
Items Also Used by Other Services-----	372, 389	23. 3	408, 225	24. 8

Table 41

COST REDUCTION PROGRAM

(In millions of dollars)

	Estimated savings to be realized in ¹			
	FY 1963	FY 1964	FY 1965	FY 1966
BUYING ONLY WHAT WE NEED				
Refining Requirement Calculations				
Major items of equipment ² -----	90	487	1, 060	803
Initial provisioning-----	163	218	368	215
Secondary items-----	481	643	626	53
Technical manuals-----	-----	10	9	8
Technical data and reports-----	-----	2	6	13
Production base facilities-----	35	14	18	4
Increased Use of Excess Inventory in lieu of new procurement				
Equipment and supplies-----	-----	57	169	114
Idle production equipment-----	1	-----	4	20
Excess contractor inventory-----	18	14	8	29
Eliminating "Goldplating" (Value Engineering)-----	72	76	204	324
Inventory Item Reduction-----	-----	-----	83	82
Total Buying Only What We Need--	860	1, 521	2, 555	1, 665
BUYING AT THE LOWEST SOUND PRICE				
Shift from Non-Competitive to Competitive Procurement				
Total percent competitive ³ -----	(37. 1)	(39. 1)	(43. 4)	(44. 4)
Total amount of savings-----	237	448	641	551
Shift from CPFF to Fixed or Incentive Price				
Total percent CPFF ⁴ -----	(20. 7)	(12. 0)	(9. 4)	(9. 9)
Total amount of savings-----	-----	100	436	600
Direct Purchase Breakout-----	-----	5	6	14
Multi-Year Procurement-----	-----	-----	67	70
Total Buying at Lowest Sound Price--	237	553	1, 150	1, 235

See footnotes at end of table.

Table 41—Continued

COST REDUCTION PROGRAM—Continued

(In millions of dollars)

	Estimated savings to be realized in ¹			
	FY 1963	FY 1964	FY 1965	FY 1966
REDUCING OPERATING COSTS				
Terminating Unnecessary Operations	123	334	484	794
Consolidation and Standardization				
DSA operating expense savings ²	31	42	59	60
Consolidation of contract administration	-----	-----	-----	5
Departmental operating expense savings	-----	95	186	230
Increasing Efficiency of Operations				
Improving telecommunications management	80	131	118	153
Improving transportation and traffic management	24	7	35	84
Improving equipment maintenance management	-----	65	117	93
Improving noncombat vehicle management	2	18	24	30
Reduced use of contract technicians	-----	20	26	9
Improving military housing management	6	13	16	18
Improving real property management	23	25	46	54
Packaging, preserving and packing	-----	7	8	30
Total Reducing Operating Costs	289	757	1, 119	1, 560
MILITARY ASSISTANCE PROGRAM (MAP)				
Total MAP	-----	-----	19	3
TOTAL PROGRAM	1, 386	2, 831	4, 843	4, 463

¹ Includes certain one-time savings not expected to recur in the same amounts in future years.² In addition, fiscal year 1962 "requirements" for major items of equipment were reduced by \$24 billion. In fiscal year 1963, the Army reduced 1964 pipeline requirements by \$500 million.³ Fiscal year 1961 was 32.9 percent. Savings are 25 percent per dollar converted.⁴ First 9 months of fiscal year 1961 was 38 percent. Savings are 10 percent per dollar converted.⁵ Excludes DSA inventory drawdown without replacement of \$38 million for fiscal year 1962; \$262 million in fiscal year 1963; \$161 million in fiscal year 1964; \$51 million in fiscal year 1965.

Table 42

MAJOR STORAGE FACILITIES

(In millions of square feet)

	Fiscal year 1965	Fiscal year 1966
COVERED SPACE ¹		
Beginning of Fiscal Year.....	324.7	318.3
Net Reduction.....	-6.4	-21.7
End of Fiscal Year.....	318.3	296.6
OCCUPIED OPEN SPACE ²		
Beginning of Fiscal Year.....	92.9	86.6
Net Reduction.....	-6.3	-2.8
End of Fiscal Year.....	86.6	83.8
CROSS-SERVICING OF COVERED SPACE ¹	24.1	23.6
Among Defense Agencies.....	17.5	17.7
National Stockpile.....	5.9	5.1
Other Government Agencies.....	.7	.8
CROSS-SERVICING OF OCCUPIED OPEN SPACE ²	22.6	19.1
Among Defense Agencies.....	4.9	4.3
National Stockpile.....	17.0	14.3
Other Government Agencies.....	.7	.5

¹ Includes the gross interior area of buildings used for storage or in support of storage activities.² Includes the open area actually utilized for storage, exclusive of roadways, storage support activities, etc.

Table 43

PROPERTY HOLDINGS

(Acquisition cost in billions of dollars)

	Department of Defense	Army	Navy	Air Force	Defense agencies
PERSONAL PROPERTY					
<i>Material in Use</i>					
June 30, 1965.....	85.0	9.4	¹ 41.2	34.3	(²)
June 30, 1966.....	87.6	9.6	42.9	35.1	-----
<i>In Supply System</i>					
June 30, 1965.....	37.1	11.2	12.8	11.0	2.1
June 30, 1966.....	37.7	11.9	12.7	11.0	2.1
<i>Plant Equipment</i>					
June 30, 1965.....	9.8	3.9	3.3	2.0	.6
June 30, 1966.....	10.7	4.3	3.4	2.3	.6
<i>Government-Provided Material</i>					
June 30, 1965.....	1.7	.3	.1	1.3	(²)
June 30, 1966.....	4.7	.6	2.6	1.4	(²)
<i>Industrial Funds</i>					
June 30, 1965.....	.2	(²)	.2	(²)	(²)
June 30, 1966.....	.3	(²)	.3	(²)	(²)
<i>Excess and Surplus</i>					
June 30, 1965.....	3.5	.5	1.5	1.4	.1
June 30, 1966.....	2.7	.3	1.0	1.3	.1
Total					
June 30, 1965.....	137.2	25.4	59.0	50.1	2.8
June 30, 1966.....	143.7	26.9	62.9	51.1	2.8
REAL PROPERTY					
June 30, 1965.....	37.6	10.7	10.2	16.6	-----
June 30, 1966.....	38.4	11.0	10.4	17.0	-----
CONSTRUCTION IN PROGRESS					
June 30, 1965.....	1.4	.3	.5	.6	-----
June 30, 1966.....	1.5	.4	.6	.5	-----
TOTAL PROPERTY HOLDINGS—ALL TYPES					
June 30, 1965.....	176.2	36.4	69.7	67.3	2.8
June 30, 1966.....	183.6	38.2	73.9	68.6	2.8

¹ Includes \$1.9 billion for June 30, 1965, and \$2.0 billion for June 30, 1966, of expenditures for work in place on vessels under construction or conversion.

² Less than \$50 million.

Table 44

REAL PROPERTY HOLDINGS

	Department of Defense	Army	Navy	Air Force
ACQUISITION COST (In Millions of Dollars)				
<i>United States</i>				
June 30, 1965.....	32,042	9,653	8,675	13,714
June 30, 1966.....	32,566	9,720	8,831	14,015
<i>U.S. Possessions</i>				
June 30, 1965.....	1,154	151	664	339
June 30, 1966.....	1,314	286	672	356
<i>Foreign Countries</i>				
June 30, 1965.....	4,361	944	878	2,540
June 30, 1966.....	4,510	985	914	2,611
TOTAL				
June 30, 1965.....	37,557	10,747	10,217	16,592
June 30, 1966.....	38,390	10,991	10,417	16,982
ACREAGE (In Millions of Acres)				
By Location				
<i>United States</i>				
June 30, 1965.....	27.2	14.0	3.7	9.5
June 30, 1966.....	27.6	14.1	4.1	9.4
<i>U.S. Possessions</i>				
June 30, 1965.....	.2	.1	.1	(¹)
June 30, 1966.....	.2	.1	.1	(¹)
<i>Foreign Countries</i>				
June 30, 1965.....	3.4	.9	.4	2.1
June 30, 1966.....	3.2	1.0	.2	2.0
TOTAL				
June 30, 1965.....	30.9	15.0	4.2	11.6
June 30, 1966.....	31.0	15.2	4.5	11.4
By Type of Control				
<i>Owned Outright</i>				
June 30, 1965.....	7.2	4.1	1.4	1.7
June 30, 1966.....	7.3	4.2	1.4	1.7
<i>Public Domain and Public Lands</i>				
June 30, 1965.....	16.6	7.4	2.2	7.1
June 30, 1966.....	16.6	7.3	2.3	7.0
<i>Leased, Easements, etc.</i>				
June 30, 1965.....	3.7	2.6	.2	.8
June 30, 1966.....	4.0	2.7	.5	.8
<i>Foreign Rights</i>				
June 30, 1965.....	3.3	.9	.4	2.0
June 30, 1966.....	3.1	1.0	.2	1.9

¹ Air Force controlled only 39,895 acres in U.S. possessions on June 30, 1965, and 39,894 acres on June 30, 1966.

Table 45

FAMILY HOUSING

	June 30, 1965	June 30, 1966
TOTAL UNITS—MILITARY OWNED AND CONTROLLED.....	377, 159	374, 703
<i>Adequate</i>	341, 194	342, 067
Capehart.....	114, 749	112, 530
Wherry (Acquired).....	74, 400	69, 792
Leased.....	6, 044	7, 048
Surplus Commodity.....	6, 783	7, 003
Other Public Quarters.....	132, 471	139, 527
Wherry (Privately Owned).....	4, 010	3, 917
Rental Guaranty.....	2, 737	1, 255
810 Housing.....	-----	995
<i>Inadequate</i>	35, 965	32, 636
UNITS UNDER CONSTRUCTION.....	12, 190	6, 363
Appropriated Funds.....	11, 842	6, 363
Surplus Commodity.....	348	-----

Table 46

DEFENSE-WIDE TRANSPORTATION SERVICES

	Department of Defense	Military Airlift Command	Military Sea Transportation Service	Military Traffic Management and Terminal Service ¹
PASSENGERS MOVED				
Fiscal Year 1965---	6, 229, 000	1, 355, 000	413, 000	4, 461, 000
Fiscal Year 1966---	7, 846, 000	1, 848, 000	309, 000	5, 689, 000
CARGO MOVED (In Short Tons)				
<i>Dry Cargo Tonnage</i>				
Fiscal Year 1965---	16, 170, 000	253, 000	6, 955, 000	8, 962, 000
Fiscal Year 1966---	21, 777, 000	338, 000	10, 987, 000	10, 452, 000
<i>Petroleum Tonnage</i>				
Fiscal Year 1965---	33, 479, 000	-----	19, 854, 000	13, 625, 000
Fiscal Year 1966---	36, 123, 000	-----	22, 176, 000	13, 947, 000
TOTAL				
Fiscal Year 1965---	49, 649, 000	253, 000	26, 809, 000	22, 587, 000
Fiscal Year 1966---	57, 900, 000	338, 000	33, 163, 000	24, 399, 000
COSTS (\$ Millions)				
<i>Payments for Commer- cial Services</i>				
Fiscal Year 1965---	1, 195	231	355	609
Fiscal Year 1966---	1, 935	394	690	² 851
<i>Other Costs</i>				
Fiscal Year 1965---	344	216	118	10
Fiscal Year 1966---	476	233	146	97
TOTAL				
Fiscal Year 1965---	1, 539	447	473	³ 619
Fiscal Year 1966---	2, 411	627	836	² ³ 948

¹ Operations of this agency are limited to the continental United States, except for the movement of household goods.

² The increases reflected are in part attributable to the transfer of the Terminal Service function from the Army Materiel Command to MTMTS in fiscal year 1966.

³ Includes payments made by the Military Services to commercial carriers for transportation and the administrative costs of the traffic management agency. Excludes cargo tonnages and expenses for through-billed household goods moved to and from overseas locations—134,700 tons at a cost of \$90 million during fiscal year 1965 and 163,800 tons at a cost of \$103 million during fiscal year 1966.

Table 47

MILITARY ASSISTANCE, 1950-66

(In millions of dollars)

Fiscal year	Appropriations	Transfers, reimbursements, and rescissions	Available for obligation	Obligations and reservations	Expenditures
1950-----	1,314.0	.1	1,314.1	1,101.0	51.7
1951-----	5,222.5	.9	5,223.4	4,676.9	934.2
1952-----	5,744.0	-476.4	5,267.6	5,591.2	2,385.9
1953-----	4,219.8	-237.9	3,981.9	2,512.1	3,953.1
1954-----	3,230.0	-329.6	2,900.4	2,383.7	3,629.5
1955-----	1,252.7	-478.1	774.6	3,163.2	2,297.3
1956-----	1,022.2	-11.9	1,010.3	848.7	2,620.1
1957-----	2,017.5	-9.7	2,007.8	1,664.5	2,356.3
1958-----	1,340.0	-29.0	1,311.0	1,828.4	2,189.8
1959-----	1,515.0	27.8	1,542.8	1,512.2	2,368.1
1960-----	1,300.0	57.2	1,357.2	1,358.4	1,635.4
1961-----	1,800.0	-6.0	1,794.0	1,786.9	1,466.2
1962-----	1,600.0	-8.4	1,591.5	1,585.4	1,404.6
1963-----	1,325.0	79.2	1,404.2	1,442.7	1,767.2
1964-----	1,000.0	167.3	1,167.3	1,188.6	1,533.4
1965-----	¹ 1,130.0	62.5	1,192.5	1,174.7	1,272.6
1966-----	¹ 1,470.0	² -498.8	971.2	977.3	1,114.3
TOTAL ³ -----	36,502.8	-1,690.8	34,811.9	34,795.9	32,979.7

¹ Includes \$75 million Sec. 510 "Special Authority" in fiscal year 1965 and \$300 million in fiscal year 1966.² Reflects transfer of financing responsibility for support of military assistance free world countries in Vietnam from the Military Assistance Program to the military departments.³ Includes "Common Use Item" appropriation administered by the Agency for International Development.

Table 48

MILITARY ASSISTANCE DELIVERIES

(In millions of dollars)

	Fiscal year 1965	Fiscal year 1966	Fiscal years 1950-66
EUROPE			
Belgium.....	4.8	1.6	1,235.6
Denmark.....	48.1	20.1	610.6
France.....	4.9	-1.6	4,153.0
Germany.....	.2	-.1	900.8
Italy.....	94.2	3.2	2,284.8
Luxembourg.....	(1)	-----	8.2
Netherlands.....	49.7	.1	1,214.1
Norway.....	35.3	42.8	819.0
Portugal.....	9.5	-.5	308.5
Spain.....	40.6	35.5	532.4
United Kingdom.....	.4	-.1	1,034.5
Yugoslavia.....	-----	-----	693.9
Europe Area.....	3.7	2.6	207.5
Total	291.4	103.6	14,002.8
NEAR EAST			
Afghanistan.....	.1	.2	3.1
Greece.....	104.0	78.7	1,303.9
Iran.....	49.9	41.1	670.3
Iraq.....	.2	.2	46.6
Jordan.....	4.6	2.8	36.1
Lebanon.....	.1	.1	8.7
Saudi Arabia.....	.8	1.5	32.3
Syria.....	(1)	(1)	(1)
Turkey.....	118.4	100.4	2,303.1
Yemen.....	(1)	(1)	(1)
Near East Area.....	-.3	-----	19.1
Total	277.8	225.1	4,423.1
AFRICA			
Cameroon.....	-----	-----	.2
Congo.....	2.3	3.6	11.0
Dahomey.....	-----	-----	.1
Ethiopia.....	8.3	10.7	91.6
Ghana.....	-----	-----	(1)
Guinea.....	(1)	.7	.7
Ivory Coast.....	-----	-----	.1
Liberia.....	.5	.6	3.7
Libya.....	2.2	1.7	9.8
Mali.....	.5	.5	2.1
Morocco.....	2.3	3.1	21.5

See footnotes at end of table.

Table 48—Continued

MILITARY ASSISTANCE DELIVERIES—Continued

(In millions of dollars)

	Fiscal year 1965	Fiscal year 1966	Fiscal year 1950-66
AFRICA—Continued			
Niger.....			. 1
Nigeria.....	. 3	. 3	. 8
Senegal.....	. 1	. 1	2. 4
Sudan.....	(1)	. 3	. 4
Tunisia.....	. 9	. 5	15. 6
Upper Volta.....	(1)	(1)	. 1
Africa Area.....			
Total.....	17. 4	22. 2	160. 2
FAR EAST			
Cambodia.....	. 3		87. 1
China, Republic of.....	84. 8	76. 5	2, 240. 7
Indo China.....			709. 6
Indonesia.....	2. 1	—4. 8	63. 2
Japan.....	29. 6	1. 2	821. 3
Korea.....	173. 1	153. 1	2, 148. 1
Malaysia, Federation of.....	(1)	. 2	. 2
Philippines.....	18. 2	26. 1	322. 7
Thailand.....	36. 4	40. 7	540. 7
Vietnam.....	274. 7	213. 4	1, 511. 7
Far East Area.....	14. 9	13. 7	243. 7
Total.....	634. 1	519. 9	8, 689. 1
LATIN AMERICA			
Argentina.....	6. 0	6. 4	16. 7
Bolivia.....	1. 9	2. 4	13. 0
Brazil.....	11. 4	9. 5	180. 6
Chile.....	6. 3	8. 4	74. 5
Colombia.....	5. 7	8. 3	59. 6
Costa Rica.....	. 2	. 1	1. 6
Cuba.....			10. 6
Dominican Republic.....	1. 2	1. 7	12. 6
Ecuador.....	2. 3	3. 9	31. 0
El Salvador.....	. 8	. 7	4. 1
Guatemala.....	1. 5	1. 2	9. 3
Haiti.....			3. 2
Honduras.....	. 7	. 7	4. 4
Jamaica.....	. 4		. 6
Mexico.....	. 2	. 2	1. 3
Nicaragua.....	1. 2	1. 0	7. 9
Panama.....	. 2	. 4	1. 8
Paraguay.....	. 9	1. 0	4. 0

See footnotes at end of table.

Table 48—Continued

MILITARY ASSISTANCE DELIVERIES—Continued

(In millions of dollars)

	Fiscal year 1965	Fiscal year 1966	Fiscal year 1950-66
LATIN AMERICA—Continued			
Peru.....	8.2	7.3	66.6
Uruguay.....	2.4	2.5	34.2
Venezuela.....	1.3	1.0	5.4
Latin America Area.....	3.0	3.3	13.8
Total.....	55.8	60.0	556.8
WORLDWIDE AND REGIONAL PRO- GRAMS ²			
	-37.1	123.6	3,850.0
TOTAL, DELIVERIES UNDER GRANT AID ³			
	1,239.4	1,054.4	31,682.0

¹ Less than \$50,000.² Includes totals for countries which must remain classified because of intergovernmental agreements or because of their sensitive nature.³ Includes only grant aid deliveries chargeable to Military Assistance Program appropriations. Additional military materiel and services valued at \$81.3 million were delivered during fiscal year 1966 under the credit assistance provisions of the Foreign Assistance Act, for a total of \$464.3 million delivered in credit assistance since 1950. Furthermore, military weapons, equipment, and supplies excess to U.S. needs and valued at acquisition costs of \$139.9 million were delivered to grant aid countries during fiscal year 1966 without charge to MAP appropriations except for rehabilitation and transportation costs, bringing total deliveries of excess stocks to \$2,934.2 million since 1950.

Table 49

MILITARY ASSISTANCE OBLIGATIONS AND EXPENDITURES

(In millions of dollars)

Budget activity	Obligations/Reservations		Expenditures	
	FY 1966	FY 1950-66	FY 1966	FY 1950-66
GRANT AID PROGRAM				
<i>Equipment and Supplies</i>				
Aircraft.....	150.4	6,688.6	173.9	6,370.2
Ships.....	85.3	1,930.1	72.3	1,806.5
Vehicles and Weapons.....	186.6	7,449.0	136.5	7,162.4
Ammunition.....	70.5	4,247.3	44.7	4,149.3
Missiles.....	13.5	1,349.0	119.5	1,318.3
Communications				
Equipment.....	53.2	2,018.1	46.6	1,851.0
Other Equipment and Supplies.....	135.7	2,578.0	110.0	2,351.9
<i>Services</i>				
Construction.....	11.4	498.4	25.5	473.5
Repair and Rehabilitation.....	30.2	512.8	11.1	475.1
Supply Operations.....	132.0	2,153.9	142.0	2,143.8
Training.....	62.8	1,115.5	65.1	1,091.7
<i>Other Services</i>				
Administrative Expenses.....	24.4	376.6	24.4	370.6
Infrastructure.....	63.5	1,067.1	50.5	940.2
International Military				
Headquarters.....	16.9	129.0	18.1	119.0
Mutual Weapons Development Program.....		272.1	2.5	270.7
Other Special Projects and Services.....	41.2	732.8	-11.1	714.2
Total.....	1,077.7	33,118.4	1,031.5	31,608.3
SALES PROGRAM.....	192.4	767.0	81.3	464.3
ECONOMIC PROGRAM.....	1.9	910.5	1.5	907.0
RECOUPMENT OF PRIOR YEAR PROGRAMS.....	-147.6	NA	NA	NA
Obligations/Reservations Transferred.....	-147.1	NA	NA	NA
TOTAL ¹	977.3	34,795.9	1,114.3	32,979.7
BY AGENCY				
Army.....	462.4	16,942.8	527.9	16,255.4
Navy.....	147.3	4,178.8	212.8	3,821.5
Air Force.....	222.3	10,861.5	294.7	10,341.4
OSD.....	142.1	1,639.3	73.6	1,388.2
Other Agencies.....	3.1	1,173.4	5.4	1,173.2
TOTAL.....	977.3	34,795.9	1,114.3	32,979.7

NOTE.—NA—Not applicable

¹ Includes "Common Use Items" appropriation administered by the Agency for International Development.

