

DEPARTMENT OF DEFENSE



ANNUAL REPORT

FOR FISCAL YEAR

1968

Including the Reports of the

SECRETARY OF DEFENSE

SECRETARY OF THE ARMY

SECRETARY OF THE NAVY

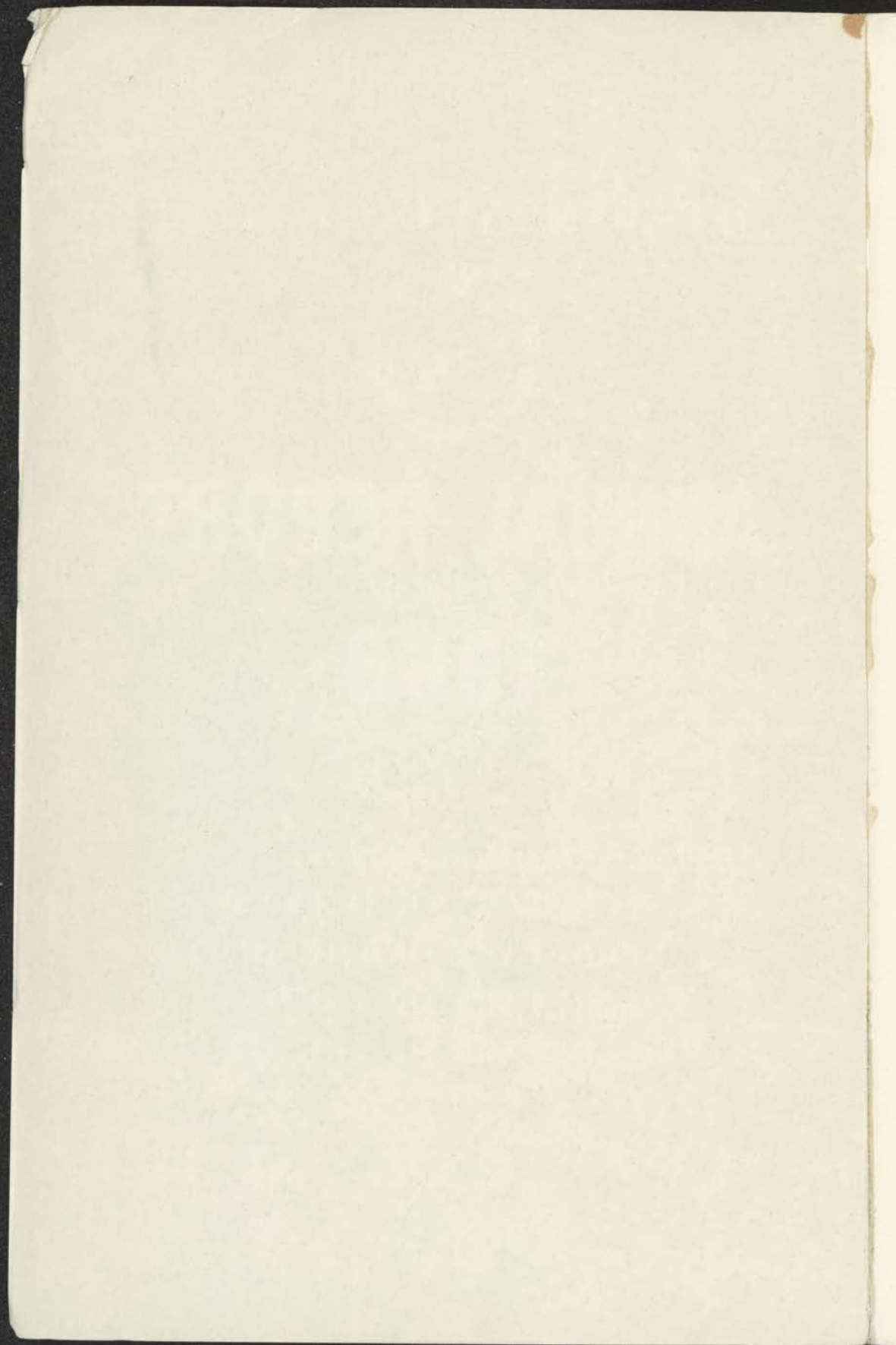
SECRETARY OF THE AIR FORCE

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SECRETARY OF DEFENSE
SECRETARY OF THE ARMY
SECRETARY OF THE NAVY
SECRETARY OF THE AIR FORCE

U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON : 1971

For sale by the Superintendent of Documents, U.S. Government Printing Office
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D1.1: 968

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Letter of Transmittal

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 1968, 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, appearing to read "Melvin R. Laird". The signature is fluid and cursive, with the first name "Melvin" being the most prominent part.

MELVIN R. LAIRD

THE PRESIDENT
THE WHITE HOUSE

Letter of Transmittal
For the Report on
Washington

Dear Mr. President:

In compliance with Section 101(a) of the National Security Act of 1947, as amended, I submit the annual report of the Department of Defense for the fiscal year 1955, together with the reports of the Secretaries of the Army, Navy, and Air Force for the same period.

Very respectfully,
Your obedient servant,



Louis B. Nichols

The President
The White House

Contents

ANNUAL REPORT OF THE SECRETARY OF DEFENSE

	Page
CHAPTER I. OPERATIONAL HIGHLIGHTS	3
II. OPERATIONAL FORCES	18
III. DEFENSE MANAGEMENT	56
Annual Report of the Reserve Forces Policy Board ..	95
Annual Report of the Defense Supply Agency	113

ANNUAL REPORT OF THE SECRETARY OF THE ARMY

CHAPTER I. INTRODUCTION	145
II. OPERATIONAL FORCES	150
III. FORCE DEVELOPMENT	169
IV. PERSONNEL	180
V. RESERVE FORCES	203
VI. MANAGEMENT, BUDGET, AND FUNDS	211
VII. LOGISTICS	224
VIII. RESEARCH AND DEVELOPMENT	244
IX. CIVIL WORKS AND MILITARY ENGINEERING	253
X. SPECIAL FUNCTIONS	268
XI. MILITARY ASSISTANCE AND FOREIGN LIAISON	274
XII. SUMMARY	278
Annual Report of the Office of Civil Defense	281

ANNUAL REPORT OF THE SECRETARY OF THE NAVY

CHAPTER I. INTRODUCTION	313
II. PROGRAMS AND EXPENDITURES	315
III. NAVY AND MARINE CORPS OPERATIONS AND EXERCISES	317
IV. SEAPOWER CAPABILITIES	333
V. ECONOMY AND EFFICIENCY	370
VI. CIVILIAN ECONOMY RELATIONS	383
VII. CONCLUSION	385

ANNUAL REPORT OF THE SECRETARY OF THE AIR FORCE

CHAPTER I. INTRODUCTION	391
II. STRATEGIC FORCES	392
III. DEFENSE FORCES	399
IV. GENERAL PURPOSE FORCES	405
V. AIRLIFT FORCES	414

	Page
VI. SPECIALIZED FORCES	423
VII. THE U.S. AIR FORCE IN VIETNAM	430
VIII. MANPOWER AND TRAINING	440
IX. RESEARCH AND DEVELOPMENT	461
X. MANAGEMENT	476
Appendix	496

**Annual Report
of the
SECRETARY OF DEFENSE**

July 1, 1967, to June 30, 1968

Contents

	Page
CHAPTER I. OPERATIONAL HIGHLIGHTS	3
The Forces in Vietnam	4
Allied Combat Operations	7
Supporting Activities	13
Increased Tension in Korea	16
II. OPERATIONAL FORCES	19
Strategic Forces	19
General Purpose Forces	26
Airlift and Sealift Forces	37
Reserve Forces	40
Defense Space Programs	45
Nuclear Effects and Test Detection	47
Collective Security	49
III. DEFENSE MANAGEMENT	57
Financial Management	57
Manpower	66
Research and Development	78
Logistics	80

I. Operational Highlights

Fiscal year 1968 opened a new chapter in the troubled history of the Republic of Vietnam. Contributing to the changing situation were the installation of an elected government in the Republic of Vietnam, the demonstrated capability of U.S., Third Country, and Vietnamese forces to deny a military victory to the enemy, the rapid recovery from the disruptive effects of the Communists' Tet offensive of January-February 1968, and Hanoi's decision, finally, to participate in negotiations.

The constant interplay between political, diplomatic, and military events remained a predominant characteristic of the war in Southeast Asia. While military operations continued undiminished throughout South Vietnam, 81 percent of the registered voters in the Republic of Vietnam turned out to elect a president and a senate on September 2, 1967, and nearly as many participated on October 22 in the balloting for the lower house of the new bicameral National Assembly. Inaugurated on October 31, 1967, the newly elected president, Nguyen Van Thieu, began the difficult task of unifying the many diverse elements of Vietnamese society and establishing a more effective administration.

On the diplomatic front, the United States continued its efforts to bring Hanoi to the conference table. In San Antonio, Tex., on September 29, 1967, President Johnson stated:

The United States is willing to stop all aerial and naval bombardment of North Vietnam when this will lead promptly to productive discussions. We, of course, assume that while discussions proceed, North Vietnam would not take advantage of the bombing cessation or limitation.

When this overture was rebuffed, another possible route to peace was offered by President Thieu who, after meeting with President Johnson in December 1967, proclaimed the willingness of his government to hold discussions with individual members of the so-called National Liberation Front.

Rejecting all offers for discussions, the Communists instead intensified their military operations. On January 30, 1968, when the cease-fire for the Tet religious holidays was supposedly in effect, North Vietnamese and Viet Cong units attacked 36 of 44

provincial capitals, 5 of 6 autonomous cities, 64 of 242 district capitals, 50 hamlets, and numerous allied military installations, including most airfields. They called for a general uprising against the Government of the Republic of Vietnam and announced the formation of a new front organization, the Alliance of National, Democratic, and Peace Forces. Although surprised by the timing of the enemy's effort, Vietnamese and allied military forces fought back vigorously, inflicted very heavy losses on the Communists, and quickly restored the government's authority in major urban centers. The Viet Cong call for a mass uprising went unheeded. Still, additional time and effort was required to resume the pre-Tet progress in the campaign to pacify the countryside.

After the military failure of the Communist Tet offensive, the United States renewed its offer to open negotiations, adding as an inducement a substantial unilateral reduction in the level of hostilities. On March 31, 1968, President Johnson announced:

Tonight I have ordered our aircraft and our naval vessels to make no attacks on North Vietnam, except in the area north of the Demilitarized Zone where the continuing enemy buildup directly threatens allied forward positions and where the movements of their troops and supplies are clearly related to that threat.

This conciliatory move was designed to permit the contending forces to move closer to a political settlement. The President hoped that U.S. restraint would be matched by the enemy. The President also paid tribute to the courage and endurance of the people of the Republic of Vietnam and promised increased assistance to enable them to undertake a larger share of combat operations against the enemy.

After a series of exchanges with Hanoi concerning the site for negotiations, representatives of the United States and North Vietnam began meeting in Paris on May 10, 1968. The initiation of a second major series of attacks by the Communists at about the same time foreshadowed the difficulties to be encountered in these negotiations.

The Forces in Vietnam

On June 30, 1968, the Communist takeover of the Republic of Vietnam was being opposed by 942,000 South Vietnamese serving in military and paramilitary forces, nearly 535,000 U.S. military personnel deployed within the Republic of Vietnam, and over 62,000 men from other countries. (See tables 3, 4, and 5.) In addition, approximately 87,000 U.S. military personnel serv-

ing with the Seventh Fleet off the coast of Southeast Asia and stationed in Thailand were participating in operations to counter North Vietnamese aggression.

The Republic of Vietnam added 210,000 men to its forces during the year, an increase of nearly 29 percent. This growth resulted from the promulgation of a partial mobilization decree in October 1967, more effective administration and enforcement of conscription, and an increase in volunteers, particularly after the enemy's Tet offensive. The new mobilization decree made all males from 18 to 33 years of age subject to the draft and authorized the involuntary recall to service of technicians and specialists in the 34-45-year group. In February 1968, reservists with less than 5 years of active service were also made liable to involuntary recall. The Vietnamese Government began calling up 19-year-olds on April 1, 1968, and 18-year-olds on May 1. A general mobilization law was enacted in June 1968 to provide the manpower for further expansion of the Vietnamese armed forces.

The intensified mobilization campaign benefited all elements of the Vietnamese force structure. The regular military forces added 76,000 men for a total of 403,000 on June 30, 1968, local forces increased by 80,000 to reach a strength of 362,000, and the National Police and other paramilitary security units rose by 18,000 for an aggregate of nearly 177,000. (See table 4.) About 88 percent of the manpower of the regular forces was allotted to the Army, which achieved a yearend strength of 358,000. It expanded its airborne elements from brigade to division size, added 7 maneuver battalions for a total of 171 on June 30, 1968, and augmented various combat and support units that had been understrength. The Marine Corps was directed to expand from a brigade to a light division. Some additional personnel were assigned to the relatively small Vietnamese Navy and Air Force. Unit effectiveness of the regular forces continued to improve, as demonstrated during the enemy offensives in January-February and May-June. As for local elements, the Regional Forces were organized into 1,053 companies manned by 198,000 personnel at the end of the year, while the 164,000 men in the Popular Forces were providing 4,571 platoons for village and hamlet security.

At the beginning of fiscal year 1968, 449,000 U.S. military personnel were serving in Vietnam, and approved plans called for a buildup to about 480,000. Following an on-the-spot review of manpower requirements by the Secretary of Defense, the President in August 1967 approved an increase of 45,000 for a total

authorized strength of 525,000. At the time of the Tet offensive, 493,000 U.S. personnel were deployed in the Republic. To counter the enemy's efforts, the President ordered the military Services to airlift about 11,000 additional troops from the United States to Vietnam, including elements of the 27th Marine Regimental Landing Team of the 5th Marine Division and of the 3d Brigade of the 82d Airborne Division. After a further review of manpower needs, the President announced in March 1968 that he had approved the dispatch of 13,500 additional military personnel to complete the deployment of these two major units, bringing the U.S. troop ceiling to 549,500. At the close of the fiscal year, 534,700 U.S. military personnel were stationed in Vietnam.

The U.S. ground forces portion of this total included 112 maneuver battalions, 81 combat support battalions, and 59 engineer battalions. U.S. Army strength had risen from $6\frac{1}{3}$ to 8 division-equivalents during the year and included the 1st, 4th, 9th, and 25th Infantry Divisions, the 1st Cavalry Division (Airmobile), the 101st Airborne Division, the Americal Division that was formed in the theater from 3 separate infantry brigades, and 3 additional brigades, 2 of them airborne. The major Marine Corps units in Vietnam were the 1st and 3d Marine Divisions, the 26th and 27th Regiments of the 5th Marine Division, and the reinforced 1st Marine Air Wing. The Navy expanded its river control force from 202 to 331 ships. Navy, Marine Corps, and Air Force fighter and attack aircraft in Southeast Asia increased by 173 to a total of 1,121 on June 30, 1968, while the number of helicopters deployed by all the military Services rose from 2,419 to 3,268. (See table 6.)

Third Country forces totaled 62,400 military personnel at the close of the year, an increase of 8,200. (See table 5.) They were organized into 26 infantry battalions and 13 other battalions. The substantial contribution of the Republic of Korea included two infantry divisions and a marine brigade. Australia provided ground troops as well as a guided missile destroyer, bomber and transport aircraft, and helicopters. New Zealand supplied an artillery battery and an infantry company. Thailand deployed its "Queen's Cobras" Regiment during the year and was planning to expand its contingent to division size, while the Republic of the Philippines continued to provide a civic action group consisting of a military engineer battalion and security units. Supplementing this military effort, 34 other nations have furnished food, medical supplies, technical advisors, instructors, and other assistance to the Republic of Vietnam.

Despite the growing strength of the Republic of Vietnam and its allies, the enemy persisted in trying to impose a military solution. The number of enemy armed attacks, which had averaged 246 per month from July to December 1967, rose to 409 in January and to 570 in February, receded somewhat in March and April, but reached the year's peak of 588 in May, averaging 467 per month for the second half of the fiscal year. Altogether the enemy mounted nearly 4,300 armed attacks during the year. This effort cost him dearly. The number of Communists killed was estimated at 161,000—including nearly 40,000 reported for February and 24,000 for May 1968. In addition, over 10,000 enemy military personnel and 4,500 civilian Viet Cong adherents defected. Allied forces captured nearly 53,000 weapons, of which 8,400 were crew-served types. As the enemy encountered increasing difficulties in recruiting and impressing South Vietnamese for military duty, more North Vietnamese had to be deployed to keep combat units at strength. At the close of the year, it was estimated that North Vietnamese comprised about 70 percent of Communist main force strength. Despite the stepped-up infiltration of men and materiel, the enemy was unable to replace all his losses, thus ending the year with less military strength than he had had at the beginning.

Allied Combat Operations

The two major objectives of allied military operations in Vietnam during fiscal year 1968 remained the destruction of North Vietnamese and Viet Cong main force units and the provision of increased security to the people throughout the country. In line with these objectives, land, sea, and air forces strove to prevent major incursions into the Republic of Vietnam, conducted numerous offensive actions against enemy units and base areas within the country, defended cities and hamlets against Communist attacks, and supported the intensified pacification program. Supplementing these activities, U.S. air and naval units launched attacks against North Vietnam to increase the cost of aggression to the Communists.

The armed forces of the Republic of Vietnam increased the tempo of their operations during the year. The intensified advisory, training, and equipment modernization program undertaken by the U.S. Military Assistance Command, Vietnam (MACV), was reflected in greater combat readiness and improved effectiveness. While Vietnamese units were severely tested by the enemy's offensives in early 1968, for the most part they stood their ground,

fought back well, and gained in self-confidence. As Regional and Popular Forces increased in size, the Regular Forces were freed for more mobile activities. They initiated nearly 40 percent more battalion-size or larger operations during the second half of the year than during the first; of the nearly 4,800 such operations mounted during the entire year, 2,800 were in the second half. In addition, Vietnamese forces substantially increased their participation in combined operations with U.S. and other allied contingents. The number of combat sorties flown by the Vietnamese Air Force also continued to rise, while the Vietnamese Navy expanded its coastal surveillance, minesweeping, and river patrols, demonstrating a capability for sustained operations.

U.S. and Third Country forces—the Koreans in their own tactical area of responsibility and the Australians, New Zealanders, and Thais under the operational control of senior U.S. commanders—conducted 1,400 battalion-size or larger actions and participated in 223 combined operations with Vietnamese units. In support of the ground forces, U.S. fixed-wing aircraft flew nearly 206,000 attack sorties and about 50,000 other combat flights in South Vietnam, while U.S. helicopters provided 1,501,000 combat assault, 705,000 combat support, and 765,000 attack sorties. Offshore naval units furnished gunfire support to amphibious elements and troops ashore and carried out coastal surveillance and sea interdiction missions. Smaller ships and craft conducted assault and patrol operations on inland waterways.

The highly mobile U.S. ground forces carried the war to the enemy through wide-ranging offensive operations, seeking out Communist units, base areas, and supply depots. Smaller unit actions were launched against local guerrilla bands and in support of pacification teams. Some of the year's most intensive fighting took place in the five northern provinces that constituted the I Corps area and in the provinces near Saigon—the III Corps area. U.S. troops in the central II Corps continued to strike at infiltration routes in the sparsely populated western highlands and to provide security to cities, villages, and hamlets along the coast. Additional American units were deployed to the IV Corps area—the Mekong River delta region south of Saigon—where they assisted the Republic of Vietnam Government in extending its control over the countryside.

U.S. Marine Corps forces in the I Corps area were joined by additional U.S. Army units during fiscal year 1968 to enable the Marines to concentrate on meeting the intensified enemy attacks near the demilitarized zone (DMZ). Counteroffensive op-

erations between July and October 1967 repulsed successive Communist attempts to break through the eastern sector of the DMZ. To protect the western sector, units of the III Marine Amphibious Force launched in November a series of operations in the Khe Sanh plateau area. Directed to hold this position during the bad weather of the northeast monsoon season, a force composed of three U.S. Marine Corps battalions, one detachment of the Army Special Forces, one Vietnamese Army Ranger battalion, and one Vietnamese Civilian Irregular Defense Group tied down an estimated force of two North Vietnamese divisions in a protracted struggle from mid-January until the end of March 1968. Supplied by airlift and supported by long-range artillery and air strikes including over 2,600 B-52 sorties, the garrison held fast. It was finally relieved in early April. The enemy not only suffered heavy personnel casualties during these operations but also left behind large caches of supplies and equipment.

Elsewhere in the I Corps area, U.S. Marine Corps and Army units, Vietnamese forces, and, in the southernmost province, Korean marines continued their offensive operations to defeat enemy main force units and to extend the government's control of the countryside. While these operations were progressing, the enemy launched his Tet offensive on January 30, 1968, with the city of Hue as one of his major objectives. This attack led to some of the most violent and sustained fighting of the war, as 3 U.S. Marine Corps and 11 South Vietnamese battalions fought some 16 Communist battalions for control of the city. The struggle to clear the enemy out of the city was not completed until February 25. In the process the Communists systematically executed thousands of Republic of Vietnam officials, school teachers, and other citizens, and some 116,000 civilians were made temporarily homeless. The enemy lost 5,000 soldiers killed in the city and another 3,000 nearby, while U.S. and South Vietnamese battle deaths totaled about 500. The enemy's attacks against other I Corps targets, such as Quang Tri city and Phu Loc, were quickly defeated. Following Tet, allied forces in the I Corps resumed offensive operations, including a reconnaissance in force into the A Shau Valley and other large unit actions that disrupted enemy plans and improved security in the area.

Growing security in the II Corps zone permitted the dispatch of some U.S. Army troops to meet the threat in the I Corps area. Large unit operations by the remaining U.S. troops were concentrated on the defense of the western highlands to counter enemy infiltration through Laos and Cambodia. These actions

sometimes involved heavy fighting, such as occurred around Dak To in northwestern Kontum province in November 1967 and during the Tet offensive against Kontum city and other provincial capitals. At other times, the enemy avoided battle, preferring to slip away to sanctuaries across the border.

The III Corps area, north of the Mekong Delta and including Saigon, was the scene of sharp fighting throughout the year. Here the dense jungles of War Zone C near the Cambodian frontier and War Zone D to the north of Saigon provided the enemy with particularly convenient bases for attacks on the capital and its communication lines. During the fall and early winter of 1967 U.S. Army and Vietnamese combined to disrupt enemy preparations and reduce some of his strongholds. Nevertheless, the enemy continued to bring in reinforcements.

In late December and early January information began to accumulate indicating enemy preparations for a major offensive against the Saigon area. U.S. and Vietnamese forces were re-deployed from forward areas in the III Corps to strengthen the defense of the capital, so that by the time of Tet well over half of the available maneuver battalions were covering the immediate approaches to the city, blocking interdiction corridors, or defending nearby villages and hamlets. Others were designated as emergency reserves. Despite increased precautions, enemy troops in civilian dress infiltrated Saigon and smuggled in weapons and ammunition. The attack began on January 31 with assaults on governmental and military installations in and near the city, including the U.S. Embassy. All attacks were beaten off after heavy fighting, and allied forces proceeded to reestablish their former positions in the provinces surrounding the capital, inflicting heavy casualties and capturing many caches of weapons and supplies. In early May the enemy struck again, attacking U.S. air bases near Saigon and infiltrating small guerrilla bands into the city. Once more the enemy was decisively beaten back.

In the IV Corps, Republic of Vietnam forces continued to expand government control in the heavily populated Mekong Delta. Substantial support was provided by the U.S. Navy's GAME WARDEN force of shallow-draft river boats and helicopters. About 477,000 enemy vessels were boarded and inspected during the year and 1,500 destroyed. The joint Army-Navy Mobile Riverine Force, composed of elements from the U.S. 9th Infantry Division and U.S. Navy River Assault squadrons, carried out numerous amphibious reconnaissance, blocking, assault, and pursuit operations. Combined at times with Vietnamese and other U.S.

units, this force operated effectively in areas that had long been under the Viet Cong control. Although the enemy's Tet offensive temporarily upset the pace of pacification, battalions of the 9th Division subsequently joined with Vietnamese forces in extensive operations that reopened and secured key highways and began to reestablish government authority in areas temporarily evacuated during Tet to protect provincial capitals.

Offshore U.S. Navy and Coast Guard ships, in conjunction with the Vietnamese Navy, maintained the MARKET TIME anti-infiltration patrol south of the 17th parallel and provided gunfire support to troops ashore. This force boarded and inspected about 200,000 ships and junks and destroyed 300 enemy craft during the year.

Air combat and air support operations by all the military Services made major contributions to the success of allied arms. The expanding force of Army and Marine Corps helicopters provided the means for concentrating assault troops rapidly to meet the enemy. Navy, Marine Corps, and Air Force tactical fighter and attack aircraft furnished a mounting volume of close air support to the ground forces and, together with B-52 bombers, struck repeatedly at enemy concentrations of men and supplies. Transport aircraft and cargo helicopters linked the troops exposed in forward positions with their rear area depots, insuring effective logistics support for combat operations. All tactical and bomber aircraft operating within South Vietnam were placed under the operational control of the 7th Air Force, while MACV coordinated ground-air operations to assure flexible and responsive aerial fire power support.

Closely interrelated with all the combat operations were the extensive pacification activities of the Republic of Vietnam. U.S. assistance to this vital program is channeled through MACV, a civilian deputy, and his staff for Civil Operations and Revolutionary Development Support (CORDS). Nearly 1,600 U.S. civilian and 6,000 military personnel were engaged primarily in this effort on June 30, 1968. U.S. advisors aided Vietnamese commanders and officials at corps, province, and district levels, working with their principals on such matters as psychological operations, public safety, refugees, education, agriculture, and other civic action programs. Particularly high priority was given to the training of local security forces and the identification and eradication of the Viet Cong underground political structure.

The pacification program was making encouraging progress until the Tet offensive in early 1968 when security forces in the

countryside were withdrawn to urban centers to counter the main thrusts of the Communists. This setback, however, was only temporary. While the percentage of the population classified as relatively secure fell from an estimated 67 percent to about 60 percent as the result of the enemy's offensive, by June 30, 1968, this percentage was back to 63 percent and continuing to rise. At that time, 17 percent of the population was reported to be living under Viet Cong control and the remaining 20 percent in contested areas.

The air campaign against North Vietnam continued to exact a heavy price from the enemy for his aggression against the Republic of Vietnam. Military installations and storage sites, industrial plants and power stations, truck convoys, waterborne traffic, and transportation facilities throughout North Vietnam remained primary targets during the first 9 months of the fiscal year. Attacks on urban centers and the agrarian economy were conscientiously avoided. The air campaign forced North Vietnam to divert all or part of the efforts of hundreds of thousands of its citizens to war-related activities, in particular antiaircraft defense and the repair of roads, rail lines, and bridges. While imports from Communist countries largely replaced production losses and provided weapons and equipment, the bombing attacks made it substantially more costly in time, manpower, and materiel for North Vietnam to sustain its war effort.

To encourage peace negotiations, the President on March 31, 1968, ordered the termination of bombing missions in North Vietnam north of the 20th parallel. Following this decision, the enemy's infiltration routes to and through Laos and to the DMZ in the southern part of North Vietnam became the principal objectives.

Throughout the year, Navy, Marine, and Air Force crews carried out their assignments against increasingly heavy antiaircraft defenses. Still, their flying skill and improved countermeasures reduced the loss rate over North Vietnam from 2.2 aircraft per 1,000 sorties in calendar year 1966 to 2.0 in 1967 and 1.1 in 1968.

Along the coast of North Vietnam, naval surface ships significantly reduced the waterborne movement of supplies and attacked shore batteries as well as land routes within range of their guns. Normally one cruiser and four destroyers, including at times an Australian ship, were assigned to units for this mission—Operation SEA DRAGON.

The intensity of the year's combat operations in defense of the Republic of Vietnam was unfortunately accompanied by rising

casualties. A total of 14,073 members of the U.S. military Services lost their lives as a result of enemy action, while 1,885 others died from accidents, illness, and other causes. (See table 7.) The armed forces of the Republic of Vietnam reported 24,261 combat deaths and Third Country contingents, 1,245. Members of all forces continued to contribute outstanding examples of bravery and devotion to duty. Exceptional valor by U.S. forces in Vietnam had been recognized by the award of 38 Medals of Honor, and nearly 700 men had received the Distinguished Service Cross, the Navy Cross, and the Air Force Cross—the Nation's second highest awards—by the end of fiscal year 1968. In addition, thousands of Silver Stars and lesser awards had been conferred. The American people can well be proud of these men and many, many more of their companions who upheld the finest traditions of the U.S. military Services.

Supporting Activities

The rapid and massive buildup of our armed forces in Southeast Asia during fiscal years 1966 and 1967 had presented challenges of the highest order to logistics and personnel managers. These challenges were met with remarkable success. Although the constant pressure of a never-ending succession of urgent support requests continued during fiscal year 1968 and total requirements rose further—although at a slower rate—the accomplishments of the preceding years permitted placing greater emphasis on reviewing and improving established policies and procedures to take advantage of the experience gained.

Dry cargo shipments to Southeast Asia by sea and air totaled about 6.6 million short tons during fiscal year 1968, compared to 6.2 million in the preceding year. This relatively slight increase in supply shipments was made possible to a large extent by actions taken in the United States and in the field to establish stricter controls over requisitions and stocks at hand. The intensive management effort by the Department of Defense for about 260 major procurement items greatly assisted in maintaining a proper balance between production schedules, inventories, and operational needs. The first step for stricter controls in the field involved the taking of a physical inventory of supplies that had been issued to troop units on the basis of anticipated usage rates. This project was initiated in the spring of 1967 and continued through fiscal year 1968. Items found in excess of actual requirements were returned to depots in Vietnam. A fully automated control center, installed by the Army during the winter of 1967—

68, assisted in the development of a centralized management system over all supply resources. The availability of more reliable and more current information permitted the cancellation of tens of thousands of requisitions and substantial reductions in depot stock levels.

In November 1967 the Secretary of Defense ordered the establishment of the Pacific Utilization and Redistribution Agency (PURA) in Okinawa to receive, store, and recondition excess materiel from Vietnam and to redistribute it as needed within the Pacific Command area. Remaining items were to be reported to U.S. control points for worldwide use or disposed of, if found surplus to U.S. needs. PURA started limited operations in the spring of 1968, and by the end of the fiscal year the military Services had reported for screening \$88 million in assets, of which \$5 million was redistributed. Parallel with this development, MACV instituted Project MACONOMY, a special management improvement program for all commands in Vietnam to conserve the use of both manpower and materiel. By June 30, 1968, some 130 actions had been taken that resulted in anticipated savings of \$512 million and made possible reassignment of 7,400 individuals.

Numerous research and development projects also made substantial contributions to combat effectiveness. During fiscal year 1968 the Department allocated nearly \$856 million to meet research requirements in Southeast Asia—\$76 million more than for the preceding year. Major emphasis continued to be placed on improving our capabilities to counter enemy infiltration, neutralize Communist main force units, and support the pacification program. The development of acoustical and seismic devices helped in detecting infiltrating personnel and vehicles around the clock. Better night vision, battlefield illumination, and jungle clearing systems reduced the protection the enemy derived from darkness and jungle cover. More accurate guided missiles and bombs and better electronic countermeasures contributed to more effective air interdiction. Many of the new detection devices as well as the more systematic collection and analysis of intelligence information served the objectives of the pacification effort increasingly well.

In the construction area, the hectic activities of the preceding fiscal years slowed down during 1968, when construction expenditures totaled \$207 million in Vietnam compared to \$843 million in 1967. The 1968 effort brought total expenditures for Vietnam construction to about \$1.2 billion, with projects estimated at \$0.4 billion still to be completed. Changing operational require-

ments continued to complicate planning, and reprogramming remained a frequent necessity. New projects with a value of \$124 million were added to the program during the fiscal year. Despite the many difficulties encountered and the magnitude of the program, military construction units and private contractors made an outstanding contribution. On June 30, 1968, U.S. and allied forces in Vietnam had available seven deep draft ports, eight jet airbases, 200 smaller airports, and almost 200 heliports as well as extensive logistics, personnel, and medical facilities to support their operations.

The parallel program in Thailand resulted in construction worth \$139 million during the year, bringing the total to \$283 million with \$89 million still to be completed. The program included the construction of a major new port, an airbase, and troop and support facilities and the improvement of six Thai airbases.

Worldwide support of Southeast Asia operations also required the construction of numerous supply, communications, and training facilities in the United States and throughout the Pacific Command area. Projects estimated to cost \$478 million had been approved for this purpose, and construction worth \$392 million had been put in place by June 30, 1968—\$134 million during the fiscal year.

In summary, since 1965 construction projects worth nearly \$2.5 billion had been approved in connection with the Vietnamese war effort. Over \$1.8 billion, or 76.1 percent of the total, had been expended at the close of the fiscal year.

Manpower policies to sustain the well-being and morale of U.S. troops in Southeast Asia continued to yield high returns. Servicemen were assured of a duty tour that did not exceed 1 year, including a rest-and-recuperation leave of 5 days outside the country. Individuals who volunteered to extend their service in the theater by 6 months were granted a special 30-day leave with free transportation; about 46,000 took advantage of this program in fiscal year 1968. Special legislation and directives provided hostile fire pay of \$65 per month, free postage for letters and voice tapes, air transportation of parcel post packages on a space-available basis, and customs duty exemption for gifts costing \$50 or less. Enlisted men were authorized to exclude from their taxable income all compensation received for active service in the war zone, while officers were entitled to an exclusion of \$500 per month. The special pay and allowances of men who were wounded and evacuated continued while they were hospitalized.

Mail to, from, and within the theater was accorded a priority second only to combat supplies. Post and base exchanges stocked a wide range of necessities and other items. Service clubs, theaters, libraries, and other recreational facilities were constructed, and a radio-television network covering major base areas was installed. Private groups, such as the American Red Cross and the United Services Organization, continued to make invaluable contributions as during previous conflicts.

The medical care provided our troops remained outstanding in all respects during the year. The expansion of hospital facilities kept pace with increased deployments. The number of beds in Service hospitals rose from about 6,000 to 8,000, not including those on two offshore Navy hospital ships, the *Repose* and the *Sanctuary*. To reserve space for emergencies, occupancy was kept around 60 percent; patients requiring treatment for more than 30 days were evacuated to facilities elsewhere in the Pacific Command or the United States. The Army contingent of helicopter ambulances expanded from 61 to 110, and moved over 138,000 patients, saving many a life by rapid evacuation to fully equipped hospitals. In addition, the Air Force transported 123,000 patients within the theater and airlifted 50,000 from Southeast Asia.

While intensified combat operations nearly doubled U.S. casualties during the year, the high recovery rates established in preceding years were maintained. Of the 161,000 U.S. military personnel injured by enemy action in Vietnam between January 1, 1965, and June 30, 1968, nearly 89 percent returned to duty or were restored to health and discharged. Wounds proved fatal for fewer than 2 percent, disability discharges were granted to about 5 percent, and the remaining 5 percent were still in hospitals. Battle injuries, however, accounted for only about 17 percent of the hospital admissions in Vietnam, with illness responsible for 69 percent of the patients and accidents for 14 percent. For all, Army, Navy, and Air Force medical personnel made available the best possible treatment in accordance with highest professional standards.

Increased Tension in Korea

The long-existing tensions between North Korea and the Republic of Korea flared to a sudden peak in January 1968. On January 18 a group of North Korean agents attempted to assassinate the President of the Republic of Korea and were nearly successful. Five days later, on January 23, North Korean gunboats seized the U.S.S. *Pueblo*, an electronic surveillance ship,

in international waters off the coast of North Korea.

These violations of existing agreements and international law posed a grave threat to peace in northeast Asia, particularly in view of recent increasingly hostile pronouncements by the North Korean Government and a sharp rise in incidents along the Demilitarized Zone (DMZ) during 1967. In that year, 445 incidents violating the 1953 armistice terms were detected by the United Nations Command, most of them involving attempts to infiltrate agents and reconnaissance teams. From south of the DMZ, 121 additional encounters with Communist infiltrators were reported. Since the flagrant actions of January might well be the prelude to further aggression, immediate precautionary measures were called for.

The seizure of the *Pueblo* led to a hasty marshalling and re-deployment of U.S. ships and aircraft in the Far East. The aircraft carrier *Enterprise*, 600 miles south of the incident, was ordered to move to the Sea of Japan, and F-105 aircraft were dispatched from Okinawa to Korea. Unfortunately, a rescue mission could not be carried out before the *Pueblo* was escorted into Wonsan harbor. The unexpected Communist action had achieved surprise, and time and distance precluded an air rescue attempt in the few hours of daylight available.

The U.S. Government immediately requested, through the Soviet Union, the return of the ship and its 83-man crew. However, at the January 24 meeting of the Military Armistice Commission at Panmunjom, the Communists showed no willingness to negotiate and maintained this position in subsequent meetings. On January 25, the President directed the Secretary of Defense to recall to active duty 28 air units manned by 14,800 Air Force and Navy reservists. As he explained to the American people on the following day, every means available would be used to find a prompt and peaceful solution to the problem and, at the same time, our military forces would be strengthened to be ready for any contingency that might arise in the area.

During the following months, ground, air, and naval forces in northeast Asia were substantially reinforced. The DMZ security barrier was tightened and equipped with new radars and sensors. On February 8, the President requested an additional \$100 million in military assistance to increase the defensive capabilities of the Republic of Korea. These actions removed whatever doubts potential aggressors might have had about the determination of the United States to meet its commitments in northeast Asia.

II. Operational Forces

Our armed forces are organized, trained, and supported by the military Services to execute operational missions under unified or specified commanders as directed by the President. In fiscal year 1968 these missions included increased combat and support responsibilities in Southeast Asia as well as the deterrence of strategic nuclear attack on the United States and the maintenance of a capability for responding rapidly to lesser threats. To carry out these tasks, the military Services added 171,000 men to the force structure, for a total of 3,548,000 on June 30, 1968, and continued to improve their striking power through the development of more advanced weapons and equipment. These programs enabled our forces to function effectively in their current assignments and strengthened them to meet future challenges.

Strategic Forces

Deterrence of deliberate nuclear attack against the United States and its allies remained the first charge on Defense resources during fiscal year 1968. Such deterrence requires that our strategic forces be sufficiently large and versatile to sustain their capability for assured destruction—the ability to inflict at all times and under all foreseeable conditions decisive damage upon any aggressor. Actions were taken during the year to counter the expansion of Soviet nuclear offensive and defensive systems as well as the developing threat of Communist Chinese nuclear capability. Most significant among these was the decision to start the deployment of an antiballistic missile system.

While the current world environment made such steps essential, the United States continued its efforts to reach meaningful and verifiable arrangements on arms control and the limitation of strategic forces. Progress toward this goal was achieved during the year. The Soviet Union, the United Kingdom, the United States, and 53 other nations agreed on the text of a treaty prohibiting the proliferation of nuclear weapons. Even more significantly, in endorsing this treaty the Soviet Government declared its readiness to enter into discussions on the

mutual limitation and subsequent reduction of strategic means of delivering nuclear weapons. Such discussions could, hopefully, lead to an agreement that would contribute to halting the nuclear arms race.

Strategic Offensive Forces

Improvements in our strategic offensive force structure during 1968 followed the trend of the past several years—greater reliance on better missile systems and retention of a substantial number of manned bombers to complicate the enemy's defense efforts. Missile programs emphasized further qualitative improvements, rather than additional quantities of weapons, to counter enemy offensive and defensive capabilities. Research and development efforts were directed toward improving the ability of our weapons to penetrate to their targets, on the one hand, and toward increasing the survivability of U.S. strategic forces in case of attack, on the other.

Strategic Offensive Missiles

The number of U.S. long-range missile launchers remained the same as last year when the military Services completed their buildup to a force level of 1,000 MINUTEMAN intercontinental ballistic missiles (ICBM's), 54 TITAN II ICBM's, and 656 POLARIS fleet ballistic missiles (FBM's). Effectiveness continued to improve as more versatile delivery vehicles replaced some of the earlier models. Concurrently, the development of still more advanced missiles progressed rapidly.

The Air Force refitted about 100 launchers with the MINUTEMAN II missile during the year; this improved model comprised nearly two-fifths of the MINUTEMAN force on June 30, 1968. It can carry a heavier warhead and penetrate to more distant targets than the MINUTEMAN I that it is supplanting. In addition, the Air Force continued the development of the MINUTEMAN III to be equipped with a more powerful third-stage motor designed to carry multiple independent reentry vehicles (MIRV) as well as penetration aids. The MIRV's and penetration aids are being designed to overcome antiballistic missile defense systems of the type being deployed around Moscow and to provide a hedge against possible future additions and improvements to Soviet defenses. Looking toward the more distant future, the Department was exploring the technology for improved penetration techniques through the ABRES and DEFENDER programs of the Air Force and the Advanced Re-

search Projects Agency (ARPA), respectively. Initial studies for an advanced ICBM compatible with the MINUTEMAN launcher were also under way.

The liquid-fueled TITAN II, which carries the heaviest payload of any U.S. long-range missile, remained deployed at three bases throughout the year. Sufficient missiles are being procured to sustain the current force level.

The changes in the Navy's FBM program during the year generally paralleled those in the ICBM structure. The FBM fleet of nuclear-powered submarines, each mounting 16 missile launchers, remained constant at 41—the level that was reached during the preceding year. Force effectiveness, however, improved as the Navy continued to replace the POLARIS A-2 missile, having a range of about 1,500 nautical miles, with the 2,500-mile A-3 model. On June 30, 1968, 28 vessels with the A-3 and 4 with the A-2 were deployed for operational patrols, as compared to 25 and 7, respectively, at the beginning of the fiscal year. The remaining nine submarines were under conversion or in overhaul. When the three submarines under conversion from the A-2 to the A-3 rejoin the fleet, the Navy will have achieved its interim objective of 31 A-3 and 10 A-2 submarines. The POSEIDON, a still more advanced missile system, successfully passed its early developmental milestones, including its first underwater launch. Current programs provide for FBM submarines to begin converting to this missile in 1969, building toward a force of 31 POSEIDON-armed submarines during the mid-1970's. The remaining 10 FBM vessels, which are too small to accommodate POSEIDON, would be reequipped with the improved POLARIS A-3. The Navy also was investigating concepts for an advanced undersea long-range missile system (ULMS) that might replace POSEIDON in the more distant future.

Strategic Aircraft

Improving the capability of strategic bombers to overcome anti-aircraft defenses and penetrate to enemy targets remained a major objective during the year. To this end, the Department concentrated on the development of new penetration aids and a better stand-off weapon and also continued to design and test critical components for an advanced bomber that might be deployed should the threat confronting the United States require a further upgrading of aircraft forces.

On June 30, 1968, the Air Force was maintaining a force of

over 550 B-52's and 80 B-58's. Modification programs to extend the service life of later model B-52's were continued. Three squadrons of earlier model B-52's were deactivated, but aircraft with a remaining service life of 4,000 flight hours or more were transferred to other units where they are being flown periodically to ensure availability for emergency use. The development of the FB-111 continued but on an extended schedule to permit additional testing of the new aircraft. To improve penetration capabilities, the new short-range attack missile (SRAM) was under development for use in suppressing enemy defenses and destroying primary targets. In addition, the Air Force placed high priority on the development of the technology for an advanced manned strategic aircraft (AMSA). During 1968 this work included system design studies, testing of propulsion units, and the investigation of new avionics for navigation, bombing, and bomb damage assessment.

Other Air Force elements continued to provide essential support to bomber aircraft. More than 650 KC-135 tanker aircraft serviced not only strategic aircraft, including the B-52's that have been flying combat missions in Southeast Asia, but also tactical aircraft both at home and abroad. Reconnaissance and postattack assessment capabilities increased in December 1967, when the first squadron with the new long-range, supersonic SR-71 aircraft achieved combat-ready status. Other strategic reconnaissance units were equipped with RC-135 and U-2 aircraft. An effective command and control system that includes the EC-135 airborne command post was maintained to assure that Strategic Air Command (SAC) aircraft and missile forces remain responsive to the direction of the Commander-in-Chief.

Strategic Defensive Forces

An enemy attack on the United States might involve a wide variety of delivery vehicles, including ICBM's, sea-launched ballistic missiles (SLBM), manned bombers, a fractional orbit bombardment system (FOBS), and possibly even satellites. The Department of Defense continued to upgrade the capabilities of warning systems and active defenses to keep pace with the changing threat to the Nation.

Antimissile Defenses

The primary means of detecting a missile attack remained the operational ballistic missile early warning system (BMEWS) consisting of three long-range radar sites guarding the northern

approaches to North America. It was being supplemented by over-the-horizon (OTH) forward scatter radar facilities. This OTH system, with separated transmitting and receiving stations, utilizes the ionosphere as a signal reflector to give early warning of missiles. A back-scatter OTH system with co-located transmitters and receivers and other advanced detection devices was also being developed. We also continued to improve our capabilities to detect and track satellites. The capability to destroy hostile satellites within certain ranges was maintained.

As for active missile defenses, the Secretary of Defense announced on September 18, 1967, that the United States would begin deploying an austere antiballistic missile defense system to counter the potential threat being posed by the Communist Chinese development of nuclear warheads. In addition, such a system would provide protection against an improbable, but possible, accidental launch of ICBM's by any of the nuclear powers and might provide a means for the defense of our MINUTEMAN sites, if such a defense should become desirable. Designated SENTINEL, this system will draw on the technology derived from the extensive research and development effort initiated in 1956 as NIKE-ZEUS and reoriented in 1962 as NIKE-X.

The proposed SENTINEL system called for more than 15 missile radar sites to provide an area defense for the United States, including Alaska and Hawaii, during the mid- and late-1970's. The system includes five principal elements: (1) A large, low frequency, phased array, perimeter acquisition radar (PAR) for surveillance, target acquisition, and tracking at ranges of over 1,000 miles; (2) a smaller, phased array missile site radar (MSR) for control of U.S. interceptor missiles; (3) the SPARTAN surface-to-air missile for intercepting ICBM's, SLBM's, and FOBS outside the earth's atmosphere at a range of several hundred miles; (4) the SPRINT surface-to-air, high acceleration missile for terminal defense interceptions at ranges between 15 and 25 miles and altitudes of 5,000 to 100,000 feet; and (5) a data processing system.

The design, fabrication, and testing of these elements progressed satisfactorily during the year. The Army awarded design contracts for the installation of the PAR at operational sites without the intermediate step of prototype testing, because this radar incorporates proven components and technology and full system tests of its performance can be simulated. A development model of the MSR was being constructed at the

Kwajalein Test Site in the Marshall Islands, where the SPARTAN missile successfully completed its first test flight on March 30, 1968. A number of successful test flights of the SPRINT missile were conducted at the White Sands Missile Range, N. Mex., during the fiscal year and a test launch facility was under construction at Kwajalein. The data processing system was also being installed there, in preparation for future tests against U.S. ICBM's. Concurrently with the development and testing effort, the Department of Defense began the selection, acquisition, and design of the first six tactical sites for the SENTINEL system with construction scheduled to begin during the coming fiscal year.

Antibomber Defenses

As in past years, U.S. continental air defense activities were closely coordinated with those of Canada. In March 1968 the two governments signified their intention to renew for 5 years the 1958 agreement governing the organization and operation of the North American Air Defense Command (NORAD) as a combined U.S.-Canadian headquarters. This command is responsible for the air defense of the northern half of the hemisphere. The major problem remained the phased adjustment of the existing defense system, developed during the 1950's, to the actual threat by providing more effective, yet smaller and less costly, warning networks and interceptor forces.

To provide early warning of an air attack, the Distant Early Warning (DEW) line radar network across northern Canada and a force of EC-121 airborne early warning and control aircraft operating off the Atlantic and Pacific coasts maintained surveillance over likely approach routes. The Department continued during the year its program for internetting its warning system with the radars of the Federal Aviation Agency for joint use, accompanied by a substantial reduction in the number of unmanned gap-filler radars and the phase-out of a few search radars. The Semi-Automatic Ground Environment (SAGE) system and the semiautomatic Back-Up Interceptor Control (BUIC II) centers remained the principal channels for the direction and control of air defense units. The fully automated BUIC III system will start to replace BUIC II during the coming year.

Antiaircraft defense systems included both manned interceptors and surface-to-air guided missiles. The 26 interceptor squadrons of the Aerospace Defense Command were equipped with F-101B's and F-106's, except for one squadron each of

F-102's and F-104's. The F-106 interceptor was being refitted with air-to-air refueling equipment and improved electronic countermeasures to increase its mission flexibility and its effectiveness, while the gradual phase-out of the F-101 continued. The active forces were supplemented by 22 Air National Guard air defense squadrons, most of them flying F-102's. Aircraft and crews from these units stood runway alert regularly and successfully completed nearly 54,000 interception missions during the year. Surface-to-air missile strength remained unchanged during the year. It included Air Force BOMARC's, Army and Army National Guard NIKE-HERCULES, and Army HAWK's.

The research effort on the components believed desirable for air defense in the 1970's progressed satisfactorily during the year. The key element in this concept is an Airborne Warning and Control System (AWACS) designed to detect low-flying attackers at an extended range and to reduce the vulnerability of air defense control systems to missile attack. Preliminary tests demonstrated the feasibility of a downward-looking AWACS radar capable of rejecting the strong energy reflected from the ground that usually masks aircraft targets. A second component in the new concept is the back-scatter OTH radar modified to detect energy reflected from aircraft or missiles rather than disturbances in the ionosphere. To operate with AWACS and OTH radars, the Department considered deployment of an improved interceptor with an advanced radar fire control system and the possible use of a modified and upgraded F-106. As for surface-to-air missiles, studies were undertaken to extend the service life of the NIKE-HERCULES, while advanced development efforts continued for a new weapon, the SAM-D, that might later replace the current systems.

Civil Defense

Civil defense functions of the Department of Defense include the establishment of a nationwide system of public fallout shelters, the maintenance of communications networks and emergency operating centers, and the conduct of supporting activities, such as training, public information, and research and development. The cooperation of state and local governments, voluntary associations, and individual citizens continued to be an important factor in these programs.

Major attention remained focused on locating, licensing, marking, and stocking shelters for public use to help protect our population from fallout in the event of nuclear attack. Shelter

spaces for 16.3 million additional persons in nearly 13,600 facilities were identified during the year, for a total national inventory of 189,000 facilities with a capacity for 176.5 million people. The number of facilities licensed for public use increased by 9,257, for a total of nearly 110,000 that have space for about 108.9 million persons. Some 107,000 facilities have been marked and 91,000 stocked with emergency supplies sufficient to accommodate 88.1 million persons for 8 days, or 52.7 million for 14 days. Additional shelter spaces in homes were being identified through a mail survey, completed in 21 states and underway in 5 others and the District of Columbia.

Civil defense warning, monitoring, reporting, and control communications networks were upgraded and extended during the year. The Department assisted state and local governments in establishing 75 additional emergency operating centers for a total of over 3,000 on June 30, 1968. Training and public information received continued emphasis. Over 2,700 architects and engineers completed fallout shelter analysis courses during the year, 1,100 personnel were trained at the staff college of the Office of Civil Defense, and 52,700 individuals participated in extension training programs. Funded on a minimum sustaining basis, civil defense activities involved obligations of about \$100.1 million during 1968, of which \$28.1 million provided financial assistance to state governments. A detailed account of programs and progress for the year is appended to the report of the Secretary of the Army.

General Purpose Forces

During fiscal year 1968 the general purpose forces were called upon to meet increasing requirements in Southeast Asia, counter a renewed threat in Korea, and maintain adequate forces for dealing with possible contingencies in other parts of the world. A personnel increase of nearly 5 percent was authorized to enable the military Services to carry out their assignments. The expansion goals were met primarily by increased recruitment and induction of new personnel, reenforced in early 1968 by the recall to active duty of trained reserve units in order to achieve the new force levels in the shortest possible time.

Army

During fiscal year 1968, the Army further increased its strength in units and in military personnel, procured the weapons

and supplies required for current use, and developed the advanced materiel for possible future needs.

The Army deployed five additional brigades, a division headquarters and supporting units, and a number of other combat support and service units to Vietnam during the year, bringing its force there to the equivalent of eight divisions. Army military personnel strength in Vietnam increased by nearly 69,000, reaching a total of 354,300 on June 30, 1968. As these deployments reduced the size of the active Army's strategic reserve in the United States, the Secretary of Defense authorized the Army in September 1967 to activate a new division, designated the 6th Infantry Division. Division headquarters, two infantry brigades, the artillery components, and other supporting units trained at Fort Campbell, Ky., while Schofield Barracks, Hawaii, became the training site for the remaining brigade of the new division. In the spring of 1968, after additional forces were dispatched to Vietnam, the Secretary ordered the call to active duty of two separate Army National Guard brigades and other Guard and Army Reserve units. These actions increased the active Army's authorized force structure to $201\frac{1}{3}$ division-equivalents—18 numbered divisions, the Americal Division (formed in Vietnam from three separate brigades plus support elements), and four additional separate brigades. Maneuver battalions were increased by 17, for a total of 218 on June 30, 1968, while the activation of 25 new aviation units raised to 212 the number of such formations in the active force structure. Army manpower strength, including reservists on active duty, rose by nearly 128,000 during fiscal year 1968, from 1,442,000 to 1,570,000.

Another shift in Army deployments was initiated with the announcement on December 20, 1967, of the return from Europe to the United States of two-thirds of the 24th Infantry Division, the 3d Armored Cavalry Regiment, and supporting units. This force, with a total strength of about 28,000 men, will remain under the operational command of the U.S. Commander in Chief, Europe, and some of these units will return annually to Germany for field exercises. Including the relocated units, the Army forces assigned to the U.S. European Command consist of three mechanized infantry and two armored divisions, a separate brigade in Berlin, and associated elements. Army forces in Vietnam and two divisions in the Republic of Korea composed the major Army combat units under the operational control of the U.S. Pacific Command. Confronted with intensive provocations from North Korea, Army forces in Korea increased their manning

levels and tightened security to counter enemy infiltration attempts. Other deployments included two separate brigades assigned to the U.S. Alaskan Command and one to the U.S. Southern Command with headquarters in the Panama Canal Zone. Nearly 680,000 Army military personnel—43.3 percent of total strength—were serving outside the continental United States on June 30, 1968.

Shortly after the close of the year, the Army's authorized force level was readjusted, in part because the Revenue and Expenditure Control Act of 1968, approved on June 28, 1968, directed a \$6 billion reduction in Federal outlays for fiscal year 1969 and in part to bring existing Army units to full strength. According to this plan, the new 6th Infantry Division will be inactivated, except for one artillery and five infantry battalions, and a new brigade will be formed in the 82d Airborne Division to replace the one deployed in Vietnam. At the same time, the troop strength of the two recalled Army National Guard brigades will be increased from 90 to 100 percent of Table of Organization allowances. These changes represent a net reduction of two brigades, leaving the Army with a force structure of $19\frac{2}{3}$ division-equivalents, of which $4\frac{1}{3}$ divisions will be in the active strategic reserve.

Army forces in the United States were called on to assist civil authorities in insuring domestic tranquility during three periods of trouble and tension. These incidents involved regular troops as well as National Guardsmen mobilized for Federal service. The restoration of order in Detroit, Mich., following an outbreak of rioting in July 1967, was achieved with the help of a task force, composed of about 16,000 troops, about two-thirds of which were from the National Guard. In October 1967 approximately 10,350 Army troops were moved to installations near Washington, D.C., to assist civil authorities during the course of a not always peaceful antiwar demonstration. Following the assassination of Dr. Martin Luther King, Jr., in April 1968, the assistance of Federal forces was requested by civil authorities to cope with disorders in Washington, D.C., Chicago, Ill., and Baltimore, Md. A total of about 23,000 active duty personnel and nearly 16,000 National Guardsmen in Federal service were utilized for this purpose. The aggregate cost of the civil disturbance operations conducted by the Army during the year was estimated at \$7.7 million.

Increased deliveries of new weapons, ammunition, and supplies from the expanded procurement programs of recent years

contributed significantly to the Army's capability for sustained combat operations. Major items of materiel and ammunition with a value of nearly \$7.7 billion were received from production lines during fiscal year 1968, with ammunition accounting for over one-half of this total. Despite the attrition of weapons and equipment and the expenditure of ammunition in combat, the value of Army inventories increased by about \$3.9 billion for a total of nearly \$34.1 billion, exclusive of real property. On June 30, 1968, weapons valued at \$13.1 billion were in the hands of troops, Army supply systems included items worth \$14.2 billion, and the Army owned other personal property with a value of \$6.8 billion.

Increases in the quantity of Army assets were accompanied by improvements in the quality of weapons. Two new helicopters became operational in Vietnam during the fall of 1967—the AH-1G Hueycobra fire support ship, with greater speed, endurance, and firepower than the UH-1C, and the OH-6 light observation helicopter, scheduled to replace the O-1 fixed-wing aircraft and the OH-13 and OH-23 helicopters. Substantial production of these new helicopters and of other aircraft increased the Army's active aircraft inventory by 1,090 for a total of 10,465, of which 8,085 were helicopters and 2,380 fixed-wing types. The Army's mobility and firepower was increased by further deliveries of self-propelled, large caliber artillery pieces and M-60 tanks, and the introduction of two new combat vehicles, the M-548 tracked cargo carrier and the M-551 General Sheridan armored reconnaissance/airborne assault vehicle. Additional procurement of M-16 rifles with a new buffer and barrel assembly permitted the arming of more Third Country as well as U.S. units in Vietnam with this versatile, lightweight individual weapon.

The new weapons being developed for future Army needs reflected lessons being learned in Vietnam where helicopters continued to contribute significantly to the mobility and operational flexibility of land forces. Projects to upgrade this capability included the development of an improved armed escort helicopter, especially designed as an integrated aerial weapons system. Designated the AH-56A Cheyenne, this all-weather, fast, highly maneuverable, heavily armed machine made its first test flight in September 1967, and preproduction planning and the procurement of long leadtime items were initiated in January 1968. The Army was also investigating advanced concepts of technology for

incorporation in successor models of its light tactical and utility helicopters.

Increased mobility, firepower, and defensive capabilities remained major objectives of Army programs for the development of new weapons and the improvement of existing systems. These research efforts included self-propelled artillery and lighter weight towed pieces for transport by helicopter, a new family of combat vehicles to replace the M-113 personnel carrier and the M-114 reconnaissance vehicle, the modification of the M-60 tank to incorporate the 152-mm. gun/SHILLELAGH guided missile system, and the longer term U.S.-German program for a new main battle tank. The Army also conducted tests of the modified PERSHING surface-to-surface missile system that is being converted from a tracked to a wheeled configuration and being given a quicker reaction capability. The decision to develop only an extended range version of the LANCE guided missile, as well as some technical problems, delayed the time when this system will begin to replace HONEST JOHN and LITTLE JOHN rockets. To improve antitank capabilities, the Army was developing the one-man DRAGON wire-guided antitank missile and the heavier crew-served TOW system. The first flight test of the former occurred in December 1967, while the latter was certified for limited production. The air defense of field armies is expected to increase with the redesign of the HAWK missile system for a self-propelled configuration, the test and evaluation of the self-propelled CHAPPARAL missile/20-mm. Vulcan gun system, and the advanced development of the SAM-D missile. Other significant Army development projects included improvements in night vision devices and techniques, small arms and ammunition, and electronic warfare capabilities.

Navy and Marine Corps

The Navy conducted intensive sea, air, and inland waterway operations in Southeast Asia during the year, while maintaining sizable task forces in readiness to meet possible contingencies elsewhere. The fleet increased the number of general purpose warships in commission by 6, from 378 to 384, but adjustments in amphibious warfare forces and auxiliaries held the net gain in total commissioned ships to 1, for an aggregate of 932 on June 30, 1968. The increasing pace of combat in Southeast Asia required the assignment of 7,000 more Navy personnel to shore-based activities in the Republic of Vietnam, bringing the yearend total to 36,100. Approximately an equal number of Navy men were

serving on the combatant ships of the Seventh Fleet operating in the South China Sea. Total naval personnel strength rose from about 752,000 to over 765,000. This increase included the call to active duty in January and April 1968 of six naval air reserve squadrons and two naval construction battalions with an aggregate manning level of about 1,600.

The composition of the fleet changed slightly during the year as the result of the delivery of new and reconditioned ships, accompanied unfortunately by some operational losses. The recommissioning of the battleship *New Jersey* on April 6, 1968, will increase the weight and effective range of the Navy's gunfire support activities in Southeast Asia. Fleet defensive resources were augmented by the commissioning of seven multipurpose (antiair and antisubmarine) ships, including four converted guided missile frigates and destroyers and three newly constructed guided missile destroyer escorts. The modernized destroyer *Barry* and the destroyer escort *Sample* from new construction, both mounting the ASROC antisubmarine rocket and new model torpedoes, strengthened the antisubmarine forces. A total of six nuclear-powered submarines with SUBROC antisubmarine rockets were commissioned during the year, but the tragic loss of the *Scorpion* in May 1968 limited the net gain in nuclear-powered submarines to five. The destroyer *Bache* was lost when damaged beyond repair during a severe storm in the Mediterranean in February 1968. Retention of the *Pueblo* and its crew by the North Koreans and the decision not to rehabilitate the *Liberty*, badly damaged by an Israeli attack in June 1967, further reduced the number of commissioned ships. A disastrous fire on the attack carrier *Forrestal*, while it was operating in the Gulf of Tonkin in July 1967, resulted in the loss of 134 lives, the injury of 62 other crew members, and extensive damage to the ship and many of its aircraft.

Of the Navy's 932 ships at the end of the fiscal year, 503 were allocated to the Pacific Fleet and 429 to the Atlantic Fleet. More than two-fifths of the Pacific Fleet, including five of its nine attack aircraft carriers, were assigned to the Seventh Fleet and deployed in the Western Pacific. For a brief period, following the seizure of the *Pueblo*, six attack and two ASW carriers were operating with the Seventh Fleet. Approximately 85 ships were maintained continuously off the coast of Vietnam. The Atlantic Fleet maintained a force of about 50 ships, including two of its six attack carriers, with the Sixth Fleet in the Mediterranean Sea.

To support operational requirements in Vietnam, the Atlantic Fleet regularly rotated some of its ships to the Pacific.

Naval air striking power was organized around the 15 attack aircraft carriers of the active fleet. These ships included the nuclear-powered *Enterprise*, and seven *Forrestal*-class, two *Midway*-class, and five *Essex/Hancock*-class carriers. The lead ship of the *Midway*-class remained out of service for modernization. The *Forrestal*-class *John F. Kennedy*, which was launched in May 1967, was being prepared for commissioning, and in June 1968 the keel was laid for the nuclear-powered *Chester W. Nimitz* that will be considerably more advanced and efficient than earlier nuclear-propelled surface ships. Current plans call for the construction of two additional *Nimitz*-class carriers, for an eventual force level of four nuclear-powered, eight *Forrestal*-class, and three modern *Midway*-class ships. The force of *Essex/Hancock*-class ASW carriers remained at eight, of which four were assigned to the Pacific and four to the Atlantic.

The delivery of recently developed aircraft and weapons upgraded the operational effectiveness of the attack carrier forces. The newest Navy light attack aircraft, the A-7A Corsair II, began flying combat sorties over Vietnam in December 1967, and the A-7B with an improved engine subsequently entered the operational inventory. In January 1968 the latest model Skyhawk light attack aircraft, the A-4F—with a more powerful engine and better avionics than earlier models—started to be used in Southeast Asia. The versatile, all-weather A-6 Intruder was being provided with a new bombing system to increase its ability to destroy moving vehicles at night. The first two operational Phantom II squadrons equipped with the F-4J were deployed aboard carriers in April 1968, while deliveries of a modified SPARROW III air-to-air missile further improved the armament of all F-4's. F-8 Crusaders, used on *Essex/Hancock*-class carriers, were being modified for continued service. The introduction of the EKA-3A, a Skywarrior tanker configured for electronic warfare missions, also increased the effectiveness of the naval air arm. Additional deliveries of land-based, four-engine P-3 patrol aircraft augmented naval ASW resources.

A major change occurred during the year in the Navy's plans for the development of a new fleet air defense fighter. Two programs remained under consideration until the spring of 1968. One involved the further development of the F-111B to overcome the engineering shortcomings noted by Navy test pilots; considerable progress was made in this respect, although all the

problems had not been resolved early in 1968. The other concerned the design of a new multimission aircraft that would utilize the engine, technology, and the PHOENIX air-to-air missile system developed for the F-111B. This double effort was cut short in April 1968 when the Senate Armed Services Committee denied additional funds for the F-111B and recommended the development of a substitute aircraft. As a result, the Navy concentrated its efforts on the design of a fighter smaller and lighter than the F-111B, but capable of carrying out all of the missions assigned to its predecessor. This aircraft was subsequently designated the F-14A.

A comprehensive study of future Navy requirements for escort ships was completed during the year, calling for the design of three new classes of ships that would be standardized to the maximum feasible extent in order to reduce development, construction, and operating costs. These classes would include destroyers (DX), guided missile destroyers (DXG), and nuclear-powered guided missile frigates (DXGN). The DX would have guns for fire support missions as well as the new SEA SPARROW close-in air defense missile system and the latest ASW equipment. In February 1968 the Navy invited contractors to submit contract definition proposals for the DX. The DXG would be somewhat larger than the DX and carry, in addition, the new STANDARD air defense missile system. The DXGN, while somewhat smaller than the existing DLGN's, would be a heavier, nuclear-powered version of the DXG. In the meantime, part of the Navy requirement for nuclear escorts will be met by the construction of two more nuclear-powered frigates, similar to the *Bainbridge* and the *Truxtun*. This decision was reached in March 1968, when the President approved the release of funds previously appropriated for this purpose.

Marine Corps strength rose from 285,000 to 307,000 during fiscal year 1968 to support the deployment of nearly one-third of its manpower in the Western Pacific on 12-month tours and to increase the readiness of units remaining in the United States. The force structure included four active divisions, three air wings, supporting forces, and the training base. Additional light helicopter squadrons were organized for such combat support missions as medical evacuation and wire laying.

The Marine Corps increased its troop deployment in Vietnam by over 5,000 men during the year for a total of 83,600 on June 30, 1968. Most of this increase resulted from the commitment of an additional regimental landing team following the Tet offen-

sive. Marine units in Vietnam, organized as the III Marine Amphibious Force, included the 1st and 3d Marine Divisions, one regiment and elements of a second from the 5th Marine Division, the heavily reinforced 1st Marine Air Wing, and combat and service support units. Other 5th Marine Division troops and a provisional Marine aircraft group formed the 9th Marine Amphibious Brigade, attached to the Seventh Fleet, to provide battalion-sized special landing forces as required. Additional ground and air units of the Pacific Fleet Marine Force were stationed in Hawaii. Oversea deployments of the Atlantic Fleet Marine Force included a Marine landing force with the Sixth Fleet in the Mediterranean, the Caribbean Ready Force, and one battalion with combat and service support elements at Guantanamo Naval Base, Cuba. The 3d Air Wing and remaining elements of the 5th Marine Division were stationed on the west coast while the 2d Air Wing and the 2d Division, less the overseas units of the Atlantic Fleet Marine Force, were on the east coast of the United States.

Combat capabilities of the Marine Corps operating forces continued to improve with the introduction of new materiel. Air units completed the phaseout of the F-8 Crusader as additional F-4's became available and increased their inventory of A-6's. The new OV-10A light reconnaissance aircraft and the CH-46D helicopter, equipped with a more powerful engine than earlier models, became available to Marine forces in Vietnam. The delivery of more CH-53 Seastallions, a heavy helicopter, provided a greater capability for moving larger payloads at higher speed. Weapons, equipment, ammunition, and supplies were received from production in adequate amounts to meet combat requirements.

Programs to improve amphibious assault capabilities continued to make good progress as the amphibious transport dock ship *Dubuque* was commissioned in September 1967 and several other new amphibious warfare ships were launched during the year. In addition, the Navy completed contract definition for a new class of large, general purpose amphibious assault ships, the LHA, for which production funds were included in the fiscal year 1969 budget.

Air Force

The Air Force component of our general purpose forces consists of tactical fighter wings, reconnaissance squadrons, electronic warfare support elements, air control systems, special air

warfare units, and air defense fighter interceptor squadrons deployed to overseas bases. While the Air Force continued to maintain 23 wings of tactical fighters, it increased the number of aircraft squadrons from 123 to 144, including 10 tactical fighter groups of the Air National Guard recalled to active duty. Oversea deployments in the Pacific rose with the dispatch of more units to Southeast Asia and Korea; however, the number of Air Force personnel in Europe declined as some squadrons began to re-deploy to bases in the United States. Deliveries of new aircraft increased the number of tactical aircraft in active operational service during the year despite combat losses and attrition. The principal change was the further buildup of F-4 Phantom II assets from assembly lines. The F-4E—the latest model with a more powerful engine, an internally mounted 20-mm. Vulcan rapid fire gun, and more advanced tactical capabilities—began to enter the inventory in October 1967; production of the predecessor F-4D model was completed in April 1968. In addition, production models of the new F-111A variable sweep-wing fighter were delivered to operational units beginning in October 1967 and holdings increased although the schedule was cut back to permit the more orderly phase-in of the later F-111D model equipped with an improved avionics system. In operational tests the F-111A demonstrated outstanding long-range, all-weather, low altitude penetration and attack capabilities; however, three failed to return from missions in Southeast Asia and two were lost on training flights in the United States. The mobilization of the Air National Guard squadrons added to the number of F-100's in active service and restored some F-86H's to an operational role.

Continued production of RF-4's and the call-up of three Air National Guard groups equipped with RF-101's enlarged the tactical reconnaissance aircraft inventory. Special air warfare forces deployed a squadron of A-37A's to Vietnam and accepted the first A-37B from new production. The A-37A is a modified attack version of the standard T-37 primary jet trainer, while the B model has a higher thrust engine and in-flight refueling capability. The Air Force inventory of A-1 Skyraider tactical attack aircraft rose as a result of transfers from the Navy which continued its phaseout of this aircraft. Increasing numbers of O-2's were placed in service—the O-2A for forward air control and the O-2B for psychological warfare operations—and the Air Force initiated operational testing of the multi-Service, multipurpose OV-10 Bronco short takeoff and landing aircraft.

Older aircraft were modified and tested for new missions, including C-119's and C-130's as gunfire support ships and the EB-66 to increase electronic countermeasures and electronic reconnaissance capabilities.

To improve further its close air support of ground troops, the Air Force awarded a production contract in December 1967 for the A-7D, adapted from the Navy's Corsair II, but equipped with a more powerful engine, a 20-mm. Vulcan gun, and additional weapons delivery capabilities. Advancements in tactical reconnaissance were being sought through the development of the RF-111, equipment for which was flight tested on a modified F-111 during the year. For the longer range future, the Air Force was refining the concepts for an advanced tactical fighter and for a fast, long endurance, close air support attack fighter, the AX, that might supplement or replace the A-7 and A-37.

Air strike and close ground support capabilities were being augmented by the production of air-to-ground missiles and the development of more advanced models. In March 1968 the Air Force began procuring the new AGM 78A Standard Antiradiation Missile (ARM) for the destruction of enemy ground radar stations, as a supplement to the SHRIKE ARM being used in Vietnam. To improve upon the interdiction capabilities currently provided by the BULLPUP missile and the WALLEYE television-guided bomb, the Air Force was continuing the development of the MAVERICK TV-guided rocket-powered missile. For air-to-air combat, SIDEWINDER, FALCON, and SPARROW missiles were being modified to improve their performance.

The Pacific Air Force, the largest Air Force tactical command and a component of the U.S. Pacific Command, was further strengthened during the year to meet its increasing operational requirements. Following the seizure of the *Pueblo* in January, tactical fighter and air defense squadrons, a tactical reconnaissance unit, a tactical electronic warfare detachment, a tactical air control center and control system elements, and supporting personnel, ordnance, and equipment were moved swiftly to bases in Japan and Korea. The deployment of additional tactical units to Southeast Asia expanded the capability of the Air Force to provide close air support and to carry out strike and interdiction missions. This buildup included four of the Air National Guard squadrons mobilized in January. Extension of the tactical air control system, improvements in tactical electronic warfare resources, and augmentation of the special air warfare forces increased operational effectiveness in Southeast Asia. Other Pacific

Air Force units continued to be assigned to bases in Hawaii, the Philippines, the Ryukyus, and Taiwan.

The U.S. Air Forces in Europe maintained a strong, combat ready force of F-4 and F-100 fighter wings, RF-4 and RF-101 tactical reconnaissance squadrons, and F-102 air defense interceptors plus one squadron of MACE surface-to-surface missiles. Based principally in the Federal Republic of Germany, the United Kingdom, and Spain, these elements comprised a significant portion of the air striking and support power committed to the North Atlantic Treaty Organization (NATO). During fiscal year 1968, the command kept a large part of its strength on quick reaction alert, participated in a number of NATO field training maneuvers, and cooperated with air forces of other NATO members in collective defense activities. Arrangements were completed for four tactical fighter squadrons and support elements manned by about 4,800 military personnel to redeploy to the United States. They will remain assigned to the European Command, ready to return to their bases in Germany in the event of an emergency, and participate annually in NATO training exercises.

The Tactical Air Command in the United States continued to provide trained units and crews to oversea forces and improved its readiness to respond to emergencies. Its tactical fighter and reconnaissance wings were being reorganized to increase their self-sufficiency and capability for rapid deployment to forward operating bases. As in previous years, elements of the command, including reserve forces on active duty training tours, participated in a number of joint Army-Air Force exercises in the United States and abroad that further developed, sustained, and tested their proficiency for carrying out contingency missions.

Airlift and Sealift Forces

Our airlift and sealift forces continued to expand their capability for moving men and materiel promptly in response to strategic and tactical requirements, effectively supported our worldwide deployments, and met critical needs in Southeast Asia and Korea. Active duty forces include the strategic transport and aeromedical evacuation squadrons of the Military Airlift Command (MAC), the assault and intratheater airlift elements assigned to the Tactical Air Command and unified commands, some Navy and Marine Corps cargo and transport aircraft, aerial port squadrons and other specialized transportation groups, and the sealift forces of the Military Sea Transportation Service

(MSTS). These active forces are supplemented by transport and tactical airlift units in the reserve components of the military Services and by air and sea transportation procured from commercial sources. Reserve airlift units recalled to active duty during the year included two wings with five military airlift groups, one tactical airlift group, and three aerial port squadrons of the Air Force Reserve and one aeromedical airlift group of the Air National Guard. Other Air Force and Navy reserve crews and aircraft supported the active forces regularly as part of their training.

The number of transport aircraft assigned to MAC airlift service operations increased by a net of 48 to a total of 543 on June 30, 1968. Deliveries of 56 C-141 Starlifter transports from new production permitted MAC to complete its buildup to 14 squadrons equipped with this high speed, long-range, large capacity jet aircraft, to phase out its last C-135's, and to transfer these aircraft and some C-124's, C-130's, and C-131's to other missions and commands. As the most recently formed C-141 squadrons gained operating experience, the daily utilization rate per aircraft rose. Reflecting the increase in the size of fleet, the capacity of aircraft, and daily flying hours, MAC flew 45.5 percent more ton-miles in military aircraft during the year and carried 29.0 percent more tons. Commercial carriers continued to provide about 95 percent of the strategic passenger airlift, but their share of cargo operations declined from 39 to 27 percent in ton-miles flown. Civil Reserve Air Fleet (CRAF) resources increased by 48 aircraft and included at the end of the year 372 aircraft in the long-range, international sector and 72 aircraft in the domestic sector. These civil aircraft and their crews can be placed under MAC control within 48 hours during an emergency.

As for the future expansion of airlift capacity, a major milestone was passed on June 30, 1968, when the newest transport, the C-5A Galaxy, completed its first test flight. Designed to carry about 100,000 pounds of cargo for a distance of over 5,800 nautical miles at a speed approaching 440 knots, the Galaxy will be capable of airlifting large divisional equipment such as tanks, helicopters, and missile systems. Operating together with C-141's, it should significantly increase the capability of the United States to deploy men and materiel swiftly to threatened overseas areas and reduce reaction time. To modernize its medical evacuation airlift resources, the Air Force started the procurement of the C-9 Nightingale, a high speed jet transport that will accommodate 30 stretchers or 40 ambulatory patients. This shorter

distance aircraft will complement the C-141's used for trans-oceanic medical flights.

Tactical airlift requirements continued to grow, particularly in Southeast Asia. Nearly 50 percent more passengers and over 25 percent more cargo were transported within that theater of operations during fiscal year 1968 than during the preceding year. Elsewhere, tactical airlift units augmented MAC resources during periods of peak demand and supported the general purpose forces in the performance of operational and training missions. The force structure was composed primarily of squadrons equipped with C-123 Provider, C-124 Globemaster, and C-130 Hercules transports, supplemented by intratheater transport squadrons with C-7A Caribou short takeoff and landing aircraft. Following a rise in combat and attrition losses during the year, the Air Force initiated the procurement of additional C-130E transports. Concepts for an advanced intratheater transport, the LIT, were being investigated.

Sealift resources include the tankers, troop ships, and cargo ships in the Government-owned MSTS nucleus fleet, tankers and cargo ships chartered from commercial owners, and Government-owned ships from the National Defense Reserve Fleet (NDRF) that had been reactivated to meet Southeast Asia transportation needs. MSTS moved 6 percent more cargo and 15 percent more petroleum, worldwide, than in fiscal year 1967. It handled this larger volume of traffic with fewer ships, in part through improved utilization and reduced turnaround time and in part by chartering additional modern merchant vessels to replace NDRF ships. In support of these operations, MSTS controlled 516 ships on June 30, 1968, a net decrease of 9 that resulted from the deactivation of 22 NDRF ships and a net increase of 13 chartered cargo and petroleum ships. The MSTS nucleus fleet included in this total consisted of 133 ships—16 troopships, of which 11 were not in active operation, 26 tankers, and 88 cargo, stores, and large coastal ships.

Studies of the sealift requirements for future contingencies indicated a need for greater cargo-carrying capacity to support airlifted troops in distant areas. The Department of Defense considered two complementary solutions to this problem. First, it began working with the industry and other Federal agencies to establish a maritime counterpart to the CRAF arrangement that provides commercial airlift augmentation in an emergency. Second, it proposed to the Congress once more that the Navy be authorized to build a fleet of fast deployment logistics (FDL)

ships especially designed for the storage and rapid discharge of heavy weapons and equipment. The Navy has completed contract definition for this new class of ships but Congressional authorization was not obtained.

Reserve Forces

The reserve components materially contributed during fiscal year 1968 to the successful accomplishment of many Defense missions. Nearly 37,000 officers and men, including some 115 reserve units, were called to active duty. Many other units and individuals carried out, as part of their training, a great variety of functions in direct support of the active forces. Readiness for emergency mobilization continued to improve. The Army reserve components completed a reorganization and realignment that will facilitate the attainment of realistic readiness goals and of a better balance between personnel and equipment resources and between combat and support elements. In addition, organizational arrangements and administrative procedures throughout the Department of Defense were adjusted in accordance with the Reserve Forces Bill of Rights and Vitalization Act of 1967 which the President approved on December 1, 1967.

President Johnson ordered some reserve forces to active duty on January 25, 1968, following the seizure of the U.S.S. *Pueblo* on the high seas by North Korea. Mobilization notices went to 3 Air National Guard wings with 11 tactical fighter and reconnaissance groups, 2 Air Reserve wings with 5 airlift groups, 1 Air Reserve rescue squadron, and 6 Naval Reserve attack and fighter squadrons—a total of 28 units manned by 14,800 reservists and equipped with over 370 aircraft. The rapidity with which these elements took their assigned places alongside the regular forces testified to their high degree of readiness.

On March 31, when the President addressed the Nation to announce the bombing halt and the additional actions being taken by the United States to support the Republic of Vietnam, he indicated the need for the call of additional reservists. On April 11 the Secretary of Defense issued the orders that brought 1,700 individual reservists and 87 units with a strength of about 20,500 officers and men to active duty on May 13. This mobilization included 42 Army Reserve and 34 Army National Guard combat and support units, 2 Naval Reserve mobile construction battalions, 1 tactical airlift group and 5 nonflying units of the Air Force Reserve, 2 Air National Guard tactical fighter groups, and 1 Air National Guard aeromedical airlift group. These units provided

additional trained men to meet contingency requirements in the Far East and temporarily strengthened the active forces held in strategic reserve in the United States.

Thousands of other reservists volunteered for duty during the year, supplementing those mobilized, with the net result that about 350,000 reserve personnel were serving with the active forces on June 30, 1968, or nearly 47,000 more than at the end of the preceding year. (See table 27.) Despite the partial mobilization, the number of reservists not on active duty increased by 87,000 for a total of 2,845,000. Of this number, 1,991,000 were in the Ready Reserve, 395,000 in the Standby Reserve, and 459,000 in the Retired Reserve at the end of the year as compared to 1,863,000, 536,000 and 359,000, respectively, on June 30, 1967. (See table 28.) Some 909,000 personnel were receiving drill pay for regular participation in reserve training at the close of fiscal year 1968 for a gain of 21,000, but the number on active duty for basic training declined by nearly 82,000 between June 1967 and June 1968, or from 95,000 to 13,000. (See tables 29 and 30.) This change reflected the return to normal training rates, disrupted by the buildup of the regular forces in 1966 and followed by intensive efforts to reduce the backlog of untrained reservists during fiscal year 1967.

Although calls to active duty caused a few minor delays, the Army reserve components completed their major organization smoothly and on schedule by May 31, 1968, in time for their annual summer training. The plans for this realignment to increase readiness had been announced in June 1967. Subsequently, the proposed troop structure was revised (1) to take account of Congressional desires that the Army Reserve be maintained at a strength of 260,000, instead of 240,000 as originally proposed by the Department, and (2) to retain some combat and combat support elements, instead of transferring all such units to the National Guard. Conversion began on December 1, 1967. It involved an increase in the manning level of units to at least 90 percent of wartime allowances and the eventual provision of the full authorization for weapons, equipment, and spare parts. It also eliminated 15 divisions and many nondivisional units not required by contingency plans that had been only partially manned and equipped. The new troop structure included 8 combat divisions, 18 combat brigades, and 31 air defense battalions in the Army National Guard and 13 training divisions, 3 combat brigades, and 2 maneuver area commands in the Army Reserve, as well as a full range of combat, combat support, and logistical

and service elements required to round out the Army. Following the reorganization, the Army National Guard structure consisted of 2,890 units with an authorized drill pay strength of 400,000, replacing one composed of 2,520 units manned at 80 percent or higher strength by 308,000 men and 1,480 other units manned at 50 percent or less by 111,000. The Army Reserve reduced its units from 3,575 to 3,482 but continued to be authorized 260,000 drill pay positions.

Concurrently with this realignment, the Army Selected Reserve Force was modified in accordance with long-term requirements. This force had originally been established in the fall of 1965 to improve the readiness of certain National Guard and Army Reserve units for meeting such contingencies as might arise while the strategic reserve of the active Army was providing troops for the buildup in Southeast Asia. The selected units successfully achieved and sustained an improved posture for mobilization, but experience indicated the need for some rebalancing of combat and support elements and for relieving men who had carried the burden of additional training and increased likelihood of recall for over 2 years. Accordingly, new units were added and others eliminated from the force on December 1, 1967, to create a balanced, 3-divisional troop structure that was designated Selected Reserve Force I-A. On the same date, a new group of units was designated as Selected Reserve Force II and began accelerated training. On May 1, it relieved Selected Reserve Force I-A. At the close of the fiscal year, the Selected Reserve was composed of 623 National Guard and 501 Army Reserve units with authorized strengths of 89,000 and 48,000, respectively, or a total of 1,124 units and 137,000 personnel.

With the completion of the realignment plan for the Army reserve components, the Department of Defense came closer to achieving a reserve force tailored to the requirements of contingency plans and so organized, trained, and equipped as to permit its rapid integration into the active Army. The troop structure meets these objectives and the units should fully attain the readiness required of them with additional training and equipment.

Army reserve component units, not on active duty, continued to support the regular forces during the year, manning a significant portion of the NIKE-HERCULES surface-to-air missile batteries in the United States and providing training and logistical services at many active Army installations.

The Naval Selected Reserve improved the readiness of its per-

sonnel for mobilization through effective training programs, although plans to upgrade the materiel condition of units have been delayed because of the higher priority requirements of the active fleet. As a result of the recall of some units, the numerical strength of the Selected Reserve temporarily declined from 126,000 to 124,000 during the year. These men are grouped in two types of units: (1) Those to be mobilized with the ships, aircraft, and other equipment already assigned to them, and (2) those to provide individuals to augment the active forces in being from peacetime to wartime manning allowances. Available to the Selected Reserve are 558 aircraft and 75 ships, including 16 destroyers, 19 destroyer escorts, and 31 minesweepers and mine warfare ships. During the year Naval Air Reserve units were restructured and their equipment allowances adjusted to improve their responsiveness to either partial or complete mobilization. Joint training exercises of reserve surface and air units with active fleet elements materially assisted in sustaining the readiness of the Selected Reserve. Naval Air Reserve transport units, as part of their training, continued to augment the airlift resources of the active forces in support of Southeast Asia operations; reserve crews in 4,553 flight hours logged 3,663,098 ton-miles of cargo and 8,525,000 passenger miles in such missions during the year.

The Marine Corps Reserve is organized to provide a complete expeditionary force consisting of one division, one air wing, and supporting elements, ready to be deployed in combat 60 days after mobilization, and some augmentation units to round out the regular establishment during wartime. The reserve expeditionary force attained the highest state of readiness in its history during the year, helped along by joint exercises of reserve ground and air units with the regular 2d and 5th Marine Divisions. Units of the reserve expeditionary force, whose mission had been changed during the preceding year from ground combat to service support, achieved the requisite level of proficiency to be rated ready for mobilization on June 30, 1968; a few units, redesignated as augmentation for the regular forces, will not attain this goal until the coming year. Engineer, maintenance, and other service units continued, as part of their training, to provide direct support to the active Marine Corps with mutually beneficial results.

The Air National Guard and the Air Force Reserve substantially augmented the active forces during the year as part of a realistic and effective training program. Each of the 22 Air National Guard fighter interceptor squadrons provided aircraft

and crews on around-the-clock alert in support of the North American Air Defense Command; they spent over 98,000 man-days on alert logging over 42,000 flying hours which included nearly 54,000 completed interceptions in some 67,500 missions—over half of those flown by NORAD during the year. Air National Guard airlift units flew 2,469 missions—268 in support of Southeast Asia, 1,815 to other oversea areas, and 386 aeromedical evacuation flights. These crews accumulated nearly 68,000 hours of flight time, of which 14,400 were to and from Southeast Asia. Air Reserve airlift crews, for their part, flew more than 10,000 missions that totaled some 87,000 flying hours, including 16,000 hours in support of Southeast Asia. Air National Guard tactical fighter and reconnaissance squadrons participated in a number of joint training maneuvers, including some in Alaska, Hawaii, and Turkey as well as in the continental United States. Nonflying units supported the active forces by providing a number of specialized, technical services.

The airlift units of the Air Force reserve components continued their equipment replacement programs at an accelerated pace. C-124 Globemaster aircraft were furnished to six Air National Guard squadrons, replacing C-97 Stratofreighters, while three Air Force Reserve tactical airlift groups, formerly equipped with two-engine C-119's, were converted to four-engine transports. Initiating a new concept, one of these three groups was redesignated as an associate military airlift unit and co-located with a military airlift wing of the active forces, operating jet-propelled C-141 Starlifters. The reserve group will use the aircraft and facilities of the active unit. The other two C-119 groups converted to C-130 Hercules tactical airlift transports, one as a tactical airlift group and the second as a C-130 training squadron. Nonflying units were reorganized to conform as nearly as possible to the latest deployment and operational concepts that govern the troop structure of the active forces. Despite the dislocations associated with the partial mobilization and changes in organization and equipment, the Air Force reserve components continued to sustain a high state of readiness for rapid deployment in the event of an emergency.

Departmental structures and procedures for the administration of the reserve components were adjusted during the second half of the year in accordance with the provisions of the Reserve Forces Act of 1967. The position of Assistant Secretary of Defense (Manpower) was redesignated as Assistant Secretary of Defense (Manpower and Reserve Affairs) and, to provide a focal

point for coordination of all matters affecting the reserves, the position of Deputy Assistant Secretary (Reserve Affairs) was created by statute. At the same time, the Congress authorized each of the three military departments to establish a position of Assistant Secretary (Manpower and Reserve Affairs) to handle functions formerly charged to Deputy Under Secretaries. In addition, general officers were assigned to the new posts of Chief of Reserves on the Army and Air Force staffs, paralleling the office of the Chief of the National Guard. Moreover, the Department of Defense in preparing its budget for fiscal year 1969 determined the proportion of each reserve component to be included in the Selected Reserve and requested drill pay funds for the ready reservists designated. In February 1968, these recommended strengths were submitted to the Congress for authorization, as required by the new law.

Defense Space Programs

Military space activities, conducted as an integral part of the national space program to avoid duplication, aim to utilize new technologies and the new environment to enable our forces better to carry out their missions. The Department of Defense spent nearly \$1.9 billion on space research and operations during fiscal year 1968—about 28 percent of the total Federal expenditures for space programs of \$6.7 billion. It requested new obligational authority of \$2.2 billion to continue these efforts during the coming year.

Satellite communications systems have provided a valuable addition to military command and control communications, and further improvements are being planned. An increasing amount of long-distance point-to-point traffic was handled during the year by the SYNCOM III, developed by the National Aeronautics and Space Administration (NASA) and used by the Navy in the Pacific, and by Phase I of the worldwide Defense Satellite Communications System (DSCS). The latter was declared operational in mid-July 1967, following the July 1 launch into equatorial orbit of 8 satellites that supplemented the 10 previously orbited. A subsequent launching in June 1968 put 8 more DSCS satellites in orbit, for a total of 26, of which 25 were operating at the close of the year. Surface transmitting and receiving terminal equipment was available for 16 fixed, 13 transportable, and 7 shipboard installations in the United States and overseas, including Southeast Asia. DSCS has provided sustained communications support to the armed forces and the national command

authorities, permitted the rerouting of traffic from disrupted channels, and furnished a new capability for transmitting high quality photographs. Following nearly 1 year of operating experience, the Department of Defense in June 1968 decided to proceed with the development of Phase II of DSCS. The objective is to provide more advanced, synchronous orbiting satellites and new terminal equipment having greater capacity and reliability.

The development and testing of tactical communications satellites—a joint program of the U.S. military Services in which six NATO members are participating—progressed satisfactorily. LES-5, the first of two planned Lincoln Laboratory Experimental Satellites, was launched into a nearly synchronous orbit on July 1, 1967. It was used to test experimental terminals in aircraft, ships, submarines, and combat vehicles. LES-6, a more advanced model, was being prepared for launching in the coming year. It, in turn, is to be followed by TACSATCOM I, being designed by the Air Force to continue the development of an operational tactical satellite communications system for mobile field forces.

Other military applications of new space technologies included detection and warning, navigation, and mapping and geodesy. The North American Air Defense Command continued to operate the Space Detection and Tracking System (SPADATS), composed of the Air Force's SPACETRACK and the Navy's SPASUR complexes of radar, optical, and radiometric sensors for detecting, tracking, identifying, and cataloging man-made objects in space. An improved, phased array radar for SPACETRACK was being installed to increase the operational capabilities of SPADATS. More advanced instruments were being developed during the current year for the VELA satellite, eight of which were providing warning of nuclear detonations within or beyond the earth's atmosphere. Use by commercial interests of the Navy's TRANSIT navigation satellite was authorized by the President in July 1967; the system achieved full operational configuration in March 1968 with the launching of a fourth satellite. The Navy also began testing a TRANSIT receiver for aircraft. Using Defense and NASA satellites, the military Services continued geodetic programs that were yielding more precise information about the earth's size, shape, mass, and gravitational field as well as aiding in the determination of geodetic positions of land areas.

The TITAN III family of space boosters, derived from the TITAN II ICBM, was providing the Department of Defense with

reliable, standardized vehicles for a variety of applications. Production models of the TITAN IIIB-AGENA were used for a number of spacecraft experiments during the year. In addition, two developmental test flights of the TITAN IIIC, equipped with two solid propellant strap-on motors, placed 14 objects into high, nearly synchronous orbits. TITAN IIIC production was initiated during the summer of 1967, following the demonstration of its reliability. Development continued for two additional models with higher thrust, the TITAN IIID and the TITAN IIIM. The latter might be used as a launch vehicle for the Manned Orbiting Laboratory, a program designed to explore the usefulness of manned space systems for military purposes. Satisfactory static test firings of the TITAN IIIM first stage engine were conducted.

Concepts and equipment for returning men to earth from space were being investigated by the Air Force through the Spacecraft Technology and Advanced Reentry Test (START) program. This program included two test projects—Precision Recovery Including Maneuvering Entry (PRIME) and Piloted Low Speed Tests (PILOT). PRIME was completed in the summer of 1967 following three successful flights of a small unmanned maneuverable lifting-body spacecraft, the SV-5. A PILOT X-24A vehicle was delivered for preliminary testing during the coming year.

Nuclear Effects and Test Detection

The nuclear effects and nuclear test detection programs of the Department of Defense contribute to the survivability and effectiveness of our strategic forces and help to safeguard the Nation against the consequences of a sudden abrogation or a violation of the Nuclear Test Ban Treaty of 1963. In approving this treaty, which prohibits nuclear detonations in outer space, the atmosphere, and under water, the Congress authorized the establishment of four specific safeguards as a joint responsibility of the Department of Defense and the Atomic Energy Commission (AEC): (1) A comprehensive underground test program; (2) effective laboratory research in nuclear technology; (3) readiness to resume atmospheric testing; and (4) detection and monitoring of foreign nuclear detonations of all types. The Department of Defense programed nearly \$232 million for the support of these activities during fiscal year 1968, or \$7 million more than the preceding year.

Since 1963 the United States has developed an extensive capability for carrying out a wide range of underground nuclear experiments. This capability has been utilized to learn more

about the effects of nuclear detonations on the performance and vulnerability of strategic weapons and supporting systems that might be required to operate in a nuclear environment. Underground testing also has assisted in the design of advanced weapons and in the improvement of detection methods and systems. The Crosstie series of tests that were conducted during fiscal year 1968 at the Nevada Test Site included 26 publicly announced detonations, of which 22 were conducted by AEC, 3 by Defense for the nuclear effects program, and 1 jointly by Defense and AEC for the detection program. The effects tests were concerned primarily with determining the vulnerability of ballistic missile reentry bodies to enemy nuclear attack. Approximately 16 percent of Defense safeguards funds were allocated to underground testing.

Defense laboratories also provided useful information about the vulnerability and survivability of weapons and supporting systems. Theoretical work continued on simulation devices and techniques for laboratory and field use and on computer programs for better prediction of effects. Other tasks included the exploration of new fuzing devices, arming and control procedures, delivery methods, and weapons components. As a result of these studies and the underground tests, the military Services are acquiring a substantial body of knowledge to increase the effectiveness of our offensive and defensive systems. Laboratory research accounted for about 26 percent of the nuclear safeguards program of the Department.

The Department of Defense and AEC continued to maintain facilities and other resources in readiness to resume testing in currently prohibited environments should the test ban treaty be violated or abrogated. Scientific and operational installations at Johnston Atoll and in Hawaii, together with diagnostic NC-135 aircraft, B-52 drop aircraft, sampling aircraft and rockets, instruments for airborne and ground observations, and similar testing devices are held in readiness, and the entire system is being tested annually by Joint Task Force 8, headquartered at Albuquerque, N. Mex.

As a result, operational systems tests and nuclear tactical exercises could be mounted within 2 to 3 months and full-scale weapons effects tests in 6 months. The maintenance of this capability represented about 10 percent of the total Defense nuclear safeguards program during the year.

To gather information on foreign nuclear weapons events and monitor the test ban treaty, the Department of Defense operates

the Atomic Energy Detection System and participates with AEC in the VELA program for the development of improved methods for detecting, locating, and identifying nuclear detonations. These two activities comprised about 48 percent of the Department's budget for treaty safeguards. VELA projects include advanced sensor systems for all environments—underground, underwater, the atmosphere, and outer space. Several VELA subsurface improvement efforts were undertaken during the year. A Large Aperture Seismic Array (LASA) was being constructed in Norway for use in conjunction with the LASA emplaced earlier in southeastern Montana and one of the underground nuclear tests—the Scroll shot of April 23, 1968—was designed to study seismic decoupling potential of dry, low density, high porosity material. The VELA satellite program for space and atmospheric detection was discussed briefly in the preceding section of this report.

Collective Security

Our national security policy continued to be tied closely to the principle of collective security during fiscal year 1968. In support of this principle, the Department of Defense, in close coordination with the Department of State, participated actively in multilateral and bilateral mutual defense arrangements and helped allied and other friendly nations to strengthen the capabilities to guard their territorial integrity against external threats and to maintain internal security. To an increasing extent, this assistance consisted of sales of military weapons, equipment, and services rather than grant aid, which was limited largely to countries most directly threatened.

Collective security treaties, concluded with the advice and consent of the Senate, link the United States to more than 40 nations. These agreements include four multilateral arrangements—the North Atlantic Treaty Organization (NATO), the Organization of American States (OAS), the Southeast Asia Treaty Organization (SEATO), and the Australia-New Zealand-United States (ANZUS) Treaty. The United States, although not a member, also participated in the activities of the Central Treaty Organization (CENTO), composed of Iran, Pakistan, Turkey, and the United Kingdom. In addition, bilateral defense arrangements are maintained with Japan and the Republics of China, Korea, and the Philippines.

Buttressed by this treaty system, the United States and its allies have been seeking to lessen tensions between themselves and their potential adversaries. Some progress in this direction

was realized during the year. The treaty on the peaceful uses of outer space entered into force, and a supplementary agreement on the rescue of astronauts and the return of space objects was concluded. In the field of arms limitation, the Soviet Union joined the United States and the United Kingdom toward the close of the fiscal year in sponsoring a treaty to prevent the proliferation of nuclear weapons, and asking all other nations to become signatories. At the same time, the President announced that the United States and the Soviet Union had agreed to enter into discussions on the limitation and the reduction of both offensive strategic nuclear weapons delivery systems and systems of defense against ballistic missiles.

In response to the existing world situation and in accordance with the principle of collective security, the United States continued to assign a substantial portion of its military forces to overseas bases and to afloat and mobile naval activities. While the buildup of U.S. military strength in Southeast Asia and Korea was accompanied by some draw down in other overseas areas, the number of military personnel serving at sea or outside the continental United States increased by over 10,000 to a total of 1,519,000 on June 30, 1968—42.8 percent of our armed forces. Nearly 1,198,000 of these men were based ashore at overseas locations, including Alaska, Hawaii, and U.S. territories. These assignments accounted for 43.3 percent of the Army, 34.5 percent of the Marine Corps, 33.8 percent of the Air Force, and 13.9 percent of the Navy. Some 313,000 sailors and 8,000 marines were assigned to afloat and mobile activities, 40.1 and 2.4 percent of Navy and Marine Corps strengths, respectively. (See table 18.) About 22 percent of the civilian employees of the Department, including 61,000 U.S. citizens and 258,000 foreign nationals, worked in support of these deployments.

Although developments in Asia compelled the concentration of substantial U.S. forces in the Far East, cooperation for mutual defense with the nations of Western Europe remained a vital concern. In December 1967 the North Atlantic Council, including the French representative, unanimously approved a report on the future tasks of the alliance calling for the retention of adequate military strength and political solidarity for the deterrence of aggression and the defense of the treaty area. They also expressed the hope that current efforts to improve East/West relations might lead to progress in the settlement of outstanding European problems.

The NATO Defense Planning Committee made significant ad-

vances during fiscal year 1968 developing plans for the coordination of NATO strategy, force structure, and fiscal resources available. Following a comprehensive review of the strategic threat, the Committee recommended preparation for a wider range of contingencies, based upon a flexible and balanced response—including, as appropriate, conventional or nuclear weapons—to all levels of aggression or threats of aggression. The new force planning system, initiated during the preceding year, was further developed in support of this strategy. A 5-year force plan, covering the period from 1968 to 1972, was adopted for the first time in December 1967, and tentative force goals for the 1969-73 period, prepared in May 1968, served to guide the detailed planning by member countries.

The seven-nation Nuclear Planning Group, a permanent forum for NATO countries to participate in the discussion of nuclear matters, met twice during the year. At their fall meeting, the ministers reviewed concepts for the defensive use of atomic demolition munitions and plans for other strategic and tactical nuclear weapons. At the spring meeting the problem of antiballistic missile systems was examined, and it was concluded that present circumstances did not justify the deployment of ABM's in Europe. This recommendation was subsequently confirmed by the Nuclear Defense Affairs Committee, open to all NATO members, and by the Defense Planning Committee.

Developments in the Mediterranean area during the year gave rise to considerable concern. A new flare-up of tension between the Greek and Turkish communities on the island of Cyprus threatened for a time to involve Greece and Turkey despite their common membership in NATO. Fortunately, through the good offices of the NATO Secretary General, the representative of the Secretary General of the United Nations, and the Special Representative of the President of the United States, the Governments of Cyprus, Greece, and Turkey averted this tragedy. Increasing Soviet activities in the eastern Mediterranean were another source of apprehension, and the Defense Planning Committee asked NATO authorities to consider measures to improve surveillance and improve force effectiveness in this area.

Other NATO developments included the establishment of a multinational naval squadron, further upgrading of the NATO air defense system, and improvements in communications links. Activated on January 13, 1968, at Portland, England, the Standing Naval Force, Atlantic (STANAVFORLANT), was composed of four antisubmarine warfare frigates and destroyers from the

Netherlands, Norway, the United Kingdom, and the United States. The long-term program for upgrading the air defense warning and control system of the alliance—Project NADGE (NATO Air Defense Ground Environment)—progressed with the activation in April 1968 of the Programming and Training Center at Glons, Belgium. Manned and operated by Belgian, Dutch, and German personnel, Glons is the first modernized installation of the integrated network and will also serve as a training unit and computer programming center to meet NADGE requirements. The first steps toward the development of an operational capability for satellite communications covering the whole European NATO area were taken as NATO personnel, sharing time on the U.S. Defense Satellite Communications System, began operating an experimental network linking Supreme Headquarters, Allied Powers Europe, at Mons, Belgium, with the headquarters of Allied Forces, Southern Europe, in Naples, Italy. Personnel from eight nations were receiving training to provide a nucleus for future expansion.

The United States and its ANZUS, CENTO, OAS, and SEATO allies held economic and military planning conferences and combined military training exercises to foster interallied cooperation. Allied maneuvers sponsored by SEATO included SEA DOG for naval forces in July 1967 and RAMASOON for ground forces and communications elements in March 1968. Military planning for the mutual defense of the Western Hemisphere continued to be coordinated through the Inter-American Defense Board, headquartered in Washington, D.C. The U.S. Southern Command provided troops that participated in multinational ground force maneuvers in March and May 1968, while the Atlantic Fleet supplied ships for the annual Operation UNITAS series of combined naval exercises held in cooperation with naval and air force units from Argentina, Brazil, Chile, Colombia, Ecuador, Peru, Uruguay, and Venezuela. Brazilian and Ecuadorian ships also took part in a joint exercise with British, Canadian, Dutch, German, and U.S. fleet units during the winter of 1967-68 in the Caribbean.

Military Assistance

The President's budget for fiscal year 1968 included \$596 million for the military assistance program—\$536 million for grant aid and \$60 million to finance the sales of equipment on credit. It did not include funds for (1) military assistance to Laos and Thailand, (2) the U.S. share of annual NATO infra-

structure programs, and (3) the U.S. portion of support costs for NATO, SEATO, and CENTO international military headquarters and agencies, but requested that these accounts be shifted from the military assistance to the regular Defense appropriation. A similar transfer had been authorized in 1966 for the funds required for the support of allied forces in Vietnam. The Congress approved the newly proposed transfers except for the support of the international military headquarters—thereby raising the military assistance request from \$596 million to \$620 million. Congressional authorization actions reduced this amount to \$510 million, which was further reduced to \$400 million in the Foreign Assistance Appropriation Act of 1968, as finally approved on January 2, 1968—6 months after the beginning of the fiscal year. In March 1968, the President requested \$100 million in additional military assistance to strengthen the defenses of the Republic of Korea. The Congress included this amount in the Second Supplemental Appropriation Act of 1968, approved after the close of the fiscal year on July 9, 1968, thus bringing the military assistance appropriation for fiscal year 1968 to \$500 million. Recoupments from prior year programs and other financial adjustments brought the total obligational authority to \$605 million, as compared to \$744 million for the preceding year.

With the reduction in available funds, the amount of grant aid delivered and the number of recipients both continued to decline. During fiscal year 1968 the Department of Defense furnished materiel, services, and training with a value of \$718.7 million to 49 allied and friendly nations—representing a decrease of \$94.8 million in deliveries and 14 countries as compared to the preceding year. (See table 49.) Shipments included weapons and equipment surplus to the needs of U.S. forces, originally acquired at a cost of \$145.4 million, that were provided without charge except for rehabilitation and transportation expenses. Over 80 percent of the 1968 program was allocated to five “forward defense” nations—the Republics of China and Korea, Greece, Iran, and Turkey. Regionally, 56 percent of the program was used to assist countries in the Far East and 27 percent to countries in the East and South Asia. The remaining funds supported worldwide cooperative military undertakings and military assistance for Latin America, Africa, and Europe, with the residual programs in Europe accounting for less than 1 percent of the total effort.

Training programs for foreign military personnel accounted for less than 6 percent of military assistance expenditures, or

only \$41 million. These programs have made a major contribution to interallied military cooperation and to the effectiveness of allied forces. Utilizing service schools at home and overseas, on-the-job instruction, military exercises and seminars, mobile training teams, and other field training, the U.S. armed forces instructed nearly 10,800 foreign military students during the year, over half of them in the United States.

Materiel assistance under the grant aid program was provided to 32 nations, 4 fewer than during the preceding year, and a further reduction to 25 was planned for the coming year. Economic progress in allied and friendly countries continued to make possible reductions in grant aid and shifts to direct purchase. Particularly encouraging in this respect during the past year were advances in Iran and the Republic of China. The size and content of military assistance programs were also affected by developments in international relations. The shipment of selected materiel—primarily repair parts, components, and similar items for the maintenance of weapons and equipment—was resumed to Israel, Lebanon, Libya, Morocco, Saudi Arabia, and Tunisia in October 1967 and to Jordan in February 1968, after having been suspended as a result of the Arab-Israeli war of June 1967. The prohibition against shipments to other Arab states that had broken relations with the United States was not withdrawn. Limitations on the deliveries of certain major items to Greece, imposed following the coup d'état of April 1967, remained in effect. The outbreak of hostilities in Nigeria led to the suspension of training Nigerian military personnel in the United States.

In separate legislation approved on December 26, 1967, the Congress authorized a 5-year extension of agreements with 10 countries covering the loan of 25 U.S. naval ships from the reserve fleet and the conclusion of two new agreements for the loan of two additional destroyers to the Republic of Korea and one to the Republic of China. For the most part, these ships are being loaned to countries whose navies participate with the United States in bilateral or multilateral military responsibilities but who lack the capacity or resources to build or purchase the equipment necessary for meeting these commitments. Outstanding loans at the beginning of the fiscal year were providing 76 ships to 18 countries. While the loan period was expiring for 27 of these units, the renewal included only 25 as Greece and Brazil returned one submarine each to U.S. control. The 25-ship total included 15 destroyers, 5 destroyer escorts, and 5 submarines on

loan to Korea, Spain, three NATO members—the Federal Republic of Germany, Greece, and Portugal—and five Latin American countries—Argentina, Brazil, Chile, Colombia, and Peru.

The military assistance budget for fiscal year 1969, submitted to the Congress by the President in January 1968, requested \$420 million for the military assistance program and \$120 million for financing military credit sales—\$56 million less than the budget request for the preceding year. The funds required for programs transferred from the military assistance account to the regular Defense appropriation accounts—support of allied forces in Vietnam, local forces in Laos and Thailand, and NATO infrastructure—were estimated at about \$1.8 billion. These budget recommendations were pending before the Congress at the close of fiscal year 1968.

Military Export Sales

The sale of U.S. weapons and equipment to friendly nations has assisted these countries to strengthen their self-defense as well as their contribution to collective security. It has also promoted standardization and cooperative logistics arrangements between U.S. and allied forces and helped to reduce the deficit in the U.S. balance of international payments. Such sales were authorized by the Mutual Defense Assistance Act of 1949 and subsequent legislation, but during the 1950's they accounted for only about one-fifth of U.S. military exports which at that time comprised primarily items provided by grant aid. Since fiscal year 1962, foreign purchase orders have averaged \$1.6 billion.

In recognition of the expanding role of the military sales program, the Foreign Assistance Act of 1967, approved on November 14, 1967, consolidated and more precisely delineated the provisions of earlier laws. In February 1968 the Administration proposed new legislation to clarify procedures and to separate military sales from military assistance. This measure was pending at the close of the fiscal year.

All proposed purchases under the military sales program continued to be carefully reviewed. Departmental policy precluded the sale of items that a foreign country could not afford, did not need for its defense requirements, or could obtain cheaper or better from another Free World source. Consideration was also given to the internal and external threats confronting the potential buyer, the relative need to channel available resources to economic and social development projects, the effect of the sale on regional tensions and local arms races, the risks from improper

use of the equipment, and the countervailing risks that might arise from failing to approve the sale. As a result, all agreements concluded were based upon a positive determination that the sale would be in the over-all best interest of both the United States and the prospective buyer.

Military export sales meeting these standards totaled over \$1.8 billion during the year. By far the largest part of these orders came from industrialized nations and from countries with growing foreign exchange holdings. Although the substantial reduction in sales of equipment and services to the Federal Republic of Germany was only partially offset by orders from other economically strong countries, resulting in an over-all decrease of about \$0.1 billion in sales compared to the preceding year. Nearly 73 percent of the year's sales was for cash—three-fifths administered by the Department of Defense and two-fifths in direct purchases from U.S. firms. About 13 percent of the transactions involved credit arrangements between foreign governments and the Export-Import Bank without any U.S. repayment guaranty. The remaining 14 percent of the orders was financed through the military assistance credit-sales revolving fund of the Department of Defense, the authority for which terminated on June 30, 1968.

Under the terms of the new legislation proposed by the Administration, sales formerly assisted by this revolving fund will be financed through annual appropriations.

Co-production of weapons and equipment remained an important element in the military sales effort. NATO members negotiated agreements to produce such major U.S.-developed systems as the M-60 tank, an advanced version of the NATO F-104 Starfighter, and various helicopters. To strengthen its air defenses, Japan arranged to buy HAWK and NIKE-HERCULES surface-to-air missiles and ground equipment, some of which will be produced in Japan and some in the United States. Co-production programs benefit the United States through the sale of technical data, components, and tools and the purchaser through the expansion of his industrial base and new employment opportunities.

Military export sales are not an end in themselves. Like military assistance, they constitute an integral and essential part of our collective defense and total foreign policy. The program has helped to reduce costs for ourselves as well as for our allies by minimizing duplicative development programs and by realizing the economies of larger scale production.

III. Defense Management

The primary responsibility of the Department of Defense is to maintain the military strength required for our national security. Coordinate is the obligation to achieve this defense posture at the lowest possible cost. This goal determined Defense management policies throughout fiscal year 1968.

Financial Management

The basic financial management tool during the fiscal year continued to be the Planning-Programming-Budgeting System (PPBS) as reflected in the Five Year Defense Program. Providing essential data in a single coherent framework, it materially assisted the President and the Secretary of Defense as well as the Congress in reaching informed decisions on the optimum allocation of resources. Supported by the expanding utilization of systems analysis focusing on available options, the PPBS concept has made a major contribution to better management throughout the Department.

The development of more accurate and meaningful information for all phases of the new system has been a continuing effort since 1961. With the initiation of Project PRIME in 1964, particular attention has been given to the management of operating resources, which comprise over 50 percent of the annual Defense budgets. The objectives of Project PRIME are to provide accounting data in terms consistent with PPBS to permit a more effective review of program decisions and, at the same time, to improve the management process by focusing attention on expenses incurred and resources consumed by organizations at the installations level, thus enabling managers to relate the cost of operations to output in financial terms.

The PRIME system was tested and further refined during fiscal year 1968 at one major command of each military Service—the Sixth Army, the Naval Air Training Command, the Development and Education Command of the Marine Corps, and the Air Training Command of the Air Force. With the approval of the Congress and of the Comptroller General of the United States, as required by the Defense Appropriation Act of 1968, other operating com-

ponents of the Department will begin converting to the new procedures during the coming year. These procedures involve four major changes.

First, accounts were redesigned to support PPBS by introducing a uniform account structure identifying the military program or purpose of each organization. This uniform account structure serves three purposes. The program element information helps planners and programers in allocating resources. The functional information assists managers of common support activities in measuring mission accomplishments in such areas as administration and the maintenance of materiel and facilities. The expense information aids managers in controlling the input of resources, and the elements provide central fiscal agencies with "objects of expenditure" data.

The second significant change in the accounting system was the introduction of the accrual basis of accounting. This change from the cash basis focuses attention on the resources consumed and relates outlays to outputs in accordance with the recommendations of the President's Commission on Budget Concepts in October 1967.

The third major change provided for the disclosure of the "full cost" of operating each organization. It was designed to stimulate cost consciousness by including in the account structure the cost of military personnel as well as of those goods and services formerly furnished as "free" issue.

The last major change involved a modification of the appropriation structure. In order to facilitate the accumulation of operating costs, as opposed to investment costs, expense items were transferred from the capital acquisition appropriations to the operations appropriations and investment items from the operations appropriations to the capital acquisition appropriations. For all practical purposes, the accounting system for operations will include expenses only and exclude the cost of investment items.

In conjunction with the PRIME system, the Department of Defense was making more extensive use of working capital funds to facilitate charging the ultimate consuming unit with the full measurable costs of its operations. Working capital funds, which have been used by the military for many years, include (1) industrial funds that cover the costs of performing industrial and commercial-type support functions and (2) stock funds that finance the acquisition of wholesale supply inventories, particularly of consumable items. The fund is subsequently reimbursed from the appropriations of using organizations at the time bene-

fits are received, thus relating costs to use. This process helps to focus the attention of operating managers on the value of resources consumed in operations, rather than only on the acquisition of physical goods and supporting services.

To this end, 15 additional logistical activities were chartered during fiscal year 1968 to operate through industrial funds and 22 more were scheduled for conversion to this management device early in fiscal year 1969. The instructions governing the operation of industrial funds were also revised during fiscal year 1968 to encourage better management control over materiel inventories and work in process by substituting progress payments from customers for advanced billings on long leadtime orders. With the 1968 additions, a total of 83 activities—production plants, shipyards, major overhaul and repair depots, transportation agencies, and similar service and support organizations—were operating under industrial fund charters on June 30, 1968. Sales to customers during the year totaled \$6.2 billion, as compared to sales of \$5.5 billion by a smaller number of activities during the preceding year. Combined assets of all the funds totaled \$1.5 billion, combined liabilities \$1.1 billion, and the combined capital of the funds \$0.4 billion at yearend, as compared to about \$2.9 billion, \$2.5 billion, and \$0.3 billion, respectively, on June 30, 1967. The decrease in assets and liabilities was the result of the shift from prepayments to progress payments for work in process.

Supply activities financed by stock funds, which have expanded substantially between 1965 and 1967 primarily as the result of the quickening tempo of operations in Southeast Asia, declined slightly during fiscal year 1968. Sales to customers from all stock funds totaled \$11.7 billion, as compared to \$11.9 billion for fiscal year 1967, \$9.1 billion for 1966, and \$6.8 billion for 1965. Inventory levels have been raised to support these higher activity rates, increasing from a combined total of \$5.3 billion on June 30, 1965, to \$7.9 billion on June 30, 1968. Of this increase, however, only about \$0.4 billion occurred during fiscal year 1968. The combined capital of Department of Defense stock funds totaled nearly \$8.3 billion on June 30, 1968, an increase of more than \$0.5 over the total of \$7.8 billion registered a year ago.

Improvements in accounting and reporting procedures were also carried out during fiscal year 1968 in many other Defense activities. On August 15, 1967, the Department revised its regulations on uniform property records, property classifications, and financial reporting procedures for Government-owned real property, plant equipment, and materials in the possession of con-

tractors in order to provide better identification, physical inventory, and maintenance of these assets. In the foreign military sales area, procedures for billing foreign governments and for compiling status reports were revised to provide more accurate and timely information for both the Department of Defense and foreign purchasers. The existing program for the recurring collection from Defense contractors of estimated cost data for major weapons systems was further expanded. By June 30, 1968, collection plans had been approved for 37 aircraft, missile, and space systems—an increase of 13 during the year—and cost information reporting had been instituted under 47 contracts for 23 systems, as compared to 10 contracts for 7 systems in effect at the beginning of the year.

The Budget

The guidelines for the 1968 Defense budget provided that estimates were to cover all the requirements for U.S. military operations in Southeast Asia throughout the fiscal year and that projects that could safely be deferred were to be postponed while marginal activities were to be completely eliminated. In keeping with the first of these guidelines, the 1968 budget was to assure the uninterrupted flow of combat materiel from production lines until fiscal year 1969 appropriations could sustain output. This meant that for items such as ammunition, with a 6-month procurement leadtime, the 1968 budget would have to cover requirements through January 1, 1969, while aircraft, with an 18-month leadtime, had to be funded through January 1, 1970. The second criterion of the 1968 budget guidance ruled out, for example, the procurement of later models of equipment merely to replace items already in adequate supply when the improvement in combat capability would be marginal.

Based on these guidelines, the President's budget, transmitted to the Congress in January 1967, requested a total of \$75.2 billion in new obligational authority for Department of Defense military activities. The estimates included \$71.6 billion for operations financed through the basic Defense Appropriation Act, \$2.9 billion for military construction and related functions, \$0.1 billion for civil defense, and \$0.6 billion for military assistance. The total exceeded 1967 appropriations by \$2.5 billion.

Of the new appropriations requested by the President, \$24.3 billion required prior Congressional authorization—\$21.1 billion for the procurement of aircraft, missiles, naval vessels, and tracked vehicles and for research, development, test, and evaluation;

\$2.6 billion for military construction; and \$0.6 billion for military assistance. Congressional action on these requests resulted in a net reduction of \$0.3 billion, for a total of \$24.0 billion. The Congress eliminated \$0.3 billion from the military construction authorization bill and \$0.1 billion from the military assistance request and added \$0.1 billion to the basic Defense authorization bill. The increased authorization resulted principally from the addition of about \$0.6 billion for the construction of two nuclear-powered frigates and the development of the Advanced Manned Strategic Aircraft (AMSA)—an amount that was only partially offset by the cancellation of the proposed programs for fast deployment logistics (FDL) ships and for two conventionally powered frigates.

In considering the appropriation requests, the Congress was governed by the authorization reductions and, in addition, cut back numerous other budget items in order to reduce Federal expenditures. These downward adjustments totaled \$2.7 billion, or nearly 4 percent of the \$75.2 billion requested. The basic Defense Appropriation Act, approved on September 29, 1967, provided new obligational authority of \$69.9 billion, a reduction of over \$1.6 billion or 2.3 percent. Far larger percentage cuts were made in military construction, civil defense, and military assistance funds, for which \$2.1 billion, \$0.1 billion, and \$0.4 billion were appropriated—or 29, 22, and 33 percent less than requested, respectively. With the enactment of these four appropriation bills, \$72.5 billion in new funds became available to the Department for fiscal year 1968.

Subsequent Congressional actions required further adjustments in the Department's financial plans. First, approval of a 4.5 percent pay raise for military and civilian personnel in December 1967, retroactive to October, and adjustments in the wage scales of blue collar workers added nearly \$1.0 billion to Defense payroll costs. A further complication arose from Congressional direction on December 18, 1967, that Federal agencies reduce their budget estimates of obligations for personnel by 2 percent and for all other cost categories by 10 percent, except for the support of Southeast Asia operations. As the Congress itself had already reduced budgeted obligational authority for non-Southeast Asia Defense programs by about \$2.4 billion, the Department was required by the new law to cut back its planned obligations by an additional amount of nearly \$3.0 billion, to be placed in reserve.

The pressure of events created further difficulties. In presenting the 1968 budget to the Congress, the Secretary of Defense

had stated that the estimates would be adequate, barring a significant change in the character or scope of the Southeast Asia conflict or unforeseen contingencies elsewhere in the world. This caveat took on deeper meaning as the year unfolded. The budget had been based on a projected deployment of about 470,000 U.S. military personnel in Vietnam, but in August 1967 the President announced his approval of an increase to about 525,000 men as recommended by the theater commander, the Joint Chiefs of Staff, and the Secretary of Defense. In addition, about 10,000 more U.S. servicemen than originally planned were deployed to the Seventh Fleet and to Thailand, other free world countries augmented their contingents in Vietnam, and the Republic of Vietnam increased the number and upgraded the capability of its own forces. To offset the higher costs resulting from these actions, the President, in approving the strength increases, instructed the Department of Defense "to conduct a searching review of all defense expenditures and to withhold all such expenditures that are not now essential for national security."

The results of this searching review were presented to the Congress in February 1968. It was found that an increase of roughly \$6.0 billion in Southeast Asia programs could be offset by reprogramming actions in other Defense accounts and by the release of the \$3.0 billion reserved from obligations in accordance with the Congressional action of December 18, 1967.

Yet, even as these adjustments were being submitted, they were overtaken by events. The seizure of the U.S.S. *Pueblo* on the high seas by North Korea and the initiation of the Communist Tet offensive in January presented the United States with an additional contingency and a change in the scope of the Southeast Asia conflict. To counter the situation in Korea, the United States deployed additional forces to northeast Asia and augmented its military assistance program for the internal security of the Republic. The Tet offensive in Vietnam resulted in the immediate reinforcement of U.S. combat elements and longer range programs to increase both U.S. and Republic of Vietnam strengths in the theater. On March 31, President Johnson announced that the United States would augment U.S. deployments to a total of about 550,000 and would support an increase of 135,000 in the armed forces of the Republic of Vietnam.

To finance these additional deployments and cover the higher costs of operating the Department of Defense, the President requested supplemental appropriations of \$4.7 billion from the Congress in March and in May 1968. He also renewed his February

request for the release of the \$3.0 billion placed in reserve. The supplemental submission included \$0.1 billion for an expanded military assistance program for the Republic of Korea, nearly \$0.7 billion for military and civilian pay raises, and an emergency fund of \$3.9 billion for increased deployments and higher operating rates.

Congressional action on these requests was incorporated in the Second Supplemental Appropriation Act that President Johnson signed on July 9, 1968. This measure provided the Department \$4.3 billion in new obligational authority—a reduction of about \$0.4 billion—and authorized the release of over \$2.3 billion from the \$3.0 billion Defense reserve established by Congressional action on December 18, 1967. New appropriations included the \$0.1 billion requested for an expanded Korean military assistance program; more than \$3.7 billion for the emergency fund, a reduction of \$0.2 billion; and about \$0.5 billion for higher military and civilian payrolls, a reduction of over \$0.2 billion that reflected a later estimate of requirements. This Supplemental Appropriation Act, together with the acts approved earlier, brought total new obligational availability for the Department to \$76.8 billion, of which nearly \$0.2 billion was earmarked as additions to the capital of stock funds that finance supply activities. The balance, \$76.6 billion, was for military functions and military assistance programs.

Obligational availability, excluding transfers and revolving funds, thus rose to \$96.6 billion for fiscal year 1968—the new appropriations of \$76.6 billion, unobligated balances of \$13.7 billion from previous years, and reimbursements and other financial adjustments of about \$6.3 billion. The Department obligated \$83.0 billion of these funds during the year—as compared to \$78.2 billion during the preceding year—and expended \$78.0 billion, or \$9.5 billion more than the \$68.5 billion that it had spent in fiscal year 1967. (See tables 12 and 13.)

While the Congress was considering the budget estimates for fiscal year 1968, the Department of Defense was developing the following year's request. The guidelines for the 2 years were basically the same—calling for full support of combat requirements and deferral of low priority projects not associated with Southeast Asia. Prepared in the fall of 1967, the budget for 1969 was based on a projected deployment of about 525,000 U.S. troops to Vietnam and did not include the augmentation of forces there and in Korea that subsequently became necessary. Transmitted to the Congress by the President in January 1968, the compre-

hensive budget statement requested \$79.7 billion in new obligational authority for the Department of Defense, including \$0.5 billion for military assistance and foreign military credit sales. Congressional action on the 1969 estimates was still pending at the close of fiscal year 1968.

International Balance of Payments

The Department of Defense programs to reduce military expenditure abroad continued to be emphasized in fiscal year 1968. The fact that the net adverse balance attributable to Defense activities rose from \$2.4 billion to \$3.3 billion during the year does not reflect upon the effectiveness of these programs (see table 15). This increase resulted primarily from the combined effect of the rise in deployments and operating rates in the Far East and of lower receipts from the sale of military equipment and logistic services to foreign governments.

In coping with the balance of payments aspects of its military programs, the Department has been guided by the requirement to maintain essential combat capability unimpaired and the desire to preclude undue hardship for U.S. military and civilian personnel and their families. Subject to these prerequisites, the Department has concentrated its efforts on reducing the procurement of foreign goods and services by its field agencies and by individuals.

To limit military procurement abroad, U.S. materials, supplies, and services have been substituted for those of foreign origin to the maximum extent feasible. Contract awards have normally been placed with U.S. firms whenever the cost of an item, including transportation and handling, did not exceed foreign bids by more than 50 percent, and even higher differentials have been authorized on a case-by-case basis. A special effort during fiscal year 1968 reduced foreign currency requirements for the procurement of subsistence items abroad from \$100 million to \$80 million. Expenditures for U.S.-funded research and scientific activities in foreign countries were further limited by revisions of policy criteria, reductions in the number of U.S. military and civilian research personnel assigned overseas, and the colocation of the Department's European research offices in the United Kingdom.

The efforts have been supplemented by actions to limit foreign exchange expenditures for the construction and operation of overseas facilities. Military activities and functions continue to be consolidated in order to reduce the number of overseas head-

quarters and bases. All marginal construction has been deferred or eliminated while extra budgetary costs have been authorized for essential projects to permit the utilization of materials, equipment, and even prefabricated buildings procured in the United States and transported overseas by U.S. flag carriers. The Vietnam military construction program continued to receive special attention; of the approximately \$1.2 billion expended for this purpose through fiscal year 1968, only about \$325 million, or 27 percent, represented foreign exchange costs.

The program to reduce the employment of foreign nationals overseas continued to make progress, particularly in Europe, but such reductions were more than offset by increasing requirements for local labor in the Far East. The direct and indirect foreign nationals increased by nearly 2,000 during the year to a total of 258,000. This slight augmentation, coupled with continuing foreign wage increases, required an expenditure of \$572 million, an increase of about \$47 million over the previous year.

Savings in oversea Defense expenditures of about \$75 million annually will result from the redeployment to U.S. bases of two infantry brigades, an armored cavalry regiment, and four Air Force tactical fighter squadrons. This transfer, to be carried out between April and September 1968, will involve 33,000 U.S. Army and Air Force military personnel, 300 civilian employees, and about 16,000 dependents. These forces and aircraft remain committed to NATO under the operational command of the U.S. Commander-in-Chief, Europe, and will maintain a high state of readiness for swift redeployment to Europe in the event of an emergency.

The funds on deposit as well as the number of military personnel participating in the Uniformed Services Savings Deposit Program continued to grow during the year. Available only to members of the armed forces stationed overseas, the program encourages saving by offering an interest rate of 10 percent. Over \$358 million was deposited between September 1966 and the close of fiscal year 1968, at which time a balance of nearly \$254 million was still on deposit in some 197,000 accounts. Intensified informational campaigns to discourage oversea spending, greater use of Hawaii as a rest and recuperation site for military personnel from Southeast Asia, and further restrictions on official oversea travel also contributed to the reduction of foreign currency requirements. As for nonappropriated fund activities, they have followed purchasing and pricing policies that reduced their procurement of foreign commodities for resale by about \$5 million

during fiscal year 1968 while their total volume of business increased by nearly \$100 million.

The sale of equipment and services to foreign governments not only promotes the defensive strength of our allies and encourages the establishment of cooperative logistic systems but also contributes to offsetting military expenditures abroad. The cash receipts from such sales amounted to \$1.0 billion in fiscal year 1968 after reaching a peak of nearly \$1.6 billion in the previous year, when the Federal Republic of Germany made large payments under the then-existing offset agreement. As part of new arrangements, Germany undertook to invest \$500 million in U.S. Government securities during fiscal year 1968. This transaction and similar arrangements with other countries resulted in the capital inflow of about \$800 million during the year, which is not reflected in Defense accounts.

Anticipated price and wage increases indicate a continuing rise in military expenditures abroad for the coming year. This outlook calls for further efforts to make existing programs more effective and to find additional ways to improve the U.S. balance of payments.

Manpower

Increased oversea requirements continued to pace the manpower programs of the Department of Defense during fiscal year 1968. U.S. troop strength in the Republic of Vietnam was raised by about 86,000 men, while combat and support commands elsewhere in Southeast Asia were also reinforced. Scrupulous adherence to the policy of 12-month duty tours in the combat zone required that the military Services provide tens of thousands of replacements for the men sent to Vietnam in 1967. Meanwhile, the manpower needs of combat-ready forces in other parts of the world had to be met, including higher strength levels authorized for units in the Republic of Korea. These requirements imposed heavy recruiting and training loads on the military departments as over 900,000 men had to be enlisted, inducted, or called to active duty from the reserves and prepared for service. To support the enlarged active forces, the Department of Defense also had to expand its corps of civilian workers.

While successfully meeting these immediate requirements, the Department continued its efforts to resolve its longer range manpower problems, particularly those related to attracting and retaining high-caliber personnel, both military and civilian. In support of this objective, the Congress brought military and civi-

lian pay scales more in line with those of private industry, and the Department of Defense undertook a comprehensive survey of military compensation and benefits to facilitate further improvements in personnel management.

At the same time further progress was made in the military programs directed toward reducing domestic tensions and strengthening the Nation internally.

The Active Forces

Active duty military personnel increased by 171,000 during the year for a total of 3,548,000 on June 30, 1968. (See table 17.) To attain this strength while replacing the substantial numbers of men whose terms of service expired in 1968, the armed forces brought some 70,000 officers and 922,000 enlisted men on active duty. These numbers would have been even larger had not 203,000 individuals reenlisted during the year.

Nearly one half of the new officers—32,000—were commissioned through officer candidate schools and over one quarter—18,000—through senior Reserve Officers' Training Corps courses and related programs at colleges and universities. The remaining 20,000 officers were mainly reservists who volunteered for or were called to active duty, graduates of Service academies, or direct appointees from civil life in professional specialties.

As for new enlisted personnel, some 513,000 men voluntarily joined the armed forces, or 30,000 more than during the preceding year. About 69,000 reserve enlisted men began tours of extended active duty, including some 30,000 called involuntarily in the spring of 1968. It remained necessary to place draft calls for 343,000 men—337,000 for the Army and 6,000 for the Marine Corps—and to induct 340,000 in order to secure replacements for men drafted in 1966. Some 40,000 more men were inducted in 1968 than the preceding year. (See table 20.)

The 70,000 officers and 922,000 enlisted men who came on active duty accounted for about 17 percent of the officers and 30 percent of enlisted men in service at the close of the year. The high percentage of new personnel reflected the fact that only about 1 out of 4 ROTC officers and 1 out of 5 of the enlisted volunteers eligible to reenlist remains in service after his first tour of duty and only about 1 out of every 10 draftees. Even though nearly 4 out of 5 "career" regulars—men in their second or subsequent enlistments—who were eligible to reenlist chose to remain in service during the year, this ratio has been declining during the past 2 years. (See table 21.) Obviously a

reduction in personnel turnover represents one of the most urgent requirements of the Department.

Of particular help in this regard was the action by the Congress increasing military compensation. This measure originated with recommendations by the President in April 1967, when he called for (1) increases in Federal civilian and military pay scales by 4.5 percent during fiscal year 1968; (2) the establishment of full comparability between civilian salaries and those in private industry by October 1969; and (3) further adjustments in military pay after the completion of a searching Defense review of all military compensation and benefits. The Congress fully accepted the first proposal, accelerated the timetable of the second, and took preliminary action on the third. The resulting legislation, the Uniformed Services Pay Act of 1967, was approved on December 16, 1967, retroactive to October.

The new legislation provided:

- An across-the-board increase in basic pay of 5.6 percent, the equivalent of a 4.5 percent increase in regular military compensation.
- An increase of about 9 percent in dependents' assistance allowances payable to some 270,000 first-term enlisted men and draftees in the four lowest pay grades.
- The authorization to pay quarters and dislocation allowances to bachelors during a permanent change of station, correcting an inequity in entitlement to such allowances.
- The authorization of "continuation pay" bonuses for certain senior medical specialists as an incentive for extended active duty.
- An amendment of the method of adjusting retired pay to insure equitable treatment for persons retiring just before or after a cost-of-living adjustment becomes effective.

The annual cost of these provisions was estimated at about \$810 million, adding approximately \$625 million to the fiscal year 1968 budget for the 9 months that the new pay scales would be in effect.

A further provision of the act linked future military compensation to Federal civilian salaries and authorized the President to adjust such salaries at the close of fiscal year 1968. Accordingly, when the President on June 11, 1968, increased civilian pay rates for fiscal year 1969 by an average of 4.9 percent, military basic pay was raised by 6.9 percent to provide an equivalent increase in military compensation.

The Defense review of military compensation, to which the

President had referred in his April 1967 proposals, was conducted by a joint group headed by Rear Adm. L. E. Hubbell. Findings and recommendations on active duty compensation were transmitted to the Congress in April 1968 while the study group continued its review of reserve forces pay, retired pay, and survivor benefits.

On the subject of military pay, the Hubbell group concluded that the existing complex and fragmentary system was confusing to the individual serviceman and ineffective in achieving a properly balanced force. To remedy these shortcomings, the report recommended separate compensation systems for noncareer and career personnel. The former, who comprise about 52 percent of the armed forces, would continue to receive a combination of cash payments and in-kind benefits such as food, clothing, shelter, and medical care. Career personnel, however, would be placed on a full cash salary basis tied to Federal civil service scales, and this salary would include a contributory retirement system.

Pending further analysis of these recommendations, the Department continued to improve existing incentives for career service. Particular attention was directed toward the management of the enlisted promotion program. The development of common analytical data for more effective review and evaluation of grade structures and promotion procedures validated proposals for additional positions in the top six enlisted pay grades to meet long-term career development needs. By June 30, 1968, 57 percent of enlisted men—1,790,000 of 3,120,000—were E-4's or higher, an increase of about 2 percentage points and 157,000 men during the year. The force structure that was approved for the coming year authorized additional positions in the higher enlisted grades, opening some 98,000 more opportunities for promotion than were available in 1968. Actions were also taken to foster better understanding of and confidence in the promotion systems of the military Services. A worldwide sampling of enlisted men opinion confirmed the need, particularly in the Army and Air Force, for remedial actions that included the establishment of measurable and weighted criteria for selection and making available to men not chosen for promotion the point scores obtained.

Reenlistment rates improved slightly during the year with the help of the variable reenlistment bonus (VRB) and proficiency pay. The VRB, supplementing the standard reenlistment bonus, provides an additional amount ranging from one to four times the basic entitlement, normally payable in equal annual

installments during the enlistment term. The multiplier depends upon the relative scarcity of career personnel within a particular skill and training investment required to develop that expertise. Some 71,000 personnel, including nearly 34,000 who reenlisted during the current year, received VRB installments in 1968 as compared to about 50,000 who were paid initial or subsequent increments during the preceding year. Proficiency pay at rates ranging from \$30 to \$100 monthly is awarded to enlisted personnel qualified and serving in designated critical skill specialties; proficiency payments of \$30 per month are also provided as incentives for superior performance in other occupational areas, particularly in the Army, not eligible for specialty payments. Over 218,000 men—about 7 percent of enlisted strength—were drawing these two types of proficiency pay on June 30, 1968, an increase of about 9,000 during the year.

Since inadequate housing is one of the negative features of military life most frequently mentioned by men who decline to reenlist, the Department continued its efforts to upgrade the quality and increase the availability of modern barracks, bachelor officer quarters, and family housing. New designs enlarging the size and enhancing the privacy of living accommodations for single military personnel were being prepared under a contract awarded this year. The Department's military construction appropriation requested over \$359 million for new barracks and quarters to house over 68,000 enlisted men and about 5,800 bachelor officers. In addition, the Department sought increases in cost limitations for barracks from \$2,300 to \$2,900 per man and for bachelor officer quarters from \$8,500 to \$10,200 to permit construction of the new designs. Although these higher cost limits were denied by the Congress pending completion of the detailed plans, the Military Construction Appropriation Act of 1968 provided funds for most of the proposed housing—63,268 barracks spaces and 4,042 new bachelor officer quarters. Some 2.5 million square feet of new troop housing was completed during the year, adding about \$90 million to the real property assets of the Department. In a related action to improve housing for bachelors, the Congress appropriated funds to cover housing allowances for some 12,000 single junior officers and senior enlisted men to permit them to live off base in civilian communities.

For married personnel, the Department of Defense requested a family housing program of 12,500 units in 1968, of which the Congress authorized 10,609 and funded 6,750. In addition, the

Congress accepted the Department's recommendation that the average cost limitation per unit be increased from \$17,500 to \$19,500 in order to maintain quality standards. Almost 6,500 new units were under construction on June 30, 1968. These actions will greatly assist the implementation of the Department's family housing program, interrupted by the suspension between December 1965 and January 1967 of all construction not directly related to Southeast Asia operations. As the result of this suspension, the closure of military bases, and the phaseout of older dwellings, the number of units available declined slightly during the year, from 382,000 to 380,000. (See table 45.)

The program, initiated in 1956 and expanded in 1966, to utilize civilian sources in providing medical care for retired personnel and dependents continued to make an important contribution to the morale of members and former members of the armed forces. Supplementing the medical services furnished at military facilities, these benefits include inpatient and outpatient treatment, care for chronic mental and nervous disorders, and, for the dependents of active duty personnel, aid for the physically handicapped and mentally retarded. The growing significance of this assistance was reflected in the markedly increased outlays during the year, when the Government's share of the cost rose by \$65 million, from \$92 million to \$157 million. (See table 32.)

Civilian Personnel

Total civilian employment in the Department of Defense rose from 1,423,000 to 1,435,000 during fiscal year 1968—a net gain of less than 1 percent to support an increase of about 5 percent in the numerical strength of the armed forces. The addition of 13,000 civilian employees resulted from the growing requirements for support of Southeast Asian activities, only partially offset by decreases elsewhere. Direct hire employees increased by 14,000 for a yearend total of 1,317,000, while the number of foreign nationals hired under labor agreements with other governments decreased by about 1,000 to a total of 119,000. Of the direct hire employees, nearly 1,281,000 were supporting the military functions of the armed forces and the remaining 36,000 were engaged in civil functions, principally the public works program of the Army Corps of Engineers.

The Department's program to substitute civilians for military personnel wherever feasible was continued during the year. Phase I of this program, initiated in 1965 and completed by the end of the fiscal year 1967, had released 74,300 military personnel

for other tasks and replaced them with 60,500 civilian employees. The manpower saving of 13,800 positions had been achieved largely through elimination of training and support requirements associated with military personnel. Phase II of the program, stated at the beginning of the current fiscal year, had as its goal the employment of 34,500 civilians and the reassignment of 39,900 military personnel for a further manpower saving of 5,400 positions. By the close of the year, Phase II was 73 percent completed; however, full achievement had become doubtful because of the enactment on June 28, 1968, of the Revenue and Expenditure Control Act, which required the Executive Branch to reduce civilian employment to the level of June 30, 1966. Although the Congress subsequently authorized the Department of Defense to exceed its 1966 strength by 150,000 positions in view of Southeast Asia requirements, no widespread expansion of this program can now be contemplated.

The recruitment and retention of civilian employees were facilitated during the year by the enactment on December 16, 1967, of the Federal Salary Act of 1967. The new law was designed to achieve a goal established by the President and the Congress in 1962, namely, that "Federal pay rates be comparable with private enterprise pay rates for the same level of work." Although Federal civilian pay raises totaling more than 23 percent were granted between 1962 and 1967 in fulfillment of this principle, President Johnson pointed out to the Congress in the spring of 1967 that full comparability had not yet been realized. He proposed a three-stage program: (1) An across-the-board increase of 4.5 percent in Classification Act salaries effective in October 1967—an amount that would slightly exceed the gains in private industry during 1966 and thus narrow the gap; (2) a further increase in October 1968 equal to one-half the remaining difference; and (3) a final closing of the gap in October 1969. The December 1967 legislation embodied the President's recommendations with an accelerated time schedule. The act provided the 4.5 percent increase, retroactively effective in October 1967, and authorized the President to adjust salaries administratively in July 1968 and July 1969 to meet the rates of private employment. In addition, the new law liberalized the Federal employees insurance program, expanding both the coverage and the U.S. contribution. The fiscal year 1968 cost of this law to the Department of Defense with its 675,000 salaried employees was slightly more than \$200 million. At the close of the year the President, as directed by the Congress,

ordered a further increase in Federal salaries, ranging between 4 and 8.8 percent and averaging 4.9 percent, to become effective on July 1, 1968. This second pay increase will add an additional \$285 million to Defense expenditures for fiscal year 1969.

Compensation of the Department's 642,000 "blue collar" workers is not covered by the Federal Salary Act, but is determined by local Navy and Army-Air Force wage boards in accordance with prevailing wages paid by industrial establishments in the areas surrounding Defense installations. Upward adjustments for these workers added about \$115 million to the Defense budget for fiscal year 1968. A new Coordinated Federal Wage System was approved by the President on December 1, 1967, for adoption beginning in fiscal year 1969. The new system prescribes uniform policies and practices for fixing and administering local wage scales, thus eliminating any differences in job grading standards and rates of pay by separate Federal agencies and departments operating in the same locality. While wage rates will still be determined on the basis of prevailing area norms, the coordinated system will assure that all Federal workers in an area receive equal pay for substantially equal work and that pay distinctions accurately reflect work distinctions. The Department of Defense will have major responsibilities for the operation of the system at the national level and in many areas where it is the predominant Federal agency employing blue collar workers. The elimination of inexplicable discrepancies in pay is expected to improve the morale and effectiveness of the Department's employees.

Training and career development programs (for blue collar as well as salaried employees) continued to upgrade the skills and improve the utilization of all Department of Defense employees. Hundreds of thousands of Defense workers completed courses of instruction during the year, ranging from those of a few hours' duration in specific job skills to year-long graduate and postgraduate study in professional, managerial, and scientific disciplines. Trainee and apprenticeship programs at Defense installations remained an important source of skilled craftsmen. While all the military departments conduct training and career development programs for their civilian employees, the first such Defense-wide activity was initiated in March 1967 for procurement officials. It operated very satisfactorily during fiscal year 1968, providing greatly improved opportunities to some 16,000 specialists in this field. The program included a series of training courses geared to levels of responsibility and a central

automated personnel inventory and referral system for filling executive vacancies throughout the Department. The experience gained in the operation of this career program will be applied in new Defense-wide programs now being developed for some 57,000 employees in two additional occupational specialties—financial management and quality control.

Special Manpower Programs

The special effort of the Department of Defense to contribute to the amelioration of the social problems confronting our Nation continued to produce gratifying results during fiscal year 1968. Particularly significant in this effort were Project 100,000 and Project TRANSITION—two special manpower programs that had been initiated during the preceding year.

Project 100,000 admits to military service a limited number of men who, under strict earlier regulations for enlistment and induction, would have been below military entrance requirements. These men participate in the regular training courses and, if necessary, are given special educational and medical assistance to meet the established performance standards. Approved plans call for about 140,000 men to participate in the program between October 1966 and October 1968. The first year's quota of 40,000 was exceeded by 9,252, and over 118,000 men had been accepted by June 30, 1968—about half of them volunteers.

The performance of these men to date has fully justified the effort. About 96 percent completed basic training satisfactorily—as compared to 98 percent of all recruits—and 87 percent of those sent to advanced schools graduated. Others have received on-the-job training in units. Of the group that entered service during the first 4 trial months of the program, 90 percent were still in the armed forces at the close of the current fiscal year, 91 percent were rated as excellent in conduct and efficiency, 47 percent had reached the grade of corporal or sergeant, 37 percent were privates first class, and only 16 percent had not been promoted. Continuation of the program at the 100,000 level is planned for future years.

The second special manpower program—Project TRANSITION—was established on a trial basis in the spring of 1967 at one installation of each military Service and expanded in January 1968 to include some 238 bases, mostly in the United States but some overseas. It is designed to equip military personnel originally trained for combat and combat-support assign-

ments with skills useful in the civilian economy and to upgrade the training of other military personnel, thus improving the opportunities for productive employment of noncareer servicemen immediately upon their return to civil life. The program provides counseling, special training, and placement assistance during the final months of enlistment. Special training options include (1) educational courses sponsored by the United States Armed Forces Institute, (2) formal service school and on-the-job training in civilian-related skills by the armed forces, (3) special courses sponsored by the Department of Labor, and (4) training on or near military bases by industrial firms at their own expense in skills for which these firms have specific labor requirements. During the first 6 months after the program became fully operational in January 1968, over 132,000 men received transition counseling and nearly 20,000 enrolled in training courses. Most of the cost is borne by private industry and by the Department of Labor through Manpower Development and Training Act funds.

Defense manpower policy has long required that equal treatment and opportunity be afforded all servicemen without regard to race, color, creed, or national origin. The application of this principle, established in 1948, has officially eliminated racial discrimination in the military Services and led to major breakthroughs in advancements in rank based on merit alone. In 1948 only 1.5 percent of the Negroes serving in the armed forces were officers, and they comprised only 0.9 percent of the officer corps. Of these 1,637 Negro officers, only 72 held the rank of major or above. Twenty years later, the ratio of Negro officers to all Negro service personnel had almost doubled, and that of Negro officers to all officers more than doubled. During the same period, the number of Negro officers increased fivefold to 8,335 and 2,324 of these were field grade officers. Recent increases in Negro enrollment in the Service academies and in Reserve Officers' Training Corps courses at colleges and universities are expected to further this trend. Advancement among Negro enlisted personnel has been even more notable. In 1948, Negroes accounted for about 7.5 percent of total enlisted strength, but were concentrated at the lowest grades; only 14 percent of Negro enlisted personnel were serving in pay grade E-4 or higher. Currently, the proportion of Negroes to total enlisted strength has increased to 9.9 percent while 35 percent are E-4 or higher—as compared to only 32 percent of all enlisted men at this level.

Despite this considerable progress, the racial disturbances in

major U.S. cities inevitably affected the relations between ethnic groups in the armed forces, particularly as many of the men entering military service brought with them racial attitudes acquired in civilian life. In recognition of this problem, plans were being developed for educational programs in race relations and the establishment of human relations councils to assist commanders in dealing with racial matters.

The job performance, career motivation, and family life of many Negro servicemen also continued to be affected by discriminatory practices in communities near military installations, particularly in regard to housing. Even though local commanders were instructed in 1963 to foster greater off-base equality of opportunity and subsequently scored some successes in removing racial barriers, the problem persisted. To remedy this situation, the Department of Defense intensified its efforts in the spring of 1967. A nationwide census of rental facilities in the vicinity of Defense installations was undertaken to determine the extent to which open housing was available, and base commanders were asked to renew approaches to local leaders for support in eliminating off-base housing discrimination. In addition, a special action program to increase the availability of open housing near military installations in the Washington, D.C., metropolitan area was initiated to serve as a model for commanders elsewhere.

The intensified program continued throughout fiscal year 1968. On July 17, 1967, the Secretary of Defense directed the establishment of housing referral offices on military installations to which 500 or more servicemen were assigned to provide a full range of personal assistance to all military personnel requiring off-base housing. At the end of August the nationwide census was completed and showed that only about 22 percent of some 1.2 million rental units near Defense installations were listed with base housing offices as open to all military personnel. In the meantime, the Washington model program demonstrated that substantial progress could be made by combining persuasion with economic sanctions—forbidding military personnel to lease or rent quarters in facilities not open on an equal basis to all servicemen. By September 1967 the Department of Defense was able to announce a 300 percent gain in the number of open units in the State of Maryland. Special attention was then shifted to California and northern Virginia, while local commanders and more than 250 housing referral offices continued their efforts to assist all military personnel in securing housing. Further impetus was provided during the spring and early

summer of 1968, when the Congress approved the Civil Rights Act of 1968, making discrimination in housing unlawful after January 1, 1969, and the Supreme Court sustained legislation, enacted in 1866, to bar discrimination in the sale and rental of property. In line with these actions, new instructions were issued by the Secretary of Defense on June 20, 1968:

1. Effective August 1, 1968, no member of the armed forces stationed at a base in the United States will be authorized to enter into a new lease or rental arrangement if the owner of the housing unit follows a discriminatory policy toward servicemen.

2. Legal advice and assistance will be provided to Service personnel who experience discrimination in obtaining housing in violation of U.S. laws.

3. Assistance will be given to personnel in enforcing their rights under the Civil Rights Act of 1968 in coordination with the Departments of Justice and of Housing and Urban Development.

4. Programs will be established to assist personnel in locating nondiscriminatory housing in areas where the services of a housing referral office are not available and, if necessary, sanctions will be invoked against occupancy of facilities by other military personnel in such areas.

With the help of communities throughout the United States, impressive progress had been made at the end of fiscal year 1968 in eliminating housing discrimination. At that time, nearly 83 percent of the apartments and trailer courts near military installations had been listed with housing referral offices as open to all—compared to only 22 percent a year earlier.

As for civilian employees, the principle of equal employment opportunity without regard to race, creed, color, or national origin was reaffirmed by the Secretary of Defense, who called for priority efforts at all levels of command, taking into account the need to help overcome the effects of past prejudices and inequities. The scarcity of minority representation in executive positions indicated that greater emphasis had to be placed on making more effective use of the talents and skills of such departmental employees. Equal opportunity for employees in Defense industry is provided for in all contracts and has been monitored since July 1, 1967, by the Defense Supply Agency under the supervision of the Office of the Secretary of Defense. More than 3,500 contract compliance reviews and complaint investigations were carried out during fiscal year 1968.

The Department also continued its extensive participation in

the programs established by the President's Council on Youth Opportunity. More than 47,000 young men and women, ages 16 to 21, were hired as temporary employees during the summer of 1967 and nearly 55,000 during the succeeding summer. In each year, approximately 75 percent of these employees met special Civil Service Commission criteria for the employment of youths from disadvantaged families. Some 3,000 other needy young people, employed by the Department on a part-time basis during the regular school term, had their work weeks extended to 40 hours during the summer months. In addition, the military Services helped sponsor and provide facilities for recreational and other vacation programs for youngsters at 640 military installations during 1968. Approximately 250,000 children participated, about 100,000 more than during the preceding summer.

Research and Development

The Department of Defense devoted about 10 percent of its fiscal year 1968 budget to research, development, test, and evaluation (RDT&E) activities. This annual investment has been the key factor in providing the weapons and equipment that have been needed to deter aggression. Similarly, our future margin of safety will depend on our ability to continue an imaginative and vigorous program of scientific research and technological development in the years ahead.

The Department's financial plan for fiscal year 1968 included \$7.5 billion for RDT&E—\$7.3 billion in new appropriations and \$0.2 billion in recoupments from prior year programs. This budget represented an aggregate increase of \$0.3 billion in the amount available for the preceding year. The Congress, directing additional recoupments and a reduction in some supporting activities, provided \$7.1 billion in new appropriations. Acting to reduce yearend balances, the Department obligated \$8.0 billion and spent \$7.7 billion for RDT&E during the year. With lower carry-over funds available, the budget for the coming year proposed new appropriations of \$8.0 billion to continue existing programs and initiate new research. This request was pending before the Congress at the close of fiscal year 1968.

Nearly 39 percent of the fiscal year 1968 RDT&E funds was allocated to projects for improving strategic offensive and defensive weapons systems and 28 percent to the needs of the general purpose forces, including over \$850 million for Southeast Asia requirements. Another 16 percent was programed for airlift, sea-lift, command and control, and communications. The remaining

17 percent of the funds was used to acquire the scientific and technological base for future development and to provide general support.

The size as well as the great diversity of the Defense RDT&E program with its thousands of separately identifiable tasks present a major management challenge. Choices have to be made between a multitude of opportunities for technological advances, and all projects are subject to the inevitable uncertainties accompanying attempts to extend the frontiers of knowledge.

As an aid to judgment, planning, and operational control, RDT&E activities have been grouped for programing purposes into six categories; (1) Research to discover and understand scientific phenomena; (2) exploratory development to extract from that research results of potential significance to defense purposes; (3) advanced development to transform such opportunities into options for weapons systems; (4) engineering development to show how feasible options can be perfected and at what cost; (5) operational systems development to ready a tested, feasible, and viable weapons system for production and deployment; and (6) management and support of facilities, test ranges, and other resources. During fiscal year 1968 the Department of Defense allocated its funds among these categories in the following proportions:

<i>Category</i>	<i>Percent</i>
Research	5.0
Exploratory Development	12.5
Advanced Development	10.0
Engineering Development	11.1
Operational Systems Development	46.0
Management and Support	15.4

As an additional management tool, the Development Concept Paper (DCP), was introduced during the current year to aid in the continued systematic consideration of major projects by the Secretary of Defense. The DCP is a summary top management document which presents the rationale for starting, continuing, or stopping a program at each critical decision point. It points out the known risks involved in each decision, along with the full military and economic consequences of the program, and establishes decision-review "thresholds" for such key factors as technical performance, cost, and schedule. Key officials in the Defense agencies directly concerned with a specific program review the DCP for accuracy and note their recommendations. In short, a DCP aims to minimize biased advocacy and to state clearly the known uncertainties involved in major decisions.

Nearly two-thirds of the fiscal year 1968 RDT&E funds financed projects assigned to U.S. industry, while over one-quarter supported the work of Defense laboratories and other Government research facilities. Substantially all of the remaining funds—except for less than one-half of 1 percent allocated to overseas research activities—was shared by universities and contract research centers. The Department intensively reviewed the performance and contributions of the 16 contract centers and worked with the boards of trustees of each to clarify and strengthen the relationship between these institutions and the organizations utilizing their unique talents. As for university programs, the Department expanded its support of Project THEMIS, initiated in 1967 to broaden the base of Defense-oriented research. Contracts for 49 THEMIS research projects at 42 universities had been awarded during fiscal year 1967, and the Department received 413 additional proposals during the current year from which it selected 43 at 35 institutions. A total of \$35 million was allocated to this program during the year—an increase of about \$15 million to finance the new projects and continue uncompleted work.

Further progress was also made during the year in realigning Defense laboratories into more cohesive weapons development centers and in assigning them broad functional responsibilities for the solution of military problems. The Navy, for example, combined elements from several laboratories to form the Undersea Warfare Center to be in charge of systems analysis and systems integration for surface, airborne, and subsurface ASW systems. Similarly, the Naval Ships Research and Development Center was created from existing assets and made responsible for research, exploratory development, and advanced development through concept formulation of advanced ship designs, high speed ships, and deep ocean vehicles. The Army was preparing to establish a single Materials and Mechanics Research Center from eight RDT&E activities. As a result of such realignments and redefinition of functions, the in-house laboratories are expected to become a more important source of technical judgment and advice in research and development.

Logistics

The 1968 guidelines for the logistics activities of the Department of Defense stressed two major objectives: (1) Continue the effective and responsive support to the operating forces, particularly those in Southeast Asia, and (2) sustain and

strengthen the management improvements introduced to increase logistics efficiency in recent years. The first of these goals took precedence, but it was not accomplished at the expense of the second. U.S. experience in Vietnam showed that good management and military readiness go together and that effective support of combat operations does not require the generation of huge surplus stocks of materiel. Moreover, many innovative techniques that were devised in the first instance to resolve special problems encountered in Southeast Asia contributed to the strengthening of our over-all logistics management systems.

The financial significance of these improvements is quite substantial. Nearly three-quarters of the annual Defense budget is allocated to the acquisition, distribution, and maintenance of logistic resources, beginning with the development of weapons, extending through procurement, production, construction of facilities, supply, storage, maintenance, and transportation, and ending with the disposal of surplus materiel and facilities. These functions are carried out by many hundreds of thousands of U.S. military and civilian personnel at hundreds of installations throughout the world. They account to a large extent for the vast physical assets controlled by the Department of Defense, valued at an acquisition cost of \$202.5 billion on June 30, 1968—\$7.0 billion more than at the beginning of the year. Nearly one-half of this amount, \$100.0 billion, consisted of weapons and other military equipment in the hands of troops, while supply system inventories and items designated for disposal were valued at \$45.8 billion. Real property and construction in progress accounted for another \$40.4 billion. The remaining \$16.3 billion in assets included plant equipment, Government-owned items in the possession of contractors for incorporation in major weapons systems, and the inventories of the industrial and commercial activities of the Department of Defense. (See table 43.)

The magnitude of these resources, the multitude of separate actions and decisions required, and the number of individuals involved have posed some of the Department's most difficult and elusive management problems. Workable solutions to many of them have been found by motivating personnel at all levels to develop and apply more effective ways of doing their jobs. This objective was one of the major purposes of the cost reduction program that was initiated in 1961 and has contributed impressive improvements in efficiency during each successive year. Actions during 1968 alone contributed about \$1.2 billion, bringing the aggregate since fiscal year 1962 to over \$16.5 billion. Despite

this record, opportunities for additional economies will continually arise. Defense logistics operate in a dynamic environment as new weapons and new support items are constantly entering the supply system, creating new challenges for the future.

Procurement and Production

The logistical needs of our forces in Vietnam were effectively met during the year, although rapidly changing combat demands and the wide array of different items in military supply systems complicated the task of forecasting requirements. Some 263 major items most critical to operational success were intensively managed; i.e., production and delivery schedules, usage rates, and stocks on hand were kept under constant review and procurement programs were adjusted whenever necessary to assure that approved inventory levels were being maintained. The accelerated tempo of operations created additional demands for ammunition and some other major hard goods, but the flow of weapons, equipment, and supplies from existing production lines satisfied many expansion objectives. In placing contracts, the Department made every effort to preserve the gains achieved through the adoption in recent years of more businesslike methods; however, changes in the types of materiel needed and the unavoidable urgency of numerous emergency requirements all combined to restrict the opportunities for new savings of the magnitude registered earlier.

The Department of Defense awarded military prime contracts with a net value of \$43.8 billion during fiscal year 1968, about \$0.9 billion less than the preceding year. Contracts for ammunition, totaling \$4.6 billion, increased by about \$1.0 billion, and orders for missiles and space systems, for fuel and lubricants, and for services also showed sizable year-to-year gains. Despite lower requirements for aircraft, electronics and communications equipment, and ships, purchases of major hard goods increased both in value and in proportion to total awards. Most soft goods and other materiel categories declined, more than offsetting the gains in major hard goods. (See table 33.)

These changes in the Defense shopping list reduced the opportunities for small business firms to produce materiel for the armed forces despite the Department's continued intensive program to channel contracts to small concerns. Although the value of prime contracts and subcontract commitments that were awarded to small business declined from \$15.1 billion in 1967 to \$14.1 billion in 1968, it remained nearly double the \$7.2 billion reported during fiscal year 1961. The larger purchases of ammuni-

tion and some other major hard goods that were beyond the productive capacity of smaller companies, coupled with lower demands for textiles, commercial items, and construction, reduced from 70 to 65 percent the proportion of pending procurement actions that could be usefully publicized for consideration by small firms. In addition, such companies submitted bids for fewer contracts and were somewhat less successful in bidding during the current year than during 1967. They were awarded military prime contracts with a value of \$7.3 billion and Defense civil functions prime contracts of \$0.3 billion, for a total of \$7.6 billion or 18.8 percent of all direct Defense procurement from industry for work in the United States. Small business had bid successfully for \$8.4 billion in Defense prime contracts during the preceding year, or 20.6 percent of all awards. (See table 34.) The Department's program for reporting small business subcontracting was extended during the year to include 70 additional large prime contractors, for a total of 886, but subcontract commitments declined from \$15.5 billion to \$15.2 billion, reflecting the decrease in over-all procurement volume. Small business firms received about 43 percent of these subcontracts with a value of \$6.5 billion, as compared to \$6.7 billion in 1967.

A major feature of the Department's cost reduction program since 1961 has been intensified emphasis on buying at the lowest sound price. To this end, military procurement offices have sought to restrict the volume of cost-plus-fixed-fee contracts, to make greater use of incentives that encourage contractors to hold down production costs, and to increase the extent of price competition. These approaches continued to assist in promoting economy in military buying during the year. The proportion of cost-plus-fixed-fee contracts was held within the previously attained range of 10-11 percent—a two-thirds reduction since 1961 and a level consistent with the necessity of undertaking numerous research and development projects that involve substantial technical uncertainties. Contracts containing incentive clauses for improved performance and lower costs continued to be favored; 27.7 percent of all awards during the year were of this type, slightly more than in 1967 and almost double the percentage in effect at the beginning of the cost reduction program. Sufficient additional procurement was shifted from a single source to a competitive basis to generate savings of some \$118 million. Multiyear procurements and the break-out of components for separate purchases also fostered competition and cut costs. The percentage of contracts awarded through price competition—37.7 percent—

remained above the 32.9 percent level of 1961, but two factors were about equally responsible for less favorable year-to-year comparisons with 1967. First was the increase of major hard goods procurement already mentioned, and particularly a substantial volume of repeat orders to established producers for weapons and equipment being used in Vietnam. Second, more restrictive reporting procedures were adopted on the competitive status of (1) Defense requisitions against competitive contracts awarded by the General Services Administration, and (2) Defense small purchase actions of \$10,000 or less from commercial sources.

Special attention was given to improving the effectiveness with which procurement offices purchase small quantities of spare parts and other supplies needed for immediate use. Orders of \$2,500 or less generate nearly 70 percent of the procurement workload although in aggregate they account for only about 4 percent of the value of contract awards. The volume of small purchases has risen substantially in recent years, reflecting the increase in operational activities. At the direction of the Secretary of Defense, the Department undertook an intensive assessment of these operations and initiated a comprehensive program to promote the most economic procedures and avoid overcharges without, however, adding significantly to administrative costs. Steps were taken to upgrade the training and competence of the junior buyers who place these orders; to improve the organization, supervision, and procedures of purchasing offices; and to increase the availability of information that will assist buyers in identifying items and the potential suppliers and in determining reasonable prices. As part of this effort, the Defense Logistics Service Center maintained data on some 8 million different manufacturers' parts and provided 1-day service to buying offices on requests for source and cost information.

As price competition remained infeasible for a substantial volume of Defense procurement, the Department concentrated on improving its procedures for protecting the Government's interests in contracts placed after negotiations with a single supplier. These contracts cover many of the most difficult, complex, and unique military weapons and the research and development projects that underlie them. They have often been preceded by the solicitation and evaluation of highly competitive design and technical proposals from industry. The contractor selected through this process is required to submit an itemized breakdown of his principal cost estimates in accordance with the Truth in Negotiations Act of 1962 and other relevant statutes. The Department

carefully analyzes these submissions prior to negotiating the contract. It took additional actions during 1968 to assure that contractors comply fully with the law. Training materials were developed and distributed to thousands of Defense procurement officers and auditors to inform them more fully about cost analysis and pricing procedures. The Armed Services Procurement Regulation was revised to clarify the rights of Defense auditors for access to actual cost data for fixed-price contracts negotiated without price competition and to insure that such data are, in fact, current, accurate, and complete at the time of negotiation. Erroneous data entitle the Government to price adjustments. In this connection, the Defense Contract Audit Agency reviewed 582 contracts and subcontracts with equipment with a value of \$3.8 billion during the year and identified possible cost deficiencies totaling \$18.6 million. In addition, it expanded its program for the review and evaluation of estimating methods and procedures used by contractors—an effort that is expected to improve the quality of the pricing data made available prior to negotiations.

In its review of negotiating procedures, the Department remained concerned that prices be equitable to the supplier as well as to the Government. A survey of the profitability of defense industry, completed during the year, showed that since 1961 profits per dollar of sales had declined sharply and that profits as a percentage of capital investment had dropped even more. In contrast, the profits of commercial durable goods' companies had steadily risen since 1958 and were nearly twice the percentages reported by the Defense contractors included in the survey.

The availability of package plants, standby assembly lines, and other reserves of plant equipment owned by the military Services helped greatly during the Vietnam buildup to reduce the leadtime for establishing new production sources. Investments in plant equipment increased by about \$600 million during the year to a total of \$11.9 billion. These resources have been primarily allocated to Government-owned, Government-operated and to Government-owned, contractor-operated facilities. Contractors held Government plant equipment with a value of about \$4.5 billion on June 30, 1968, or 38 percent of the total inventory. Nearly three-fifths of the equipment on loan to contractors had been purchased 12 years or more ago, while over half of the items in Government plants was of more recent manufacture. In 1968, as requirements for additional production leveled off,

so did the redistribution of equipment. The value of reactivated tools in package plants and standby lines totaled \$22 million in 1968 compared to \$101 million in 1967. Similarly, the plant equipment in the general reserve redistributed in 1968 was valued at only \$115 million as compared to \$193 million in 1967.

The Department took a series of actions to improve the management of these assets. An aggressive program to evaluate and dispose of plant equipment with only marginal further utility was pursued. The Armed Services Procurement Regulation was revised to require that contractors keep better records on Government machines in their possession and Defense auditors were instructed to give increased coverage to property administration and to the use of Government-owned tools by contractors.

In procuring goods and services from U.S. industry, the Department of Defense was governed by legislation and Executive orders that require Government contractors to adopt affirmative action programs for hiring, training, assigning, promoting, paying, and laying off workers without discrimination on the basis of race, creed, color, national origin, or sex. At the beginning of fiscal year 1968, administrative responsibility for assuring compliance with this policy was delegated to the Defense Contract Administration Services (DCAS) of the Defense Supply Agency, the organization charged with supervising the execution of a majority of Defense contracts. During the year, DCAS completed some 3,600 compliance actions, including pre-award surveys, reviews of contractor employment programs, and investigations of complaints. Defense officials worked with contractors to correct deficiencies. Employment opportunities for members of minority groups improved substantially during the year; their numbers increased from 9.8 percent to 12.4 percent of the work force at Defense plants employing some 3 million workers.

Supply Management

Organizational and procedural improvements over the past years not only increased the logistic readiness of the armed forces but also reduced inventory requirements by nearly 30 percent. In 1961 the military Services stored 60 cents' worth of spare parts and supplies for every dollar's worth of weapons and equipment issued to the troops. By the end of fiscal year 1968 this ratio had dropped to 44 cents in spare parts and supplies. As the value of weapons in use increased by about \$32 billion during this period, some \$16 billion more in inventories would have been required if the 1961 ratio had been maintained.

The Federal Supply Catalog, maintained and administered for the Federal Government by the Defense Supply Agency, remains one of the basic tools for effective logistics management. It provides a common means of identifying nearly 4 million separate items in military supply systems and over 300,000 items of other Catalog users. Although some 3,342,000 new items have been added since 1961, the Catalog expanded by a net of only 384,000 listings; of this increase, 179,000 were Defense items. A net gain of less than 5,000 occurred during fiscal year 1968. (See table 40.) This limited growth reflects the deletion of some 2,958,000 items since 1961 as the result of special procedures for purging obsolescent equipment and for eliminating unnecessary varieties and types of items through military standardization programs. During fiscal year 1968 some 275,000 inactive items were reviewed and 170,000 of these deleted, while reviews of an additional 184,000 listings resulted in 65,000 deletions through standardization and the identification of duplicate or similar items. In addition, every new item proposed for the Catalog is matched against existing identifications to determine whether the same or a substitute item already in the system might be used. This procedure of item entry control prevented some 62,000 unnecessary additions to the Catalog during the year.

The Catalog has facilitated the continued, steady growth in the number of commonly used supply items placed under the integrated management of a single agency. This development has made a major contribution to more effective logistic support and the reduction of duplicating inventories and distribution channels. In fiscal year 1968, the Defense Supply Agency was assigned the responsibility for the central procurement, storage, and issue of some 227,000 additional items, for a total of 1,766,000 on June 30, 1968. The General Services Administration was the single manager for about 68,000 items, including more than 13,000 that were transferred to it by the Department of Defense during the year, while other Defense components were responsible for about 64,000. Thus, about 1,898,000 items, or nearly one-half the Defense listings in the Federal Catalog, have been brought under central integrated management, as compared to less than 2 percent in 1961. Further progress was also made in developing a National Supply System for the Federal Government. In keeping with this concept, the Defense Supply Agency was providing a full range of support to the Coast Guard and the National Aeronautics and Space Administration and was furnishing more limited support to some 12 other civilian agencies.

Most of the items not under integrated management are used

by a single military Service or are directly related to the operation of weapons systems. Even in this sensitive operational area, the application of integrated weapon support management to the F-4 aircraft, used by the Navy, Marine Corps, and Air Force, has demonstrated the feasibility of providing better support for commonly used weapons and equipment with significant economies. Some 29,400 parts and components of the F-4 had been placed under integrated management by the close of the year, including approximately 20,000 common-use items managed by the Defense Supply Agency. The Air Force, as integrated manager, was providing total support to all users for about 5,500 items; Navy stocks of these items were transferred to the Air Force on March 1, 1968. The Air Force was also the single procuring agency for 1,400 additional F-4 items. Interservicing agreements covered 2,500 items and provided that one Service would release assets even if in critical short supply to prevent the deadlining for lack of parts of an F-4 operated by another Service. The experience being gained through the F-4 program should be helpful in designing similar arrangements for other multi-Service aircraft and for aircraft engines.

Integrated supply management and interchange of stocks among Defense components have been greatly facilitated by the development and improvement of a uniform set of forms, records, and codes for requisitioning, shipping, and accounting for supplies. These standard data systems, high-speed automatic communications for logistics data, and the automation of records have all contributed to more effective management. For example, the Military Standard Requisition and Issue Procedures (MILSTRIP)—one of the uniform data systems—were modified during the preceding fiscal year to provide for the validation of requisitions that remain outstanding after 90 days. This process permits adjustments that reflect changes in requirements and compensates for the tendency of users to submit duplicate requisitions when deliveries are delayed because of procurement lead-times. The reconciliation of backorders through MILSTRIP resulted in the cancellation of 284,000 line items with a value of \$688.6 million during fiscal year 1968. Another extension of this system permitted the automatic referral of back orders from an inventory control point of one Service to that of another.

The substantial problems encountered in the management of spare parts and consumable items with high usage rates have been given special attention. At the close of the preceding year, the Department of Defense instructed its components to intensify their control of secondary items for which the annual demand

was \$1 million or more. Inventories, consumption rates, and production plans for 500 such items, for which the annual procurement volume aggregated \$1.7 billion, were reviewed monthly during the current year in order to improve the timeliness with which schedules were adjusted. In addition, further instructions were issued to classify secondary items in four groups depending upon annual demand and to apply management procedures appropriate for each class. More intensive controls were also applied to some 41,000 highly perishable supply items.

Transportation

The troop buildup and the quickening pace of operations in Southeast Asia generated additional requirements for transportation during fiscal year 1968, although the increase was less than during either of the 2 preceding years. The three single manager transportation agencies—the Military Traffic Management and Terminal Service, the Military Sea Transportation Service, and the Military Airlift Command—moved 33.7 million tons of dry cargo, 46.7 million tons of petroleum, and 9.8 million passengers during the year, as compared to 30.9, 41.8, and 9.8 million, respectively, in 1967. (See table 46.) Annual expenditures rose from \$3.4 billion in fiscal year 1967 to \$3.7 billion in 1968.

Improvements in traffic management have helped to hold down cost increases. Defense components reported savings of \$112 million during fiscal year 1968. Nearly one-half of this amount was realized from rate reductions for airlift provided by commercial carriers. The Department of Defense recommended and the Civil Aeronautics Board approved separate rate schedules for turboprop and for jet aircraft that took into account the substantial variation in the operating costs of these different types of airplanes. This action reduced passenger tariffs by about 7 percent and cargo rates by 13 percent. The extension of procedures, initiated in May 1967, for the revalidation of the need for airlift for proposed shipments weighing in excess of 1,000 pounds also pared transportation costs. More favorable commercial stevedore contracts, better coordination of ammunition production and movement schedules, development of new techniques for loading UH-1 helicopters in transport aircraft, and greater use of the cargo-carrying capacity of Navy fleet ships produced additional savings.

The freight workload of the Military Traffic Management and Terminal Service (MTMTS) increased during the year by about 8 percent, from 18.2 to 19.6 billion ton-miles. Ammunition, for

which premium tariffs are charged, accounted for a substantial part of the increase; as a result freight costs rose by 11 percent, from \$809 million to \$895 million, as compared to 1967. Passenger workloads and costs declined about 9 percent, from 3.9 to 3.5 billion passenger miles and from \$210 million to \$192 million. Substantial progress continued to be made in developing and applying a series of integrated, automated transportation information data systems (AUTOSTRAD) to assist in accelerating the movement of Defense traffic. As part of this effort, MTMTS completed the installation of computers for the processing of air shipment requests at its area commands during the year. Scheduled to become fully operational in July 1968, this Military Air Cargo Export (MACE) subsystem of AUTOSTRAD will be used for the control of military air freight from the United States to overseas destinations.

The Military Sea Transportation Service (MSTS) delivered 15 percent more petroleum and 6 percent more dry cargo during 1968 than during the preceding year while the number of passengers moved by ship continued to decline. About 58 percent of the dry cargo and 57 percent of the petroleum was destined for Southeast Asia; as a result of these requirements, the MSTS cargo and petroleum workload has more than doubled since 1965, from about 95 to 219 million ton-miles. Passenger lift declined by about one-third during the same period, from 1.5 to 0.5 billion passenger miles. Payments to private industry for ocean transportation and related services, including the operation of Government-owned ships, rose by about \$120 million and accounted for 87 percent of MSTS costs that totaled almost \$1.3 billion. In its search for economies, MSTS continued to expand its use of containerized cargo shipments. A container service route to Vietnam was established in July 1967, and about 2.4 million measurement tons of cargo in containers was delivered, worldwide, during the year, or about 8 percent of total dry cargo movements.

The Military Airlift Command (MAC) substantially expanded its operations; passenger lift increased by 37 percent, from 9.9 to 13.6 billion passenger miles, while freight operations rose 24 percent, from 3.0 to 3.7 million cargo ton-miles. Expenditures, totaling nearly \$1.1 billion, were only 7 percent higher than during 1967, reflecting the more favorable rate structure mentioned above and the continuing modernization of the MAC airlift fleet. As a result of the latter factor, nearly 73 percent of the cargo was moved by Government-owned aircraft, an increase of 12 percentage points. Commercial carriers continued, however, to

provide more than 90 percent of the passenger lift; payments for commercial augmentation increased from \$685 million to \$691 million during the year.

Construction and Installations

With most of the construction in support of Southeast Asia operations funded in prior years, the 1968 military construction program placed greater emphasis on the long-range construction needs of the armed forces, such as upgrading the quality of barracks, hospitals, and operational facilities. For fiscal year 1968 the Congress made over \$1.5 billion available for military construction, including only \$0.3 billion for Southeast Asia, as compared to \$1.1 billion for the preceding year, of which over half was for support of operations in Vietnam. The military Services awarded construction contracts with a value of \$1.7 billion during the year and the year-end property inventory included about \$1.8 billion of uncompleted work in progress.

In managing its real property holdings, estimated to have an acquisition cost of \$38.7 billion, the Department of Defense continued to consolidate, reduce, or terminate unnecessary activities and dispose of unneeded installations. It approved over 100 actions of this type during fiscal year 1968. These decisions should produce savings of some \$85 million after the one-time costs of relocation and closure of bases are met. Since initiating this intensive screening of the base structure in 1961, the Department has taken some 1,100 actions to dispose of over 1.8 million acres of land valued, with improvements, at an acquisition cost of nearly \$6.8 billion. These actions have produced savings of almost \$1.6 billion and released about 218,000 military and civilian personnel for other assignments. The communities affected by these base closures receive assistance in planning the readjustment of their economies. Additional help to Defense personnel transferred to other assignments was made possible during the current year when the Congress made available in December 1967 an initial appropriation of \$20 million to compensate individuals who suffered losses in the sale of their homes near military installations that have been closed subsequent to November 1, 1964. As many as 45,000 individuals may be eligible to receive this type of financial assistance.

Management Improvements

Defense personnel at all levels of responsibility helped to find more than 27,000 opportunities for reducing the cost of logistics

activities during the year. These actions saved more than \$1.2 billion in 1968 and will generate aggregate savings of \$2.6 billion by the end of 1970, exceeding the established goal by almost 40 percent. (See table 41.) Cumulative results of the cost reduction program initiated in 1961 have now reached a total of over \$16 billion in savings. This amount has been realized through such actions as: (1) Calculating requirements more precisely; (2) finding new uses for excess materiel; (3) applying value engineering techniques; (4) shifting from noncompetitive procurement; (5) contracting for 2 or more years' requirements at one time; (6) purchasing spare parts and components directly from the manufacturer rather than through the weapon system prime contractor; and (7) decreasing the cost of operating logistic support services such as communications, transportation, maintenance of equipment, and real property and family housing. Specific examples of the actions taken in a number of these areas have been mentioned earlier.

The success of the cost reduction program in stimulating management improvements led in September 1967 to the extension of its principles to other logistics activities for which tangible goals can be established even though progress cannot be measured directly in dollar savings. Logistics managers selected 11 such areas for starting the new program: (1) Better control of new items proposed for the supply system; (2) more rapid elimination of unessential items; (3) swifter preparation of military specifications; (4) improvement of item identifications; (5) greater reutilization of excess property; (6) better operation and maintenance of noncombat vehicles; (7) improved utilization of warehouses; (8) decreased use of letter contracts; (9) timely modifications of contracts to reflect change orders; (10) greater use of formal advertising in procurement; and (11) prompt evaluation of value engineering changes proposed by Defense contractors. The initial goals for many of these areas were exceeded during the first 6 months of the new program, while in other areas new problems were uncovered that require further attention by management.

The cost reduction program and the new management improvement program have provided a framework for finding new ways to carry out Defense logistics functions. Actual accomplishments will continue to depend on the devotion of men and women throughout the Department to getting their job done a little better.

Contents

	Page
Annex A. Annual Report of the Reserve Forces Policy Board	95
Annex B. Annual Report of the Defense Supply Agency	113

Annex A

ANNUAL REPORT

of the

RESERVE FORCES POLICY BOARD

July 1, 1967, to June 30, 1968

General

The Reserve Forces Policy Board (RFPB) was concerned during fiscal year 1968 with a wide variety of reserve affairs, highlighted by the callup of a limited number of reserve units, in executing its statutory mission as the principal policy advisor to the Secretary of Defense on matters pertaining to the reserve components. The RFPB monitored, examined, and assessed the performance of the reserve components with the objective of promoting the development of policies designed to more efficiently administer and maintain a strong and viable reserve structure which can respond readily and effectively to mobilization requirements.

During fiscal year 1968, the RFPB convened four times. New members, either designated by law or appointed to the Board by the Secretary of Defense, are: The Honorable Townsend Hoopes, Under Secretary of the Air Force, who subsequently was succeeded by The Honorable J. William Doolittle, Assistant Secretary of the Air Force (Manpower and Reserve Affairs); The Honorable Randolph S. Driver, Assistant Secretary of the Navy (Manpower and Reserve Affairs); The Honorable William K. Brehm, Assistant Secretary of the Army (Manpower and Reserve Affairs); Maj. Gen. William H. Prentice, USAR; Maj. Gen. Clifford B. Drake, USMC, who was succeeded subsequently by Rear Adm. Julian T. Burke, USN; Brig. Gen. Dudley E. Faver, USAF, who was succeeded in turn by Maj. Gen. John H. Bell, USAF; Maj. Gen. Edwin W. Heywood, ARNGUS; Brig. Gen. Willard W. Millikan, ANGUS; Rear Adm. Arnold I. Sobel, USCGR, who subsequently was succeeded by Rear Adm. John D. McCubbin, USCG; Maj. Gen. Douglas J. Peachner, USMCR; Rear Adm. States Morris Mead, USNR; and Maj. Gen. Martin H. Foery, ARNGUS.

The principal matters affecting the reserve components which were considered by the RFPB during the four sessions are:

1. Mobilization and demobilization policies as they apply to the reserve components.
2. The role of the reserve components in civil disturbances.
3. Reorganization of the Army reserve components, including the new Selected Reserve Force.

4. Policies for screening the Ready and Standby Reserves.
5. Career patterns for reserve officers.
6. Uniform Code of Military Justice in its application to reserves.
7. Negro participation in the reserve components.
8. Role of the reserve components in the President's Youth Opportunity Program.

In addition, the Board considered various items of proposed legislation pertaining to the reserves, including not only those originating within the Department of Defense, but also bills referred to the Department for comment by Congressional committees. Where appropriate, the recommendations of the RFPB on legislative proposals were forwarded to the Secretary of Defense for consideration in formulating the Department position.

Reserve Officer Personnel Act

In its assessment of the effectiveness of the Reserve Officer Personnel Act (ROPA), as amended, as codified in titles 10 and 14, U.S. Code, the RFPB ascertained that ROPA continues to serve generally the purpose for which it was enacted. It has provided a corps of reserve officers who respond effectively to mobilization requirements. ROPA also has provided the authority to effectively administer and control the officer corps of the reserve components and to separate officers from the program under various criteria.

Although the critical test period for the attritive features of ROPA (1968 to 1971, when many officers commissioned during World War II will complete their service and be removed from active service) is underway, there is no evidence that compliance with the law's attritive provisions has compromised the ability of the reserve components to maintain the level of qualified officer personnel available for mobilization. ROPA, moreover, has provided the authority to reward outstanding officers with reasonable promotion opportunity.

ROPA related legislation enacted during fiscal year 1968 has alleviated several problems. Public Law 90-130, the female officer omnibus law, greatly enhances promotion opportunities for women reserve officers. Public Law 90-168, the Reserve Forces Bill of Rights and Vitalization Act, permits the Air Force to exceed through June 1969 the authorized grade ceilings for majors and lieutenant colonels in its reserve components, providing the Air Force with a further period to resolve the problem of overages in those grades without allowing or halting normal promotion rates.

Among pending legislation is H.R. 11144, which, if enacted, would aid the Marine Corps to maintain a strong and viable reserve officer structure by increasing the promotion opportunity to general rank and bringing it into line with naval reservist opportunity to advance to rear admiral. Moreover, the current statutory ceiling of 10 on the number of Marine Corps Reserve general officers who can be maintained in an active status (Ready Reserve) is not adequate to meet general mobilization requirements.

The 1968 recall has brought to light a potential inequity with regard to promotion opportunities of recalled Naval Reserve officers. Under present law, the recalled naval reserve officer is considered for promotion with naval officers on extended active duty. Unlike his Army and Air Force reserve counterpart, the recalled naval reserve officer cannot be considered for promotion under ROPA provisions. Moreover, experience shows that the recalled officer has a reduced opportunity for promotion when competing with officers on extended active duty. On the other hand, the naval reserve officer who was

not recalled would appear to have increased opportunity for promotion as his former contemporaries now on active duty are no longer competing for promotion under ROPA. It is therefore recommended that the law should be amended to permit the naval reserve officer and the Marine Corps reserve officer who has been recalled to remain eligible for a ROPA promotion throughout his tour of active duty, exclusive of voluntary extensions.

Personnel

The strength of each reserve component and the number of personnel in paid status in fiscal year 1968 are shown in tables 28 and 29 of the appendix.

Army Reserve Components

The Army reserve components continued to improve their over-all military posture during fiscal year 1968. A reorganization plan, designed to improve the deployment capability and combat readiness of the Army Reserve and Army National Guard forces, was implemented on December 1, 1967, and completed by May 31, 1968.

The reorganization provided for eight divisions and 21 separate brigades with the necessary supporting units. This new structure permits: (1) Attainment of realistic readiness goals; (2) better balance between personnel and equipment assets of the reserve components; and (3) greater reliance to be placed on reserve participation in contingency plans.

Significant aspects of the reorganization were:

(1) The manning level for all units was established at 90 percent or higher of full wartime allowances.

(2) Sufficient combat service support structures were allocated to both components to satisfy maintenance, supply, and service requirements.

(3) Structural changes were made within the 700,000 (260,000 for the USAR and 440,000 for the Army National Guard) strength ceiling.

In the reorganization process, it was recognized that the reserve components would not be able to maintain their annual strength without exceeding the authorized strengths because of a lag between losses and gains of new personnel. Therefore, each of the reserve components was authorized a 3 percent overstrength to compensate for this time delay between losses and gains and permit the attainment of the average annual strengths specified by the Congress (DoD announcement of November 6, 1967).

A reorganization of the Selected Reserve Force (SRF) was effected concurrently with the reorganization of the reserve components. The SRF was modified on December 1, 1967, by adding a support package of units and by eliminating those units that were excess to create a balanced three-division force equivalent. The resultant force was called Selected Reserve Force IA and it continued in being until May 1, 1968.

A new force, called Selected Reserve Force II, also was organized on December 1, 1967. It conducted accelerated training during the period December 1, 1967, to June 30, 1968, and relieved SRF IA of the Selected Reserve Force mission on May 1, 1968. The SRF consists of a force with the authorized paid drill strength of 137,427 (89,088 ARNG and 48,339 USAR) in 1,124 units (623 ARNG and 501 USAR). The assigned strength attained by the SRF as of June 30, 1968, was 131,790 (87,428 ARNG and 44,362 USAR).

The training experience of the SRF I provided a wealth of information to

the Army which can be used to improve reserve forces in the future. Significant lessons learned included:

(1) Reserve units can rapidly attain and support their full TOE strength provided they are geographically located in a rational manner.

(2) The sustained conduct of drills at the rate of 72 per year caused some unobligated reservists to leave. The modified accelerated training program of 58 drills per year proved more acceptable to the average enlisted man.

(3) With necessary priorities on equipment and extra drill authorizations, SRF units can accomplish up to company-level training and successfully complete company tests. The lack of battalion-level training facilities will, in certain instances, restrict unit sustained readiness capability to company-level training. Reserve units can reach battalion-level training and pass battalion training tests before mobilization if adequate drills, technicians, personnel, and equipment are provided.

The 14 U.S. Army corps responsible for the control and administration of the USAR in the continental United States were eliminated during the period January 1 to July 1, 1968. In their place, 18 new USAR general officer commands were activated to assume the command and control responsibilities not transferred to the CONUS armies. The new command structure places every USAR unit under an Army Reserve general officer command which in turn reports directly to a CONUS army commander. A few general officers report to another Army Reserve general officer command. Substantially greater responsibilities are placed on Army Reserve commanders in this new chain of command.

During fiscal year 1968 there was some improvement in the materiel readiness and availability status of Army reserve components equipment with the receipt of significant quantities of new equipment such as $\frac{1}{4}$ -ton truck, $\frac{1}{4}$ -ton trailer, grenade launcher M-79, and 5-ton dump truck. The rebuild program for M-48A1 tanks also enhances readiness.

On the negative side, the Army reserve components continued to experience shortages of equipment and repair parts throughout the fiscal year since funds were not available to purchase these items because of the priority of Southeast Asia demands.

The readiness of the Army reserve components improved during fiscal year 1968, although the reorganization of these components had an adverse effect on readiness temporarily in that it required retraining of many individuals because of changes in skill requirements. In anticipation of this requirement, additional instructors were authorized for USAR schools. The USAR school system, which provides one of the primary sources for continued training of individual officers and enlisted members of the Army reserve components, expanded from an enrollment of approximately 24,000 in fiscal year 1967 to 30,000 in fiscal year 1968. A special problem area was the training of reserve aviators. Continued demands of Southeast Asia on the aviation training base precluded the training of reserve aviators and necessitated establishment of an alternate method of cross qualification of rated USAR aviators. Continental U.S. armies were authorized to conduct informal fixed-wing qualification training of rotary-wing aviators.

The reorganization of the USAR resulted in decreased participation in active service exercises. Four of the five CONUS Army areas requested and were granted relief from their annual Army-wide reserve component CPX requirement. All major units conducted CPX's either at home or at annual active duty for training. Field exercises were limited to battalion level in prep-

aration for Army training tests. However, 800 unit and 600 nonunit personnel of the USAR participated with 1,600 active Army and 400 active and reserve Navy, Marine Corps, and Air Force players in LOGEX 68 at Ft. Lee, Va., during the period April 28-May 11, 1968. In conjunction with exercise HIGH HEELS 67, conducted from October 24, to November 1, 1968, 500 USAR officers participated as state level controllers for a civil defense exercise (CDEX 67).

The Army National Guard air defense program is now in its 16th year of operation. A study is underway to determine the extent of possible participation in the ballistic missile defense of the United States. The performance of the fire units, distributed between the continental United States and Hawaii, continued to improve. The on-site batteries in the continental United States represent a significant percent of the NIKE-HERCULES units of the Army Air Defense Command, and the fire units in Hawaii provide the only surface-to-air missile defense of that state. These units, manned by Army National Guard technicians, are sited to protect selected population and industrial centers against air attack and are manned and operated around the clock.

During fiscal year 1968, the Army reserve components significantly improved their capabilities to control civil disturbances. In August and September 1967, all units of the Army National Guard underwent a comprehensive training program on riot control and civil disturbances consisting of 32 hours of training for all units and 16 hours command and staff training for staffs of battalions and larger units. Particular emphasis was placed on "lessons learned" from the riots in Detroit and Newark in the summer of 1967.

During fiscal year 1968, National Guard units were employed during civil disturbances 75 times in 50 cities in 29 states. The Governors of Michigan, Illinois, Maryland, and the Mayor of the District of Columbia requested and received Federal troops to quell civil disturbances. The National Guard of these states and the District of Columbia were called to Federal active duty with the commitment of Federal troops.

Special civil disturbance equipment, not previously authorized to the states, such as gas agent dispersers, bullhorns, body armor, grenade launchers, sniper rifles, and searchlights for night illumination, was made available. Additional jeep-mounted searchlights and radio equipment were prestocked and prepositioned in depots located on the east and west coast for rapid delivery to states in need of such equipment. Planning packets were completed for all cities considered by the CONUS Army headquarters to have a high probability of civil disturbances. All states have either revised or rewritten their state civil disturbance plans.

Because of the continuation of CONUS-wide civil disturbances, the decision was also made to train selected USAR units and provide essential equipment for this mission. This specialized training and equipment prepared the USAR for employment in an active Army role in civil disturbance situation when required and sufficient Army National Guard troops are not available. When so employed, these units would be on active duty under active Army command and control.

All units selected for training followed the standardized program developed last year by the U.S. Continental Army Command. Instruction included an introduction to civil disturbance, riot control formations, and riot control agents and munitions. The authorized strength of units selected to conduct this training totaled 204,000 and included the majority of units of the USAR.

During fiscal year 1968, the screening operation of the Department of the Army covered a total of 1,125,126 reserve component personnel. The screening process removed a total of 265,841 from the Ready Reserve. Of these, 163,833 officers and enlisted men were transferred to the Standby or Retired Reserve and 102,008 were discharged.

With the lifting of the suspension of the military construction program for the reserve components, 18 armory and 14 nonarmory projects were programmed for the National Guard during fiscal year 1968. A total of 13 military construction projects were programmed for the USAR. Two of these are to be jointly constructed with the Department of Navy. Upon accomplishment of these 13 projects, home station training facilities will be provided for 5,250 USAR personnel.

Naval Reserve

The Naval Reserve is organized and administered in two separate but coordinated programs, Air and Surface, with the latter including all programs other than the Naval Air Reserve. The Naval Reserve maintained an excellent military posture during fiscal year 1968 in the personnel sector, but continued to experience problems in the availability of equipment. The Naval Surface Reserve maintained a high state of readiness for general mobilization. Reserve ships were manned to more than 100 percent of officer complement and in the case of minesweepers, in excess of 100 percent of enlisted personnel. The latter on board the DD/DE-type vessels averaged 90 percent. Assigned strengths in shore-based units (construction battalion, inshore undersea warfare) ranged from 63 to 75 percent of that authorized.

However, due to priority requirements for Southeast Asia, needed improvement in material condition and modernization of existing reserve ships did not materialize, although funding was authorized to provide for overhauling reserve ships at fleet unit cost levels. A program also has been submitted for updating the communications equipment of the destroyers. It is judged that, in order to become ready for general operations coincident with extended deployment remote from U.S. bases, some time would be required to accomplish certain updating of equipment and to provide refresher training for crews.

The two construction battalions mobilized and ordered to Southeast Asia are fully equipped, but shortages of material and equipment exist for the remaining 16 reserve construction battalions.

In the Naval Air Reserve, an estimated 98 percent could be mobilized in a 48-hour period. Its over-all readiness increased during fiscal year 1968 in those categories which were compatible with available equipment and training time. In the area of readiness for deployment, a wide degree of variance exists among the different units, depending primarily on the type of aircraft and support equipment available. The time necessary to prepare squadrons for deployment could be reduced substantially by the addition of mission-equipped combat deployable aircraft, special support equipment, and current pilot/crewman training aids.

A significant development for the Naval Reserve during fiscal year 1968 was the enactment of Public Law 90-168. As a result, the Office of the Assistant Secretary of the Navy (Manpower and Reserve Affairs) was established on January 1, 1968. He is responsible to the Secretary of the Navy for all matters relating to manpower and reserve component affairs of the Department of Navy, including the U.S. Marine Corps and Marine Corps Reserve.

In another important development, a reassessment of Naval Reserve missions and requirements has been undertaken and is expected to be completed in fiscal year 1969. Tentative plans have been developed to provide for annual incremental increases of 3,000, commencing in fiscal year 1970, to attain the ultimate Selected Reserve goal of 139,000. Such increases will be subject to verification of the ultimate requirement of the Naval Reserve force study which is being conducted within the Department of Navy.

The Selected Naval Reserve has two general groupings:

(1) Those forces consisting of units to train, mobilize, and serve with their assigned hardware (these forces comprise the combat unit component; 100 percent manning is authorized for these units).

(2) Individuals who train in Selected Reserve training units but who will mobilize to augment the active forces in being from peacetime allowances to wartime complements (87 percent manning is authorized for these units).

A major modification in the Naval Air Reserve was directed by the Chief of Naval Operations which required redesignation of all Reserve units (tactical and nontactical) in order to make these units more responsive to both partial and full mobilization requirements. Training unit allowances were realigned with hardware requirements. The billet structures of the tactical units were adjusted to delineate enlisted TAR's for each individual fleet operational unit. Priority manning of the fleet operational units also was directed by the Chief of Naval Operations, thereby significantly reducing personnel shortages both in rating structure and numbers for the tactical units in the event of additional recall.

Attention was directed toward recruitment of minority group personnel during fiscal year 1968. Negroes on board in a pay status were 69 officers and 2,474 enlisted personnel through June 30, 1968. Of the 1,091 Negroes who applied for enlistment, 298 were enlisted and 562 remained on the waiting list. The remaining number either joined other armed forces or elected not to remain on the waiting list. The recruiting effort for minority group officers had the following results: 1,697 interviewed, 321 examined, 111 attained qualifying score, and 99 selected with 12 cases pending.

Both the Naval Surface Reserve and the Naval Air Reserve units depend on "fall-out" from the active fleet for ships and aircraft, respectively, and other major items of equipment. Such "fall-out" during fiscal year 1968 was negligible because of hostilities in Southeast Asia.

It is the policy of the Navy to program for the Naval Air Reserve combat capable aircraft to satisfy the training, mobilization readiness, and deployment requirements for those units approved for mobilization as "hardware squadrons." Tactical aircraft (attack and fighter) are old and limited in capability. Fighter aircraft are assigned to the 4th Marine Air Wing for mobilization. The TA-4A aircraft are restricted from carrier operations because of structural limitations. The TA-4B aircraft would require extensive modification to bring them to a minimum acceptable combat configuration.

Antisubmarine warfare (ASW) aircraft assigned are capable of performing most missions. The situation is improving with the assignment of SH-3A helicopters. The remaining aircraft types lack some of the more sophisticated detection equipment and the aircraft themselves are old. More modern aircraft would increase effectiveness measurably. In addition, there is a shortage of special and ground support equipment needed to meet mobilization requirements.

Planning in fiscal year 1968 provided that Naval Reserve training ships

would utilize the same training exercises and readiness reporting system as active fleet ships during the normal 2-year competitive and training cycle. The command structure was modified to place training responsibility on the active duty squadron commander. In the Seabee program, 18 reserve mobile construction battalions performed unit active duty for training, with 12 of them training in pairs as part of a naval construction regiment.

Throughout fiscal year 1968, reserve crew active duty for training was scheduled to afford antisubmarine warfare and mine warfare units the opportunity to participate in operations at sea with their respective division organizations. Two or more ships were scheduled to operate in company whenever possible to accomplish this purpose. During the active duty for training periods, the policy of scheduling modified refresher training for ASW units with fleet training groups in alternate years was continued. Those naval district ASW units scheduled for refresher training proceeded to designated training operations area in company, conducting inter-ship exercises during the transit, thereby deriving the greatest training benefit.

The ASW ships, which were not scheduled for refresher training, participated in type training where the services of target aircraft, target submarines, and surface target sleds were available. When practicable, the available targets were shared with other units of the fleet desiring to conduct the same or similar exercises, a practice which, in addition to the obvious economics involved, contributes to the "One Navy" concept. Other mutual training, such as workup exercises for deploying submarines, was conducted in cooperation with fleet units. Increased emphasis on active fleet and reserve ship training cooperation is contemplated for the year ahead.

During weekend drill periods for ASW ships, joint exercises involving Naval Reserve aircraft and fleet submarines were conducted. A factor contributing significantly to improved operational readiness of ASW units was the operational coordination and cooperation provided by the Chief, Naval Air Reserve Training, in providing airlifts for antisubmarine warfare, mine warfare, and submarine Naval Reservists. More reservists gained singular experience by performing multiple drills and annual active duty for training in the fleet submarines. Where more than one mine warfare ship was located in an area, multi-unit exercises were scheduled during weekend drills and during annual active duty for training. Ships remotely located from each other were scheduled to join other mine warfare units during annual cruises.

In individual training, class A school participation was not as great in fiscal year 1968 as in the preceding year (933 in fiscal year 1968 and 2,871 in fiscal year 1967) as a result of fewer quotas being available to the Naval Reserve program. Of particular significance was the lack of availability of quotas in the critical ratings of ET, FT, GM, RD, RM, ST, and TM. This problem area was due to the tremendous demand for training of 4-year and 6-year enlistees in the active Navy to meet fleet needs and limitations on school capacities.

In the Naval Air Reserve, fleet competitive exercise criteria, with an assigned active duty observer, are utilized for qualification exercises analogous to the unit aircraft's combat employment. All qualifications are subject to periodic renewal to insure highest possible individual and unit readiness. The competitive environment enjoyed through readiness competition is a major factor in readiness improvement. The readiness reporting system is being incorporated into the Automatic Data Processing Bank.

The multiple unit exercises for fiscal year 1968 consisted of RESAWEX series and numbered 19 exercises with 212 sorties and 1,350 flight hours.

Comments by fleet commanders indicate continued improvement in the quality of Naval Air Reserve Training Command aircrewmembers was realized in fiscal year 1968. The total number in the Aircrew Training Program as of June 30, 1968, was 4,108, or 82.8 percent of allowance. Of these, 69.1 percent were designated aircrewmembers. This represents an increase of 77 aircrewmembers during fiscal year 1968.

The Ready Reserve of the Naval Reserve is screened on a continuous basis. During fiscal year 1968, a total of 709,359 Naval Reservists were screened, with some being screened twice. A total of 10,349 officers and enlisted men were transferred to the Standby or Retired Reserve and 39,003 were discharged. At the end of the fiscal year, 328,167 remained in the Ready Reserve.

The Naval Reserve surface units occupied 425 training facilities at the end of fiscal year 1968 which included those jointly utilized with reserve components of the other military Services. Comparable to the regular Navy military construction program deficiencies, the military construction, Naval Reserve program (surface), has approximately 37 percent of its facilities which have exceeded or have nearly reached the end of their designed life span. At the current \$2.01 million annual average rate of funding for construction of replacement facilities, 42 years would be required to eliminate the backlog of approximately \$84 million required to replace only the existing temporary and semipermanent facilities. This does not reckon with another very important factor of recent years. Often a facility which is scheduled for programming is deferred as a result of dislocation of facilities due to nonrenewal of leases, urban renewal, Federal flood control projects, Federal interstate highway programs, and activities in highly undesirable locations.

Of the 1,303 buildings utilized in the Naval Air Reserve training program, nearly half were constructed during or prior to World War II. Many are approaching or have exceeded their designed life span. Many operational facilities are inadequate due to deterioration, obsolescence, new equipment, and/or change of mission. The authorization level for the Naval Air Reserve during fiscal years 1964-69 has averaged \$2.6 million. Of this funding, expenditures include \$2.6 million for the new construction and alterations of existing facilities at Selfridge AFB necessary to accommodate the Navy in a move from NAS Grosse Ile, Mich. Since fiscal year 1967, the entire military construction, Naval Reserve program, including Naval Air Reserve, has had an approved funding level of \$10 million in the Five Year Defense Plan. The Navy has programmed at least that amount each year. Escalation of construction costs, estimated at 3-7 percent per year and rising, further magnifies the problem. Presently, the Navy program objective for the Naval Air Reserve contains an average funding of approximately \$5 million for the fiscal years 1970-74, with an additional \$21 million of identified but unprogramed projects. In recognition of the program deficiencies, the Naval Facilities Engineering Command is presently conducting a study to determine the funding level necessary to generate an orderly reduction of the total backlog of facility construction deficiencies. This information will be the basis of a Program Change Request to seek adequate funding for fiscal year 1971 and the out years.

Marine Corps Reserve

The Marine Corps Reserve, which is primarily structured to provide a combat-ready reserve of one division, one aircraft wing, and combat and service support units to form the IV Marine Expeditionary Force, continued to improve its over-all military posture during fiscal year 1968 with significant advances being made in its Ready Reserve forces readiness. All combat units of the Organized Marine Corps Reserve were considered combat ready at the beginning of the fiscal year, although some service support units were not trained in those skills necessary to fill a mobilization mission in the IV Marine Expeditionary Force. During fiscal year 1968, this situation was corrected. Combat units (ground) in excess of 4th Marine Division requirements were redesignated as service support units needed to round out the structure of the 4th Force Service Regiment. Additional units were redesignated as Fleet Marine Force augmentation units for the regular establishment.

Dependent upon the availability of class III, Ready Reservists (pool), the IV Marine Expeditionary Force will be capable of deploying to combat subsequent to M+60 days. The Marine Corps Automated Services Center continuously monitors billet vacancies and automatically assigns class III reservists to fill them. Upon mobilization, the necessary orders for class III reservists will be printed and mailed within 48 hours. Mobilized units reporting to their station of initial assignment will join other units of their parent battalion or regiment for predeployment training. The capability to deploy to a combat area subsequent to M+60 in a high state of readiness is considered to be a realistic and attainable goal.

The 4th Marine Aircraft Wing, utilizing class III reservists to fill certain billets, could mobilize and deploy a Marine aircraft wing with no significant personnel shortages. The wing does not possess electronic warfare and in-flight refueling (tanker) aircraft, and is hampered by helicopter shortages. In addition, 4th Wing aircraft presently on hand are "fall-out" assets from the regular forces and lack certain capabilities of more modern equipment. The wing, however, could accomplish its mission but at a reduced level of effectiveness caused by these equipment deficiencies.

Although the IV Marine Expeditionary Force could deploy in a high state of personnel and training readiness, one engineer battalion and two motor transport battalions selected to be augmentation units for the Fleet Marine Force will not attain a satisfactory readiness state until the fourth quarter of fiscal year 1969. These units will not be redesignated and assigned the new missions required for the round out of the regular forces until the second quarter of fiscal year 1969. Mobilization prior to the third quarter of fiscal year 1969 would require a longer training time than M + 60 before these units could deploy in a combat-ready status.

In the equipment field, the Marine Corps Reserve (ground) has a capability to mobilize and support the IV Marine Expeditionary Force with initial issue and mount-out requirements only. Major item deficiencies exist in the communications-electronics and engineer equipment areas. Shortages in radios and power-generating equipment will be alleviated during the third quarter of fiscal year 1969. Shortages of engineer equipment, such as bulk fuel systems, bridges, forklifts, refrigerators, and water purification units, will be eliminated during the second and third quarters of fiscal year 1970.

Availability of major items in prepositioned war reserve stocks has im-

proved over fiscal year 1967 and should attain an excellent state of readiness by fourth quarter fiscal year 1970.

Aircraft deficiencies in the inventory of the 4th Marine Air Wing have been caused by the demands of the Southeast Asian conflict which has prevented the transfer of aircraft from the regular forces to the reserve establishment. The wing has no heavy or light helicopter assets and less than one-third the medium lift capability of an active wing. Transport capability is very limited because the 4th Marine Air Wing is operating with obsolete C-119 aircraft.

For the past 3 years joint regular/reserve, air/ground exercises have been conducted with units of the 2nd and 5th Marine Divisions. The units and squadrons of the 4th Marine Division and 4th Marine Aircraft Wing have benefited significantly from this joint training and close association with units of the regular establishment.

During fiscal year 1968, the Marine Corps Reserve had a marked increase in civil disturbance training. Nine infantry battalions, two military police battalions, and one military police company received 33 hours of special training in order to be prepared for employment during civil disturbances. Forty-one officers from these units have attended the senior officers disturbances course at Fort Gordon, Ga., for training in planning and operations in the civil disturbance field.

The Organized Marine Corps Reserve Commissioning Program, which was initiated in fiscal year 1967 to alleviate the acute shortage of lieutenants in the Marine Corps Reserve, produced 109 lieutenants in fiscal year 1968. The program provides 7½ months of active duty for training, during which time the candidate receives training that leads to a reserve commission and basic officer's schooling. Upon completion of this training, the officer returns to his parent unit for 5¼ years of mandatory drill participation.

A total of 146,500 individual records of Marine Ready Reservists was screened during fiscal year 1968. As a result, a total of 14,583 Reservists was discharged and 21,392 were transferred to the Standby Reserve or were retired.

At the end of fiscal year 1968, Marine Corps Reserve units occupied 194 facilities—129 shared with the Navy or Army, 42 exclusively owned Marine Corps Reserve Training Centers, 4 exclusively leased Marine Corps Reserve Training Centers, 16 Naval Air Stations, 1 Naval Air facility, 1 Air National Guard field, and 1 Marine Corps base. During fiscal year 1968, improvements were made to ground training centers to provide more adequate facilities. Projects included the completion of 3 new training centers, 82 others which cost from \$300 to \$1,000, and 67 which cost from \$1,001 to \$10,000.

Air Reserve Forces

The Air reserve components continued to improve their over-all military posture during fiscal year 1968 and their capability to respond rapidly to any given emergency was effectively demonstrated during the January and April-May 1968 callups. The expansion of operational responsibilities and the refinement of training programs and management systems aided the Air Force Reserve and the Air National Guard to achieve increased effectiveness in support of Air Force missions. The Air reserve components flew round-trip airlift missions to Southeast Asia, Europe, Africa, South and Central Amer-

ica, Australia, and other parts of the free world. Aerospace defense units of the Air National Guard also continued to accomplish commitments successfully under the 24-hour runway alert program.

A serious problem area continued to be the lack of pilot and navigator training programs. Input cannot be fully accomplished from active duty fall-out. With the air component pilot and navigator inventory representing primarily products of World War II and the Korean conflict, attrition through retirement will greatly deplete this area of capability.

Air Force Reserve

One of the most significant developments for the Air Force Reserve during fiscal year 1968 was the enactment of Public Law 90-168, the Reserve Bill of Rights and Vitalization Act, which provided a basis for a new command and management system for the Air Force Reserve structure. The major results of this reorganization are the establishment of the Office of Air Force Reserve as a special staff agency of the Chief of Staff, USAF, and replacement of Continental Air Command with Headquarters, Air Force Reserve, as a separate operating agency under the Chief of Staff, USAF, but responsible to the new Office of Air Force Reserve for technical direction and control. The Air Reserve Personnel Center, located in Denver, Colo., was also activated as a separate operating agency.

Personnel actions taken during the year to strengthen the Ready Reserve of the Air Force Reserve included 3,437 nonprior service quotas filled, 33 outstanding airmen commissioned, 54 officer training quotas filled, 101 pilots and 29 navigators placed on flying status, and 148 pilots and 56 navigators gained by flying units. In addition, a total of 124,160 Ready Reserve personnel, involving 83,533 airmen and 40,627 officers, was screened during fiscal year 1968. As a result 40,661 reservists (340 officers and 40,321 airmen) were discharged, 9,049 were transferred to standby status or retired, 57,210 obligated or nonobligated reservists volunteered to remain in the Ready Reserve.

A controlled retirement board also convened to identify some 4,500 majors and lieutenant colonels out of approximately 9,000, who had completed 20 years, for immediate retirement. Those who were considered by the board were given the option of requesting voluntary retirement or submitting letters and documents to show why retirement should not be considered.

At the end of fiscal year 1968, the Air Force Reserve had 38 flying units and 204 nonflying units (excluding the 7 flying and 5 nonflying units called up for extended active duty). Manning levels in the Air Reserve units were at or near the maximum within imposed ceilings. Some units were below ceiling but were at their programed level since recent reorganization or relocation.

Organizational changes for fiscal year 1968 reflected efforts to strengthen the Air Force Reserve by realigning mission elements to requirements of the active Air Force. Four Medical Service squadrons and one aeromedical evacuation flights were activated. Five navigator training squadrons, two Medical Service flights, one instructor training squadron (navigator training) and its five detachments, and one USAF hospital were inactivated. Seven troop carrier wings, 21 troop carrier groups, and 21 troop carrier squadrons were redesignated tactical airlift wings, groups, and squadrons. Subsequently, one of these tactical airlift groups, less one tactical airlift squadron, was inactivated. The remaining squadron was then redesignated a combat crew training squadron, equipped with C-130A aircraft, and assigned to take over the re-

sponsibility for all C-130A aircrew training, both active and reserve, from the Tactical Air Command's combat crew training wing at Sewart AFB, Tenn.

In another change, a tactical airlift group at March AFB, Calif., was selected as the initial Air Force Reserve unit to convert into an associate unit and then moved to Norton AFB, Calif., where it augmented a military airlift wing. The Military Airlift Command's associate concept is based on the activation of an Air Force Reserve military airlift group, less unit equipment, co-located with, training with, and directly associated with and utilizing the equipment and facilities of an active duty MAC military airlift unit.

Equipment on hand at the end of fiscal year 1968 would permit effective mobilization of all Air Force Reserve units. Flying units of the Air Force Reserve had approximately 89 percent of their authorized aircraft combat ready. The status of equipment, other than aircraft, was also generally good, with flying units possessing 94.3 percent and nonflying units 97.0 percent of authorized equipment. Emergency radios and radio beacons, however, were in short supply and considered critical items.

Training activities of the Air Force Reserve during fiscal year 1968 included significant support and assistance to the active Air Force. Unit training was conducted by reserve flying units and their support elements in connection with the operational requirements in military and tactical airlift and aerospace rescue and recovery programs. Reserve units also supported and assisted Air Force general forces in three airlift and air mobility exercises in the continental United States conducted by the Tactical Air Command and the Joint Chiefs of Staff. Air Force Reserve units flew 60 aircraft, C-119's and C-124's, on more than 166 missions for over 340 flying hours.

Air Force Reserve flying hours for the year totaled 81,875. Reserve units airlifted 16,408 tons of cargo 49.9 million ton-miles, and 1,254 passengers 1.8 million passenger miles on worldwide routes for the active Air Force. A total of 259 missions were flown by aerospace rescue and recovery units of the Air Force Reserve, utilizing 1,523 flying hours. In addition 126,778 paratroops were airdropped.

A total of 4,714 officers and airmen, representing an aggregate of 75,836 man-days of training effort, entered Air Force Reserve programs in fiscal year 1968. About 80 percent of these officers and airmen entered the air qualification aircrew training program and accounted for approximately two-thirds of the total man-days of training effort. The remaining personnel entered other crewmen training, medical aircrew training, skill qualification training, skill proficiency training, medical general professional development, general professional development, and the officer training school programs.

Officer and airmen technical training programs formed special elements of the over-all training effort. Some 60 officers and 45 airmen entered some 20 technical courses in fields such as special investigation, air police, aircraft maintenance, and data systems analysis. In professional training, where courses ranged from chaplain orientation to nuclear engineering, 406 officers and 42 airmen were accommodated.

During fiscal year 1968, the major Air Force Reserve building programs had to do with former C-119 units with additional facilities as they converted to C-124 aircraft, preparing Ellington AFB, Tex., with construction to accommodate the C-130 program, and modifications at Norton AFB, Calif., for the C-141 associate unit program.

Throughout fiscal year 1968, the Air Force Reserve flying units maintained

a high readiness capability to support the active Air Force mission. As of June 30, 1968, 27 of the 36, or 75 percent, were operationally ready for immediate deployment. Of the remaining nine units, six had only minor personnel shortages and three were converting to other aircraft or had been earmarked for conversion or relocation early in 1969.

Personnel of the Air Force units, which were called to active duty during the last half of fiscal year 1968, demonstrated their capacity for rapid mobilization. In January, 99.5 percent of the 812 officers and 4,039 airmen of the two military airlift wings, five military airlift groups, and one aerospace rescue and recovery squadron, which were called up on 36 hours' notice, had responded within 24 hours. The second callup, announced in April, provided for the mobilization of one tactical airlift group, three aerial port squadrons, one aeromedical evacuation squadron, and one medical service squadron on 30 days' notice. Of the 134 officers and 621 airmen included in the callup, 99.9 percent responded within 24 hours of the reporting date.

Air National Guard

In the Air National Guard, continued attention was given to the screening personnel. During fiscal year 1968, there were 118 officers and 194 airmen screened out of the program.

Another major action was the reorganization of the four mobile communications groups and subordinate units which comprise the largest portion of Air National Guard units responsive to the Air Force Communications Service to conform as nearly as possible to the latest deployment and operational concepts. The reorganization satisfies the requirements of the various major commands for mobile communications and flight capabilities in the reserve forces.

The changed organization identifies teams within the structure of the Air Force component command post squadron (a subordinate unit of the mobile communications group) to install and maintain the communications facilities necessary for the Air Force component commander to exercise command control over subordinate forces, to communicate with lateral forces, and to provide him access to the Defense Communications System with its worldwide facilities. The new organization, further, provides the contingency squadrons of the mobile communications group with a radio relay and tributary team capability which permits the recall to active duty of a minimum number of personnel in a limited mobilization to provide complete base communications, radio relay, and terminal facilities in one squadron. An improved grade structure in all units has also been accomplished under the reorganization, thus providing for better career progression and enhancing the reenlistment program throughout the mobile communication groups.

Other organizational changes during fiscal year 1968 reflect efforts to strengthen the Air National Guard by realigning mission elements to requirements of the active Air Force. This resulted in the activation of a weather flight (support Army), a tactical electronic warfare group, a mobile communications flight, seven aerial port flights, and eight mobile communication squadrons. Eight aeromedical evacuation flights, one military airlift group, and eight radio relay squadrons were inactivated. One military airlift group was redesignated to an aeromedical airlift group and one military airlift squadron was redesignated to an aeromedical airlift group and one military airlift squadron was redesignated an aeromed airlift squadron.

As of June 30, 1968, equipment on hand would permit an effective mobilization of all Air National Guard units. The C-124 aircraft conversion program continued at an accelerated pace, with six units receiving aircraft. As of June 30, 1968, two C-124 units had achieved C-2 operational readiness status and four were in a C-3 status.

Efforts were continued during fiscal year 1968 to re-equip the mobile communications groups with the latest communications-electronics equipment. Equipment procurement programs, moreover, are being adjusted to conform to the new authorizations and operating concepts.

The Air National Guard flew a total of 463,108 flying hours during fiscal year 1968. This total included 268,499 hours in jet aircraft, 169,960 hours in tactical nonjet aircraft, and 24,649 hours in support aircraft. Included in the total are 12,667 hours in support of the Air Force: MAC airlift, 7,597 hours; aeromedical evacuation airlift, 2,360 hours; Dart tow in support of TAC, 1,205 hours; and C-121 training in support of ADC, 1,634 hours.

In individual training, the Air National Guard graduated 9,154 non-prior servicemen from basic military training. Of these, 6,395 subsequently entered technical training immediately, while the remaining 2,759 airmen were returned to home base or nearby Air Force bases for training, as they were in skill areas more receptive to on-the-job training.

Additionally, 125 pilots completed undergraduate pilot training and 59 individuals graduated from navigator training. Advanced flying training, which consisted of combat crew training for the newly graduated pilot/navigator and cross-training of new Air National Guard prior-service pilots, who were previously qualified in other aircraft, was provided for a total of 323 students. Another 161 officers completed professional development programs. A total of 1,291 officers and 1,952 airmen received technical and special training in Air Force technical schools, while 330 noncommissioned officers were graduated from various NCO academies and other courses directed toward professional advancement.

The most significant multiple unit training of the Air National Guard in fiscal year 1968 consisted of Exercises GUARD STRIKE I and SENTRY POST I, which were conducted during the annual summer field training period. These exercises were designed to indoctrinate and train Air National Guard units in all phases of the Tactical Air Control System. (Forces used will be combined in the summer of 1968 to complete GUARD STRIKE II. Each segment of the GUARD STRIKE series covers a larger scope than the previous stage and incorporates lessons learned in the earlier exercises. The last phase of the GUARD STRIKE series is scheduled for the summer of 1969.)

Coast Guard Reserve

During fiscal year 1968, the Coast Guard Reserve maintained its capability for rapid mobilization. All members of the Ready Reserve have been issued card-type mobilization orders which show the location and timeframe for reporting. The four Coast Guard Reserve training vessels, moreover, are immediately deployable into the fleet for service in the regular Coast Guard. They require only additional augmentation personnel to bring them up to post M-day complement.

Phase I of the Centralized Reserve Mobilization System, the centralization of manpower requirements into an automated data processing system, was

completed during fiscal year 1968. Work commenced on phase II which, when completed in fiscal year 1969, will provide a computer match of reserve personnel to mobilization billets. The system scheduled for implementation in early fiscal year 1970, is designed to provide better utilization of reserve manpower resources in relation to Coast Guard-wide mobilization requirements. Further, an improved management information system for analyzing and forecasting training and personnel requirements is an expected benefit.

A most important development affecting the Coast Guard Reserve was the decision to reduce the early response strength figure. Based on the findings of the Port Security Mission Study completed in fiscal year 1967, it was apparent that the previously visualized early response figure of 33,600 officers and men could be substantially reduced. Immediately following this determination, the Commandant imposed a hold on the early response strength at about 18,000 for both fiscal years 1968 and 1969 pending completion of a study of the remaining mobilization mission areas.

This study, entitled "Reserve Training Concepts and Force Analysis," which is scheduled for completion on or about September 30, 1968, has as its objective the determination of: (1) The Coast Guard's manpower requirements necessary to meet its current wartime missions; (2) manpower available upon mobilization from nonreserve forces; (3) the composition and strength of the reserve force necessary to meet the remaining mobilization needs; and (4) the most cost-effective means of producing and maintaining the required reserve force.

The first two objectives were completed during the fourth quarter of fiscal year 1968, and as a result of these findings, the Commandant has determined that the total Ready Reserve requirement is approximately 25,000.

The Coast Guard Reserve program operates under the same laws which govern all reserve components. In order to insure maximum uniformity, the Coast Guard adheres closely to the regulations, policies, and directives promulgated by the Department of Defense, and particularly those of the Department of the Navy, since one of the primary duties as contained in Section 2, Title 14, U.S. Code, is to "maintain a state of readiness to function as a specialized service in the Navy in time of war." Close liaison and excellent working relationships are maintained with all of the armed Services. The Chief, Office of Reserve, is a member of the Reserve Forces Policy Board, which by statute is the principal policy advisor to the Secretary of Defense on matters pertaining to the reserve components. Additionally, one senior Coast Guard officer was assigned on a full-time basis during the first quarter of fiscal year 1969 to the staff of the Deputy Assistant Secretary of Defense for Reserve Affairs.

It is general Coast Guard policy to avoid stockpiling of equipment for mobilization except for port security, as most Coast Guard wartime duties require only additional personnel to augment existing units and facilities. For the port security mission, however, the existing reserve port security training units (operational) would be activated as entities and would require additional equipment. Training equipment in almost every instance will be equally usable as mobilization equipment. Thus, funds expended for training equipment will enhance mobilization capability. Currently, some items of equipment and training aids are in short supply. While these shortages are not considered to be critical with respect to mobilization capability, lack of equipment does result in some loss of training effectiveness, particularly for Coast Guard port security training units (operational). Planned procurement

through fiscal year 1973 will provide nearly 100 percent of requirements based on current planning.

The three major elements of the Coast Guard Reserve Training Program—inactive duty training accomplished primarily at the Coast Guard Reserve training units, initial training accomplished at recruit training centers and followed by advanced training, and active duty for training accomplished at schools and at regular and reserve shore establishments and floating units—were successfully carried out during fiscal year 1968.

Extensive measures were implemented to effect a general over-all improvement in the quality and effectiveness of the training program. These improvements include standardization of initial training courses, greater emphasis on quality and content of instruction within units, more effective course material, the addition of new and the improvement of existing annual active duty for training courses, and more exacting standards of attendance and participation. The results of these changes are reflected in increased levels of inactive duty training, active duty for training, and correspondence course activity during fiscal year 1968.

Throughout fiscal year 1968, an important part of reserve training consisted of those exercises conducted by two or more units operating as a team at a specific port area and conducting port security operation under simulated conditions that would prevail at the time of initial mobilization. A typical exercise of this sort was conducted in Chicago, Ill. Four port security training units (operational), with a total of 31 officers and 224 enlisted assigned, participated in this exercise utilizing the Coast Guard Reserve's floating port security training platform, the USCGC *Courier*, as the base of operations.

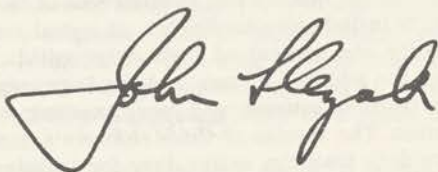
The *Courier* provides berthing and messing facilities for personnel engaged in the exercises and also furnishes operating equipment such as boats, communications equipment, disaster control equipment, etc., to supplement that held by the individual units. In general, the *Courier* provides the necessary support and guidance in conducting these valuable periods of training that would otherwise be limited because of lack of facilities, at least in some port areas. A total of 2,018 officers and men participated in 39,389 man-days of training through *Courier* operations during fiscal year 1968 in major ports, including Cleveland, Detroit, Portland (Maine), Boston, Norfolk, Miami, Tampa, New Orleans, Galveston, and others.

Exercises of the same type were conducted at other selected port sites using the facilities of the Coast Guard shore establishments both on weekend drills and during ACDUTRA. Some of these were in conjunction with Operation WEBFOOT, an annual Captain of the Port training requirement for personnel of the regular Coast Guard Service in coastal districts, and involved participation of reservists. Others were concerned with individual unit operational training at their mobilization sites such as those conducted at Baton Rouge, New Orleans, and Houston.

Screening of the Ready Reserve continued throughout fiscal year 1968. A total of 263 officers and 314 enlisted men were transferred to the Standby Reserve, 46 officers and 21 enlisted men to the Retired Reserve, and 86 officers and 5,229 enlisted men were discharged.

During fiscal year 1968, inactive duty training continued to be conducted at a number of different types of facilities. A total of 117 Naval Reserve, Naval and Marine Corps Reserve, and Armed Forces Reserve Training Centers was utilized by 140 Coast Guard Reserve units. The Coast Guard and other armed

forces active duty commands provided drilling sites for 74 units. Coast Guard Organized Reserve Training Centers, which now total seven in number, provided drilling sites for 35 units, and eight units conducted drills at other public and privately leased facilities. Three of the Organized Reserve Training Centers were newly established during fiscal year 1968. The continuing program to establish these centers at selected locations affords the opportunity to consolidate personnel, training aids, and equipment, and to make more effective use of support personnel with a resultant increase in training effectiveness and economy of operations.

A handwritten signature in dark ink, reading "John Slezak". The signature is fluid and cursive, with a large, stylized initial "J" and "S".

JOHN SLEZAK,
Chairman, Reserve Forces Policy Board.

Annex B

ANNUAL REPORT

of the

DEFENSE SUPPLY AGENCY

July 1, 1967, to June 30, 1968

This is the seventh annual report of the Defense Supply Agency (DSA). At the beginning of fiscal year 1968 the Agency anticipated sales to the military Services exceeding \$4.2 billion, which would have been an alltime record. However, by November 1967 there was a noticeable falling-off in the level of demands for support. Early in December the DSA Director instructed his field commanders to begin reviewing their major procurements personally to assure essentiality and avoid the accumulation of excesses. Simultaneously, DSA obligation authority was cut about 13 percent to \$3.1 billion, and the annual procurement program was adjusted to \$5.1 billion, or \$700 million below the original budget allocation. From these annual lows, moderate increases were authorized during the balance of fiscal year 1968 in successive increments, reflecting tight fiscal controls responsive to military requirements, and primarily to the Southeast Asia situation.

The long industrial leadtimes mentioned in last year's report have continued. Although current buying had been curtailed to meet a changed situation, material on order, most of it purchased in the previous year, continued to pour in. Credit returns from the Services amounted to more than \$110 million. Deliveries from contractors exceeded net sales by nearly \$190 million, and DSA ended the year with an inventory increase of \$145 million, instead of the anticipated \$50 million drawdown (see table below). Material on order totaled about \$1.09 billion on June 30, 1968, a decrease of \$0.44 billion during the year. This was significant as one of the few areas in which the Agency was able to respond quickly to a change in Defense policy.

DSA STATISTICAL TRENDS

[In millions of dollars]

	End fiscal year 64	End fiscal year 65	End fiscal year 66	End fiscal year 67	End fiscal year 68
Stock Fund Obligations	1,577.8	1,825.8	4,245.7	4,309.8	3,319.1
Procurement Deliveries	1,590.0	1,739.1	2,902.9	4,822.5	3,963.3
Gross Customer Sales	1,805.2	1,968.0	3,010.2	4,090.7	3,886.6
Net Inventory Change	-180.3	-255.0	+17.3	+902.2	+145.0

Changes in Agency Mission and Organization

Effective July 1, 1967, administration of the DoD Contracts Compliance Program was transferred from the Assistant Secretary of Defense (M&RA) to DSA. This program, which assures that equal employment opportunity policies are followed in plants working on Defense contracts, was immediately redelegated to the Deputy Director, DSA (Contract Administration Services), as a part of contract administration.

On July 28, 1967, responsibility for policy direction and supervision of the Item Entry Control Program was transferred from DSA to the Assistant Secretary of Defense (I&L). DSA continued to provide personnel, administrative support, and services. One of the more important services is item intelligence support by the Defense Logistics Services Center, Battle Creek, Mich.

Also on July 28, the Defense Documentation Center (DDC) Field Service Office at Los Angeles, Calif., was disestablished. This was the last of the DDC field activities. All documentation requirements are now met from Headquarters, DDC, Alexandria, Va.

On October 1, 1967, the DSA Performance Standards Support Office was established at the Defense General Supply Center, Richmond, Va., as a HQ DSA field extension office of the DSA Comptroller. The new office is responsible for designing, directing, and conducting training courses and accomplishing projects in support of the DSA Performance Standards Program.

On January 17, 1968, the Defense Contract Administration Services District (DCASD) Oakland, Calif., was disestablished; functions were consolidated under DCAS Region, San Francisco, Calif. Also during fiscal year 1968, DCAS Offices (DCASO's) were established at Sanders Associates, Nashua, N.H., and at the General Electric Co., Syracuse, N.Y.; DCASO's were disestablished at Clearwater, Fla., at Reaction Motors, Denville, N.J., and at American Machine and Foundry, York, Pa.

Effective February 5, 1968, DSA was assigned responsibility to serve as the operating agency for the automated overseas employment referral program. The function was subassigned to the Defense Electronics Supply Center, Dayton, Ohio.

On April 30, 1968, Defense Surplus Sales Offices (DSSO's) at Tucson, Ariz., and Brooklyn, N.Y., were disestablished, their functions being transferred to DSSO San Diego, Calif., and DSSO Newport, R.I., respectively. These actions reduced the number of DSSO's to 10.

Changes in Item Management Responsibility

At the start of fiscal year 1968, the five operating inventory control points of DSA were managing 286 Federal supply classes (FSC's) for all the military Services encompassing a total of 1,538,500 centrally procured items. No change in class assignments was experienced by DSA during 1968. On June 30, 1968, DSA was centrally procuring 1,765,500 items in 286 FSC's for all the military Services, a net increase of 227,000 times during the year. A large part of this increase (147,400 items) could be attributed to the retroactive item management coding program described in last year's report. Although a transfer of some 13,700 items to GSA was officially scheduled for July 1, 1968, the transfer was completed early and is reflected in the above figures.

Distribution by supply center, inventory value, and annual sales of DSA centrally procured 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 10 direct supply support points (DSSP's) for Navy support. The shortage of storage space on the west coast eased during fiscal year 1968 as stock levels were lowered to meet decreased requisitioner demand. As a result, DSA has made a significant stock drawdown in the military Service and GSA storage sites temporarily utilized on the west coast to accommodate the peak workload mentioned in last year's report. Of the 12 temporary storage sites utilized, 1 has been completely evacuated and receipts into several others have been discontinued. Also, the temporarily leased commercial space in the Stockton, Calif., area is in process of evacuation with the objective of closing out completely by the third quarter of fiscal year 1969. DSA-owned materiel stored in attrition sites reflected a slight net increase during the year due to capitalization of stocks from the military Services through item management coding actions. As of June 30, 1968, 21,633 tons of DSA-owned materiel was located in 24 attrition sites.

Depot Operations

Progress in redesigning and installing the mechanization of warehousing and shipment processing (MOWASP) procedures continued on schedule in fiscal year 1968. The revised MOWASP was installed at the Defense Construction Supply Center (DCSC) in February 1968, and the installation at the Defense General Supply Center was updated in the following month. Installations at Defense Depot Mechanicsburg (DDMP) and Defense Depot Tracy (DDTC) were completed in May and June 1968 respectively. The remaining schedule calls for all seven DSA principal depots to be operational under MOWASP before the end of calendar year 1968.

The drawdown of DSA tonnage during fiscal year 1968 contributed significantly to reducing the highly critical storage space situation experienced by DSA in the previous year. By June 30, 1968, DSA's \$3.04 billion inventory was stored in 88 locations, the major portion being Government-owned and about one-third being leased or commercial. Most of the commercial locations are refrigerated facilities and handle perishable subsistence. Approximately 89 percent of the DSA inventory was stocked in the DSA hard-core depot system comprised of seven principal distribution depots and four specialized support depots. The depots continued to be augmented by temporary locations and leased space approximating 6 percent of the total 25 million net square feet of covered space. Another 8 percent of this space in the DSA depots was unavailable for DSA use since it was being utilized by other Government agencies. At the end of the fiscal year, the occupancy rate of this space still exceeded the optimum 85 percent, and it continued to be necessary to store in the open some materiel which normally requires covered storage.

The leveling off of depot operations workload in fiscal year 1968 below the level of the previous year precluded the necessity for procurement of additional materials handling equipment (MHE). Also, cost avoidance was derived from continuing in operation "temporary hold" (TH) MHE units withheld from disposal in prior years. The heavy usage to which these over-age

units were put during the peak Southeast Asia period 1965-67, however, finally took its toll, necessitating the scrapping of 45 such TH units.

Significant progress was made in the further mechanization of warehouse bin-room operations. Cost reductions are accruing as anticipated from the pilot system at Defense Depot Ogden, Utah (DDOU), described in last year's report. Additional systems were procured during the fiscal year for Defense Construction Supply Center (DCSC), Columbus, Ohio, and Defense Depot Memphis, Tenn. (DDMT), which will be fully operational before the end of calendar year 1968. The system for Defense Depot Mechanicsburg, Pa. (DDMP), has been designed and is scheduled for procurement early next fiscal year.

Metals handling systems were installed at Defense Depot Tracy, Calif. (DDTC), and DDMT and are operational. A metals handling system for DDMP will be installed and become operational in fiscal year 1969.

Logistic Support of Civil Defense

During fiscal year 1968, survival supplies were issued to 8,033 shelter facilities, increasing the grand total of stocked facilities to about 91,000. The supplies issued during the year were enough for nearly 6 million persons, bringing the cumulative total to a level sufficient for approximately 53 million persons for 14 days. About 84 percent of the total shelter supplies procured (sufficient for 63 million persons for 14 days) had been issued by June 30, 1968. At that time, 16 DoD and 9 GSA warehouses served as distribution points to local governments—a reduction of 6 warehouses during the year.

Food inspectors of the U.S. Army Veterinary Corps and Air Force Veterinary Services are being utilized to inspect civil defense supplies stored in shelters. The objective is to obtain valid data on the serviceability of these supplies by inspecting fallout shelters on a scientific sampling basis. During fiscal year 1968, survival supplies in approximately 2,000 shelter facilities were inspected. Results received from approximately 1,750 inspections are being computerized. The inspection sample size next year will be approximately 6,000.

DSA maintains an engineering equipment inventory for use during civil defense postattack operations and in natural disasters valued at about \$6.5 million. During the fiscal year, engineering equipment was on loan to 15 states for use in 53 communities to help alleviate the persistent water shortage in the northeastern United States, spring floods along the Mississippi River, and a hurricane in southeast Texas.

Procurement and Production Program

During fiscal year 1968, DSA procurement activities awarded a total of 848,300 contracts aggregating \$5.36 billion. Of the awards subject to competition, 87.5 percent were accomplished through competitive procurement. Awards of \$10,000 and above in labor surplus areas totaled \$467 million, or 11.5 percent of all DSA awards in the United States and possessions. Awards to small business totaled \$2.14 billion, or 45.0 percent of all awards to U.S. firms. In addition, under the DSA CAS small business program, subcontracting commitments to small business by DoD prime contractors amounted to \$4.3 billion, representing 49 percent of all subcontracting commitments of DoD primes under the DSA CAS program.

DSA actively and aggressively pursued a small purchases improvement program designed to correct the most serious deficiency in the small purchases area—lack of knowledge of the items being purchased. Particular emphasis has been devoted to increasing the adequacy of descriptive data provided to the buyer. Much of the available technical data capability in DSA has been devoted to developing better procurement identification descriptions for items previously bought by part number. Visual search microfilm records of commercial catalogs and other documentation have been installed in our centers to increase buyer access to supplementary information. Display boards have been placed in buying areas to increase buyer familiarity with commodity groups being bought. DSA also increased supervision of small purchase buyers by more experienced purchasing agents; intensified management attention in the low value area; and worked to improve systems which will provide quality items correctly priced.

Training for small purchase buyers was accelerated and improved. In addition to internally training new buyers in Government procurement practices and small purchase techniques, DSA has increased its participation in the DoD small purchase course; during the fiscal year, 350 DSA buyers were trained in the formal course. Increased training for management was also effected.

Major efforts were also made to improve the quality and professionalism of the buying personnel through recruitment of more qualified individuals. To promote this effort, a new career classification series for small purchase buyers was developed in conjunction with the Services and the Civil Service Commission. This new series is designed to secure people who are qualified to progress from small purchases to more complex and costly procurements and to procurement management. This should enable small purchases offices to secure better people and to motivate them with the possibility of progressing to better paying positions.

A review of all standard clauses used in DSA contracts was initiated during fiscal year 1968. Over 100 clauses have been eliminated thus far as being either unnecessary or in conflict with the Armed Services Procurement Regulation (ASPR). It was noted that where clause books are in use, there is a tendency to retain many obsolete clauses. The use of clause books is being phased out. Also, clauses locally developed at various centers to serve similar purposes are being replaced by over-all DSA clauses. These are being submitted for possible inclusion in the ASPR. The effect of these efforts has been to simplify and reduce the size of contractual documents. This is a continuing project since the reviews conducted to date have demonstrated the value of surveillance in this area.

As in previous years, the expanded quality check program included visits to Coast Guard stations and Job Corps centers in its scheduled round of visits to all customers. These visits were productive and very well received. The extension of DoD policy on quality and reliability assurance to include storage and maintenance activities was implemented in DSA through regulatory instructions and procedures.

DSA requests to the Department of Commerce for special assistance under the priorities and allocations program were considerably reduced from the peaks reached in fiscal year 1967. Approximately 125 cases involving expedited delivery of materials on existing contracts were handled during the year. Most of these deliveries were for use in Vietnam; some were the result of strikes in various industries (e.g., glass and copper). Industry was quite

responsive to DSA needs for procurement coverage on critical items, and it was not necessary to resort to the "rated order" procedure to obtain critical items.

In January 1968, the Defense Supply Agency contractor experience list (DSACEL) program was established. The program assists contracting officers in the selection of responsible contractors by identifying and flagging those submarginal firms whose qualifications will be the subject of a thorough and careful analysis, including a mandatory pre-award survey. The inclusion of firms on the DSACEL does not mean that they are prohibited from bidding or submitting proposals for future contracts. The Air Force and Navy have similar programs and the lists are interchanged.

Effort continued to reduce contract delinquency by providing special management attention in the areas of contract status reporting and increasing liaison between production elements of the Defense Supply Centers and the Defense Contract Administration Services activities. Names and telephone extensions of production specialists were exchanged to provide more effective communication between the procuring and administering functions.

Special reporting procedures were utilized for monitoring production progress on critical supply items, such as sandbags, landing mats, tents, and fortification items. Production situation analysis reports were prepared in conjunction with the material readiness studies required by the Emergency Supply Operations Center (ESOC) at DSA Headquarters. These reporting procedures provided output for required reports to higher authority such as the Joint Materiel Priorities and Allocation Board. Steps were taken to improve quality of pre-award surveys by establishing in Center production elements, focal points of contact with pre-award survey monitors in the DCAS field organization. These focal points review pre-award survey requests for completeness and adequacy prior to forwarding the requests to the cognizant DCASR. Upon return of completed survey reports from DCAS, the production focal point insures review of all pertinent factors including production and quality assurance by responsible Center personnel. The purpose of this review is to determine and resolve discrepancies, deficiencies, and ambiguities prior to use of pre-award survey reports by contracting officers in making determinations of contractor responsibilities.

In addition, policy in regard to waiving pre-award survey requests was established as follows. A decision by a buyer or contracting officer not to request a pre-award survey for a proposed award in excess of \$10,000 (except for perishable and commodity market subsistence items and bulk fuel) shall be fully documented as to the reasons therefor and shall be recorded in the contract file. In order to ensure full compliance with the intent of ASPR 1-905.4(b), each DSA procuring activity shall establish and maintain requirements and procedures for review and approval of such decisions. These procedures shall include a requirement for approval of such decisions at the level of the Director of Procurement and Production for proposed awards in excess of \$100,000, except that for subsistence, approval shall be at the level of the Chief, Purchasing Division, of the subsistence regional headquarters.

Contract review procedures and a professional capability in this area were established at each of the Agency's procuring centers during the year. These procedures required the centers to perform an in-depth review of selected high dollar and complex procurements, with post-award review on a random sampling basis for those contracts not subject to review prior to award. The contract review function was established at staff level to the Director, Pro-

curement and Production, at the centers to assure independence of action. In addition to the review performed at the center level, Headquarters review was still required for the highest dollar value and most complex actions of the Agency. A reduction in DSA's over-all procurement program and additional delegations of review and approval authority to the centers resulted in some reduction in total purchases subject to Headquarters review and approval. During fiscal year 1968, 11.2 percent of DSA's procurement program dollars were subject to Headquarters review and approval, as compared to 13.8 percent in the previous year.

The DSA Procurement Management Review Office reporting channel was restructured to permit direct access to the Director of Procurement and Production. Three review reports were published during the year, covering the Defense Fuel Supply Center, the Defense Personnel Support Center (Clothing and Textiles, and Medical), and the five largest subsistence regional headquarters of the Defense Personnel Support Center. These reviews resulted in a total of 115 recommendations plus numerous suggestions which were designed to materially improve the efficiency and effectiveness of DSA's procurement function. Center commanders have been encouraged by the Director, DSA, to study all procurement management review reports to assure maximization of benefits from reviews and cross fertilization of ideas.

Progress continued toward implementation of the Standard Automated Materiel Management System (SAMMS). During the year the procurement subsystem of SAMMS underwent successful segment testing as well as the programming of numerous additional systems refinements which will contribute to the over-all effectiveness of the program.

During fiscal year 1968, DSA purchased Service-managed items in DSA-assigned classes amounting to \$351.9 million, a decrease of 7.4 percent from the previous year in this facet of the DoD Coordinated Procurement Program. The decrease can be attributed in large measure to a better stock position of the military Services in certain commodity areas. For example, herbicides were down \$41 million and boxes, cartons, and crates were down \$9.8 million. In addition, the recoding over the past 30 months of about 500,000 Service-managed items in DSA-assigned classes for DSA integrated materiel management is no doubt starting to have an effect on DSA's MIPR (military interdepartmental purchase request) program.

Effective July 1, 1968, the General Services Administration was brought into the DoD Coordinated Procurement Program as a full partner. GSA's total procurement assignments now cover in whole or in part 69 FSC's. In fiscal year 1968, GSA's portion of this program amounted to approximately \$400 million.

Defense-Wide Services

During fiscal year 1968, DSA continued to administer Defense-wide programs for cataloging, materiel utilization, surplus disposal, technical documentation services, and coordinated procurement. DSA was also standardization assignee and item reduction preparing activity for approximately 2.5 million items, or 62 percent of the 3.97 million DoD items in the Federal Catalog.

Cataloging and Technical Data

There was a net increase of 4,478 DoD items in the Federal Catalog during

the fiscal year. This actually represented 372,724 additions and 368, 246 deletions. The net increase in catalog items is attributed primarily to the introduction of repair parts for new major end items. (See table 40 in the appendix.)

Under the DSA inactive item review program, 274,831 reviews were completed during the year, and 170,414 items were deleted from the supply system and from the catalog. Of this total, 136,412 were deleted in coordination with the military Services, and 34,002 nonstandard or no-user items were deleted in accordance with instructions from the OASD(I&L).

DSA continued to give major attention to reduction in the number of items in assigned or managed commodity classes. In fiscal year 1968, as a result of identification of duplicate or similar items and of standardization actions, decisions were made and concurred in by the military Services to eliminate 64,623 items. These decisions were based on a review of 184,132 items during the 12-month period. In addition, the DSA supply centers determined through review that 215,190 items were not susceptible of standardization.

Use of provisioning screening techniques has continued to increase. A total 6,341,406 manufacturers' parts were screened during fiscal year 1968, an increase of 30 percent over the previous year. The ratio of provisioning items matched to existing Federal stock numbers (FSN's) increased to approximately 40.3 percent. All provisioning items identified with an FSN were also screened against the PLUS file of long supply and excess items. Assets were found to exist for 5.2 percent of the FSN's matched, leading to normal reutilization procedures. Items screened for purposes other than provisioning totaled 2,236,565 manufacturer's numbers and 3,260,196 FSN's.

As a part of the SAMMS concept, the SAMMS catalog subsystem team developed controlled functional tests and conducted extensive logic testing of ADP programs at the SAMMS model center in Columbus, Ohio. Monitoring and controlling conversion and implementation programs, including training and procedures, were conducted at each of the DSC's. The catalog subsystem of SAMMS is scheduled for implementation at the pilot supply center (DCSC) in January 1969.

During fiscal year 1968, the Federal Item Identification Guide (FIIG) improvement program moved ahead in development of documents and preparation of item logistics data. As of June 30, 1968, 121 FIIG's were in various stages of completion with 29 published. Twenty-two FIIG's have been implemented, and all new items in the commodity areas covered are being submitted in the FIIG format. Approximately 175,000 items have also been redescribed in the FIIG format. The ultimate objective of the FIIG improvement program is to provide the means for mechanized collection and retrieval of supply logistics data from a single record for multiple logistic purposes.

In the area of catalog publication, DSA was able to effect considerable savings by using the new ultra-high-speed electronic typesetting system of the Government Printing Office. In this first application of the electronic composing technique, the DSA centralized master cross-reference list of military supplies was reduced from approximately 70,000 pages to 34,000 pages, composing time was reduced from about 100,000 hours to 300 hours, and the finished product was improved to the equal of traditional hot metal typecast products. This publication is published annually in 6,000 copies with quarterly changes. Utilization of this new GPO technique is expected to save the Government \$321,000 annually.

Item Entry Control

Effective July 1, 1967, four DSA centers were assigned 35 high-growth classes under the DoD Item Entry Control Program for the purpose of screening proposals for new FSN's and accomplishing certain cataloging actions. The DSA centers processed 217,309 requests for new FSN's during fiscal year 1968, and 36 percent or 78,451 items of the total requests processed were prevented from entering the supply system. The prevention of 78,451 items from entering the supply system resulted from (1) determination that the new items were already duplicated by existing items, (2) substitutions currently available in the supply system, and (3) return of new items because they were unprocessable due to errors.

The DoD Five Year Standardization Program was updated during the year, establishing goals in support of both supply management and engineering within the high-growth classes already mentioned. These new goals provided for the initiation of item reduction studies to achieve standardization coding of 25 percent of the items not yet coded during fiscal year 1969 and additional programming to accomplish complete coverage in the classes within the 5-year period. In support of engineering, goals were established to prepare military standards that list parts preferred for use in new design in the high-growth classes sufficient to achieve optimum coverage in Federal Supply Group 59 (electrical and electronic equipment components) by the end of 1970. Similar DSA goals for FSC classes 2530, 3110, 4720, 4730, and 4820 were set for the end of fiscal year 1972.

A completely automated system to mechanize all of the logistic services performed at the Defense Logistics Services Centers (DLSC) was described in the previous report from DSA. During fiscal year 1968, DIDS progressed to the completion of an ADPE system design specification, and a formal request for proposals was addressed to the ADPE industry, with replies due in the second quarter of fiscal year 1969.

Military Standard Data Systems (MILS)

DSA continues to serve as the designated DoD-wide systems administrator for surveillance and further development of the MILS—a large family of standard data systems created during the last 7 years.

Progress in implementation of the military standard contract administration procedures (MILSCAP) has been approximately on schedule. As noted in last year's report, complete implementation will have wide impact on existing ways of doing business, and will require several years. However, certain portions of the system are being implemented early by the military departments and Defense agencies. Noteworthy among these was the successful implementation during the year of the punched card material destination acceptance procedures between Department of Navy consignees and the 11 DCASR's. With the exception of the Air Force, which has a very small number of destination acceptance contracts, the MILSCAP destination acceptance procedures will be implemented DoD-wide on February 1, 1969.

In June 1967 the finalized DoD instruction and operating manual for the military supply and transportation evaluation procedures (MILSTEP) were forwarded to all DoD components. MILSTEP is a DoD standard data system for collection of data necessary to measure supply systems performance and transportation effectiveness. This measurement is applicable to all DoD and

GSA activities insofar as they support the military Services. During fiscal year 1968, each of the military Services, DSA, and GSA attained varying degrees of success in implementing the system. Full implementation is expected during the ensuing fiscal year.

Plans to enhance the Defense Automatic Addressing System (DAAS) in order to provide system capacity sufficient to process DoD requirements worldwide were described in last year's report. In accordance with the plan, three additional DAAS facilities were activated in the fourth quarter of fiscal year 1968, two at Gentile AFS, Dayton, Ohio, augmenting the present DAAS in operation at that location, and one at McClellan AFB, Calif., augmenting the present facility in operation at that location.

The enhancement plan also provides for activation of two additional facilities during the fourth quarter of fiscal year 1969. These two facilities will utilize space at Dayton as vacated by the Defense Electronics Supply Center in its move to the new computer site. With activation of these two facilities, a total of seven DAAS facilities will be operational—five at Dayton and two at McClellan AFB. The long-term configuration requirements, scope of application, and expansion of service of the DAAS will be determined and implemented in phase III, scheduled for completion during fiscal year 1973.

Materiel Utilization

Materiel utilized within DoD declined in fiscal year 1968 to \$1,102 million. This was a decrease of 28 percent, and was largely attributable to aircraft and missile property excess generations and utilization transfers effected during the previous year. Of the total, \$242 million represented utilization of supply system stocks (\$188 million inter-Service reutilization and \$54 million intra-Service reutilization), while utilization of declared excess amounted to \$860 million. (See table 39 in the appendix.)

Reutilization of high-value excess property (over \$10,000 acquisition cost) continued to be successful. Materiel in this category worth \$83.4 million was reutilized in fiscal year 1968, an increase of \$28.3 million over last year. In this program, utilization amounted to 73 percent of the value of all materiel advertised.

An "operational orientation" booklet concerning the DoD central mechanized screening system (PLUS) was prepared and issued to the Services for distribution to inventory control points (ICP's). The 41-page booklet presents, in relatively informal language, the background of the Defense utilization program, and the PLUS procedural requirements which have been established for ICP participation. The booklet uses the question and answer technique and includes a test which may be used to measure a degree of understanding of the program possessed by the field personnel responsible for its success.

Procedures were developed in coordination with the military Services, which provide for a "closed-loop" transaction reporting system under PLUS. When implemented, these procedures will make it possible to maintain positive information on the status of all transactions from the initial offer of excess through and including shipments.

Within the materiel utilization areas the DSA also administers the Defense Retail Interservice Logistic Support Program. This is a program designed to promote inter-Service support between posts, camps, stations, bases, and in-

stallations of the military Services and other DoD agencies. The objective is to achieve the greatest over-all effectiveness and economy in retail operations by mutual use of one another's logistic support capability. The program is conducted on a decentralized basis with decision authority vested in commanders of local activities. Coordination of the program is accomplished through area coordination groups, which are established on a geographical basis corresponding to the six Continental Army areas. Similar groups are organized in the overseas commands.

Since 1961, when DSA was assigned responsibility by the DoD to administer this program in coordination with the military Services, use of inter-Service support has steadily increased among participating activities. Administrative, supply, and services support are the categories of inter-Service support provided. As an indication of this progress, \$209 million of support was reported as being provided among approximately 620 military Service activities during 1961. In 8 years, under the coordinated direction of this program by the DSA, participating activities rose to 1,178 and the dollar value of support provided is currently reported at \$591.6 million a year at the end of fiscal year 1968.

Industrial Plant Equipment

The Defense Industrial Plant Equipment Center (DIPEC) at Memphis, Tenn., is charged with the responsibility for maintaining central records of the DoD inventory of industrial plant equipment (IPE) and for managing idle equipment. In April 1968, a plan for implementation of the report on management of industrial plant equipment was submitted to the ASD(I&L). This plan scheduled the transfer of management functions for certain Federal supply classes to DSA/DIPEC. On June 4, 1968, the Assistant Secretary directed implementation of the plan with certain modifications. The military Services were to retain requirements determination, procurement, budgeting, and funding functions until further evaluation.

At the end of fiscal year 1968, DIPEC held records of 463,782 items with an acquisition cost of \$4,425 million. The center received 39,274 requests for equipment during the year and redistributed 13,226 units with an acquisition value of \$114.57 million declared idle by military and contractor activities of the Defense Department. Included in these totals were 3,658 items with an acquisition value of \$19,445,600 which were redistributed to the other Government agencies such as the Atomic Energy Commission, National Aeronautics and Space Administration, and Federal Aviation Agency. Also, equipment was made available through DIPEC for use by private firms participating in the President's program for training the hard-core unemployed.

DIPEC ended fiscal year 1968 with 22,824 items of idle equipment valued at \$206.6 million in the general reserve. The balance of the DoD industrial equipment reserve, controlled by the military departments, consisted of 29,770 items valued at \$400.9 million and earmarked for specific mobilization requirements. The first revision to DSAM 4215.1 Defense Industrial Plant Equipment Center Operations (DIPEC manual) was published and distributed throughout DoD. This joint DSA/military Service manual provided improved systems and procedures for recording and reporting IPE to DIPEC, and for screening the DIPEC central records to locate suitable IPE for use in lieu of new procurement. Preparation of handbooks of standards for describing IPE continued. During the year two handbooks were revised and a new one pub-

lished. Additional issues or re-issues of all older handbooks are in progress and several are scheduled for publication early in fiscal year 1969.

During the year action was started to improve the quality of the idle inventory by evaluating each item and retiring some of the older, less desirable IPE. A special effort was undertaken to accelerate reconciliation of contractor IPE records with those of DIPEC by completing physical inventories ahead of schedule. The project involved 92 out of a total of 1,725 contractor locations and required a special report to the Assistant Secretary of Defense (I&L).

Material Disposal

DSA is responsible for the administration of the DoD Disposal Program worldwide, including utilization of DoD excess, donations, sales, demilitarization, and scrap preparation. Property declared excess, surplus, and foreign excess within DoD during fiscal year 1968 amounted to \$4,451 billion, which was \$334 million less than the previous year, reflecting the continuation of downward trends due to increased requirements from Southeast Asia.

The dollar value of DoD property processed for disposal during fiscal year 1968 was \$4,827 billion, of which \$1,773 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 \$3,054 billion. Further details regarding these programs are given in table 41 of the appendix.

The DoD average rate of return for fiscal year 1968 was 4.6 percent, a decrease of 0.6 percent from the previous year; this was a direct result of the continued high rate of utilization of usable property. Thus, most of the personal property being offered for sale had a very low commercial appeal.

Proceeds from the sale of scrap increased slightly due to the rising price per ton of nonferrous scrap. Total proceeds of \$89.5 million for the year represented a \$11.9 million decrease from 1967. This decrease in cash realized from the disposal program has been offset to a small degree by a \$1.2 million decline in operating expenses. Total program expenditures in 1968 amounted to \$72.4 million.

The closing of two Defense Surplus Sales Offices (DSSO's), already mentioned, resulted in staff reductions amounting to 19 personnel; other consolidations and staff realignments accounted for 47 additional personnel savings. Some reductions in program costs beyond those reported last year are anticipated.

Defense Scientific and Technical Information

The Defense Documentation Center (DDC) continues to serve as the central facility for secondary distribution of technical reports of DoD-sponsored research and development activities. However, in an environment of technological change, the Center's functions, products, and services have expanded considerably beyond the traditional concept of an archival repository and library-oriented operation for DoD. In fiscal year 1968, about 25 percent of DDC's total effort was programed in support of work unrelated to the original mission of secondary distribution of DoD technical reports.

A directive from the DDR&E in July 1967 instructed the Center "... to structure a dynamic program embracing both current services and a laboratory environment capable of large-scale experimentation with varied tech-

niques for information and document storage, retrieval, and transfer." DDC's current workload and these guidelines on the Center's future role dictated a decision to acquire a third-generation computer system. The new computer system was to be fully operational late in fiscal year 1969. The organization of DDC was restructured to include a Directorate of Systems Development, and an expanded Directorate of Technical Services was organized to include research and engineering management information services as well as documentation services.

During the year, DDC was assigned responsibility for supporting the Interagency Materials Sciences Exchange (IMSE) and the Committee on Academic Sciences and Engineering (CASE). The research and technology work unit information system data base has continued to expand, and in fiscal year 1968 answered 5,102 inquiries compared to 3,194 in the previous year.

In the documentation services category, DDC provides acquisition, announcement, reproduction, and distribution of full text copies of technical reports of research and development activities sponsored by DoD, bibliographic and reference services, and contractor performance evaluation (CPE) and contractor cost reduction (CCR) report services. Key documentation services showed increases in demand for services and in accessions during fiscal year 1968 as follows:

	<i>Fiscal year 1967</i>	<i>Fiscal year 1968</i>
Requests for documents	1,846,240	1,930,927
Requests for bibliographies	20,365	21,928
Requests for CPE/CCR reports	2,500	7,000
Technical reports in the DDC collection	830,000	875,000

Effective September 1, 1967, the Technical Abstract Bulletin (TAB) was classified confidential, and thereafter all unclassified unlimited document announcements were made in the U.S. Government Research and Development Reports published by the Department of Commerce. However, the DDC data bank continued to store all applicable technical reports.

Relationships with Federal Civil Agencies

In support of their mutual agreement to provide a more efficient and economical Government-wide system for procurement and supply, the DoD and the General Services Administration (GSA) agreed to an additional transfer, effective July 1, 1968, of approximately 13,000 items in the 65 primary FSS classes from DSA to GSA for management. The transfer was completed ahead of schedule, and on July 1, 1968, GSA was the integrated materiel manager in 65 FSC's containing 68,418 items in support of DoD. The transferred functions included coordinated procurement, mobilization reserve management, and provisioning. DSA retained management responsibility for 216 items for reasons connected with military missions.

DSA initiated necessary action for the assumption of full support to civil agencies for fuel and electronics during calendar year 1969. A DSA review of the nonperishable subsistence requirements of civil agencies, for commonality and possible increased standardization, has been completed and forwarded to the interested agencies for their review and evaluation. A similar review of surgical instruments, the first increment in a complete survey of all medical supplies, was also completed during the year and awaits civil agency comment before proceeding with the balance of the medical review.

Additional formal agreements were made during fiscal year 1968 whereby

DSA became responsible for supporting the Department of Agriculture with selected general, industrial, and clothing and textile items; the Department of Interior with selected items (Bureau of Indian Affairs with perishable subsistence and the Bureau of Sport Fisheries and Wildlife with amyl nitrite ampules); the Atomic Energy Commission with perishable subsistence. Further, the General Services Administration (Transportation and Communications Service) agreement has been expanded from electronic support to include selected construction, industrial, and general supply items. In addition to consummating the above interagency supply support agreements, DSA and GSA entered into an agreement wherein maximum utilization will be made of long supply stocks of dual-managed items.

DSA support to civil agencies during fiscal year 1968 is listed in table below.

SALES TO CIVIL AGENCIES UNDER FORMAL INTERAGENCY AGREEMENTS FISCAL YEAR 1968

[In thousands of dollars]

Coast Guard (all commodities)	\$7,621
GSA, Transportation and Communications Service (electronics)	4
Veterans Administration (medical-subsistence)	2,916
Federal Aviation Agency (electronics)	1,439
National Aeronautics and Space Administration (all commodities)	3,030
Office of Economic Opportunity, Job Corps (clothing and textile, subsistence, general supplies)	7,981
Public Health Service (medical-subsistence)	1,190
Atomic Energy Commission (subsistence)	943
Bureau of Indian Affairs (subsistence)	229
Post Office (industrial, electronics, general supplies)	13

Defense Contract Administration Services

The contract administration services (CAS) functions of DSA are performed through a field organization divided into 11 Defense Contract Administration Services Regions (DCASR's) which in turn are divided into districts and offices. There are DSA CAS personnel either assigned to or regularly visiting virtually every industrial community in the country. During fiscal year 1968, 2 new field offices were established and 4 disestablished, so that there were 96 CAS field offices at the end of the year. Also during fiscal year 1968, DSA CAS gained cognizance of CAS functions at one plant from the Air Force, and lost cognizance of another to the Air Force. Both plants were subsidiaries of the General Electric Company.

DSA CAS was administering 258,200 contracts at the end of fiscal year 1968. Material inspected and released for shipment during the year was worth \$20.6 billion, a 6.2 percent increase over the previous year. During fiscal year 1968, 2,005,000 invoices were completed as compared to 1,945,000 invoices completed in 1967. Contract terminations for the convenience of the Government received for processing during the year increased 21.2 percent over the prior year. Terminations in process of settlement at the end of the year increased 19.2 percent. Some of the new DSA CAS programs and areas of the major effort during fiscal year 1968 are listed below.

CWAS Program

Under the Contractor Weighted Average Share in Cost Risk (CWAS) Program, described in last year's report, qualified contractors can be exempted from review of certain of their indirect costs for reasonableness. In December 1967, after the Office of the Assistant Secretary of Defense (I&L) had expressed concern over limited contractor participation, DSA CAS made a study of eligible contractors, and launched an aggressive effort to explain the advantages of participation in the CWAS program. As a result, the number of approved profit centers increased from 38 in June 1967 to 185 in June 1968. Meanwhile, the Industry Advisory Council has proposed revisions to broaden the application of CWAS, and also to relax the qualification threshold. Two ASPR subcommittees have been established to review these recommendations.

Overhead Surveillance Techniques Committee

By participation in this committee, DSA CAS has contributed to the DoD/NASA study of overhead, which currently accounts for some 40 percent of the billions of dollars spent on Government contracts. Purpose of the committee is to gain a complete understanding of the processes involved in reviewing, analyzing, negotiating, or establishing overhead rates. Specific objectives are to:

1. Improve definition of relationships among the administering activity, auditor, procuring activity, and (when involved) the tri-Service negotiation group.
2. Record as exactly as possible the details involved in the review, analysis, and negotiation processes, how and by whom conducted, and results.
3. Examine degree to which elements of overhead cost are measured against what they ought to be, and describe tools, criteria, or techniques used by Government examiners.

Of nine contractors under study, two were administered by DSA CAS. The committee has had an opportunity to study military department as well as DSA CAS overhead control techniques, and is currently preparing recommendations for additional guidance to be included in the ASPR.

Administration of Contracts with Provisioning Requirements

A study to improve the provisioning procedures used in contracts issued by the military departments and DSA was completed in fiscal year 1968 and is currently under consideration by the Contract Administration Panel of the ASPR Committee. Major recommendations of this study include:

1. Use of a standard contractual document (provisioning order) for ordering provisioning-type support items, to facilitate control of orders by mechanized accounting systems.
2. Require citation of funds in an estimated amount on provisioning orders to give some degree of control over prices on those unpriced orders.
3. Provide a brief description of significant steps in the provisioning cycle, for orientation of procurement personnel.
4. Specify the functional responsibilities of DSA CAS personnel in administering provisioning-type contracts.
5. Establish procedures to expedite provisioning actions, insure prompt definitization of unpriced orders, and timely delivery of provisioning technical documentation.

Approval and early publication in the ASPR are expected.

Corporate Administrative Contracting Officer (ACO) Program

The program for appointment of a single ACO to handle corporate matters with multidivisional contractors, described in last year's report, expanded until 16 contractors were included. All of the contractors selected have met the criteria established within DSA CAS; i.e., multidivisional contractors whose divisions or plants are completely under DSA CAS cognizance and whose annual corporate sales to the Government exceed \$25 million, of which a minimum of \$10 million is cost-type procurement. Action has been initiated by DCAS through ASPR to extend the program to include all eligible DoD contractors.

DCAS Compensation System Review (CSR) Program

Since 1959, there has been considerable concern by Congress and the Executive Branch over the total compensation paid employees of contractors with substantial amounts of government business, and the GAO recently issued a report on this subject. During the last year and a half, DCAS has completed the development of a pilot test program that provides for review of a contractor's total compensation system. An initial workload of 210 contractors was established, the provisions of DSAM 8105.1 were updated, and a CSR guide was compiled and issued to the DCASRs for a 6-month field test. The full implementation of this program is scheduled to begin in October 1968.

Contractor Procurement System Review (CPSR) Program

The review and evaluation of the subcontracting and purchasing operations of DoD contractors is conducted in accordance with ASPR XXIII. As of June 30, 1968, 172 contractors were included in the CPSR program, which had resulted in approval of 108 contractor systems and nonapproval of 43; 21 systems had not been evaluated at the end of the year. The primary reasons for nonapproval were:

1. Noncompliance with Public Law 87-653, Truth in Negotiations Act.
2. Lack of adequate and effective competition.
3. Ineffective price/cost analysis methods.
4. Inadequate subcontract clauses.
5. Lack of documentation.

The CPSR program provides surveillance over the purchasing and subcontracting operations of approximately 50 percent of the dollars administered by DSA CAS.

Contractor Insurance and Pension Review Program

An insurance/pension review capability has been established within DSA CAS, to assist ACO's in making determinations regarding insurance approvals, reasonableness of costs, and compliance by contractors with terms of contracts in insurance/pension matters. Specialists have been placed in DCASRs in New York, Chicago, and Los Angeles to work with and assist ACO's in geographically proximate areas. This program provides ACO's with advice on complex problems of insurance coverage required by contract provisions, insurance carried by contractors under sound commercial practices, pension and

group insurance benefits, and costs involving trust funds, reserves, credits and refunds, and special rating plans. The objective is to assure that ASPR principles and criteria are observed in the review of contractor insurance and pension plans, that the Government's interests are protected, and that fair and reasonable determinations are made by the ACO.

Training in the Application of Public Law 87-653

During the period January 23-July 12, 1968, two specialists from HQ, DSA CAS, conducted a series of 1-day seminars on Public Law 87-653 (Truth in Negotiation). In total, 69 seminars were conducted at 40 locations throughout the country where DSAC field activities are located. The agenda for these seminars included the DoD film on this subject plus a discussion of: (1) The history leading up to the enactment of Public Law 87-653; (2) the provisions of the law; (3) the ASPR procedures implementing the law; and (4) techniques to improve compliance with both the statute and the regulation.

A total of 2,210 personnel attended these seminars, including 2,062 DSA CAS representatives, 93 from the Defense Contract Audit Agency, 31 contractor personnel, and 24 representatives of military department purchasing offices. This program augments prior training in the application of Public Law 87-653 provided by an OASD(I&L) seminar conducted last fall and by extensive "in-house" training sponsored by individual DCASRs. Virtually all DSA CAS personnel who are involved in the evaluation of contractor proposals have now received formal training in the application of the law. Industry as well as Government representatives have made favorable comments on this CAS effort, which provided an informative, high caliber presentation on this most complex subject. Top-level DCASR management personnel were especially appreciative of this opportunity to bring representatives of their various functional areas (e.g., contract administration, pricing, production engineering, and quality assurance) together for open discussion on subjects of prime importance to the efficient interface of their day-to-day jobs.

Small Business

A vigorous small business and economic utilization program was continued in fiscal year 1968. Subcontracting programs with the DoD prime contractors were increased from 1,488 in the previous year to 1,595 by June 1968. These programs were established and are being reviewed either quarterly or semi-annually by a DSA CAS field force of 51 small business and labor surplus area specialists. During the year, DCASR and district small business specialists also took a complete inventory of business concerns located in or near sections of concentrated unemployment or underemployment (the so-called ghetto areas) in order to assist the various DoD procurement activities in developing realistic bidders' lists for solicitation of bids and awarding of contracts in these areas.

Management of Property

Programs in this area initiated in previous years were continued. Also, 3-day seminars were conducted at each DCASR headquarters on recent changes in property administration policies and procedures. One day of each seminar was attended by industry personnel and was devoted to policy and procedure pertinent to contractors.

A pilot test was initiated at 19 selected contractor locations, on the maintenance of machine-by-machine utilization records for industrial plant equipment. The test is designed to produce data on methods or processes used, benefits, problems, conclusions, and recommendations necessary to determine the feasibility of a standard contractual requirement.

A program of self-analysis was initiated by DCASR's of property administration in the regions. All phases of property administration, from acquisition to disposition, were examined and programs established to overcome unsatisfactory conditions disclosed.

Industrial Security

DSA CAS continues to administer the program for the safeguarding of classified information entrusted to industry by all DoD elements plus a total of 11 other Federal departments and agencies. During fiscal year 1968, DSA administratively terminated the security clearances of 2,935 industrial facilities and processed clearances for 2,465 new facilities, ending the year with 13,500 facilities under its security cognizance. In all, 26,249 security inspections were conducted. Thirty-eight facilities were selected for the James S. Cogswell Awards for maintaining outstanding security programs.

After a 3-year grace period, new standards for the storage of classified information became mandatory on March 1, 1968. By June 1968, 98.5 percent of all cleared contractors requiring storage were either in full compliance or had plans for compliance with the new standards. Three significant changes in the program were implemented with cleared contractors, effective May 1, 1968: (1) A procedure and forms change enabled contractor employees to submit certain types of information to the Government on their clearance applications as privileged communications; (2) revised forms and procedures were established to improve security classification guidance to contractors; and (3) a procedure was established to permit the administrative termination of unneeded contractor employee security clearances. To assure maximum understanding and compliance with these procedural changes, 61 training seminars were conducted nationwide for over 7,000 representatives of industry. Formal resident school training during the year included 301 Government representatives, 698 contractor representatives, and 13 foreign governmental officials. A new industrial security film, "Defense Against the Spy," was produced to train contractor personnel in countering the devices and techniques employed by hostile espionage agents.

The Defense Industrial Security Clearance Office's average processing time for a secret personnel security clearance was reduced from the 1967 average of 25 days to an alltime low of 21 days. Transfers of clearance for employees of industry who changed jobs were handled on a 1 day average. DISCO absorbed the increased workload resulting from the changed forms and procedures for industrial personnel clearance processing with no decrease in efficiency.

Contract Management Reviews

During fiscal year 1968, the first cycle of reviews of all DCASR's under the Defense Procurement Management Review Program was completed. The 11 reviews yielded a total of 745 recommendations for improvement—122 addressed to HQ, DSA CAS, and 623 addressed to the DCASR's, to the customers, and to OASD(I&L). Improvements in the modus operandi for conducting

contract management reviews and the addition of reviewers to the staff resulted in increased depth of coverage and wider acceptance of the recommendations.

Customer Relations Visits

This program was initiated in November 1966 with the objective of upgrading DCAS responsiveness to the buying activities through improved communications. The organization was developed on the team concept with monitorship and coordination residing in the HQ, DSA CAS, Office of Management Review. The visits were conducted by three three-man teams, each comprising one specialist in contract administration and one each in production and quality assurance. Each team was accompanied by a senior officer, colonel, or captain of the same Service as the activity being visited. The three teams visited a total of 92 Service, NASA, and DSA buying activities.

Management Control

In concert with the Defense Documentation Center, HQ, DSA CAS, developed a new information management system (IMS) during fiscal year 1968. IMS is viewed as a process for systematically receiving, reviewing, analyzing, correlating, storing, and retrieving narrative and numeric management information drawn from diverse and varied sources nationwide. The storage and retrieval portion of this system, which encompasses computer and microfilming applications, is maintained by DDC. The system is capable of responding to queries by searching through its specialized data bank with electronic swiftness, selecting all the information that deals specifically with the subject. After appropriate analysis, this information is delivered in hard copy form. The initial design has been completed and the system is under an operational test and evaluation which will conclude on April 1, 1969.

Contracts Compliance Program

As already noted, this function was transferred to DSA on July 1, 1967. The DSA Office of Contracts Compliance organization is comprised of a headquarters staff and offices of contracts compliance staffs stationed in each of the 11 DCAS regions. During the first year of operation under DSA a total of 3,629 compliance actions, including compliance reviews, preaward reviews, and complaint investigations, were completed. In January 1968, a program was initiated to review approximately 65 facilities of 10 of the largest textile companies in North and South Carolina. Much progress was made in the hiring and upgrading of minority group employees as a result of the review process at the textile facilities visited.

The contracts compliance program cannot be evaluated with absolute accuracy regarding the full extent of its impact. It is likely that the cause-and-effect relationship between a compliance review or investigation and a subsequent improvement in a plant's equal opportunity posture can never be totally assessed, but it is certain that there is a definite relationship between compliance actions and improvement in the compliance posture of contractor facilities. A random sampling of statistics in five DCAS's affecting over 3,000,000 contractor employees shows that minority utilization in the plants contacted rose from 9.8 percent in July 1967 to 12.4 percent in July 1968. There was an increase of 16 percent in the total workforce of the contractors

involved, but minority employees increased by 46 percent. These statistics are the more tangible evidences of results; underlying gains, in terms of assistance to contractors and communities, complaints resolved and productive training programs initiated, are manifold and no less impressive.

Mechanization of CAS Data System

During fiscal year 1968, the MOCAS data system continued to progress with the implementation of MOCAS IB, which was primarily a change in ADP equipment to provide uniform and improved hardware at all DCASR's. Reprogramming of MOCAS for the new hardware was accomplished by the Data Systems Automation Office (DSAO) at Columbus, Ohio. Several improvements were incorporated into the MOCAS system, the most noteworthy being the increased mechanical validation of data before entry into the master files.

Tentative selection of the new ADPE was made on June 9, 1967, and consisted of Honeywell 2200's for the five larger regions and Honeywell 1200's for the six smaller regions. The equipment was successfully benchmarked at the Honeywell Offices, Cambridge, Mass., between July 31 and August 9, 1967, and final selection took place a week later.

The functional test of MOCAS IB took place at DSAO during January 1968, and the pilot test at DCASR, Detroit, during February and March 1968. Both were successful, and phased conversion of the other 10 DCASR's was accomplished as follows:

<i>DCASR's:</i>	<i>Implementation Date</i>
Boston, Philadelphia, and Los Angeles	May 1968
Atlanta, Dallas, and San Francisco	June 1968
Cleveland, St. Louis, New York, and Chicago	July 1968

By June 30, 1968, all DCASR's were operating on uniform tape-oriented ADPE, using standard programs, centrally controlled and programed by DSAO. In addition to this major hardware conversion, a draft documentation of the MILSCAP/MOCAS II system requirements was completed during the year, and time frames for implementing MILSCAP on July 1, 1970, were announced by the Assistant Secretary of Defense (I&L). In order to meet the 1970 implementation date, the MOCAS II requirements were limited to permit use of the MOCAS IB equipment, with augmentation as necessary. DCASR, Cleveland, was nominated as the MILSCAP/MOCAS II pilot test site. The test was scheduled to start on February 1, 1970.

Specialized Safety and Flight Operations (SS&FO)

Prior to January 31, 1968, the SS&FO was limited to safety matters on hazardous and dangerous materials and processes. With the addition of paragraph 1-406 to ASPR, SS&FO functions were amplified to include responsibility for maintaining surveillance of flight operations and assuring contractor compliance with applicable safety requirements. The SS&FO continues to provide accident prevention, fire protection/prevention, and staff assistance to the DSA CAS property administration elements.

DCAS QA Technical Data Training Syllabus

In June 1968, the HQ, DSA CAS, Directorate of Quality Assurance pub-

lished an instructor's training syllabus to meet the pressing needs of DCASR's to train quality assurance representatives (QAR's) in their responsibilities, and especially regarding military specification requirements for technical data. The syllabus contains a number of lessons which the instructor can use to provide responsive training support to DCASR field activities. DCASR's have instituted plans and schedules to train selected QAR's in the depth of coverage established by the syllabus.

DSA CAS Quality Assurance Support of NASA

A program has been established to insure that only fully trained and qualified personnel are assigned to perform quality assurance functions at contractor facilities in support of NASA. The program also assures that DSA CAS personnel are not moved out of a facility until NASA is advised and a replacement is assigned with equivalent training and skills to perform the necessary quality assurance functions for NASA.

QA Support to the Naval Nuclear Propulsion Program

The essential high quality levels in the naval nuclear program are maintained through special arrangements authorized by the Secretary of Defense in deviation from the normal quality assurance delegation patterns prescribed in Project 60. These arrangements were initially implemented in 1965 through a QA support agreement between the Navy and HQ, DSA CAS. The agreement was reissued in November 1967 as a DSAR to preserve and strengthen its capability to assure the sensitive support required by the Naval Ship Systems Command, and specifically by the nuclear power propulsion organization.

Correcting Inadequate Procurement Data Packages

During the year a program was started to correct and improve the quality aspects of procurement data packages. Basically, the data package is a compilation of the procuring contracting officer's background file on contractors' standards and procedures to prevent defective materials from being delivered to the military users. The program has received the support of DoD, the military departments, and DSA. DSA Form 623 was developed as a vehicle to report deficiencies in the procurement data package. By June 30, 1968, approximately 4,000 of these forms had been initiated, chiefly by QAR's. In an effort to attain standardization, it is envisioned that the program will be recommended for adoption DoD-wide.

Initiation of CAL (Contractor Attention List) Program

Early in fiscal year 1968, it was recognized that there was an incomplete awareness in HQ, DSA CAS, of the general quality problems being experienced by the regions at contractor facilities. As a result, a program was initiated wherein each DCASR reported on a quarterly basis detailed information on the 12 contractors who were considered most troublesome because of failure to comply with contract quality requirements. It was known as the Contractor Attention List (CAL) and has proved to be of considerable value in bringing Headquarters into closer touch with field problems. The information thus developed has been utilized in many ways, including preaward surveys, sensitive complaints, and quality audits.

Zero Defects Contractor Program 1968

DSA CAS has continued to support the Services and DSA in their efforts to assist contractors in learning about and establishing Zero Defects (ZD) programs. ZD acknowledges the need to rekindle and encourage the individual pride of workmanship which is lost in today's mass production and complex administrative operations. DSA CAS has awarded 400 Zero Defects Participation Awards to contractors, and has also reviewed and presented to the Services and DSA 67 achievement and 7 craftsmanship ZD awards for approval and presentation.

Petroleum Quality Assurance

In the petroleum area, the procurement quality assurance program (PQAP) involves situations, equipment, and operations normally beyond the scope of the supply or service contract and, therefore, must be applied in a unique fashion. For example, title to bulk shipments is transferred from the supplier to the Government at such time as the product passes the flange connecting the supplier's pipeline and the carrier's pipeline. Consequently, while the entire operation comes within the scope of PQAP, the actions required of the QAR extend beyond the FOB point of the supply contract into the carrier's area of responsibility and thus beyond acceptance or rejection of tendered supplies. A DSA regulation has been published which addresses these unique requirements and provides a uniform approach to quality assurance for petroleum within the continental United States.

M-16 Rifle Committee

A joint USAMC/DCAS M-16 Rifle Quality Assurance Committee was established during the year to exercise over-all integrated control for both the U.S. Army Materiel Command and the Deputy Director, DSA (Contract Administration Services), over the effort to insure that rifle production met desired quality levels. The committee reviewed significant quality assurance findings, recommended actions to resolve problems, and provided required advice and recommendations to the USAMC Project Manager, Rifles.

Deficiency Reporting

The HQ, DSA CAS Quality Assurance Directorate, was requested by OSD to prepare a DoD directive concerning standardized reporting procedures for new defective material. The objective of the directive was to assure that all Services report defective material using the same form, routings, and procedures. The proposed directive was prepared, coordinated with the Services, revised, and reCOORDINATED. The final draft, including the proposed form, was forwarded to OSD for final editing and publication.

Industrial Mobilization Planning

During fiscal year 1968 the DCASR's reported that they were holding approximately 11,000 emergency production planning schedules (DD Form 1519) which DSA CAS representatives had negotiated with industrial management for the military departments and participating agencies. DSA CAS representatives were responsible for the direct negotiation and coordination of emergency production planning with 11,938 of the 12,908 industrial plants

registered as participants in industrial readiness planning. During the last half of the year, DSA CAS initiated and completed a comprehensive analysis of the validity of planning for which additional industrial plant equipment was cited as being necessary. Procuring activities (claimants) were requested to confirm availability of additional equipment necessary to support the planned schedules, and equipment voids were identified. During the year DSA CAS also updated and reissued the Register of Planned Emergency Producers, which identifies companies throughout the United States and Canada participating in industrial mobilization planning.

Plant Equipment Utilization

DSA CAS has developed and implemented policy and guidance for accomplishing utilization surveys of Government-owned industrial plant equipment (IPE) provided to contractors. Utilization surveys were performed to ascertain that sufficient DoD requirements existed for continued retention of IPE, and that the equipment was being used as authorized by the terms of the contracts. Surveys were conducted frequently enough to assure that the Government-owned IPE was put to maximum economic use to minimize cost, to increase productivity, and to lessen the need for providing additional facilities. Techniques developed by DSA CAS were also adopted as an ASPR requirement for contractor system management of Government-owned facilities.

DCAS Manufacturing-Cost Control Digest

The primary purpose of the digest was to encourage greater industry participation and action in support of DoD programs to increase production effectiveness, reduce costs, and to publicize defense contractor accomplishments. Circulation was expanded, nationwide. One digest was published at three DCASRs for the eastern, central, and western geographical areas every 2 months. Copies were distributed to all defense contractors assigned to DSA CAS for administration, to OASD(I&L), and to the military departments on request.

Industrial Labor Relations

Actual or potential strike actions steadily increased at DCASR cognizant contractor plants, with approximately 400 actual strikes taking place during the fiscal year. In these actions, requirements of the military departments and OASD(I&L) expanded DSA CAS workload to include plant removals and labor relations monitoring actions at subcontractor and vendor levels not heretofore required. At OASD(I&L) request, DSA CAS prepared and submitted a calendar year listing of data on major contractor plants having labor contract expirations; a total of 1,385 plants were involved. DSA CAS also developed a standard format, which was DoD sponsored for Defense-wide use, for obtaining and managing data on all labor-management contract expirations at Defense contractors' plants. A revised regulation was issued implementing a revised DoD directive on policies and procedures for handling contractor request for assistance in obtaining deferments of contractor employees under the Military Selective Service Act.

Delinquent Contracts

Intensive management attention was directed toward reducing the number

of contracts in a delinquent delivery status. Early detection of problem areas was emphasized so that timely corrective action could be taken to prevent contracts from becoming delinquent. As a result, the delinquency rate was gradually reduced from 11.1 percent at the beginning of the fiscal year 1968 to 7.1 percent at the end.

Budgeting and Funding

DSA's share of O&M Defense Agencies' obligation in fiscal year 1968 was \$575.6 million. Additional funds of \$33.1 million were received from the military departments and other Government agencies as reimbursement. Also, the military departments funded \$17.7 million for military personnel assigned to DSA in fiscal year 1968. The total operating cost for the year 1968, including reimbursements and military pay, amounted to \$626.4 million.

RDT&E funds are used for the operating and management costs of the Defense Documentation Center. In fiscal year 1968, DSA obligated \$9.9 million in RDT&E funds for this purpose.

DSA received Military Construction funds totaling \$8.4 million during fiscal year 1968 to provide for administrative and logistical facilities, including minor construction and planning. Procurement, Defense Agencies, funds in fiscal year 1968 in the amount of \$9.1 million were received by DSA, principally for procurement of mechanized materials-handling systems and automatic data processing equipment. Under the appropriation Family Housing, Defense, \$0.1 million was obligated by DSA during the year to operate 93 family housing units.

Data reflecting final obligations and sales of the Defense Stock Fund for fiscal year 1968 are reflected in figure 1. As already noted, there was a considerable shift in the world situation and in official DoD procurement policy during the year, and DSA responded as speedily as its existing commitments permitted. However, the enlarged materiel responsibility assigned to DSA in the last 3 years has had a considerable impact on industry, and to an increasing extent major procurements must be effected through multiyear contracts. Consequently, the decelerating effect of a reduction in a single year's obligating authority is no longer instantly apparent. DSA is aware of the need for tight controls to offset the increased momentum of large economic operations and anticipates that it will more nearly approximate the supply posture desired by DoD by the end of fiscal year 1969.

Personnel

DSA civilian strength declined from 64,448 to 62,185 during fiscal year 1968 as a result of a reduction in manpower authorizations (see following table). Careful management of voluntary attrition and the expiration of temporary appointments brought civilian strength under the required ceiling without involuntary separations of permanent employees.

The year was also characterized by intensive effort, across the full range of civilian personnel management programs, on qualitatively strengthening the work force. A special program, Operation DEEP LOOK, was developed to emphasize actions designed to build this quality. Among the program accomplishments was the first Annual Awards Day in June, when 20 of DSA's top personnel were recognized. The rate of accessions of college caliber employees increased to 28.2 percent of all hired at GS-5 and above, in spite of

STATUS OF DSA PERSONNEL

	June 30, 1967			June 30, 1968		
	Total ¹	Civilian	Military	Total ¹	Civilian	Military
Defense Supply Centers:	(23,660)	-----	-----	(22,057)	-----	-----
Construction	5,801	5,747	54	5,387	5,332	55
Electronics	4,048	4,005	43	3,858	3,815	43
Fuel	186	169	17	190	174	16
General	3,581	3,528	53	3,442	3,389	53
Industrial	2,779	2,734	45	2,615	2,575	40
Personnel support	7,265	7,096	169	6,565	6,399	166
(Clothing factory only) ...	(2,388)	(2,387)	(1)	(1,859)	(1,859)	(-)
Defense Depots:	(12,629)	-----	-----	(11,427)	-----	-----
Mechanicsburg	1,862	1,836	26	1,744	1,722	22
Memphis	2,535	2,514	21	2,445	2,418	27
Ogden	5,017	4,998	19	4,357	4,338	19
Tracy	3,215	3,197	18	2,881	2,857	24
Defense Contract Administration	(24,447)	-----	-----	(24,895)	-----	-----
Service Regions:						
Atlanta	1,848	1,797	51	1,881	1,819	62
Boston	3,099	3,055	44	3,200	3,154	46
Chicago	2,352	2,318	34	2,311	2,274	37
Cleveland	1,872	1,842	30	1,877	1,846	31
Dallas	1,146	1,099	47	1,312	1,264	48
Detroit	1,384	1,364	20	1,539	1,519	20
Los Angeles	3,358	3,310	48	3,484	3,433	51
New York	3,604	3,546	58	3,409	3,352	57
Philadelphia	2,767	2,725	42	2,738	2,689	49
St. Louis	1,702	1,670	32	1,770	1,737	33
San Francisco	1,315	1,290	25	1,374	1,351	23
Service Centers:	(2,754)	-----	-----	(2,881)	-----	-----
Documentation	609	605	4	578	574	4
Logistic services	1,194	1,187	7	1,250	1,243	7
Industrial plant equipment	495	494	1	484	483	1
Administrative support	456	410	46	569	528	41
Field Extension Offices	814	783	31	848	830	18
Headquarters	1,281	1,129	152	1,237	1,070	167
	65,585	64,448	1,137	63,345	62,185	1,160

¹ Includes part-time and temporary civilian personnel.

the strength reduction. In the summer hire program, a total of 4,299 persons were employed against a goal of 3,809. The rate of employee suggestions reached a new high of 59.3 adoptions per 1,000 employees, resulting in nearly \$4 million in tangible benefits.

Union activity within DSA experienced a marked upturn, with the number of exclusive recognitions increasing from 18 to 34 and the coverage of DSA employees increasing from 5.5 to 25 percent. DSA continued its good record in equal employment opportunity. The November 1967 census required by the Civil Service Commission showed that DSA led the other DoD components in percentage of Negro employment in every salary category. DSA expanded its use of the Automated Civilian Personnel Data Bank and new types of print-outs and analyses were furnished to the field. The development of an agency-wide automated personnel operations system was begun as a part of a total automated payroll, cost and personnel system (APCAPS). Completion is scheduled for mid-1970.

During fiscal year 1968, 2,899 DoD employees who were scheduled for involuntary separation were registered under the DoD Centralized Referral System; 2,669 were placed. Also during the year, 580 DoD employees in over-sea positions were registered in the DoD Automated Overseas Returnee Program and 279 were placed. On June 3, 1968, the DoD Automated Overseas Referral Program was initiated to assist DoD in filling vacancies in overseas positions. In the 3 weeks remaining in the fiscal year, 1,562 employees registered under the program in 381 skills and 7 were placed.

Military personnel positions continue to be staffed on the basis of balanced military Service representation at all levels of operation. Authorized distribution by Service on June 30, 1968, was: Army, 34 percent; Navy, 29 percent; Air Force, 34 percent; and Marine Corps, 3 percent.

With the cooperation of the military Services, DSA initiated a program to train junior medical service officers in the supply/logistics skills. Training is being conducted at the Defense Personnel Support Center with initial training in the basic level course at Fort Lee, Va. It is planned to continue the program with an annual input each September of six officers.

An in-depth study of DSA's requirement for officer mobilization designees was initiated. The purpose of the study is to assure that personnel mobilization requirements adequately reflect the augmentation needed to sustain the increased workload anticipated in the event of mobilization.

Cost Reduction and Management Improvement Program

In the second half of fiscal year 1968, DSA's cost reduction program was officially expanded to include evaluation of management improvements in areas where progress could not be measured on the basis of dollars saved. This expansion, initiated at the direction of the Secretary of Defense, resulted from recognition of the fact that many of these areas contained a potential for management improvement, and that the expertise of experienced cost reduction personnel fitted them to exploit these additional possibilities. The expanded program would employ the familiar procedures of establishing objectives in the new areas, measuring performance against the objectives, analyzing the performance, and validating results. Existing data and reporting channels were to be utilized to a maximum extent.

Implementation of the expanded program, which was actually part of a DoD-wide expansion, was planned in three phases. Of these, phase II was

scheduled for fiscal year 1969, and phase III would require further study. Reporting under phase I began in the third quarter of the year, and involved 11 DoD-wide areas, of which DSA participated in 8, as follows: (1) Item entry control; (2) inventory item reduction; (3) item identification improvement; (4) utilization of long supply, excess, and surplus stocks; (5) operation and maintenance of administrative use of motor vehicles; (6) warehouse utilization; (7) formal advertising; and (8) processing class I value engineering change proposals.

At the end of the fiscal year, factual reports had been received in all eight areas. The program was at the stage of comparing the data in these areas with performance in previous years, formulating recommendations for improvement, and developing additional areas for reporting.

In the original dollar-based cost reduction program, DSA reported realized validated savings of \$63.1 million or 190 percent of the established 1968 goal. Savings were reported in nine areas. The largest savings were reported in the value engineering area, which accounted for \$23.7 million, or 198 percent of the established goal. The second largest area, operating expense savings, contributed \$18.4 million, which was 205 percent of the goal. As in previous years, DSA also contributed indirectly to savings reported by the military departments through such activities as administering Defense-wide programs and performing such Defense-wide services as materiel interservicing and industrial plant equipment reutilization.

Supply Effectiveness

A uniform procedure for the measurement of supply effectiveness was one of DSA's earliest management objectives, and was implemented in November 1962. As noted earlier in this report, considerable progress was made during the year in the implementation of MILSTEP, which will provide a more detailed measurement of supply performance by DSA's centers and depots, and also by the transportation agencies of the military Services. Current DSA procedures are based upon two key effectiveness indicators.

The first management indicator, stock availability, measures the performance of the centers as inventory managers by the percentage of requisitioned items supplied from available stocks. The net number of requisitions processed by DSA supply centers dropped slightly from 19.7 million in fiscal year 1967 to 19.1 million in fiscal 1968. Average availability of the system during fiscal year 1968 was 90.5 percent, an increase of 4 percentage points from the rate achieved in the previous year. The fiscal year 1968 rate meets the goal set for the year and is considered to provide a satisfactory level of supply support to the Services.

The second indicator, on-time fill, measures supply system effectiveness by the percentage of stocked items processed for shipment within the time frames specified in the DoD uniform materiel movement and issue priority system. During fiscal year 1968, DSA filled 79.6 percent of its shipments on time, or a rise of 4.3 percentage points above the previous year's rate.

A total of 18.8 million shipments were made during fiscal year 1968 with 15.0 million being shipped on time. Of the 3.8 million late shipments, 1.4 million or 37 percent resulted from backorder releases. Under DSA's measurement system, requisitions placed on backorder and subsequently released as materiel becomes available are counted late at time of release. Therefore, requisitions placed on backorder normally result in late shipments. The rate of

on-time fill has improved and is expected to continue upward to 83 percent by the end of fiscal year 1969.

Customer Supply Assistance (CSA) Program

The program described in the previous year's report has continued to expand. During fiscal year 1968, the team of 12 supply management representatives of the Western Customer Supply Assistance Office (CSAO) provided their services to over 325 installations (Army, Navy, Air Force, Marine Corps, and non-DoD), making some 765 liaison visits. The 12-man team of the Eastern CSAO visited over 400 bases of military and nonmilitary customers for a total of nearly 750 visits during the year.

In the third quarter of fiscal year 1968, the basic CONUS CSA mission was expanded to include routine, continuing field supply assistance visits to oversea customers in both PACOM and EUCOM (Pacific Command and European Command). The many benefits, both to DSA and to the customer, to be gained from such routine liaison visits to oversea areas, as reported last year, have been amply confirmed by actual experience.

The visits overseas are on a 3-month temporary basis. The most recent teams going to both theaters have had a mix of military and civilian personnel in order to cover command and headquarters type visits as well as various functional areas.

Summary

In the 7 years since its establishment, it has become apparent that DSA has not solved and will not solve all problems of logistic support in the areas assigned to it by the Department of Defense. Some of these are inextricably bound up in the complex relationships of strategy and economics, the forward sweep of technology, and the momentum of accelerated large-scale industrial activity. But, during the same period DSA has demonstrated that some military supply and service problems are susceptible to integrated management and that the agency can handle them rapidly and well.

After 3 years, the U.S. commitment in Vietnam continues to provide a challenge to the agency's abilities to anticipate, and meet, military requirements. The current supply situation includes both an overabundance of some DSA-managed items, and persistent shortages of other items. In the contract administration area, the same situation has caused a noticeable rise in contract terminations, and meanwhile intensive management attention has resulted in a very gradual decrease in contract delinquencies. 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 common 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 and war.



EARL C. HEDLUND,
Lieutenant General, USAF,
Director, Defense Supply Agency.

**Annual Report
of the
SECRETARY OF THE ARMY**

July 1, 1967, to June 30, 1968

Contents

	Page
CHAPTER I. INTRODUCTION	145
II. OPERATIONAL FORCES	150
The Pacific and the Far East	150
Europe, the Middle East, and Africa	153
Alaska and Latin America	154
Continental United States	155
Civil Disturbances	156
Army Readiness	157
Special Forces	159
Civil Affairs and Psychological Operations	159
Strategic Mobility	161
Communications and Electronics	163
Civil Defense	165
III. FORCE DEVELOPMENT	169
Plans and Programs	169
Staffing Standards and Manpower Utilization	171
Training and Schooling	173
Systems Development	176
Air Defense	177
Army Aviation	178
Nonstandard Equipment for Vietnam	179
Chemical-Biological Matters	179
IV. PERSONNEL	180
Military Personnel	180
Military Justice, Discipline, and Legal Affairs	187
Health and Medical Care	190
Housing, Religion, Safety	192
Personnel Management and Special Problems	195
Civilian Personnel	198
V. RESERVE FORCES	203
Reorganization of the Reserve Components	203
Partial Mobilization of the Reserve Components	205
Selected Reserve Force	206
Readiness	207
Elimination of the 14 U.S. Army Corps and Revision of the Army Reserve Command Structure	209
Air Defense	209
National Guard Support of Civil Authorities	210
VI. MANAGEMENT, BUDGET, AND FUNDS	211
Organizational Developments	211
Management Programs, Systems, and Techniques	214

	Page
Finance, Accounting, and Auditing	220
Budget and Funds	222
VII. LOGISTICS	224
Procurement	225
Support of Operations in Southeast Asia	226
Support of Operations in Europe	230
Support of Army Troops in Time of Civil Disorder	231
Materiel Maintenance	232
Army Aircraft	233
Logistics Systems	234
Supply and Depot Management	236
Installations	237
Transportation	241
Support Services	242
VIII. RESEARCH AND DEVELOPMENT	244
Funding	244
Firepower	245
Mobility	246
Communications and Electronics	247
Combat Support	249
Other Significant Research Programs	250
IX. CIVIL WORKS AND MILITARY ENGINEERING	253
Civil Works	253
Water Resources Development	253
Pollution Abatement	257
Emergency Operations	259
Nuclear Power Applications	261
Military Engineering	263
Engineer Operations in Southeast Asia	263
Mapping and Geodesy	266
X. SPECIAL FUNCTIONS	268
Administration of the Panama Canal	268
Interoceanic Canal Study	269
Administration of the Ryukyu Islands	269
Promotion of Rifle Practice	272
XI. MILITARY ASSISTANCE AND FOREIGN LIAISON	274
Foreign Military Training	274
International Logistics	275
Foreign Liaison	276
XII. SUMMARY	278
Annual Report of the Office of Civil Defense	281

142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000
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I. Introduction

The condition of the Army, in every branch, both of the Line and Staff, in its material and personnel, and in its discipline and administration, is highly respectable.

Report of Secretary of War John C. Calhoun
November 29, 1823

It is almost a century and a half since the U.S. Government began publishing the Army Secretary's Annual Report. Secretary of War Calhoun's account of 1822 was the first to appear in print. His executive summary was two pages long, and since the Calhoun stewardship came in the middle of a peaceful period, well removed even from such minor contemporary conflicts as the bracketing First Seminole and Black Hawk wars, the Secretary had little of great military moment to record; his reports deal primarily with organization, disposition, and disbursements. Small wonder that in 1823, for example, he found the condition of the Army to be "highly respectable."

Although 145 years have passed and Americans today have slightly different ways of saying things, Army concerns remain fundamentally the same as they were in Calhoun's day, and the basic mission is unchanged—to insure that the Army fulfills its role in national defense.

In fiscal year 1968, domestic emergencies and several potential crises elsewhere in the world joined with the Vietnam war to place heavy operational demands on the Army. Over-all Army strength reached a million and a half in March 1968, while the ascending ground force commitment in Vietnam gradually leveled off at slightly above 350,000. Of 20 $\frac{1}{3}$ divisions in the active Army (19 numbered divisions plus four independent brigades—a 1 $\frac{1}{3}$ -division force equivalent), 8 were in Vietnam as the year closed.

The commitment in Vietnam has grown over a number of years in a series of distinct phases. An advisory period began in 1950 when the United States signed an agreement with France and the Associated States of Indochina, of which Vietnam was one, to provide military aid, and a U.S. Military Assistance Advisory Group, Indochina, was established to administer the pro-

gram. Attention to South Vietnam's needs came into focus in the middle 1950's following the signing of the Geneva Accords (which divided Vietnam at the 17th parallel) and subsequent French withdrawal from Indochina. Although the United States was not a signatory to the Accords, it moved to fill a vacuum created by the French departure by launching, at South Vietnam's request, an advisory, logistical, and training program.

A renewal of revolutionary activity in 1960 and the authorization in January 1961 for U.S. advisors to be assigned to Vietnamese field units—although with the understanding that they would not engage in combat except in self-defense—signaled an expansion of U.S. assistance to include an operational support as well as an advisory role. The implications of this move at the start of 1961 later served to fix a line for statistical compilations on the conflict, although the first American was not wounded by hostile action until April and the first not killed until December of that year. In any case, the operational support mission required an infusion of airmobile, communications, intelligence, logistics, and Special Forces personnel for a phase of American assistance to South Vietnam that extended over a period of about 3 years and included numerous activities to improve the lot of the Vietnamese citizen as well as to develop his army.

The present phase of the U.S. commitment in Vietnam opened early in 1965 when Communist forces announced and launched operations against American advisory personnel and installations and it also became apparent that the South Vietnamese forces could not cope with mounting enemy attacks. The United States responded by sending combat units, and over the past 3 years these forces have been sharply augmented to meet rapidly expanding enemy forces and operations, even as the Army contribution to a broad revolutionary development program was greatly enlarged.

As the 1968 fiscal year closed, another phase in a long and costly war seemed to have been reached. In the theater of operations the forging of the immense logistic base had been largely completed and a force appropriate to the measured scale of the war had been fielded. Extending from the battlefield back to the home front, the variety of contributing systems of personnel, training, supply, equipment, weapons, transportation, and reclamation were functioning smoothly. On the diplomatic front, U.S. and North Vietnamese negotiators were meeting in Paris in a face-to-face attempt to find mutually acceptable grounds for reducing or ending the conflict. In the meantime, however, fighting

on a much larger scale than the year before was continuing in South Vietnam.

The accelerated tempo of operations inevitably raised the level of casualties. In the 7½ years of war—January 1961 through June 1968—American combat casualties exceeded 25,000 killed and 159,000 wounded. As the major element of the deployed force, in direct contact with the enemy on the ground, the Army bore the heavier total loss, with 15,648 killed and 96,173 wounded. It is a measure of the increased pace of operations that more than a third of those killed in action during the full course of the war were lost in the first 6 months of 1968.

In Korea, where two U.S. divisions continued to serve, the Army also sustained casualties as North Korea stepped up its probing and infiltration along the demilitarized zone. This activity produced the highest level of conflict since the cease-fire agreement 15 years ago, and prompted award of the Armed Forces Expeditionary Medal for service in Korea after October 1, 1966. In calendar year 1967 there were more than 400 incidents involving an exchange of gunfire, and in the 18 months from January 1967 through June 1968 the Army sustained 93 casualties, with 21 killed and 72 wounded. Tensions reached a peak when a group of infiltrators penetrated to Seoul in an attempt to assassinate President Chung Hee Park, and North Korea seized the U.S. intelligence ship *Pueblo*. In response to this provocation, U.S. priorities in personnel and equipment were raised for South Korea and additional measures were taken to prevent infiltration.

The situation in Western Europe was in marked contrast to that in Southeast Asia during the fiscal year. While Communist restrictions on access to West Berlin pointed up the importance of the U.S. presence in the tripartite garrison there, no real East-West crisis marred the international picture. Thus the cost of maintaining five U.S. Army divisions in Western Europe and a separate brigade in Berlin was reassessed during the year in the light of such pertinent considerations as the balance of payments, Atlantic stability, NATO evolution, Pacific requirements, and domestic needs, and it was decided to reduce the force by about 28,000 troops.

In a period of heavy overseas deployment, and with wartime requirements affecting the Army across the board, an additional burden was superimposed on the Department's operation in fiscal year 1968 by the heavy incidence of civil disturbances in U.S. cities. Historically, the Army has been the primary instrument of Federal authority when it has been necessary to assist civil

authority in domestic troubles. Federal troops have been used on many occasions in the Nation's history either to uphold the law or to quell civil disturbance. The first instance of the use of Federal troops under the Constitution was the Whiskey Rebellion of 1794, when President Washington dispatched a federally activated militia army into Pennsylvania to end resistance to the payment of excise taxes on distilled whiskey. Since that time there have been numerous and diverse situations such as enforcement of the commercial embargo of 1808, assistance in dealing with a slave rebellion in Virginia in 1831, enforcement of the Fugitive Slave Law in Massachusetts in 1854, maintenance of law and order on a host of occasions in the South during Reconstruction, similar actions in the railroad riots of 1877, the Pullman strike of 1894, the mining troubles in Idaho, Colorado, and West Virginia between 1892 and 1922, dispersion of the bonus marchers in Washington in 1932, numerous plant seizures during World War II, and preservation of order during a race riot in Detroit, Mich., in 1944. Notable examples of recent times are those connected with school desegregation, at Little Rock, Ark., in 1957-58 and at Oxford, Miss., in 1962-63.

Serious rioting in Detroit late in July 1967 apparently inaugurated a new era of use of Federal troops in domestic disturbances in cities. An unusual and potentially dangerous demonstration took place in Washington, D.C., in late October 1967 when some 25,000 people assembled to march on the Pentagon in protest against the war in Vietnam. The widest and most serious disorders occurred in April 1968, when the assassination of Dr. Martin Luther King, Jr., a prominent Negro civil rights leader, triggered disorders throughout the Nation.

Following the Detroit riot in 1967 a task group evaluated the roles and functions of the active Army and the reserve components in civil disturbances, and in April 1968 a Directorate for Civil Disturbance Planning and Operations was established in the Office of the Chief of Staff to assist the Secretary of the Army, as the executive agent for the Secretary of Defense, in discharging his responsibilities in this field of emergency activity.

In the larger context of air and space defense, the Secretary of Defense in September 1967 authorized the Army to proceed with the evolution of the NIKE-X missile system into a so-called "thin" or limited deployment to be designated as the Sentinel System. A Sentinel System Office was established within the Office of the Army Chief of Staff to develop this ballistic missile defense system designed to meet a potential Chinese missile threat while

offering an option for extension to counter a larger Soviet missile threat.

These are only a few of the highlights of operation during fiscal year 1968, a year when the Army numbered a million and a half men and women and was responsible for the efficient expenditure of \$25 billion dollars, about 32 percent of a Defense budget, including supplemental appropriations, that totaled \$78 billion of a national budget of \$179 billion. Some of the details and dimensions of the Army element of national defense are spelled out in the following pages.

II. Operational Forces

Experience shows that modern wars come on suddenly; that serious international disputes occur between nations the relations of which are apparently the most unlikely to be other than friendly, and that a condition of readiness for defense and an attitude of belligerency are sometimes the best preventives of actual war.

Report of Secretary of War Robert T. Lincoln

November 10, 1881

This statement from an earlier annual report is interesting because at the time it was written the United States had not been at war with another power for over three decades, would not move outward onto the world scene for almost another two decades, was not seriously threatened from any quarter, and was involved militarily only in some internal and incidental Indian campaigning. While the comment is valid today, it is more axiomatic than prophetic; an observer of the 1880's could hardly have anticipated a nuclear age, worldwide deployments, limited wars, the measured application of force.

In fiscal year 1968 the Army deployed substantial additional forces to Southeast Asia, conducted wide-ranging combat operations in Vietnam, maintained combat-ready forces in other areas of the world and as a strategic reserve in the United States, and dealt with serious civil disturbances at home.

The Pacific and the Far East

The U.S. Army, Pacific, which extends from Hawaii westward to Japan, Korea, and Southeast Asia, increased in size during the year as a result of the Vietnam conflict. Operational forces in the region reached a level of nine combat divisions, four combat units of brigade size, five corps or equivalent headquarters, and numerous support elements, including a missile command and air defense brigades, and engineer, signal, aviation, and military police brigades.

In Vietnam, U.S. Army strength increased during fiscal year 1968 from 308,000 to 355,000 (figures include patients and temporary duty personnel, exclude transients). The major combat units deployed to Vietnam during the year included the 101st

Airborne Division less the one brigade already in Vietnam, the 198th and 11th Light Infantry Brigades, and the 3d Brigade of the 82d Airborne Division. The 23d Infantry Division (Americal) was activated in Vietnam in September 1967, composed of the already present 196th Light Infantry Brigade, the newly deployed 198th and 11th Brigades, and a number of combat support and combat service support units that were also deployed to round out the organization.

In the early fall of 1967 a program was begun to standardize the size of maneuver battalions in Vietnam to provide more firepower and an organizational structure to improve combat effectiveness. This will be extended to combat support and combat service support units to provide economies in critical skills and materiel. U.S. Army, Vietnam, provides broad combat support and combat service support in South Vietnam not only for its own forces but for U.S. Navy, Marine Corps, and Air Force units and for the military forces of the Republic of Vietnam and other participating allies.

U.S. Army forces in Vietnam operated in all four established corps tactical zones and in three major roles—containment operations along the demilitarized zone (DMZ) and along the borders with Cambodia and Laos to prevent major enemy incursions into South Vietnam; offensive operations against enemy main forces and their base areas; and operations to support the Republic of Vietnam Government's pacification program. Offensive and containment operations constituted the primary role, and large numbers of the enemy were driven into border sanctuaries. The extension of security around bases brought protection to an increasing number of people, while improved security for lines of communication, coupled with engineer operations, opened many roads to the civilian population.

Friendly forces, by capitalizing on their greater firepower and mobility, have maintained the initiative against the enemy's main forces. While spoiling attacks and penetrations of his base areas have kept the enemy off balance, he has demonstrated the ability to mount coordinated countrywide attacks—although suffering severe losses in the process. A continuing buildup in enemy forces and activity, particularly in the areas of the DMZ, the central highlands, and Saigon's environs, necessitated a readjustment of friendly forces. At the same time, the U.S. Army assisted the Vietnamese to expand and modernize their armed forces to enable them to take on a greater share of the war. Clearing and securing additional areas of the Republic of Viet-

nam, a slow and tedious task, continued during the year, marked as before by close and continuous coordination between civil and military agencies. There was continued progress in rooting out the Viet Cong infrastructure.

In the Mekong Delta an Army-Navy team was formed to press operations along the many waterways. This mobile riverine force was able to penetrate areas previously thought to be inaccessible. The enemy was thus denied important sanctuaries within striking distance of the capital, and a large measure of control of a food-producing area was restored to the Saigon government.

The United States continued to help Thailand along both military and economic lines during the year. The U.S. Army command structure there was reorganized and the government was assisted in developing a Thai division for service in Vietnam. Construction and maintenance of strategic roads, communications networks, port facilities, and supply depots continued, along with efforts to assist the Royal Thai Army, to improve its combat readiness.

The U.S. commitment in Korea continued at approximately the same level in fiscal year 1968, with elements of the Eighth U.S. Army deployed along the DMZ with Republic of Korea forces to provide for the ground defense of that country. The Eighth Army is the second largest subordinate command of the U.S. Army, Pacific, containing major forces that include the I Corps (Group), the 2d and 7th Infantry Divisions, the 4th Missile Command, and the 38th Artillery Brigade (Air Defense). The I Corps (Group) defended the western avenues of approach into South Korea with one division deployed along the DMZ and one in reserve.

North Korea's intensification of hostile actions along the DMZ and elsewhere in the Republic of Korea during the year appeared to be the beginning of a renewed effort to achieve the long-term Communist objective of reunifying Korea under Communist rule. The attack on the Republic's Presidential "Blue House" in Seoul and the seizure of the U.S. ship *Pueblo*, along with continued provocations along the DMZ, are manifestations of North Korea's hostile policy toward the United States and the Republic of Korea.

A number of steps were taken to tighten security along the DMZ. The use of radar was increased, anti-infiltration barriers were strengthened, dogs were employed for patrol and rear area security, and cameras, starlight scopes, and anti-intrusion devices were introduced.

On Okinawa, the Headquarters of the U.S. Army, Ryukyu

Islands, continued in operation in fiscal year 1968, with the Headquarters, IX Corps, and the 2d Logistical Command, the 30th Artillery Brigade (Air Defense), the 7th Psychological Operations Group, the 1st Special Forces Group, and the 97th Civil Affairs Group. In a realignment of logistical missions, the 2d Logistical Command assumed certain support functions for Army forces in South Vietnam.

In Japan, the mission assigned to the U.S. Army, Japan, remained relatively unchanged. Still headquartered at Camp Zama, it provided logistical support to Army and allied forces in the Far East, including military assistance, depot operations, procurement, and hospital facilities. In the latter field the command provided a 2,750-bed capacity for battle casualties from South Vietnam.

Europe, the Middle East, and Africa

In Europe the U.S. Army, Europe, continued to fulfill its role as the Army component of the unified U.S. European Command and as an important element of North Atlantic Treaty Organization forces. Its forces included three mechanized infantry and two armored divisions deployed behind a screen of two armored cavalry regiments and with a third such regiment providing rear area security. Combat support units including nuclear artillery back up the maneuver forces.

In January 1968 the Army completed the last unit deployments from Europe resulting from the relocation of the line of communications from France to Germany and the Benelux countries, while in April redeployment of troops began under a plan that will reduce the Army contribution in Europe by about 28,000 men. Two-thirds of the 24th Infantry Division, the entire 3d Armored Cavalry Regiment, and selected support units will return to the United States, remaining committed to NATO, however, and leaving their heavy equipment prepositioned in Germany to accommodate a rapid return of personnel by air if required. One brigade of the 24th Division will remain in Germany and the division's three brigades will rotate the European duty, while all will assemble annually in Germany for a division exercise. As the year closed, most of the division's returning units had taken station at Fort Riley, Kans. The 3d Armored Cavalry will redeploy to Fort Lewis, Wash., by the end of July 1968.

Further streamlining is inherent in the recommendations of a theater logistics study, approved by the Secretary of the Army

in March 1968, that would inactivate some general support units and reduce prescribed load lists, establish a single automated inventory control center in the theater support command, replace the Seventh Army Support Command with two corps support commands, and rearrange the U.S. Army tactical control echelon under NATO.

As the year closed, a reorganization of the 10 area support districts of the U.S. Army Communications Zone, Europe, into 5 had been completed. The boundaries of the five consolidated districts will conform to those of the five German states and scarce management skills will be concentrated in half as many headquarters.

In Africa, the United States since 1961 has supported and assisted the Congolese government and people to attain their national goals. Thus when President Mobutu in July 1967 appealed to President Johnson for assistance to counter a revolt in the eastern Congo by European mercenaries and Congolese Army troops, the United States provided a small joint task force (Bonny Birch), consisting of an Army airborne infantry platoon and three C-130 Air Force aircraft and crews. Their mission was to support the Congolese Army, transporting troops, equipment, and supplies. The Army platoon provided security for the aircraft and personnel. More than 150 missions were flown to evacuate civilians and wounded soldiers, deliver equipment and ammunition, and transport food and medical supplies for both military and civilian use. The operation was concluded in December 1967.

Alaska and Latin America

The U.S. Army, Alaska, continued as the Army component of the unified Alaskan Command, charged with providing Alaska's ground defense. The tactical forces are positioned in two general locations: About half are north of the Alaskan Range in the Fort Wainwright-Eielson AFB complex near Fairbanks, and are assigned to or support the 171st Mechanized Infantry Brigade; the remainder are in the Fort Richardson-Elmendorf AFB complex near Anchorage in the south, where they are assigned to or support the 172d Mechanized Infantry Brigade. Each brigade has two maneuver battalions and a battalion of artillery.

Alaska affords a fine natural training area with virgin land, muskeg, woods, mountains, lakes and rivers, and cold weather. The wide variety and range of geographic and meteorological conditions contributes to the development of well conditioned

and versatile forces. Two Alaskan-trained infantry battalions sent to Vietnam were rated among the best prepared units to enter the war there, despite environmental differences.

Headquartered in the Panama Canal Zone, the U.S. Army Forces, Southern Command, continued as the Army component of the unified U.S. Southern Command. The 193d Infantry Brigade was the major tactical unit, with organic mechanized and infantry battalions, a field artillery battery, an engineer company, and an aviation company. Other units included the 8th Special Forces Group (Airborne); the 4th Missile Battalion of the 517th Artillery; the 470th Intelligence Group; the 3d Civil Affairs Detachment; the U.S. Army School of the Americas; the Inter-American Geodetic Survey; and the Atlantic Area Installation Command. The U.S. Army Forces, Southern Command, Puerto Rico, located at the San Juan Naval Annex, formerly Fort Buchanan, is now supported by the U.S. Navy.

The Southern Command's functions are varied, ranging from actual participation in the defense and security of U.S. personnel and property in the Canal Zone to training assistance to Latin American countries for counterinsurgency operations. Through the U.S. Army School of the Americas, mobile training teams, and Army sections of military groups in 17 countries, U.S. Army personnel provided valuable guidance and professional military assistance and advice to the armed forces of Latin American nations.

Continental United States

At the same time that the Army has provided a major combat force in Vietnam and combat ready forces in other areas of the world, a strategic reserve has been maintained in the United States with a capability of reinforcing the Vietnam effort, meeting contingencies elsewhere in the world, or coping with civil disturbance at home. This strategic force has supplied trained manpower for the fighting army and has in turn gathered in combat veterans whose experience is invaluable in maintaining the readiness and effectiveness of the reserve force in the United States. The major combat organizations and supporting units provide the structure for the regular flow of trained manpower through a worldwide system. The effectiveness of the system was proven last year by the immediate and unscheduled response to the requirements for a brigade reinforcement for Vietnam and deployment of large numbers of troops to counter civil disturbances in several cities in the United States.

Civil Disturbances

There were three civil disturbances in fiscal year 1968 whose magnitude required the use of Federal troops to assist state and local authorities to restore law and order. All required the use of large numbers of troops and resulted in heavy and unbudgeted expenditures.

The first involved an outbreak of racial violence in Detroit, Mich., on July 23, 1967. When police and National Guard troops were unable to quell the disorders, the Governor requested Federal troops. On July 25 some 4,782 active Army troops from Fort Bragg, N.C., and Fort Campbell, Ky., joined 10,448 Federalized Guardsmen in a force designated Task Force DETROIT and commanded by Lt. Gen. John L. Throckmorton. The Honorable Cyrus Vance, former Secretary of the Army and Deputy Secretary of Defense, at President Johnson's request went to Detroit to evaluate the disturbance, coordinate the Federal effort, and take what action he deemed appropriate as a Federal representative on the scene. Order was restored and the Federal troops were withdrawn after participating in an operation estimated to have cost \$1,456,000 in unprogramed and unbudgeted funds.

The second disorder that required the use of troops was neither spontaneous nor violent, but the Army took advance steps to meet the situation because of its potentially dangerous nature. This was the anti-Vietnam war demonstration announced in advance by a National Mobilization Committee to End the War in Vietnam and scheduled to take place in the Greater Washington area on October 21-22, 1967, including a march on the Pentagon building, headquarters of the Department of Defense. The demonstration took the form of a mass meeting at the Lincoln Memorial and a march of some 25,000 people across Memorial Bridge to the Pentagon. About 10,350 active Army troops were dispatched to Washington, D.C., where the bulk were held in reserve at area installations in case of need. Less than a third of the force was deployed and incidents were relatively minor and well within the capability of civil and military police to handle. The unprogramed and unbudgeted cost of this demonstration to the Army was \$908,495.

The most serious and extensive civil disorders broke out on April 4, 1968, when Dr. Martin Luther King, Jr., head of the Southern Christian Leadership Conference, Nobel Prize winner, and a leading civil rights advocate, was assassinated in Memphis, Tenn. This spark ignited racial disorders throughout the Nation and necessitated the use of Federal forces in three cities—

Washington, D.C., Chicago, Ill., and Baltimore, Md.—to assist local and state authorities in restoring law and order. National Guard units were alerted in 26 states and were used in some 30 cities in 14 states and the District of Columbia. National Guard troops were on active Federal military service in the jurisdictions where active Army troops were called in. In the period of April 5–12, 1968, a total of 13,682 active Army and 1,848 Federalized National Guard troops were used in Washington, D.C., while 5,005 Regular and 6,973 Guard troops were used in Chicago from April 7–11, and 4,321 Regular and 6,765 Guard troops were used in Baltimore, Md., during a similar period. While all disorders were extremely serious, those in Washington were especially so because of their magnitude and the fact that they occurred in the Nation's capital. The military operation in Washington was commanded by Gen. Ralph E. Haines, Vice Chief of Staff of the Army, and once again President Johnson called on Mr. Vance to coordinate the details of what was a large, complex, and dangerous situation.

The estimated cost of active Army participation in the April riots was \$5,375,410, again representing a totally unprogramed and unbudgeted cost.

As a direct result of these disorders and the potential for further disturbances, the Secretary of Defense designated the Secretary of the Army as the executive agent for the Department of Defense for all civil disturbance matters. To perform the function, a Directorate for Civil Disturbance Planning and Operations was established on April 22, 1968, positioned in the Office of the Chief of Staff, and Lt. Gen. George R. Mather was designated the director. Its objective is to expand as rapidly as is feasible the Federal military capability to respond with large forces and with speed to directives from the President to control civil disorder.

Army Readiness

The sustained program to improve the combat readiness of the Army worldwide proceeded concurrently in fiscal year 1968 with the buildup and the prosecution of the war in Vietnam. Up to this year the Army had been able to meet its manpower needs without drawing upon the resources of the reserve components. The heavier demands in Vietnam and the requirement to sustain strategic reserve levels made it necessary to call up selected reserve units. Personnel readiness dropped sharply in the first half of the fiscal year because of a drop in trained strength, an increase

in transients, and the recurring turnover of personnel. The decline in personnel readiness was substantially halted in some major commands during the third quarter and improvements in personnel posture became evident in the fourth quarter, although major commands continued to experience serious shortages of majors, captains, and certain noncommissioned officers and enlisted specialists. While the over-all training posture improved during the first half of the year, a decline became evident in the third quarter as a result of personnel turbulence, shortages, and grade imbalances. Indeed, declining operating strength and personnel turnover often invalidated training previously accomplished by a unit. All of these conditions were to be expected under prevailing circumstances.

The Army deployed one division (-), three separate brigades, and numerous smaller combat and support units to Southeast Asia during the fiscal year, all from the active Army. To maintain strategic reserve levels, activation of the 6th Infantry Division was begun in November 1967 at Fort Campbell, Ky.—except for its 4th Brigade, stationed in Hawaii—and two National Guard brigades were mobilized in May 1968, one in Colorado, the other in Hawaii. As the year closed, the 6th Division's activation was being halted and its resources earmarked for other elements of the strategic reserve. A new airborne brigade will be activated at the beginning of fiscal year 1969 to replace the one of the 82d Airborne Division deployed to Vietnam. These actions will reduce the strategic reserve by two-thirds of a division, and the authorized strength of the active Army will be $19\frac{2}{3}$ divisions.

The war and the concurrent task of readying and deploying forces had some adverse effect on the logistical readiness of units, notably in shortages of major items of equipment, repair parts, and experienced supply and maintenance personnel. Aging equipment and heavy use placed great demands on the Army's maintenance capability. It was necessary to transfer both personnel and equipment from units with lesser priorities to those selected for deployment, to the detriment of the losing units.

A data base on Army forces and resources and on the operational readiness of all U.S. forces was maintained in the Army Operations Center during the year and utilized by all Department of Defense and other governmental agencies as a basic information source. Operational around the clock, the center's situation maps and intelligence, logistics, and personnel data were available to support decision-making processes, and the

staff monitored international crises, domestic disturbances, and joint exercises.

Special Forces

Special Forces continued their assigned missions in Germany, Panama, Okinawa, Thailand, Vietnam, and the continental United States. Recruitment, retention, and training efforts were intensified to overcome personnel shortages in key specialties. The only major changes in Special Forces posture during the year were those connected with an augmentation of the 46th Special Forces Company in Thailand to support the training of the Royal Thai Army division preparing for service in South Vietnam, and the scheduling of the return to the United States in September 1968 of the major portion of the 10th Special Forces Group from Germany.

In Vietnam the 5th Special Forces Group continued to support the expansion of the Civilian Irregular Defense Group Program, under which South Vietnamese civilians are organized into battalion-size camp strike forces, strategically positioned mobile strike forces, and highly trained reconnaissance teams, and trained to conduct light infantry tactics and unconventional warfare operations such as interdiction of enemy infiltration routes. In executing this function the program has been effective in denying the enemy free access into South Vietnam from border areas of Cambodia and Laos. In addition to training indigenous personnel for such missions, the 5th Special Forces Group has conducted stability operations of various kinds.

Other Special Forces elements continued to advise, train, and otherwise assist military and paramilitary forces of Asian and Latin American nations in matters relating to internal defense and development.

Civil Affairs and Psychological Operations

The basic civil affairs responsibility in Vietnam is assigned to the Office of Civil Operations and Revolutionary Development Support of the Military Assistance Command. It provides single manager direction over all U.S. civil/military revolutionary development there. Three civil affairs companies and one platoon supported combat operations, providing a variety of services. They conducted water supply surveys, hired laborers, established laundries, distributed food and commodities to refugees, distributed feed for livestock, constructed schools and sanitary facili-

ties, provided medical and dental care, resettled refugees and tribal groups, gave English language instruction, provided agricultural advice, handled foreign claims, and furnished interpreter support.

Under the Military Provincial Hospital Assistance Program, 23 U.S. military surgical teams worked in provincial hospitals, supporting the Ministry of Public Health and providing medical care for civilians, furnishing advice and assistance in public health and sanitation, and training Vietnamese health personnel in medical care and public health and sanitation.

Four engineer construction advisory detachments supported the Republic of Vietnam's rural surface water supply program, assisting in the construction of water systems with capacities varying from 25 to 50 gallons per minute. Technical assistance teams performed construction and development work, such as well drilling and sewer construction, initiated self-help projects, and demonstrated techniques for the rural population.

Two areas of civil affairs operation received serious study during the fiscal year. One was a consideration of relocation of the civil affairs community to Fort Bragg, N.C., under an arrangement that would consolidate several related Army activities such as civil affairs, psychological operations, and special forces and advisor training functions at one installation, enabling them to share facilities, faculties, concepts, research, and training support. The other was a consideration of reorientation of civil affairs doctrine, training, operations, research, and intelligence to conform with the Army's role in stability operations. Both evaluations were being reviewed and pending final action as the year closed.

The Army Reserve civil affairs troop structure was revised as a part of the general reorganization of the reserve components, and effective January 31, 1968, the civil affairs element was reduced from 77 to 53 units. Retained units are authorized to be filled at 100 percent of their table of organization strength, which will greatly improve their readiness.

In the field of psychological operations (PSYOP) the U.S. Army continued to support both tactical forces and the Republic of Vietnam Government's nation-building programs. Participation included air and ground loudspeaker missions in friendly and Viet Cong areas; printing and distributing leaflets, safe conduct passes, posters, news sheets, and other materials; radio and television broadcasts; audio-visual activities; training for Vietnamese PSYOP units; providing PSYOP officers for U.S.

division and brigade staffs; and supporting revolutionary development, refugee, public safety, and Vietnamese public information programs. The U.S. Army psychological warfare battalion assigned to Vietnam was expanded into a group composed of four battalions, with one located in each corps area. Although the Viet Cong defection rate under the Chieu Hoi program did not reach desired goals, primarily because of the Tet offensive in the spring of 1968, the fact that the South Vietnamese people rejected the Viet Cong call for a general uprising, were revolted by the enemy's wanton destruction and disregard of life and property, and willingly supported the government's restoration programs all provided valid indications of their loyalty to their government and the effectiveness of U.S. and Republic of Vietnam Government and other allies' efforts in their behalf.

With the assistance of U.S. Army psychological operations personnel, the Royal Thai Army improved its capability to produce PSYOP printed material and also improved its broadcasting techniques. The 93d U.S. Psychological Operations Company supported the Royal Thai Army with classroom instruction in PSYOP intelligence and area assessment, leaflet preparation and distribution, and the exploitation of vulnerabilities. As a result of instruction in the techniques of face-to-face communication utilizing audio-visual equipment, Thai Army elements were better able to call attention to the benefits to be derived by the civilian population from their Army's civic action projects. The Thais recognize the role of PSYOP in stability operations and have developed not only their Army capability in this technical subject area, but workable plans at national and regional levels.

U.S. Army psychological operations capabilities have been improved as a result of experience gained in Vietnam, and new concepts and programs have been developed at Headquarters, Department of the Army, that will improve the capabilities and readiness of both active Army and Reserve units.

Strategic Mobility

Strategic mobility—the capability to deploy and sustain combat forces anywhere in the world on call—has become an increasingly important element of U.S. national military strategy. Effective strategic mobility embraces force readiness, prepositioned materiel on land and afloat, and adequate and balanced airlift and sealift forces.

The buildup of Army forces in South Vietnam, a major

achievement in itself, was of such a magnitude that it could only have been accomplished by drawing on the rest of the Army, thereby depressing temporarily the over-all readiness to meet other contingencies. Both the Department of Defense and the Department of the Army recognize that significant improvements in the readiness of Army forces are required to meet programed improvements in airlift and sealift forces.

While high priority war requirements restrained advance in the prepositioning of materiel, there was progress in the construction of controlled humidity storage facilities during the year. Where airlift is concerned, procurement of the C-141 intertheater transport was completed and the last planes on order were delivered, while the roll-out of the C-5A heavy logistics transport occurred preparatory to flight tests in the summer of 1968. This plane is designed to transport divisional equipment and provide subsequent divisional support. Providing a more than threefold lift increase over previous aircraft, the C-5A can transport outsize materiel that was not previously deployable by air. Other airlift progress was made by the Civil Reserve Air Fleet, where expansion and modernization, including conversion to jet aircraft, provides the regular military fleet with both passenger and cargo backup in time of need.

Where sealift is concerned, the American flag ship posture did not improve during the year. The Army supported the development of a Defense Department sealift augmentation program similar to that involving airlift, and joined with the other Services in a program to develop a multipurpose general cargo ship for the Military Sea Transportation Service (MSTS) nucleus fleet of the future, a ship whose design should satisfy peacetime shipping needs as well as the Army's wartime deployment requirements.

In July 1967 the so-called contract definition phase of the project to develop a fast deployment logistic (FDL) ship was completed. This ship is intended to provide the Army with high-speed, flexible sealift to deploy equipment and supplies. It will be unique in design, with controlled humidity storage, a roll-on/roll-off capability, a stern ramp for amphibious vehicle discharge and beach lighter operations, and a ship-to-shore helicopter transfer capability. It will be used also in non-assault offloading operations over the beach in the absence of secure port facilities. The FDL ship will have a speed of 25 knots and about seven times the capacity of the World War II Victory ship.

Communications and Electronics

In the past year both the Secretary of Defense and the Secretary of the Army made crisis communications the subject of special attention, and the Army developed a program to set policy guidelines, promote user education, and enforce economy and discipline in the use of electrical communications.

The effectiveness of communications in times of civil disturbance received special attention in this year of domestic unrest, and the experience gained in April 1968 prompted the development of a communications package that would link operating agencies in times of trouble, especially the Army Operations Center and task force headquarters. A number of these packaged systems have been established to cover potential trouble spots. Prewired from the Army Operations Center to an objective area, each package consists of six AUTOVON circuits, two point-to-point voice circuits, and one secure teletypewriter circuit. Planning has taken into account the possibility, as in April, of simultaneous disturbances at several locations and the requirement to support the preparation and deployment, employment, and redeployment of troops. In general, the U.S. Army Strategic Communications Command provides the communications between the operations center and the task force headquarters, while internal communications of a task force are provided by organic signal elements. Although primary communications are leased, for the most part, from the commercial telephone company, backup military communications are available at each level of command.

The tremendous expansion in communications in recent years and the need to control the use of military radio frequencies led to the development of an Automated Frequency Assignment System, and this was improved during the last year. A major innovation was the development of a Frequency Assignment Processing System to control the processing cycle from receipt of a request for a frequency assignment, on through approval and entry into the Joint and Army Frequency Records System. In this same area, progress on the concept for automation of frequency assignment techniques for the Army in the field was curtailed by budgetary restrictions, although some techniques and procedures were developed and tested.

Communications facilities in Korea were improved during calendar year 1968, especially in the line of secure voice communications between the commander of U.S. forces and the

United States. High frequency and ground satellite terminal teams were deployed.

Work was completed in the Southeast Asia area on the first two phases of the Integrated Wideband Communication System, which is a part of the Defense Communications System. As the fiscal year closed, work on the final phase was in progress, with completion scheduled for November 1968. At that point, 1,031,275 channel miles and 6,500 voice channels will have been installed.

The communications-electronics concepts developed for the mobile riverine force operating in the Mekong Delta in South Vietnam have proven valid during combat operations.

Initial deliveries of the new single sideband AM transistorized radio teletypewriter sets have been made. The basic radio in this family, the AN/GRC-106, is half the size and weight of the set it replaces, yet through the use of advanced single sideband techniques it provides twice the range and 10 times the effective signal power. It is easily mounted in a jeep, has a 50-mile range, and enables a commander to maintain radio contact with widely dispersed forces. This radio, plus a teletypewriter mounted in a jeep, constitutes a half-duplex radio teletypewriter set AN/VSC-2. A similar configuration for use in tracked vehicles is identified as radio teletypewriter set AN/VSC-3. Shelter-mounted radio teletypewriter configurations, using the same basic components, are the AN/GRC-122 and the AN/GRC-142. The AN/GRC-122 (mounted on a $\frac{3}{4}$ -ton truck) provides full duplex radio teletypewriter and single sideband voice communications up to 50 miles, whereas the AN/GRC-142 provides half-duplex (one-way reversible) communications for the same range. Initial shipments of the new radio sets have been made to Vietnam, and a token shipment was made to Eighth Army in Korea. Shipments of the jeep-mounted radio teletype set have also been made to Vietnam. Other set configurations of this item are now being supplied. Additionally, quantities of single sideband, man-pack radio sets have been provided for special operational requirements.

The Army has been issuing to its units a new family of frequency modulated radios known as the AN/VRC-12 and AN/PRC-25. The AN/VRC-12 is vehicular mounted and provides significant advantages—increased range, better intelligibility, increased frequency selection capability, and greater reliability. The new frequency modulated man-pack set has been modified to accept a security device. Peculiar requirements in Vietnam necessitated the procurement of a commercially designed multiplexer (four-channel) to use with the AN/VRC-12 radio. Radios in

this configuration have been delivered in limited quantities. Initial issue of the new squad radio began early in 1967.

Plans were developed to introduce the second generation of radio relay assemblages to replace those currently used in the Army Area communications system. This system provides the Army in the field with an organic capability for multichannel communications. The new family consists of low, medium, and high channel capacity subsystems. The AN/GRC-103, a low channel capacity radio relay set, is used in the division area. The AN/GRC-50, a medium channel capacity radio relay set, is used in corps and army command systems. The AN/GRC-144, a high channel capacity radio relay set, will be employed in the corps and army areas. By using these radio sets and their related multiplex equipments in varying combinations and quantities, the new configurations will meet common user, sole user, and special purpose communication needs of all field army organizations.

The programed low channel capacity system was accelerated, and deliveries of this subsystem are scheduled to begin in 1968. Initial shipment of the new medium-capacity equipment was made to Vietnam during the last half of 1967. Procurement action on new high-capacity equipment has been expedited to permit field introduction at an early date. Lightweight tactical tropospheric scatter equipment, which will provide extended range for multichannel communications systems, will be introduced during the last half of 1968. When the new radio relay system becomes fully operational, it will provide increased channel capacity, reduced size and weight, and improved circuit quality over existing equipments.

Operational needs in Southeast Asia generated an urgent requirement for early replacement of the 30-line switchboard (SB-86/P) used within divisions. During October 1967, specification for a 50-line switchboard was worked out to replace the existing board. Initial deliveries to the Army are expected to begin within the next 2 years.

Civil Defense*

The mission of civil defense is to save lives in the event of a nuclear attack on the United States. Department of Defense studies show that fallout shelters would save tens of millions of lives. Therefore, primary focus in civil defense continues to be

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

on the development of a nationwide fallout shelter system through the dual use (that which has a peacetime day-to-day use) of existing structures. Management of the shelter system and supporting emergency systems is accomplished through the use of existing capabilities of state and local governments.

The Office of Civil Defense is responsible for planning and directing the over-all national civil defense program. The Director of Civil Defense is directly responsible to the Secretary of the Army, to whom the Secretary of Defense delegates these functions.

Fiscal year 1968 was the seventh year of continuous progress and growth of the nationwide fallout shelter system. By yearend approximately 180.3 million fallout shelter spaces, with a protection factor (Pf) of 40 or better, had been located through various surveys. Pf expresses the relation between the amounts of radiation that would be received by an unprotected person and a person inside the shelter. Thus, an unprotected person would receive 40 times more radiation than the person inside a shelter with a Pf of 40.

The National Fallout Shelter Survey, conducted by the U.S. Army Corps of Engineers and the U.S. Navy Facilities Engineering Command, identifies dual-use space in existing structures. At the close of the year, this survey had located 189,053 facilities with public fallout protected space for 176.5 million people. About 108.9 million of these spaces were licensed, 101.1 million marked with shelter signs, and 52.7 million stocked with Federal supplies sufficient to sustain occupants for 14 days or, if shelter areas were filled to their rated capacities, 88.1 million occupants for 8 days.

The Office of Civil Defense, with the assistance of universities, institutes, and professional societies, has qualified more than 16,500 architects and engineers in the technology of fallout shelter design and analysis. These architects and engineers know how to design buildings to enhance inherent fallout protection at little or no additional cost. The Office of Civil Defense also offers professional advisory services to architects and their clients. Many of the fallout shelter spaces added to the Nation's expanding shelter inventory are attributable to public and private developers, industrial firms, and others, who use these professional advisory services and apply the principles of radiation shielding in their construction programs.

During the year, a Direct Mail Shelter Development System (DMSDS) was inaugurated as a seven-state test program. DMSDS is essentially a systematic procedure for contacting and en-

couraging architects and owners of proposed buildings to use design techniques that provide fallout protection.

In addition to the national survey, the Home Fallout Protection Survey has been completed in 21 states, and was underway in five other states and the District of Columbia at yearend. This survey is conducted by interview or mailed questionnaire, and in the completed areas, 89 percent of the contacted householders have responded. By the end of fiscal year 1968 completed surveys revealed that 226,000 homes provide fallout shelter space with a Pf of 40 or better for more than 856,000 people, and 6.1 million homes provide fallout protection with a Pf of 20-39 for more than 20.9 million people.

Community shelter planning (CSP), an important aspect of the shelter program, continued to expand during the fiscal year. CSP is designed to develop procedures in local communities for making efficient use of the best available protection against radioactive fallout and to provide information to the public on where to go and what to do in the event of an attack. CSP also identifies in geographic detail the unfilled requirements for fallout shelter. At fiscal yearend, CSP projects in process covered 725 counties with a total population of 60.7 million people.

In addition, the development of the following civil defense emergency operations systems was continued to help assure the effective use of shelters and the conduct of recovery operations: (1) *A nationwide warning system* to alert people to impending attack and to direct them to shelters; (2) *communications systems* to keep people informed and to direct emergency operations; (3) *nationwide monitoring and reporting systems* to collect, evaluate, and disseminate information on radioactive fallout; and (4) *a damage assessment system* to provide guidance for preattack planning and postattack operations.

Emergency operating centers (EOC's) are needed at the seat of government at all levels for effective executive command and control in any widespread emergency. These EOC's are protected centers with necessary communications for key state and local officials to use in directing emergency operations. There are 2,389 EOC's in operation and 612 in preparation.

Actions are being taken to tie these EOC's by radio to the Emergency Broadcast System (EBS). This is a system managed by the Federal Communications Commission in cooperation with the broadcasting industry to provide the public promptly with official information in an attack emergency. As part of this system, OCD is providing a broadcast station protection program

for fallout protection, emergency power where needed, and radio program links connecting EOC's to key EBS stations. This will make it possible for these stations to stay on the air in a fallout environment. By the end of the fiscal year, 629 radio stations were a part of this program.

All states and more than 4,300 local governments participating in the civil defense program submitted annual program papers, one of the requirements for eligibility to receive Federal civil defense assistance. Federal assistance includes technical guidance, training and education, and surplus property donations, as well as financial assistance.

Other civil defense supporting activities included research to develop program direction and guidance; preparation of emergency public information to inform the public of actions to take in an emergency; community service activities to gain the participation of industry, national organizations, associations, institutions, and agencies; and liaison with other elements of the Federal Government and civil defense authorities of friendly countries.

The Army has primary Service responsibility for military support of civil defense functions within the continental United States, and all Services recognize the need for a strong civil defense program in presenting and maintaining a credible deterrent against general war. The Services represent a major source of assistance to civil defense because of their organization, specialized equipment, disciplined manpower, and long experience in dealing with emergencies.

State adjutants general, when federalized as state area commanders, exercise operational employment over military units made available for postattack military support of civil defense missions within each state. The Commanding General, U.S. Continental Army Command, and the Continental U.S. (CONUS) Army commanders exercise preattack military support of civil defense planning guidance over the CONUS-based adjutants general while in a state status. In Alaska, Hawaii, and Puerto Rico, similar preattack and postattack arrangements are the responsibility of the appropriate unified command.

The Army, with DoD approval, is authorized to establish reinforcement training units (RTU's) with members drawn from the Individual Ready Reserve. RTU's are authorized to perform preattack planning and training in either civil defense or military support of civil defense. RTU's are not intended to be postattack operational units.

III. Force Development

The withdrawal of the regiment of mounted riflemen from the Pacific has, to some extent, diminished the necessity of creating an additional regiment of that description of force, as that country is not peculiarly adapted to cavalry, and its place may well be supplied by infantry. Nevertheless, by the report of the General-in-chief, it will be seen that he considers not only this additional regiment of cavalry, but also an increase in the rank and file of the infantry and artillery, as indispensably necessary.

Report of Secretary of War Charles M. Conrad
November 29, 1851

This hint of Army concerns in the middle of the last century suggest how the considerations of national defense have changed. Indeed, a comparison of the present report with one even as recent as 3 years ago would reveal how accelerated change has become and how the elements of force development—plans, programs, doctrine, systems, organization, manning, training—must be constantly evolving if the Army is to be abreast of the times and prepared to carry out its responsibilities for national security. Force development thus combines advance planning and developing programs with immediate actions.

Plans and Programs

The Army Force Development Plan (AFDP), published annually, is the principal instrument for planning changes to the Army portion of the ongoing Five Year Defense Program, the central force planning vehicle for the Department of Defense. The Army plan for the period 1968–87 was published in the year, designed as always to provide for balanced and ready Army forces within reasonably attainable resources. Development of the 1969–88 plan proceeded through the year under guidance on strategy, objectives, and forces derived from higher authorities as well as from the Basic Army Strategic Estimate and the Army Strategic Plan. AFDP 69–88 analyzes three force levels, contains more detailed requirements forecasts and force alternatives than its predecessor, develops the relationship of research and development to modernization, and is oriented to influence Army budget estimates for the 1970–74 Five Year Defense Program.

Military planning involves not only estimates of potential theaters of war and appreciations of the capabilities of potential enemies, but definition of the sizes and types of forces that would be required to meet possible situations. Type troop lists called Force Planning Guides are used to analyze force requirements for Army missions. They are comparable to contingency plans for selected areas, except that contingency plans address capabilities while force planning guides address requirements. Guides are developed by war-gaming and analysis, to determine detailed force requirements to accomplish a mission posed in a scenario. They depict a time-phased buildup by displaying forces in deployment increments. By the close of fiscal year 1968, Army Force Planning Guides had been completed for three geographical areas.

The Army also continued to contract commercially for a series of Force Planning Guides that would help planners estimate the continental United States portion of planned force structures. Guides were published for replacement training centers, personnel centers, garrisons, Army schools, medical activities, and the continental United States portion of the Strategic Communications Command. One for the Army Materiel Command was in preparation at yearend.

In a similar phase of evolutionary force planning, the Strategy and Tactics Analysis Group, under the direction of the Assistant Chief of Staff for Force Development for this project, began developing for the Army a new series of geographically oriented division force guides. These will be based on combat forces developed from representative situations in general purpose force requirements scenarios. Reflecting changes in organization, improvements in sealift and airlift, and changes in the lines of communication, they will revise the existing guides and assist in developing new ones for other geographical areas. The series will enhance force planning, since estimated forces for objective areas can be structured on current strategic considerations and to meet a wider range of possible situations, including major contingencies, minor contingencies, and counterinsurgency operations. The logistics simulation for the first guide was begun in May 1968.

The magnitude and complexity of force planning today has encouraged the use of data management in force planning as in many other areas of military operation. The Force Accounting System is a comprehensive automatic data processing system which facilitates data recording, maintenance, and retrieval for

accounting and control of the units and strengths of the active Army, reserve components, and Army of the United States.

Staffing Standards and Manpower Utilization

The development of manpower staffing and utilization standards in the past year followed recent trends in Army functional alignments, organizational patterns, and management practices. Staffing guides, used by manpower survey teams to measure local requirements and by departmental headquarters for Army-wide manpower management activities, were revised for certain support activities, recruiting headquarters and stations, training center brigades, schools, personnel centers, continental Army headquarters, garrisons, and Army Reserve activities. Criteria for authorization of Reserve Officers' Training Corps instructors were liberalized to promote the utilization of retired military personnel in Junior Division ROTC units. As will be seen, the new staffing guidance cut across many areas of Army activity, reflecting the influences of the transition from the old technical service organizational pattern to the new functional structure in some cases, the wartime buildup in others. A part of the guidance included position delineation—an indication as to whether military or civilian personnel should be used. The object is to insure that military personnel are used only in positions that require military incumbents by reason of law, security, military knowledge and skill, or training, among other criteria.

Teams representing departmental and major command headquarters conducted numerous manpower utilization surveys in the year of this report, to appraise military and civilian requirements in support activities and to measure the effectiveness of personnel use. The inquiries were conducted against the background of current military operations, manpower and operating policies, approved missions, organizational structure, physical facilities and layout, operating methods and procedures, workload, and relative efficiency of the work force. In the period July 1, 1967, to June 30, 1968, the teams conducted 472 surveys worldwide, covering 294,387 spaces; 10,007 spaces were redistributed to higher priority requirements.

The development of Army strength plans and manpower budget estimates has always been handicapped by the lack of an accurate means for projecting gross requirements. During the past year considerable progress was made toward overcoming this problem, by developing manpower staffing factors from manpower utilization and workload statistics already being reported under

Army management structure codes. These staffing factors have been developed and published for certain support activities. They provide formulas to determine, on a major command or Army-wide basis, gross manpower requirements according to workload in various functions. Manpower staffing factors, it may be noted, are developed by credible statistical concepts and techniques. During the year these were successfully adapted to automatic data processing procedures.

The Army's requirements for commissioned officer aviators were the subject of a special study which resulted in new criteria governing their use. These criteria will provide guidelines for consistent and equitable officer aviator staffing and a better basis for determining total requirements. Also developed was a nonrestricted assignment policy which increases aviation knowledge in staffs of units involved with aviation and assures proper career development of individual aviators. The policy also provides the means to maintain a quick-reaction pool of qualified aviators for emergencies.

Development of table of organization staffing standards emphasized maintenance activities, particularly in aircraft and airborne equipment areas. A full-scale review of authorization standards and criteria program objectives, coverage, and current progress resulted in a detailed milestone plan which provided for: Expansion of coverage to all suitable functional areas; refinement of basic planning factors such as indirect productive time, losses due to tactical movements, and annual maintenance man-hours for all levels of maintenance; recording and compiling source data for nonmaintenance criteria; and complete revision of applicable regulations.

In the so-called civilianization program, the Army moved closer during fiscal year 1968 to its objective of having all military personnel assigned to duties for which there is a direct military requirement. Progress was tempered by rotation base requirements and by the availability of civilian skills. In the first phase of the program—January 1966 through June 1967—the Army identified 28,500 military positions that were convertible to civilian occupancy, plus another 8,000 backup military spaces in trainer, trainee, transient, patient, and student categories that could be eliminated by virtue of the conversion. Thus 28,500 civilians took over duties that had been performed by an equal number of military personnel, while another 8,000 military positions were no longer required. The result was a total reduction of 36,000 military spaces. The second phase of the program coincided

with the 1968 fiscal year, and the Army identified 7,094 positions for conversion to civilian occupancy and another 910 for elimination, a total reduction of 8,004 military spaces. With some additional Army conversions in joint activities, the Army by June 30, 1968, had eliminated 44,504 military spaces, for which 35,136 civilian positions were substituted.

Manpower productivity studies were continued during the year, revealing an increase in productivity in Army-wide laundry activities of 7.7 percent and in warehousing activities of 4.7 percent over fiscal year 1964, the base year for measurement. The Army uses statistical procedures similar to those used by the Department of Labor to measure productivity in private industry.

The Army improved its ability to manage its forces in Vietnam by standardizing the organization of approximately 600 units, thereby improving over-all combat potential and capability. Infantry battalions were reorganized to provide a fourth rifle company within an over-all battalion strength of 920. Forward observer and fire direction center sections of field artillery battalions and batteries were authorized additional personnel to enhance their capability to support sustained independent operations as well as to support the fourth rifle company added to the infantry battalion. Brigades and battalions of the 9th Infantry Division were restructured for special operations in Vietnam's delta region, and organizational refinements were made for engineer land-clearing companies, which have provided exceptionally valuable support to combat operations.

Training and Schooling

The size of the Army's training base leveled off at the end of fiscal year 1967 after fluctuations caused by the expanded commitment in Vietnam. Throughout fiscal year 1968 the Army training centers maintained their 590 basic combat training (BCT) companies and the associated advanced individual training (AIT) and combat support training (CST) companies that were in existence at the end of the 1967 fiscal year. During fiscal year 1968, 533,100 active Army trainees and 32,510 Reserve Enlistment Program trainees entered the training base.

Though the size of the training base varied little, there were significant changes in the subjects presented. Experience in Vietnam prompted the addition of 6 hours of mapreading and land navigation in BCT. In December 1967 the "quick kill" marksmanship technique was incorporated into BCT, to teach the soldier

to engage fleeting targets at short range without taking deliberate aim.

In May 1968, 12 hours of M-16 rifle instruction was introduced into BCT for trainees destined for the combat arms; this program will be expanded as the M-16 replaces the M-14 rifle in BCT, a changeover that is contingent on the availability of weapons.

It was decided in fiscal year 1968 to convert all infantry AIT to Vietnam-oriented training. This provides an additional week specifically designed to prepare trainees for service in Vietnam. Fort Ord, Calif., and Fort Lewis, Wash., converted in June 1968, and Fort Dix, N.J., will follow in fiscal year 1969.

On April 1, 1968, the Army opened a pilot program of remedial reading at 12 basic combat training centers for members of Project 100,000 (see the 1967 report) who had less than a fifth grade reading level. Over 1,300 successfully completed the 6-week course. Planned output for fiscal year 1969 is between 12,500 and 18,000. Results to date have been most encouraging.

The Army school system continued expanded operations to meet worldwide requirements for trained personnel. Priority was given to training required to support operations in Southeast Asia. High requirements in certain critical specialties made it necessary to operate 83 courses of instruction at nine service schools on a double shift, and 14 courses at four schools on a triple shift. Input to Army service schools in fiscal year 1968 totaled 412,000 as compared with 402,000 in 1967, 306,000 in 1966, and 195,000 in 1965.

The fiscal year 1968 Officer Candidate Program produced approximately 18,350 officers, while the 1969 output is programed for approximately 10,200. The downward trend in requirements permitted five of the eight male courses to be closed on March 1, 1968, leaving the infantry course at Fort Benning, Ga., the artillery at Fort Sill, Okla., the engineer at Fort Belvoir, Va., and the Women's Army Corps course at Fort McClellan, Ala. These will commission officers in Infantry, Armor, Signal, Artillery, Engineer, Military Police, Adjutant General, Chemical, Military Intelligence, Finance, Transportation, Ordnance, Quartermaster, and the Women's Army Corps.

The Army's civil schooling program provides individuals with graduate degrees for senior staff, technical, and school positions, where degree requirements are validated by the Army Educational Requirements Board. An average of 818 students was enrolled in the graduate program and 461 completed work during the

year and received degrees. Under the civil schooling program another 495 had short specialized course training at civilian institutions.

There are 256 colleges and universities conducting the senior Reserve Officers' Training Corps program on 268 campuses. Total student participation this year was 165,430, and 14,176 officers were commissioned. The international situation, strengthened management, increased publicity, and the ROTC Vitalization Act of 1964 have made it possible for the Army to be more selective in accepting cadets for the advanced program, and this will enhance the quality of new ROTC officers. An output of approximately 16,000 officers annually is forecast for fiscal years 1969 and 1970.

At the beginning of the 1968-69 school year, 2,160 four-year and 1,840 two-year scholarships will be in force; during fiscal year 1969 another 800 four-year and 964 two-year scholarships will be awarded, bringing the total to 4,000.

To prepare for the post-Vietnam period, when student interest in the ROTC may be expected to decrease, the number of institutions in the program is being enlarged. Fourteen were added in fiscal year 1968, and 16 will be added in 1969. Most will become operational during the year after their selection.

A new curriculum was developed that is more in consonance with the academic requirements of many institutions; it has been offered for development at 11 selected institutions with the intention that it become optional for adoption by all senior institutions in fiscal year 1971. Meanwhile, the 2-year program authorized by the Vitalization Act has been highly successful. This year, 2,309 students completed training at the basic camp at Fort Benning, while five advanced camps supporting both the 2- and 4-year programs were conducted with 17,453 completing their training.

There were 476 high schools in the Junior ROTC program at the end of the fiscal year. Student enrollment was 87,866 at the end of the 1967-68 school year. Expansion will continue, with 600 schools programed in fiscal year 1969 and 650 in 1971. Retired Army personnel, hired by the schools, are replacing active duty instructors in this program, as permitted by the ROTC Vitalization Act.

There were 35 high schools in the National Defense Cadet Corps (NDCC) at the end of fiscal year 1968 with a cadet enrollment of 9,349. Participation in this program is expected to decrease as more units convert to the Junior ROTC program.

Systems Development

One of the most significant developments in air and space defense in recent times was the U.S. decision to proceed with the deployment of the NIKE-X missile system on a limited or "thin" basis. Designated the Sentinel System, its importance is illustrated by the fact that a Sentinel System Office was established in the Office of the Chief of Staff, and Lt. Gen. Alfred D. Starbird was named the Sentinel System Manager, heading the organization established to develop and field the system.

Sentinel will consist of five major components—two radars, a data processing system, and two missiles. The radars—perimeter acquisition radar (PAR) and missile site radar (MAR)—are designed to achieve high operating speed and traffic-handling capability using the phased-array technique. The data processing system comprises a complex and sophisticated digital computer and a display subsystem. The two interceptor missiles are SPARTAN and SPRINT, both capable of carrying a nuclear warhead; the long-range SPARTAN is designed to intercept targets outside the earth's atmosphere, and SPRINT, with a high rate of acceleration, will engage generally within the earth's atmosphere. At present, it is planned to deploy 15 to 20 Sentinel batteries throughout the United States, including Alaska and Hawaii. The system is to be operational in 5 to 6 years at an estimated total investment of over \$5 billion. The limited deployment will provide area coverage of the United States against a potential Chinese Communist missile threat, with an option to expand the system to counter a Soviet missile threat to U.S. intercontinental ballistic missiles.

In the last fiscal year the Army accelerated efforts to improve electronic warfare capabilities. This involved steps that would make it possible to exploit, reduce, or deny an enemy the use of the electromagnetic spectrum, while retaining its effective use of friendly communications-electronics equipment.

The Army Electronic Warfare Board, composed of members whose staff agencies have major interests in electronic warfare, monitors this operational area, and during the year the board developed a blueprint for improving electronic warfare capabilities from which will flow actions connected with materiel, organization, and research and development. The Combat Developments Command also launched a study into all aspects of electronic warfare in the Army in the field, addressed at the 1970-75 period.

Combat vehicle programs progressed during the year. The main battle tank cooperative development with Germany moved to-

ward production early in the 1970's. The Hispano Suiza 820 gun, redesignated the M-139 automatic cannon, was selected to replace the .50-caliber machinegun as the armament for some M-114A1 command and reconnaissance vehicles in the NATO-oriented force. The M-548 tracked cargo carrier was introduced into the Army inventory to improve the mobility of self-propelled artillery units and to serve in Vietnam as a carrier for several items of equipment. The M-551 armored reconnaissance/airborne assault vehicle (General Sheridan), which replaces the M-41 light tank and the M-56 self-propelled 90-mm. gun, was deployed to Alaska and plans were made for its deployment to other theaters.

In January 1968 the Army promulgated a comprehensive program to provide improved direction and control over small arms development. This new small arms program will encompass all weapons of .60-caliber or smaller, and will include shotguns and infantry grenade launchers as well. During the year there were also further improvements on the M-16A1 rifle. The introduction of a chrome chamber improved the reliability and reduced the maintenance of the weapon, and there were further refinements such as a change to the flash suppressor and improved cleaning equipment.

There were advances in various missile systems during the report period. The PERSHING's readiness to perform in the quick reaction alert role in Europe benefited from operational experience, and there were some successful launchings in March 1968 in connection with the research and development effort on ground support equipment. The TOW and DRAGON heavy and medium antitank systems made progress; ENTAC has been withdrawn from Army combat units pending introduction of TOW, and DRAGON development reached the guided flight test stage. Meanwhile, development of launching and transporting equipment for the surface-to-surface LANCE missile reached technical maturity and a stage of readiness for production. LANCE is scheduled to replace the LITTLE JOHN and HONEST JOHN systems.

Air Defense

The search for new methods and means in military weaponry is open-ended, and involves not only investigation of entirely new concepts and designs, but refinements of existing equipment to improve its effectiveness. The technical complexity of modern weapons places a premium on measured advance, and that was

the nature of developments connected with several air defense systems during the year. A self-propelled version of the HAWK surface-to-air missile was under development, to provide a more mobile capability for all-weather low and medium altitude air defense for division areas of the field army. The NIKE-HERCULES system received its share of attention, centered on improving its capabilities in low, medium, and high altitude air defense; the system will remain in the Army tactical inventory beyond the time originally intended when it was deployed in 1958. The SAM-D moved into its advanced development phases during fiscal year 1968, held to an orderly progression to insure success with a minimum expenditure of resources. The CHAPARRAL/Vulcan missile/gun combination, designed to defend the field army against low altitude air attacks, with Vulcan providing a secondary ground support capability, moved ahead. And the RED-EYE shoulder-fired missile system was fielded, providing the frontline soldier with an immediate defense against low altitude air attack.

Army Aviation

The impact of the Vietnam war on Army aviation has been reported upon at some length in the annual reports of the last several years, and the impetus in development, procurement, and operations was sustained during this fiscal year. The AH-56A Cheyenne helicopter made its first flight on September 21, 1967, and contractor air firing tests will begin in August 1968 (see ch. VIII). In fiscal year 1968, contracts were let for 228 OH-6A and 300 OH-58A helicopters in the continuing program to replace the OH-13, OH-23, and O-1 models. By the close of the year 523 OH-6A's had been received and 369 had been deployed to Vietnam. The first OH-58A is scheduled for delivery in May 1969. Also being deployed was the AH-1G Hueycobra, to replace the UH-1B&C in the fire support role. The Hueycobra will be used until the Cheyenne becomes operational. There were more than 180 Hueycobras in Vietnam as the year ended, and another 200 will be added in fiscal year 1969.

In the fixed wing program, procurement action was accelerated for the OV-1D Mohawk aircraft when seven were ordered with funds received in the fiscal year 1968 supplemental budget. Delivery is to begin in September 1969. These are in addition to the previously approved fiscal year 1969 procurement of 30 aircraft. This will be an improved version of the plane.

Nonstandard Equipment for Vietnam

Over 40 urgent requirements for nonstandard equipment for Vietnam were processed during fiscal year 1968, and nearly 300 requests have been processed under this program since its inception in October 1965. Although worldwide in application, the program is intended primarily to support the war effort in Vietnam. Its purpose is to expedite development and procurement of items for which field commanders have stated an urgent need. This includes equipment not in the Army inventory, commercial items, and items being developed but not yet standardized. To be eligible for the program, a proposed item must provide a new or improved capability for a unit engaged in combat operations.

The scope of this program was broadened in the last quarter of the fiscal year when the Eighth U.S. Army in Korea and the Continental Army Command were granted limited authority to originate requirements.

Chemical-Biological Matters

Riot control agents have assumed a new role in combat operations, providing nonlethal fire support. Prior to the Vietnam war these agents were used primarily in grenades for riot control. The agent CS was initially employed in encounters in which both combatants and noncombatants were involved. Temporary incapacitation of the enemy reduces his firepower and makes him vulnerable to capture with minimum use of weapons; a reduction in the use of firepower often reduces the level of destruction of homes and buildings in cities and towns. CS has been effective in defense, counterambush, reconnaissance by fire, and interdiction. Such application in a combat role raised a requirement for improved range and capability. This flexibility is being attained with the use of CS in artillery and air-delivered munitions, and through the development of new types of CS munitions. Combat tactics and techniques are being developed to exploit the new employment concepts for riot control agents.

IV. Personnel

The American soldier is well paid, fed, and clothed; in the event of sickness or disability, ample provision is made for his support. But his moral culture is wholly neglected. There is no arrangement in our service for his mental or religious improvement. And there is perhaps no similar service in which such a measure is more necessary. Many of the positions occupied by our troops are upon the verge of civilization, or beyond it. There they are retained for years, and under circumstances which, if not counteracted, almost necessarily lead to great demoralization.

Report of Secretary of War Lewis Cass
November 21, 1831

By any standards, the American soldier is better paid, fed, and clothed today than his predecessor of any generation, and the provisions made for his support in case of sickness or disability are unequaled even in modern times. Beyond that, any neglect of his mental or religious needs has long since been rectified. One has only to consider a few current facts of Army life: There were 1,866 chaplains in the Army as the fiscal year closed; 58,852 men who would otherwise have been rejected for military service because of low educational and aptitude levels were qualified through special training under Project 100,000; Comedian Bob Hope entertained the troops in Vietnam at Christmas time at locations that could readily be considered as "upon the verge of civilization"; and 461 Army students received graduate degrees from civilian institutions under the Army's civil schooling program. There are many other evidences, throughout this report, of the Army's attention to the "moral culture" of the soldier today.

Military Personnel

During fiscal year 1968, the Army's strength increased from 1,442,498 to 1,570,343, comprising 145,988 officers, 20,185 warrant officers, 1,401,727 enlisted personnel, and 2,443 cadets. As a result of increased accessions and the reserve callup in May 1968, the Army's trained strength had reached 1,345,100 by the end of the fiscal year, marking the highest total since the Korean war. There were 37,985 officer and 5,686 warrant officer accessions

during the year, and the ratio of officers to enlisted personnel grew from 1 to 9 on June 30, 1967, to 1 to 8.4 on June 30, 1968. The Army gained a total of 334,200 men through induction and 198,900 additional soldiers enlisted for the first time, an increase of 35,100 and 8,600 men respectively over fiscal year 1967.

In Vietnam, Army strength continued to rise, from 308,000 to 355,000 men, but at a slower pace than in the previous year. The 47,000 additional forces represented a 15 percent increase, as compared with an 84 percent increase (141,800) during fiscal year 1967. In a year of relatively heavy fighting, the Army incurred 63,340 casualties, including 8,691 killed in action, 27,270 wounded in action and requiring hospitalization, and 27,347 wounded and not requiring hospitalization. Cumulative Army casualties from January 1961 through June 1968 totaled 111,821.

The Army continued its liberalized decorations and awards policy for combat and noncombat service. Commanders at division and separate brigade level were authorized to award the Silver Star and Bronze Star, respectively. By the close of the fiscal year, 14 Medals of Honor had been awarded to Army personnel, and in the 5 calendar years 1963-67 there were awarded 296 Distinguished Service Crosses, 4,591 Silver Stars, and 73,127 Bronze Stars. Meanwhile, award of the Armed Forces Expeditionary Medal for service in Korea after October 1, 1966, was approved as a morale factor in view of increasing hostile action by the North Koreans.

Replacement requirements increased evenly from June to December 1967, then accelerated sharply during January and March 1968. Subsequently, the gradual increase resumed and continued through the end of the fiscal year. The necessity to replace personnel from the previous year, added to the problem of fulfilling normal monthly requirements, combined to create the peak load. A partial solution, qualitative in nature, was provided through the initiation of the skill development base program. Designed to accelerate the skill development of recruits, this program offers advanced training to selected graduates of advanced individual training, and promotion to grade E-5 upon completion, or to grade E-6 for outstanding NCO candidate graduates. By the end of fiscal year 1968, some 4,300 students had graduated from skill development base program courses; the training goal for fiscal year 1969 was set at 30,000 graduates.

In personnel procurement, officer and warrant officer accessions in the fiscal year totaled 43,671.

OFFICER PROCUREMENT BY SOURCE
IN FISCAL YEAR 1968

Source	Actual
Service Academies	675
Reserve Officers' Training Corps	10,846
Officer Candidate School	18,355
Voluntary Active Duty	964
Professional (JAGC, WAC, MSC, CHAP)	1,464
Medical Corps, Dental Corps, Veterinary Corps	3,261
Regular Army Appointments (from civil life)	39
Miscellaneous ¹	100
Nurses and Medical Specialists	1,472
Warrant Officers	5,686
Involuntary Active Duty of Reservists	809
Total ²	43,671

¹ Includes administrative gains such as recall from retired list, inter-Service transfers, etc.

² Excludes reimbursable personnel.

Since the Army's junior officer procurement for the remainder of the year could be fulfilled through operation of the Fort Belvoir, Va., Fort Benning, Ga., and Fort Sill, Okla., officer candidate schools alone, the Army began to phase back its eight-school program on August 14, 1967, and completed the consolidation by March 1, 1968. Graduates commissioned in branches other than Infantry, Artillery, and Engineer receive their branch orientation training at the respective service schools upon completion of Officer Candidate School. This program has produced 18,355 officers during the past fiscal year, as compared with 19,240 during fiscal year 1967.

On February 9, 1966, authority was delegated to the Commanding General, U.S. Army, Vietnam, to appoint second lieutenants in the Army Reserve with concurrent call to active duty. During fiscal year 1968, 66 appointments were made. The warrant officer program simultaneously increased from 16,112 at the end of fiscal year 1967 to approximately 20,200 by the end of fiscal year 1968. The authorized end strength of the Army Nurse Corps was similarly enlarged, from 4,500 in fiscal year 1967 to 4,650 in fiscal year 1968.

Special career programs have also been designed to enable officers to develop branch and specialty skills within areas of critical Army-wide importance, but which do not fall within the development pattern of any single career branch. Atomic energy, automatic data processing, civil affairs, comptroller, foreign area specialist training, information, intelligence, logistics, operations

research/systems analysis, procurement, and research and development constitute the 11 special career officer programs now in operation.

During fiscal year 1968, a Department of the Army study prompted the Chief of Staff to approve significant changes in two special career programs during the coming year. Oversea security operations, a new program absorbing the current civil affairs officer program, will be established to develop officers qualified to serve in civil affairs, psychological operations, and related politico-military fields. The foreign area specialist training program, expanded and improved, will be renamed the foreign area specialty program. Total membership in these officer career programs now numbers over 4,269, representing an increase of 769 over fiscal year 1967.

In June 1966, in recognition of the trend toward increasing technological complexity in the modern Army, a study group was formed to organize a formal warrant officer career program; a requirement for skilled technicians had created a need to fill positions above the enlisted level but too specialized for broadly trained, branch-qualified commissioned officers. Some of the more significant results of the study, approved by the Chief of Staff in March 1967, are: Establishment of below-the-zone promotion opportunities for warrant officers, reduction of the time-in-grade for promotion to CWO-2 from 18 to 12 months, initiation of action to obtain "saved-pay" legislation to guarantee that an enlisted man will not suffer loss of pay upon appointment to warrant officer status, modification of the warrant officer specialty structure to permit more definitive description of special skills, greater educational opportunities, and various other administrative changes for more efficient utilization of warrant officers. Establishment of an orientation course for the newly appointed warrant officer, creation of a Regular Army program paralleling that for commissioned officers, and initiation of action to establish definitive career progression patterns for the various occupational fields and publish a warrant officer career planning pamphlet, complete developments in the warrant officer category.

Despite a third consecutive enlargement of the training base during 1968, Army aviators remained in great demand, with continued requests from Southeast Asia for additional aviators. By assigning some 1,600 additional instructors to the training base, flight school output increased, resulting in a total aviator strength of 16,735, a 29 percent increase over the previous year. In this improvement, 60 percent of the gain was for warrant

officers, and 40 percent was for commissioned officers. During fiscal year 1969, aviator strength will continue to grow at the previous rate of 610 pilots monthly. Career appeal has been enhanced through improvements in the aviation personnel management program and through an improved career program, including schooling opportunities, for warrant officer aviators.

A Department of the Army special program to provide high caliber province advisors in Vietnam was approved on November 28, 1967. The Vietnam advisor program begins with an invitational approach to outstanding officers of Armor, Artillery, Engineer, and Infantry for possible selection and training as either province or deputy province senior advisors. There are 44 such positions in the U.S. Military Assistance Command, Vietnam, organization. Selected officers are nominated to its commander, nominations are reviewed by the Deputy for Civil Operations and Revolutionary Development Support, and invitations are issued to approved nominees. Officers who accept attend a 49-week preparatory training program at the Foreign Service Institute, Washington, D.C. The major portion of their training (about 85 percent) is devoted to study of the Vietnamese language. Training completed, the officers are deployed to Vietnam for an 18-month tour. The first graduates were scheduled to arrive in Vietnam in December 1968.

During the second year of Project 100,000, the Army accepted approximately 58,852 men who would otherwise have been rejected, thus producing a grand total of 96,987 men since the program's inception. Youths accepted into the program differ from the average Army enlisted man in various ways, as the following figures (comparisons with over-all Army averages in parentheses) will indicate. By age, the average project member is older (20.4 vs. 20.2 years), more likely to be Negro (40 percent vs. 13 percent), and less likely to be a high school graduate (43 percent vs. 71 percent). Among these recruits, 36 percent read beneath the fifth grade level, and a remedial reading program has been established to raise their fluency at least to this level. They are in no way embarrassed by their participation in the program, and every effort is made to prevent them from being identified with the project. They are trained in the regular training centers and assigned to positions and units according to their preferences and aptitudes and in line with established requirements. The attrition rate during basic combat training and in advanced infantry training approximates that of other soldiers;

eventually, approximately 42 percent are assigned in combat skills and 58 percent in support roles.

On July 13, 1967, a career program for the Army's command sergeants major was established, centralizing selection, assignment, and career management of this important echelon of non-commissioned officers. The approximately 1,800 positions included in the program constitute the senior enlisted positions on the staffs of the various commanders from battalion to Department of the Army level. During the initial phase of the program, commanders were required to nominate individuals from within their commands to fill their command sergeant major positions. All sergeants major, regardless of military specialty, were eligible. Review and selection of the best qualified was accomplished by the Department of the Army Command Sergeants Major Selection Board. During the second phase of the program, commanders will be permitted to nominate other outstanding sergeants major to replace losses, or vacancies may be filled through promotion of outstanding E-8 enlisted men into command sergeants major positions at battalion level.

The retention on active duty of an adequate number of trained and experienced officers remains a matter of deep concern to the Army. Estimates indicate that the Army annually requires 4,500 nonregular officers to enter the career structure. By the end of fiscal year 1968 only 2,915 officers will have extended their tours of service, and the over-all retention rate is expected to be only 25.1 percent. The Army continues to exercise the provisions of the selective retention program, retaining selected regular Army officers involuntarily for periods of from 12 to 18 months following their submission of resignation. This policy has somewhat offset the low retention rate of obligated volunteer Reserve officers. The voluntary obligated tour extension program has offered additional assistance by permitting officers who have completed their minimum obligated service to extend their tours from 1 to 24 months without making a career declaration. The situation is less critical in the case of senior officers. Selected retirement-eligible Reserve officers are offered retention for a period of from 1 to 3 years beyond retirement eligibility; nearly 60 percent of those selected have accepted retention.

Many of the problems found in the retention of officers are mirrored in those encountered in the retention of enlisted men. For fiscal year 1968, reenlistment rates were 67.6 percent for career regulars, 28.0 percent for first-term regulars, and 11.5 percent for inductees. Career attractiveness has been improved

by such programs as equity of assignment, assurance of a tour in the continental United States, reenlistment bonus and options, the opportunity to attend NCO candidate courses, enlarged promotion opportunities, and the upgrading of "career counselor" as a position.

Equity of assignment insures that enlisted personnel are not involuntarily reassigned to Vietnam for a second tour until all other personnel in their grade and specialty have completed a first tour. Assurance of at least 12 months at a continental U.S. station of the enlistee's own selection is one privilege open to an oversea returnee. Promotion opportunities, while extending to all grades, have been particularly generous in promotion to corporal (E-4) upon entry into the NCO candidate course, and by revision of career counselor positions to grades E-8 and E-9. The variable reenlistment bonus presently extends to 302 military occupational specialties.

Despite many attempts on the part of the Army to improve the attractiveness of a military career, enforced competition with a dynamic economic society, nationwide occupational mobility, and prevailing attitudes toward military service are beyond the range of any conceivable retention or recruiting program, yet decisive in influencing the retention rate.

During fiscal year 1968, time-in-grade for promotion was gradually reduced so that effective May 2, 1968, first lieutenants attain eligibility for promotion to captain upon completion of 12 months in grade. First lieutenants promoted to captain under this policy will remain on active duty to complete a service obligation of 36 months, computed from the date of entry as a second lieutenant, or 12 months active service in the grade of captain, whichever occurs first. Effective April 1, 1968, eligibility for temporary promotion of warrant officers from W-1 to CWO-W2 will be on the basis of completion of a period of active duty service on the day following completion of 12 months of active duty.

On November 8, 1967, President Lyndon B. Johnson signed Public Law 90-130 to provide military career women with the same promotion and tenure opportunities as male officers. Previously, no women officers in the Army could retain a permanent grade above lieutenant colonel. While the Director of the Women's Army Corps was granted the grade of colonel while serving in the position, she was required to revert to her permanent grade should she remain in active service after being succeeded as Director. On April 1, 1968, a special board convened to select the

first six WAC colonels (AUS), and on April 15 the Department of the Army announced the selection of the six lieutenant colonels to be promoted. In another action the first female officers were named to attend the Army War College, beginning in August 1968.

Promotion opportunities for enlisted men will be improved when a new, revised regulation is implemented on August 1, 1968. Most significant is the set of standardized scoring forms based on a criterion of 1,000 points to be adopted by Army-wide promotion boards and applicable to all enlisted personnel. Now a soldier will be able to compare his qualification for promotion with contemporaries on a tangible basis, and can undertake self-improvement with full knowledge of his deficiencies. A standard system has also been established to integrate personnel with promotion list status into the promotion list of their gaining command.

As an exception to policy, the Department of the Army established accelerated promotion opportunities, for deserving individuals in Vietnam, in units alerted for Southeast Asia, in other oversea units, in Army service schools, and in the skill development base. Some examples are: Promotions in Vietnam without regard to departmental quotas to grades E-4 and E-5 to fill local vacancies; promotions in specialty-producing service schools to a grade commensurate with the skill level attained; and promotions up to grade E-6 for outstanding individuals in NCO school combat leader courses.

During fiscal year 1968, a series of pay raises benefited Army personnel. The passage of Public Law 90-207 on December 16, 1967, provided a 5.6 percent pay increase to all ranks retroactive to October 1, 1967, and in addition promised two subsequent raises equal to those for classification act employees. One-half of the difference was to be granted on July 1, 1968, while full equality was scheduled on or after July 1, 1969. The gradual upswing of the Consumer Price Index prompted a 3.9 percent increase effective April 1, 1968, in the pay of personnel retired prior to October 1, 1967, with lesser increases to interim retirees. Also, the Secretary of Defense, under the authority of Section 310, Title 37, U.S. Code, designated Korea north of the Imjin River as a hostile fire pay area, thereby enabling some 5,000 actively engaged soldiers to draw this special pay.

Military Justice, Discipline, and Legal Affairs

During fiscal year 1968, the court-martial rate per thousand

strength (including the reserve enlistment program) rose slightly to 38.14 per 1,000, compared with 34.92 during 1967 and 35.19 during 1966. In absolute terms, some 57,685 persons were tried by courts-martial, 2,375 of whom appeared before general courts-martial, 43,769 before special courts-martial, and 11,541 before summary courts-martial. The rate of 7.63 for summary courts-martial marked a decrease of 2.5 per 1,000, while the special courts-martial rate of 28.94 and that of general courts-martial at 1.57 recorded an increase of 5.8 and .2, respectively, over fiscal year 1967. Some 263,612 persons were punished under the provisions of Article 15 of the Uniform Code of Military Justice in fiscal year 1968 (174.3 per 1,000 strength) compared with 226,562 in fiscal year 1967 (158.4 per 1,000 strength).

Because of the increased strength of the Army and a wartime situation, absent without leave (AWOL) and desertion rates followed a predictable pattern and rose sharply during the year. In addition, dissident groups opposed to the United States commitment in Vietnam have organized both at home and abroad to encourage and abet military personnel to desert. Shelter, financial and travel assistance, and asylum are offered as inducements along with propaganda appeals. Although there is no immediate, direct relationship between these groups and the rising AWOL rates, measures are being taken by all commands to combat their propaganda efforts. During the year, 1,168 persons were convicted of being AWOL (Article 86, UCMJ) as compared with 876 during the previous year. Desertion accounted for the conviction of an additional 142 individuals, an increase of 48 over fiscal year 1967.

In the year ending November 30, 1967, there were 23,152 cases in which Army military personnel overseas were charged with offenses subject to the jurisdiction of foreign courts. The primary right to exercise jurisdiction was a privilege of the host country in 15,525 of these cases, although it was waived in 14,893 (96 percent) of the cases. Of the 5,641 Army members tried by foreign courts, only 83 received sentences to confinement which were not suspended. There were 5,385 convictions involving fine or reprimand, 83 suspended sentences, and 80 acquittals.

The Army buildup has resulted in a substantial increase in the number of military prisoners in confinement. To enable the Army to provide the intensive training, close custodial supervision, and correctional treatment necessary to return these men to duty as well-trained soldiers with improved attitudes and motivation, the U.S. Army Correctional Training Facility at Fort

Riley, Kans., was activated. With a capacity of 2,400 prisoners, this institution will commence correctional training activities on July 1, 1968.

During 1968, the U.S. Army Claims Service contracted 91,194 claims amounting to more than \$22.3 million and recovered 32,102 claims involving over \$970,000 in favor of the United States. (Contracted claims are those resulting, for example, from property damage caused by U.S. forces conducting maneuvers; recovered claims are those under which the United States is reimbursed for the costs of medical care to injured U.S. personnel or damage to U.S. property.) In addition, the International Affairs Division, Office of the Judge Advocate General, participated in the production of Department of Defense training films on the 1949 Geneva Conventions regarding the protection of victims of war and on Hague Convention No. IV with respect to the laws and customs on land.

In Vietnam, as elsewhere, the Army remains responsible to the Joint Chiefs of Staff for prisoner of war (POW) and civilian internee affairs, despite the fact that regulations and procedures developed during World War II and Korea are not totally relevant for application in the quasi-guerrilla operations of Vietnam. Several unique problems had to be overcome. Principal among these was the necessity to screen detainees and to accord them a legal status: POW, innocent civilian, civil defendant, or returnee. To solve the problem, it was decided to extend as a matter of policy the rights accorded POW's under the Geneva Prisoner of War Convention of 1949 and grant POW status to nonuniformed but bonafide members of all organized enemy forces. The resulting requirements for early screening were operating successfully by January 1967, with detainees classified at division level.

A new problem dictated by the nature of the Vietnamese conflict was precipitated by the decision to transfer all prisoners of war captured by U.S. forces to the custody of the Republic of Vietnam. Such transfers are permitted under Article 12 of the Geneva Prisoner of War Convention, but the United States had previously applied this transfer authority sparingly. Application of Article 12 now necessitated a U.S. advisory program to support and assist the Republic of Vietnam in the operation of its prisoner camp system.

During the fiscal year, the success of the over-all allied prisoner of war system was reflected in inspection reports submitted by delegates from the International Committee of the Red Cross. Delegates were allowed unrestricted access to all

allied facilities housing prisoners of war, in sharp contrast to the enemy's policy of not permitting inspections of any type in or around facilities housing captured U.S. or allied personnel.

Six prisoner of war camps have been established in Vietnam, including a special facility for women prisoners of war and a special youth training camp. The principal prisoner of war camp is on Phu Quoc Island off the Cambodian coast in the Gulf of Siam. By the end of the fiscal year, it housed well over 10,000 prisoners of war in a series of 10 separate enclosures. The remaining camps are used primarily for processing newly captured prisoners of war prior to their transfer to Phu Quoc Island.

Prior to November 9, 1967, an inductee who failed to complete or who qualified the information in his statement of personal history or armed forces security questionnaire had his induction withheld pending completion of an investigation. This delayed induction up to 6 months in some cases. Since the Army policy regulation, AR 604-10, is in the public domain and thus available to interested individuals, some inductees intentionally failed to complete or deliberately qualified the information in their forms in order to delay induction. In the vast majority of cases, security investigations revealed no derogatory information against these individuals. To expedite the processing of such cases and to insure equitable treatment for cooperative inductees, a new policy regulation was issued on November 9, 1967, that permits induction of an individual who modifies or fails to complete the required forms so long as his statement does not acknowledge membership in the Communist party or in an organization on the Attorney General's list. In such cases the security investigations are conducted after induction.

Health and Medical Care

During fiscal year 1968, continued combat in Southeast Asia contributed to an increase in the noneffective rate (the average daily number of active duty personnel per thousand average strength excused from duty for medical reasons) from 14.3 to 16.9 per 1,000. Noneffectiveness resulting from wounds suffered during combat similarly increased, from 2.3 to 4.2 per 1,000. The rate of admission to hospitals and quarters during the year averaged 38 per 1,000, or about 12 percent higher than the 345 per 1,000 average strength admitted during fiscal year 1967.

Of the wounded U.S. military personnel admitted to medical treatment facilities, 2.4 percent have died. This is slightly less

than the 2.5 percent recorded for the Korean war, and remarkably lower than the 4.5 percent of World War II.

While combat troop strength was increasing during fiscal year 1968, the hospitalization support available to Army forces also continued an orderly buildup. On August 15, 1967, the Department of Defense requested that the Department of the Army provide 1,100 hospital beds for the benefit of Vietnamese civilians with war-related injuries. These units were deployed and were to be operational early in July 1968. Civilian war casualties will be treated throughout the hospital system in Vietnam on a joint usage basis.

In Vietnam, the helicopter continued its role as a vital, almost indispensable part of frontline medical service and patient evacuation. By developing a high degree of mobility, flexibility, and responsiveness, the Army Medical Department helicopter evacuation system has overcome the extremely rugged terrain and insecure road network of the battle zone. During the year, air ambulances were increased from 61 to 110, and these completed over 94,000 aeromedical evacuations while flying approximately 47,000 combat hours. Approximately 27 percent of the patients were Vietnamese, and another 5 percent were from other free world nations.

By the end of fiscal year 1968, the emphasis on air mobility had placed a greater responsibility on the Army aviation medicine program, and approximately 72 flight surgeons and aviation medical officers had been assigned to major combat support units in Vietnam. Army aviation medicine is a special field concerned with applying medical and allied scientific knowledge to biological problems associated with flight. The over-all purpose of the program is to promote safe and efficient flight operations, to maintain the health and longevity of aviators, and to contribute to the over-all mission of Army aviation. Specifically, the Army aviation program includes medical examinations for selection of flying applicants and for guiding their subsequent development as pilots; clinical care of flying personnel; advice to commanders and boards of officers regarding medical aspects of aviation problems; assistance in the formulation of policies for the utilization of flying personnel, aircraft, and related equipment; and medical investigation of aircraft accidents with recommendations for their prevention.

During the past year, 431 participants were enrolled in the Walter Reed Army Institute of Nursing (WRAIN) program, 59 of whom constituted the first graduating class and were com-

missioned second lieutenants in the Army Nurse Corps on May 14, 1968. Following their officer orientation course at Brooke Army Medical Center, Fort Sam Houston, Tex., these officers were assigned to Army Medical facilities throughout the continental United States. Continuing to attract Army Nurse Corps candidates of great potential, the WRAIN program received 613 applications for the class of 1972, some 170 of whom had begun their nursing education in civilian institutions by the end of the fiscal year.

The number of potential beneficiaries of the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS) has more than doubled since its inception, having grown from 2,772,800 in 1956 to an estimated 6,014,214 during 1968. Similarly, the volume of claims paid under the program has also doubled, from 600,940 during fiscal year 1966 to an estimated 1,360,293 during fiscal year 1968. During 1967, increased benefits to retired members and their dependents, as well as to dependents of deceased active duty and retired members, had been authorized by the military medical benefits amendments of 1966. Expenditures for CHAMPUS operations for fiscal year 1968 are expected to reach \$170 million as compared to an annual expenditure of about \$75 million in fiscal year 1966 prior to expansion of the program.

Housing, Religion, Safety

The Army's requirements for family housing, based on long-range strength and deployment estimates, are 350,743 units. Present assets, consisting of military-controlled units and off-post housing, total 213,132 units. Although the gross deficit appears as 137,611 units, Department of Defense program criteria reduce this figure to only 37,113. The approved Five-Year Defense Program encompasses 12,130 new units to be constructed worldwide from appropriated funds, 600 additional trailer spaces, and 550 rental guarantee units. During fiscal year 1968, appropriations were limited to only 1,350 of the 2,850 units originally included in the Department of Defense budget. Contract awards for 1,330 of the 1,680 units deferred from the 1966 program were made; the remaining awards will be granted by the first quarter of fiscal year 1969. All construction from earlier programs was completed, with the exception of the moribund 94-unit project at Fort Richardson, Alaska, which is unsupported by current requirements. The Secretary of the Army has approved a comprehensive family housing study

during January 1968 and has forwarded recommendations to the Secretary of Defense. Some require his approval; others await pending legislation.

Bachelor officer quarters (BOQ) and troop housing presented the Army with the compound problem of an acute shortage of units and the growing obsolescence of units in current use. Considering the Army's long-range goal for permanent troop barracks (394,518 spaces) and the present assets in existing buildings or those under construction (296,336 spaces), the true deficit of 116,269 has been met through the interim use of temporary World War II barracks. The long-range requirements for BOQ's (22,744 spaces), less the assets in existing permanent buildings (13,137), leaves a true deficit of 10,320 to be balanced by use of the same World War II housing. The magnitude of this obsolescence is approximately one-third of all Army troop housing and approximately 6,000 BOQ spaces.

Beginning in fiscal year 1968, commissioned officers of rank O-1 through O-3, warrant officers, and enlisted personnel in grades E-7 through E-9, were permitted to live off-post and to draw basic allowance for quarters when minimum standards of adequacy could not be met. An increase in the statutory limitations on new BOQ housing construction costs per man, incorporated in the fiscal year 1968 military construction authorization bill, was denied by Congress. The Department of Defense has now developed standard bachelor housing designs under revised criteria; these will serve as the models for programming and obtaining construction funds for future housing.

The Department of Defense program initiated in April 1967 to secure equal opportunity in off-post housing for all servicemen irrespective of race, creed, color, or national origin, continued to record unprecedented success. The Secretary of Defense outlined a two-phase program to be initiated by all military installations in the continental United States having a population of 500 or more military personnel. Phase I consisted of a comprehensive census of all available apartment buildings, housing developments, and mobile courts of five or more rental units situated within normal commuting distance from the post. Phase II was a followup effort to enlist community support for voluntary improvement in nondiscriminatory housing.

During the first 11 months of intensive effort, the Army succeeded in adding over 64,000 rental units to the census and over 110,000 units to the number originally identified as having a nondiscriminatory rental policy. Within the framework of

Department of Defense policies, the Army acted to eliminate housing practices discriminatory toward servicemen; among others things, the Secretary and Under Secretary of the Army met with local civic, community, and business leaders, and with property owners and realtors, to discuss and solicit their support for the program.

The authorized strength of the Chaplains Branch was reduced to 1,825 during fiscal year 1968. Denominational quotas assigned to the three major religions were altered, however, to 1,090 for the Protestant, 667 for the Catholic, and 68 for the Jewish faith. By yearend, the actual branch strength totaled 1,866, comprising 1,406 Protestant, 423 Catholic, and 37 Jewish chaplains. In Vietnam, 409 chaplains were engaged in ministering to the needs of servicemen, an increase of 146 over the preceding year. Two chaplains were killed in the pursuit of their calling, and 19 were wounded. Throughout the world, 331,653 services were conducted, with a total attendance in excess of 16.5 million worshipers.

During fiscal year 1968, four chapels were completed, one a chapel center, three unit chapels. Chapel beautification and improvement programs were emphasized during the year. The Chief of Chaplains established workshops in specialized areas of the chaplain ministry which evoked the professional assistance of other Army branches. Hospital ministry workshops were held in conjunction with the Surgeon General, and workshops for the soldier in confinement were held in cooperation with the Provost Marshal General. Greater depth was added to the chaplain's pastoral ministry program through supplemental training in counseling and pastoral care provided through civilian institutions.

In fiscal year 1968, Army Safety Program personnel worked with their counterparts in other military Services and Federal agencies to establish a uniform system of terminology and of recording data. Improvements were made in the Safety Program's management information system, and research into the causes of accidents was intensified in an effort to find ways of reducing specific types of accidents. Since the quality of the Safety Program depends in large degree on the people who run it, efforts were made to recruit qualified personnel for safety positions and to improve their professional skills through courses at the Adjutant General School, Fort Benjamin Harrison, Ind.

Mishaps involving motor vehicles, aircraft, small arms, and drownings accounted for most of the Army's accidental fatalities

and severe injuries during 1968. Except for motor vehicles, these problems were associated directly with military activities in Vietnam. Training, education, and supervision were improved in an effort to reduce losses from these categories of accidents, and the National Safety Council again presented its Safety Award of Honor to the Department of the Army for excelling in accident prevention. Headquarters, Department of the Army, also presented awards for outstanding accomplishments in accident reduction to major commands, numbered armies, and divisions.

Personnel Management and Special Problems

Between December 1967 and June 1968, the first draft of the "Army 75" personnel concept was prepared and completed. Geared to the 1975 time period, this major study creates a unifying personnel concept for the Army of the 1970's while adhering to the personnel life cycle of procurement, distribution, individual training, sustainment, and separation. Embracing both military and civilian personnel, the final report is scheduled to be completed by December 30, 1968.

During the past year, the Military Occupational Information Data Bank (MOIDB) has progressed from a conceptual basis to an operating system. On March 31, 1968, the MOIDB became operational as a computerized system, and the Army became the first Service to put its automated system to use in military job analysis. Reports on 11 Army enlisted military occupational specialties (MOS) have already been processed, and approximately 25,000 questionnaires, covering 58 additional enlisted MOS, have been distributed to the field and are presently in varying stages of completion.

The New Equipment Personnel Requirements Summary (NEPRS) summarizes those materiel items or systems which have a significant bearing on personnel, training, and organizational problems. Included is a tabular recapitulation of the quantitative requirements, by MOS and by fiscal year. NEPRS recipients utilize the information for purposes ranging from a detailed description of new materiel to personnel input data needed for the Army Force Development Plan. Since the inception of NEPRS, efforts have been made to improve both the quality and the quantity of information digested. Expected improvements encompass the identification of additional sources of input, the refinement of current procedures, the capacity to handle more items of equipment, and the ability to relate the personnel implications to more variables.

Personnel inventory analysis (PIA), a new method of providing personnel management planners with the means to project the status of the Army's personnel inventory 2 years into the future with respect to a given force structure, has progressed since its inception in September 1965. By predicting what problems might arise, PIA enables the Army to lessen or eliminate the impact of such problems by acting in time. Already completed is the computer model which projects enlisted strength and which then distributes both enlisted and officer assets over a given force structure. When operational, PIA will also include computer models which will describe enlisted personnel in terms of four character MOS, and officers by grade and branch. The first type of model will project officer and enlisted assets over a 2-year period under a changeable set of promotion, retention, and other policy parameters. A second model, also flexible in adaption, will distribute these projected assets over an assumed force structure. A final type of computer subsystem will analyze the distributions previously generated and suggest possible courses of action.

A Data Processing Service Center was organized at Long Binh, Vietnam, in February 1968 to consolidate three Vietnam data processing units previously deployed with U.S. Army, Pacific, and to equip them with computers comparable to those of other major theaters. Automation at the command level in Vietnam will provide a more rapid collection and refinement of the data needed to compile a centralized personnel master file for Vietnam personnel. The Department of the Army will benefit through reception of more current and more accurate data from Vietnam; U.S. Army, Pacific, will be aided through a better distribution of a responsibility now taxing that command's capability to the utmost.

Despite the fact that the Army very often trains men in skills necessary for a professional military force but readily transferrable to the civilian labor market as well, some individuals enter service without a civilian skill, receive job training applicable only to the Army, and are separated without having developed abilities to improve their status in civilian life. With these individuals in mind, the President initiated and the Army launched Project Transition, designed to provide in-service job training reflecting current or projected employment needs and educational upgrading to offer a high school diploma or its equivalent.

From a pilot project established at Fort Knox, Ky., on June 6,

1967, Project Transition had expanded to 42 installations in the United States as of January 6, 1968. Enlisted personnel with from 1 to 6 months of service remaining prior to separation are eligible to participate in this voluntary program. Actual training is provided by the Army, by other Government agencies, and by the private sector of the economy; job placement is sponsored by the U.S. Employment Service and private industry. Since its founding, Project Transition has enrolled 14,786 enlisted personnel in academic and skill training courses, 9,844 of whom have emerged as vastly improved alumni.

As a direct result of the difficulties experienced by police agencies throughout the Nation in acquiring sufficient numbers of recruits, in November 1967 the President directed the Secretary of Defense to provide assistance in the recruitment of police officers. The Secretary of Defense designated the Army as executive agent to develop and coordinate this program with Federal, state, county, and municipal officials, and authorized the early release (up to 90 days) of servicemen who had received an appointment with an authorized police agency. The initial step involved a test period during which the Metropolitan Police Department of Washington, D.C., conducted direct, formal recruiting at various east coast military installations. Results of this test program indicated both the feasibility and the possibility of expanding the program; recruiters representing 43 major metropolitan areas of the United States were granted permission to conduct onbase testing and interviews.

Simultaneously, a nationwide publicity campaign was initiated, stressing the need for police officers and offering servicemen the opportunity to contact any police agency of their choice, thus broadening the recruiting base still further. Late in April 1968, police agencies of any jurisdiction geographically situated near any military installation were granted permission to conduct formal onbase recruiting during off-duty hours simply by requesting support from the installation commander concerned. Since inception, the civilian police recruiting program has provided over 500 potential police officers to the major metropolitan areas of the United States, and a much larger number to state and local police jurisdictions.

During the past few years, the Department of the Army has provided increasing support for the President's Youth Opportunity Programs. To many neighborhood youths, the "old swimming hole" has been replaced by the Army recreation pool. Tours are also conducted and visits to military installations invited. A

recent analysis of the Army's capacity to participate in future programs has recommended the continuation of the expanded community relations type program, which has proved so successful in the past and been economical of men and resources.

Civilian Personnel

Despite reductions in personnel ceiling and budgetary limitations during fiscal year 1968, civilian employment increased to 566,417, a slight gain of 1,317 employees over strength on June 30, 1967. While some strength fluctuations occurred during the year, primarily because of the termination of temporary employees, they were offset by gains in the full-time permanent work force totaling 2,415. The modest increase in total strength resulted from a decrease of about 2 percent in local national employment, coupled with an increase of approximately 1 percent in the number of U.S. citizens. Of the entire work force, 164,598, including 151,900 local nationals, were employed outside the 50 states. Germany, Vietnam, and Korea alone accounted for over two-thirds of all local labor employed.

While the ratio of local nationals to military and U.S. civilian employees varies from country to country, indigenous workers comprise over 50 percent of the personnel engaged in logistics and support activities, and as high as 73 percent of the work force engaged in engineer, utility, real estate, and base service functions. One of the primary reasons for utilizing locally available labor is financial; the cost of hiring a local national employee equivalent to a GS-4 clerk ranges from \$3,342 a year in Italy to \$991 a year in Korea, including fringe benefits. By contrast, a U.S. citizen would cost the Army \$5,145 a year, excluding fringe benefits, transportation abroad, and other allowances.

The need to recruit U.S. citizens for employment in Vietnam required many special efforts, including visits by recruiters to 40 Army installations and 78 universities and colleges. The Department of the Army had on hand 239 requests for recruits at the beginning of the fiscal year, received another 755 during the year, and selected or dispatched 368 employees to meet these requirements. Of the remainder, 184 requests were canceled and 442 remained unfilled. The majority of the remaining requests were received near yearend, when 267 additional spaces were authorized the 1st Logistical Command. The shortage of skilled Vietnamese citizens with employable skills inspired an intensive training program, particularly for interpreters, clerk-typists,

electric accounting machine operators, heavy equipment mechanics, forklift operators, and truck drivers.

Rotation of U.S. citizens between CONUS and overseas assignments received priority attention to insure conformance with the policy limiting overseas service to a maximum of 5 years. Any extension beyond this time must meet stringent requirements and is determined on a case-by-case basis. Long-term employees overseas in 1966, under no obligation to accept a continental United States assignment, were spared retroactive application of the 5 year maximum. Progress has been made, however, in returning these personnel to the United States through counseling and other nonmandatory actions.

President Johnson in January 1968 initiated a phased program to reduce the number of U.S. personnel overseas and thereby reduce the U.S. balance of payments deficit. The program applies to all employees under the jurisdiction of U.S. diplomatic missions, including civilian agencies, military attachés, military assistance advisory groups, and all other military personnel under the ambassadors. Steps include reducing American personnel abroad by 10 percent, conducting an intensive review of inordinately large U.S. missions in 10 countries, and expanding reductions both numerically (in terms of the number of countries) and statistically (in terms of the percentage of reduction). The program does not apply to U.S. personnel in Vietnam.

Civilian employment during fiscal year 1968 returned to a pattern similar to the one between the Korean and Vietnam buildups. Voluntary losses were low compared with other employers, while involuntary losses increased with termination of most temporary employees not directly supporting operations in Vietnam. During most of the year, Army activities operated under hiring restrictions and used normal attrition to attain lower authorized strength levels. The hiring of new permanent employees was therefore significantly below last year's level. The recruitment effort was no less difficult, however, since there were nationwide shortages in some skills, and problems arose as a result of abrupt changes in employment ceilings.

Support of Vietnam received the highest priority. The U.S. Civil Service Commission, for example, authorized the use of term appointments for more than 1 year, but not to exceed 4 years, to positions directly supporting the war effort. This authority permits conversion of on-board temporary employees to term appointment, and sanctions the term appointment of new employees. These arrangements provide greater stability, a better

recruiting posture, and more flexibility than temporary appointments since employees receive greater benefits and can be promoted or reassigned to other positions directly related to Vietnam.

Special employment programs, including equal employment opportunity, have been stressed increasingly every year since 1961. Despite the Administration's emphasis and the sociological ideals of these programs, it has been found that many of them require more effort, both by supervisors and personnel staffs, to employ, train, motivate, and utilize employees than is demanded when regular employment sources are used.

During the past year, special programs for the employment of Vietnam veterans were initiated; goals for employment of the young and the disadvantaged were increased; and greater emphasis was placed on equal employment opportunity and the employment of women. Despite these demands upon limited resources, significant progress was made in the special programs. For example, the Army employed 22,000 youths during the summer of 1967, and minority group employment between June 1965 and November 1967 showed a steady increase.

The Department of the Army now has 14 career management programs in operation on an Army-wide basis and covering over 81,000 civilian employees. Civilian Personnel Regulation 950-1, the Army's basic career management publication, was revised to improve management of these employees. Provisions were incorporated to strengthen the role and responsibilities of designated career program functional chiefs, to provide for meetings of career planning boards to assist the functional chiefs in developing policies and procedures, to provide career screening panels to expedite the referral process, and to accomplish other administrative improvements.

The Executive Assignment System was established by the Civil Service Commission in accordance with Executive Order 11315 dated November 17, 1966, and activated 1 year later. Its purpose is to provide a Government-wide source of highly qualified candidates for top level civilian positions. There is provision, however, for conducting recruitment outside the Government after qualified Army employees and employees referred from the Executive Inventory have been considered. As a result of the changes, the Army's Executive Salary Committee was discontinued and the Civilian Executive Personnel Board established. Besides serving in an advisory capacity to the Secretary of the Army, the Board performs functions relating to the establishment and staffing of executive level positions.

Late in fiscal year 1967, the Bureau of the Budget and the Department of Defense removed the numerical limitations on high-grade positions (GS-14 and above). New procedures developed during fiscal year 1968 provided for gradual elimination of the numerical limitations and required commands to obtain prior approval from Headquarters, Department of the Army, before making significant changes in GS-14 and higher positions or in establishing new ones. In August 1967, average grade allowances assigned by the Department were discontinued. Position structure surveillance was maintained through tables of distribution and allowances, and plans were developed providing for grade level guidance for typical key jobs in activities such as arsenals, engineer districts, hospitals, laboratories, supply depots, and class I installations.

Army representatives also participated with Civil Service Commission and Department of Defense officials in the formulation and review of proposed policies, regulations, and procedures for the Coordinated Federal Wage System. When operational, the new system will cover approximately 800,000 wage board employees in trades, crafts, and laboring occupations. Its basic purpose is to guarantee interagency equality in wage rates; it will standardize and replace the complex systems presently used by over 50 different agencies in more than 300 wage areas. The Civil Service Commission will introduce the new system on an area-by-area basis beginning July 1, 1968.

Development of the Defense Civilian Career Executive Institute was halted when Congress withheld funds requested for fiscal year 1969 and then requested a study of Department of Defense schools and courses to determine if unnecessary duplication of effort would be involved in its establishment. The study was completed and the findings reported to Congress in February 1968. It confirmed the need for the Institute. Despite Army plans, operations were still awaiting Congressional action on the Army budget for fiscal year 1969 as the year closed.

Employee union activity continued to increase, and the Department of the Army now has 601 approved bargaining units, 389 of whom have exclusive recognition while the remaining 212 enjoy formal recognition. There are over 141,000 Army employees covered by exclusive recognition which provides not only for consultation with the union on new or revised personnel policies, but also concedes to the union the right to negotiate a written agreement on these matters. The number of such agreements ap-

proved by the Department has now reached 208, an increase of 67 over the year.

During September 1967, the President appointed a Cabinet-level committee to review operations under Executive Order 10988, Employee Management Cooperation in the Federal Service, and make recommendations for changes. In October 1967, the Assistant Secretary of the Army (Manpower and Reserve Affairs) presented the Department's recommendations to the review committee in open hearings. Although not made public by the end of the fiscal year, the committee's proposals will probably result in a new or amended Executive order substantially altering union-management relations in the Federal service.

Civilian Personnel Regulation M-100, Mobilization Planning and Execution, was revised to provide additional guidance to Army agencies in formulating civilian mobilization plans to become operative during limited or general wartime emergencies. This revision augments the provisions of the National Plan for Emergency Preparedness, issued by the Office of Emergency Planning, as well as the regulations and procedures issued by the Department of Labor and the U.S. Civil Service Commission for stabilizing and controlling civilian manpower and wages under wartime emergencies.

The Army suggestion program celebrated its 25th anniversary by realizing over \$70 million in first year benefits from adopted suggestions. Military personnel accounted for some \$13 million of this amount, more than double their performance during fiscal year 1967, the first full year of operations under Public Law 89-198. Army Regulation 672-20, Incentive Awards, was revised in an effort to improve administration of the program. Commanding officers were given the option of delegating authority to supervisors for approving cash awards up to \$100 for adopted suggestions in order to speed up the processing procedure and to reduce the demands on the time of the Incentive Awards Committee.

V. Reserve Forces

In considering the means of resisting foreign aggression and preserving internal order and tranquillity, it should not be forgotten that much reliance is wisely placed on the militia. This reliance exempts the United States from the dangers and the expense of a large standing army. In proportion to the importance of the duties which may be required of the militia, should be the care of the government to prepare this force for the performance of them.

Report of Secretary of War William L. Marcy
November 29, 1845

The requirements of national defense in the sixth decade of the 20th century differ from those of the fourth or any other decade of the last century more in degree than in nature. Keeping the Nation's reserve forces abreast of the times is a continuing task, and in fiscal year 1968 the Army's reserve components were reorganized under a plan that was evolutionary and had been several years in the making.

Reorganization of the Reserve Components

To go back a bit, the Secretary of Defense early in June 1967 approved an Army plan for realigning National Guard and Army Reserve forces, designed to improve their combat readiness and their early deployment capability in case of need.

Presented to the Congress, this plan was opposed on two counts. The chairman of the Senate Armed Services Committee felt that some combat and combat support capability should be maintained in the structure of both the National Guard and the Army Reserve. In the House of Representatives there was sentiment for a minimum average strength of 260,000 in the Army Reserve rather than the 240,000 contemplated in the Army plan.

Further analysis of the plan, in the light of Congressional and reserve community viewpoints and Army judgments on force structure viability, led to a revised plan that retained three combat brigades and some combat support units in the Army Reserve and provided a paid-drill strength authorization of 260,000. With some exceptions, the manning level for all units was established at 90 percent or higher of full wartime authorizations. Both components were allocated sufficient combat service support struc-

COMPARISON OF 1967 AND 1968 FISCAL YEAR STRUCTURES

[Units and Strengths]

Units	Fiscal Year 1967 Structure			Fiscal Year 1968 Structure		
	ARNG IR/RR ¹	USAR IR ¹	Total	ARNG	USAR	Total
Combat Divisions	8/15	0	23	8	0	8
Training Divisions	0	13	13	0	13	13
Command Hq Divisional	0/5	0	5	0	0	0
Combat Brigades	7/0	4	11	18	3	21
Maneuver Area Commands	0	2	2	0	2	2
Air Defense Battalions	44/0	0	44	31	0	31
Field Army Support Command	0	0	0	0	1	1
Support Brigades	0	3	3	1	4	5
Adjutant General Units	36/0	96	132	40	121	161
Civil Affairs Units	0	77	77	0	53	53
COSTAR Units	0	38	38	123	163	286
Finance Units	1/0	18	19	1	26	27
JAG Units	0	196	196	0	226	226
Hospital Units	15/0	107	122	15	106	121
Military Police Battalions	6/0	0	10	7	4	11
Public Info Units	34/0	25	59	34	24	58
PSYOPS Units	0	8	8	0	6	6
Garrison Units	0	18	18	0	9	9
Terminal Units	0	19	19	0	19	19
Total Companies and Detach- ments	2,520/1,480	3,575	7,575	^{3,4} 2,890	² 3,482	² 6,372
Paid Drill Strength	(000)307.9/110.6	270.1	688.5	³ 400	³ 270	³ 660

¹ IR—Immediate Reserve: Manned at 80% or higher of full wartime strength; necessary equipment being procured.

RR—Reinforcing Reserve: Manned at 50% of full wartime strength; no equipment being procured.

² Manned at 90% or higher of full wartime strength; to be fully supported with equipment, technicians, spare parts.

³ Includes the following units mobilized May 13, 1968:

ARNG	83 Companies/detachments	12,600 paid drill strength.
USAR	45 Companies/detachments	5,900 paid drill strength.
Total	128 Companies/detachments	18,500 paid drill strength.

⁴ Does not include 144 ARNG Companies/Detachments organized for the sole purpose of satisfying state needs.

ture to meet maintenance, supply, and service requirements. Eliminated in all cases was the requirement to activate in one component a unit comparable to one inactivated in the other component. The structural changes were made within the original 700,000 table of organization and equipment strength ceiling and the same numbers and types of maneuver battalions were retained. The revised plan also provided for maximum use of existing assets of both components to minimize organizational turbulence. The accompanying table compares the old structure with the new as concerns units and strengths.

The Army's basic reorganization objectives were met in the plan. Eight divisions and 21 separate brigades and necessary supporting units, manned at 90 percent or higher, would provide the immediately available combat power required. The structure would permit the attainment of realistic readiness goals, personnel and equipment assets would be brought into better balance, and greater reliance could be placed on reserve component participation in contingency plans.

In anticipation of early Congressional approval of the revised plan, the Army on July 20, 1967, directed the major commands to plan for the reorganization to begin on October 1, 1967. Congressional approval was inherent in the passage on September 29, 1967, of the fiscal year 1968 Defense Appropriation Act. Nevertheless, it became apparent that additional time would be required to resolve National Guard state allocations and complete Army Reserve stationing plans. Reorganization was thus delayed to December 1, 1967. In November the Department of Defense announced that the reserve components would be authorized a 3 percent overstrength to assist them in attaining the average annual strengths authorized by Congress. Except for minor delays resulting from the partial mobilization of May 1968, the reorganization progressed smoothly and was completed by May 31, 1968.

Partial Mobilization of the Reserve Components

On April 11, 1968, the Secretary of Defense announced the order to active duty, for a period not to exceed 24 months, of approximately 24,500 personnel from the reserve components of the Army, Navy, and Air Force. The Army portion constituted the bulk of the force selected for mobilization and consisted of 34 National Guard and 42 Army Reserve units with a TOE/TD strength of 20,034. Selected Army units were widely distributed among 34 states.

In addition to unit mobilizations approximately 2,800 members of the Individual Ready Reserve were ordered to active duty. These individuals were needed to help bring mobilized units up to full organizational strength and to meet some critical needs of the active Army.

Earmarked for eventual deployment to Vietnam were reserve component units with a total strength of about 9,000. The balance of the units not deployed was assigned in the continental United States and Hawaii as a part of the strategic reserve.

During the alert period, active Army teams consisting of personnel management and logistics specialists assisted the mobilizing units in the variety of actions that must be taken prior to reporting for active duty. The teams were of great assistance to the units preparing for active service, although their use would appear to be feasible only in a limited mobilization like the present one.

The mobilized Reserve and National Guard unit personnel went on active duty on May 13, 1968.

Selected Reserve Force

In the fall of 1965 a Selected Reserve Force (SRF) was established to compensate for planned deployments of active Army units to Southeast Asia and to improve the Army's readiness against the possibility of emergency situations elsewhere in the world. By 1967 this force lacked the balance required by changing conditions, its temporary status had developed into something more permanent, and the selected units in the force had carried the burden of added training and an increased likelihood of mobilization for 2 years. The reorganization of the reserve components offered an opportunity for a concurrent updating of the Selected Reserve Force.

The existing force of three infantry divisions, six brigades, an armored cavalry regiment, and support units was modified by adding certain support units to balance the force while eliminating others in order to create a three-division force equivalent; this interim force (designated SRF IA) remained operational from December 1, 1967, to May 1, 1968, when a new force (SRF II), organized on December 1, 1967, and trained under accelerated schedules, assumed the Selected Reserve Force mission.

The original SRF achieved the highest readiness posture ever attained by reserve elements short of mobilization, and the Army derived a wealth of useful information from the experience. It

was demonstrated, for example, that reserve units can rapidly attain and support a 100 percent strength level if they are in the right geographical locations. It was also shown that units manned at 100 percent strength can train more meaningfully and achieve far better results than can understrength units, and that individual reservists find the accelerated training program of 58 drills per year more palatable than a schedule of 72, which might cause many nonobligated reservists to leave their units. Finally, with priorities on equipment and extra drill authorizations, it proved to be feasible for SRF units to carry out company-level training and to conduct Army training tests. The lack of battalion-level training facilities restricts most units to company-level training at home stations.

The new Selected Reserve Force has an authorized (paid drill) strength of 137,427 (89,088 ARNG; 48,339 USAR) in 1,124 units (623 ARNG; 501 USAR). Assigned strength as of June 30, 1968, was 131,790 (87,428 ARNG; 44,362 USAR).

Readiness

Reserve component paid drill strength totaled 680,031 (418,074 ARNG; 261,957 USAR) at the close of fiscal year 1967. Enlisted accessions during fiscal year 1968 totaled 80,866 (35,476 ARNG; 45,390 USAR), including 41,410 nonprior service personnel (23,726 ARNG; 17,684 USAR). A paid drill strength of 633,421 (389,182 ARNG; 244,239 USAR), which excludes demobilized units, was attained as of June 30, 1968.

On June 30, 1967, there were 10,799 (5,605 ARNG; 5,194 USAR) nonprior service enlistees awaiting initial active duty for training. The continuing active Army buildup and increasing active Army training requirements imposed on existing training base facilities curtailed the number of training spaces available for reserve components during the last 4 months of fiscal year 1968. The total number of individuals in the reserve enlistment program to enter active duty for training in fiscal year 1968 was 32,510 (20,788 ARNG; 11,722 USAR), while 18,426 (8,239 ARNG; 10,187 USAR) were awaiting active duty on June 30, 1968.

At the beginning of the fiscal year 28,332 technicians were employed with the reserve components (23,758 ARNG; 4,574 USAR), including 5,043 in the air defense program and 220 in the program for military support of civil defense. As of June 30, 1968, the actual number of technicians employed was 27,706 (23,239 ARNG; 4,467 USAR), including 4,976 in air defense and

219 in military support to civil authorities (501 temporary technicians not included).

The materiel readiness condition of the Army's reserve components was adversely affected during fiscal year 1968 by further aging and depreciation of equipment and by the necessity to withdraw some selected items for the active Army. However, over-all equipment readiness improved with the issue of significant quantities of new major equipment, and some additional improvement could be credited to the reduction of the total force requiring support.

The 1964 suspension of the reserve components construction program was lifted in the 1968 fiscal year and \$3 million was appropriated for each of the components. Added to prior year funds still being retained, this made \$22.1 million available to the Guard and \$13.1 million available to the Army Reserve. Total obligations for the fiscal year were \$5.7 million and \$1.6 million, respectively.

With the release of funds for military construction, 18 armory and 14 nonarmory projects were programed for the Army National Guard during fiscal year 1968, while 13 projects were scheduled by the Army Reserve, 2 of them jointly with the Navy. Completion of the reserve projects will make available home station training facilities for 5,200 personnel.

The reserve components occupied 3,818 armory-type facilities (2,786 ARNG; 1,032 USAR), of which 1,956 were constructed or reconstructed with Federal funds; 479 are leased and 1,383 are donated or permitted.

Attendance at unit training assemblies remained high during this year. The aggregate percentage of attendance was 95.3 (97.3 ARNG; 91.8 USAR).

The reorganization of the reserve components had its effect on readiness, as many individuals required retraining. Additional instructors were authorized for Army Reserve schools to help meet the requirement. There was also continued expansion of the reserve school system, a primary source for training personnel of the reserve components. Enrollment increased from about 24,000 to 30,000.

There were changes in the Army Reserve aviator program during the year. The continued demands of Southeast Asia on the aviation training base, combined with the inability of reservists to remain on active duty for extended periods, led to the establishment of a method for qualifying rated Reserve aviators. A civilian-military rotary-wing qualification course was authoriz-

ed, to start in fiscal year 1969, combining civilian contract primary instruction with military instruction conducted by the active Army. This course is designed for fixed-wing rated Reserve aviators and has the advantage of combining home station training with annual active duty training.

As the fiscal year closed there were 661 aviators assigned or attached to Army Reserve units, while the Army National Guard has 1,659 aviators as opposed to an opening strength of 1,765.

In August and September 1967 all units of the Army National Guard participated in a comprehensive program of civil disturbance and riot control training, consisting of 32 hours of instruction for units and 16 hours for the command and staff of battalions and larger units. The latter phase culminated in an 8-hour command post exercise in the preparation and testing of an operational plan for civil disturbance. The experience of the Detroit and Newark disturbances was applied in this training.

Because of the incidence of civil disturbance it was decided to train the majority of Army Reserve units in these operations and to provide them with the equipment required to carry out this mission. Riot control training was conducted during May and June.

Elimination of the 14 U.S. Army Corps and Revision of the Army Reserve Command Structure

The January 1967 decision of the Secretary of Defense to eliminate the 14 U.S. Army corps of the active Army which were responsible for the control and administration of the Army Reserve in the continental United States was executed in the first 6 months of 1968. The remaining three corps headquarters will be inactivated on July 1, 1968. During the 6-month period of corps headquarters inactivation, 18 new U.S. Army Reserve general officer commands were activated to assume some of the control responsibilities of the eliminated agencies; indeed, the elimination required a revision in the concept of command of U.S. Army Reserve units in the continental United States. The new structure placed every Reserve unit under an Army Reserve general officer command. Most of these commands report directly to a Continental U.S. Army commander. Substantially greater responsibilities are placed on Army Reserve commanders in this new chain of command.

Air Defense

The Army National Guard air defense program is now in its

16th year of operation. The 48 on-site batteries in the continental United States represent a large part of the NIKE-HERCULES commitment of the Army Air Defense Command, while the six fire units in Hawaii provide the only surface-to-air missile defense of that state. These units, manned by Army National Guard technicians, protect population centers against air attack and were operational around the clock during the past year.

A study is now in progress to determine the extent of possible National Guard participation in the operation and manning of the ballistic missile defense of the United States.

National Guard Support to Civil Authorities

In addition to its mission of maintaining a high state of readiness for possible Federal mobilization, the Army National Guard in its state role must be prepared to provide units that are organized, equipped, and trained to assist civil authorities in maintaining peace, order, and public safety. This involves providing military assistance during natural disasters such as earthquakes, tornadoes, floods, fires, hurricanes, and snowstorms; search and rescue and life-saving missions; and aid to civil authorities during civil disturbances.

During fiscal year 1968, National Guard units were employed during civil disturbances 75 times in 50 cities in 29 states and the District of Columbia. The governors of three states—Michigan, Illinois, and Maryland—and the Commissioners of the District of Columbia requested and received Federal troops to quell disturbances in Detroit, Chicago, Baltimore, and Washington, and National Guard units of these jurisdictions were Federalized to serve with the active Army units.

Special civil disturbance equipment, such as gas dispersers, bullhorns, body armor, grenade launchers, sniper rifles, and searchlights, has been made available to Guard units, and jeep-mounted searchlight and radio equipment has been prepositioned in several areas for rapid delivery if needed.

All states have reviewed and updated their civil disturbance plans and many states have conducted exercises to test them.

VI. Management, Budget, and Funds

It should be borne in mind that, whilst appropriations have been made to sustain our Army upon a peace footing, it has been called upon to prosecute an active and sanguinary war, for a distance extending from the thirty-fifth to the forty-sixth degree of north latitude, with very numerous tribes of hardy and warlike Indians Under these circumstances it has required the greatest watchfulness and care to keep the expenditures for the year within the appropriations for it. A sum of not less than half a million dollars has been required for these movements, the necessity for which was not and could not be foreseen in this department.

Report of Secretary of War John B. Floyd
December 3, 1860

To compare the Army's budget, strength, deployment, and operation today with its situation in these respects a century ago is to compare different worlds. The sum of half a million dollars that financed a full year of troop movements in an "active and sanguinary war" on the frontier in 1860 today purchases one Hueycobra helicopter for the Vietnam war. In the sixth decade of the 19th century, the day-to-day administration of the Army was recorded by pen and ink in ledger books; in the same decade of the 20th century, infinitely more records are kept by many more people much more rapidly with typewriters, copy machines, recorders, and computers. The task of managing an Army almost a hundred times larger than that of 1860 is a complex one that even in the brief span of a year requires a sustained evolution in budgets, methods, techniques, equipment, and organization.

Organizational Developments

Effective management requires efficient organization and there were several major and numerous minor organizational actions at the departmental level during fiscal year 1968. On January 1, 1968, the Office of the Assistant Secretary of the Army for Manpower and Reserve Affairs was established. The position was created in each of the military departments by the Reserve Forces Bill of Rights and Vitalization Act of 1967, to strengthen the management structure of the reserve forces. The incumbent will be responsible for manpower and personnel management;

National Guard, Reserve, and ROTC affairs; education and individual training; human factors research (with the Assistant Secretary of the Army (Research and Development)) employment policy and employment management relations; morale and welfare; and civil rights and equal opportunity.

The decision to deploy a "thin" missile system (see ch. III) led to the establishment at Washington, D.C., on November 15, 1967, of a Sentinel System organization under a lieutenant general as Sentinel System manager. Because of the broad national defense implications of the project, the system manager was placed within the Office of the Chief of Staff, to serve as the principal assistant and staff advisor to the Chief of Staff and the Secretary of the Army for matters pertaining to Sentinel, while exercising executive authority over the Sentinel program and resources, and staff supervision—in planning, direction, and control—over participating Army staff elements. The system manager, as head of the system organization, was designated commander of a Sentinel System Command at Huntsville, Ala., and a Sentinel System Evaluation Agency at White Sands, N. Mex.

As a result of the Detroit riot in July 1967 (see ch. II), the Army evaluated the roles and functions of all components—regular, Reserve, Guard—in civil disturbances. A departmental civil disturbance plan was published, training literature was updated, the Army Reserve was brought into the training picture, and an orientation course for senior officers was initiated. Organizationally, a Domestic Emergency Branch was established in the Army Operations Center to serve as the Army Staff contact point for civil disturbance planning and action.

The magnitude of the civil disorders that followed the assassination of Dr. Martin Luther King, Jr., and the extent of Army involvement pointed up the need for an agency of some substance to plan and coordinate civil disturbance activities. On April 5, 1968, the Secretary of Defense designated the Secretary of the Army as the executive agent for the Defense Department in all matters pertaining to the employment of Federal military resources during domestic civil disturbances. The Army thus became responsible, among other things, for providing policy and direction concerning plans, procedures, and requirements for all Service resources that might be employed during civil disturbance. Thus on April 22, 1968, a Directorate for Civil Disturbance Planning and Operations was established within the Office of the Chief of Staff. Headed by a lieutenant general, it took over responsibility for civil disturbance planning and operations from

the Deputy Chief of Staff for Military Operations. By the close of the fiscal year, plans were nearing completion for coping with emergency situations in a number of cities simultaneously.

Another organizational development during the fiscal year centered on the communications area. In September 1967 the Office of the Chief of Communications-Electronics was redesignated the Office of the Assistant Chief of Staff for Communications-Electronics. This elevation from Special to General Staff level recognized the advances that have been made in modern communications and electronics techniques and materiel; in the diffusion and complexity of communications in the Army; in the increasing requirements for communications staff support in the field and for centralized staff authority to deal with communications-electronics management and technical problems of concern to other elements of the General Staff; and in the Army's responsibility for certain Defense-wide communications-electronics systems. The elevated agency is now able to exercise full staff responsibility for communications-electronics functions as well as technical advice and assistance. The Assistant Chief of Staff for Communications-Electronics will also supervise the life cycle management of Army communications systems.

To strengthen logistical support of the Army Communications System, an Office, Special Assistant for Logistical Support of Tactical Communications, was established in August 1967 within the Office of the Deputy Chief of Staff for Logistics (ODCSLOG) to monitor and coordinate logistical support of tactical communications. The duties of this office were later expanded to include all communications-electronics equipment, and in June 1968 it was redesignated the Office, Special Assistant for Logistical Support of Communications-Electronics.

During the same period, the ODCSLOG was reorganized to concentrate and centralize direction over programs and budgets, and readiness, doctrine, and systems. Readiness responsibilities were combined with those relating to doctrine and systems, under an Assistant Deputy Chief of Staff for Logistics (Doctrine, Systems, and Readiness). Supply and maintenance responsibilities were placed under an Assistant Deputy Chief of Staff for Logistics (Supply and Maintenance). Programs and budget were placed under the direction of the redesignated Assistant Deputy Chief of Staff for Logistics (Programs and Budget), and a Director of Ammunition was established under his jurisdiction, consolidating the conventional ammunition functions assigned to the Office of the Special Assistant for Munitions and the Director Materiel

Acquisition with those pertaining to ammunition distribution formerly assigned to the Director of Supply.

The sharply increasing use of automation in military management led to the establishment on October 31, 1967, of the U.S. Army Computer Systems Evaluation Command. This agency is responsible for providing technical, management, and systems engineering assistance and advice, worldwide, to Army users of automatic data processing equipment. As a separate field activity, the command is divorced from organizational connection with computer users and is thus better able to carry out its computer evaluation and selection role.

Also established under the Army Comptroller in fiscal year 1968 was the U.S. Army Field Operating Cost Agency whose function is to identify accurately—through cost analysis studies, data gathering, and analysis of direct costs and of associated training and logistical support costs—the total cost of operating force units and weapons and support systems throughout the world.

Management Programs, Systems, and Techniques

Because of its appreciable size, complex organization and equipment, worldwide deployment, diverse functions, and high cost, the Army must have the most efficient and effective management methods and means that human capacity can provide. Management programs, systems, and techniques are applied at all levels in today's Army, over every branch of activity. Since those who make decisions at all levels of command and support must have information on which to base their actions, and since that information must be accurate, current, comprehensive, and immediately available, attention in recent years has centered on management information systems. A Study of Management Information Systems Support (SOMISS) conducted in fiscal year 1968 confirmed a trend, in both the commercial and military spheres, toward centralized development of automatic data procession (ADP) systems, the result of recent advances in both the sophistication and productivity of computers. The study indicated that the departmental headquarters organization for managing ADP systems and hardware should be strengthened; that departmental headquarters technical support to ADP users should be broadened; that a separate design agency to produce Army-wide systems be created; and that departmental staff agency personnel of the various functional areas—personnel, operations, logistics, finance, etc.—participate more in the formulation of ADP systems requirements.

Nine of the Secretary of the Army's information requirements concerning force structure, authorizations, resources, readiness, and deployability were analyzed during the year, exposing some gaps and deficiencies in the current management information systems. When the systems to answer these requirements are completed, top level management will have timely, reliable information and data on which to base policy decisions.

Supporting these requirements at the Army Staff level is the automated Force Accounting System (FAS) which was developed to record, maintain, and retrieve data necessary for force structuring, accounting, and control of the units of the active Army and the reserve components. It is the foundation for force-related planning and programing by all agencies of the Army. The FAS is now in full use and proved its great worth during preparation of the Army's fiscal year 1969 budget. The data base supporting FAS is closely monitored to insure accuracy and response to OSD's guidance.

There was also progress in improving and standardizing management information systems at various echelons within major Army commands. The Continental Army Command, for example, had previously established a substantial internal organization at the headquarters level; in November 1967 the CONARC Automated Systems Support Agency (CASSA), a centralized system design activity, was established to support the design, development, programing, maintenance, and extension of the command's two standardized systems—the CONARC class I Automated System (COCOAS) and the Centralization of Supply Management Operations (COSMOS).

The Army Materiel Command also has two major centralized data management efforts—the National ADP Program for AMC Logistics Management (NAPALM) and one for standardizing the depot system (SPEEDEX). In August 1967 the equipment for NAPALM was installed at the pilot site in St. Louis, Mo., and through the fiscal year actions were in progress to establish and staff the Automated Logistics Management Systems Activity (ALMSA), which is responsible for developing the standard programs.

Headquarters, U.S. Army, Pacific, also established a centralized management organization, the Field Systems Agency, to develop the commandwide standard supply system. This system has been extended to the 14th Inventory Control Center in four separate depots in Vietnam.

Headquarters, U.S. Army, Europe, which is assisted in its

systems development by such continental United States-based agencies as the U.S. Army Automatic Data Field Systems Command, during the year received automated equipment in each division for stock control and supply management, and planning was under way for a computer capability for corps support commands and other units to permit them to perform supply and maintenance management functions.

There were improvements in the year in the automated management information system of the Army Security Agency. The standard Resources Evaluation and Management System (REAMS) was extended to the ASA's subordinate elements in Europe and the Pacific to provide a data base of worldwide resources information to be used in the decision-making process.

The first increment of a Catalog of Interim and Standard Army Data Elements was published in April 1968; the catalog provides uniform data names, codes, and related information for Army-wide use in systems development, reporting, and data processing. A contract was awarded in June 1968 for a Department of the Army Vocabulary of Information Elements and related automated maintenance system. The vocabulary will be used to control the proliferation of new data elements.

The Army continued to participate in Department of Defense (DoD) data standardization and other management programs. The Army was designated the responsible agency to develop DoD data standards for survival measures planning and real estate functions. The Army provided the principal U.S. member at NATO Military Agency for Standardization meetings concerned with the handling of automated data.

The Army for the fifth year participated in the Defense Integrated Management Engineering Systems (DIMES) project to develop engineered time standards wherever possible. To date, about 70 percent of the potential personnel spaces in installations of the Army Materiel Command and Military Traffic Management and Terminal Service have been covered by performance standards. Favorable progress under DIMES had resulted in extension of its concepts to 150 activities by the close of the fiscal year, and almost \$43 million had been saved in Army installations up to June 30, 1968.

It is worth taking note of several developments in financial management during the year. The Army Resource Management System was tested at the Sixth U.S. Army, as a demonstration, for purposes of training, and in preparation for its ultimate application Army-wide. New concepts and procedures were intro-

duced to test operating level capabilities to meet management demands, the basic objectives of programing, budgeting, and accounting were met, and the system was readied for installation on July 1, 1968. At the same time a test of resource management system procedures for class I installations was conducted at Fort Benning, Ga., to develop, evaluate, and improve installation management.

The rapid expansion of operations in Vietnam and the attendant need for accelerated logistic support gave rise to the establishment of independent and expedient logistic support systems. The natural outgrowth was the establishment of separate financial systems responsive to these separate logistic systems. As a result, funds in support of operations in Vietnam became widely dispersed, flexibility in the use of the funds was impeded, over-all budget and funding responsibilities could not be established, and piecemeal funding actions became so numerous that the budgetary processes within the Department of Defense could not react as rapidly as necessary to adjustment requests, and the current status of support funds was not readily available.

A study of all financial systems used in support of operations in Vietnam resulted in the establishment on July 1, 1967, of a system of financial support which centered the financial responsibility for support of supply operations in Vietnam at one point with no impairment to logistic support. Procedures and machine programs were developed which provided for the collection and assembly of all out-of-country support documentation, converting the data into financial terms and disciplining the data for accounting control.

The system has eliminated the emergency funding actions which were so prevalent prior to the introduction of these procedures. It centers the full responsibility for financial support of operations in Vietnam in one commander and provides the commander with the complete and current status of the budget and fund situation on a daily basis. Additionally, the financial support system provides a built-in monitorship of requisitions in support of operations which serves the logistics as well as the financial managers.

In line with policy and procedural changes in the Department of Defense program, the Army cost reduction program was revised during fiscal year 1968, and with the introduction of a management improvement element was redesignated the Army Cost Reduction and Management Improvement Program. Eleven management improvement reporting areas were established, and

it is anticipated that some 40 more will be introduced in fiscal year 1969. The management improvement elements are measured on the basis of performance, while the cost reduction elements are measured by dollars saved. Development of performance indicators for complex management areas is considered to be an innovation of some importance. These indicators and their associated goals are unique to each management improvement area.

Progress in the cost reduction program continued during fiscal year 1968, when \$342.7 million was saved against a goal of \$235 million. In addition, the actions taken in fiscal year 1968 are estimated to have a 3-year savings effect of \$632.6 million for fiscal years 1968-70 against a goal of \$489 million. Several examples illustrate field participation in the program. A major and a master sergeant, while on temporary duty in Vietnam from their assignments at the U.S. Army Aeronautical Depot Maintenance Center, discovered that, by removing a helicopter's tail boom and mounting it on the fuselage during shipment, five UH-1 helicopters instead of three could be transported in the Air Force C-133 Cargomaster. Since payment is based on the number of flights made rather than on the number of helicopters shipped, this saved over \$0.6 million in fiscal year 1968 and will result in an estimated saving in excess of \$2.8 million in fiscal year 1969.

A value engineering study in the Honolulu District of the Corps of Engineers showed that a seawater cooling system could be more efficiently constructed by substituting a water collection chamber made of a surplus corrugated material and using centrifugal pumps in place of four wells equipped with vertical deep-well turbine pumps. The savings—almost half a million dollars in fiscal year 1968.

And finally, commercial tank storage for petroleum reserves was eliminated when personnel in Germany hit upon the device of using 215 rail tank cars at the Karlsruhe Terminal District for storage when they become excess after the relocation from France of the U.S. line of communications.

Cost analysis is just as important as cost reduction in the management process; sound cost analysis and cost-effectiveness studies are the foundation of managerial decisions relating to weapons systems development and production, depot maintenance, training programs, activations and deployments, and field operations. The Comptroller of the Army has over-all staff responsibility for the Army cost analysis program, while the Army Materiel Command, the Combat Developments Command, and the Continental Army Command are responsible for the collection,

storage, analysis, and dissemination of data in their functional areas. In the last fiscal year the program was concerned with classifying and recruiting personnel, collecting basic data, developing review and coordination procedures, and working out data processing methodology. The operating costs of specific Army units were analyzed and a contractual study was undertaken to determine the annual direct and indirect operating costs of the 1st Cavalry Division (Airmobile) and the 4th Infantry Division, both in combat in Vietnam. The study is unique in that it is concentrating on operating cost and is analyzing combat or "wartime" costs.

Also being conducted under wartime conditions is an automated personnel reporting system, personnel management and accounting-card processor (PERMACAP), being installed in division and personnel service companies throughout U.S. Army, Vietnam (USARV). PERMACAP provides procedures and equipment through which division personnel reports and rosters may be produced more easily and accurately than before. The system will benefit the entire Army as well as the units using it. The system will be operational by the fall of 1968 in Vietnam, Korea, Europe, and the United States.

The Corps of Engineers is also developing an integrated management information system and a long-range ADP plan, providing for nine regional ADP centers to serve 48 Engineer districts in the continental United States and Alaska.

During the year numerous other management procedures were carried forward, to analyze, measure and improve performance, simplify work, reduce reporting, and determine the status of programs. The support service functions of the Military District of Washington were analyzed, the operations of seven national inventory control points were examined, and a comprehensive review and analysis of the command and control structure in Vietnam was conducted. In all of these actions, organizational fitness, functional effectiveness, and possible duplication of effort or cost were appraised.

The first phase of a Program to Improve the Management of Army Resources (PRIMAR) was conducted in the period April through September 1967. The program is designed to develop an integrated resource management system that will provide and sustain the best mix of ready forces at minimum cost and within established policy constraints. Following problem definition, the second or study phase was initiated in January 1968, and 18 of 23 studies were in progress as the year closed and 2 had been

completed. The third phase, involving the testing and installation of elements of the system, began in June 1968. The underlying theme of PRIMAR is to develop an improved and more responsive Army planning and resource management system, at Department of the Army level, which will provide direction, control, and supervision of the requirements, allocations, and uses of Army resources.

Finance, Accounting, and Auditing

On October 11, 1967, the Government of the Republic of Vietnam informed U.S. officials in Vietnam that, retroactive to October 1, the monetary exchange rate of 118 piasters to \$1 formerly applied only to accommodation sales to eligible personnel for their personal use would be extended to include official and semi-official expenditures which had been based on an 80 to \$1 exchange. The military Services developed uniform procedures for all disbursing officers, and the Army provided Service-wide adjustment instructions so that a loss by exchange would not be recorded in official accounts.

On December 16, 1967, the Congress passed the Uniformed Services Pay Act of 1967 (Public Law 90-207), providing military personnel of all ranks with a 5.6 percent increase in basic pay retroactive to October 1, 1967. A special rate of pay was established for the enlisted man holding the position of sergeant major of the Army, and the law also increased the dependents quarters allowance for enlisted members in the lower pay grades; provided authority for a system of continuation pay for selected medical and dental officers who extend their active duty service (presently restricted to medical officers); refined the formula for computing future increases in the pay of retired military personnel, making it responsive to changes in the Consumer Price Index (its continued rise prompted a cost-of-living increase of 3.9 percent in April 1968); and provided authority to pay basic allowance for quarters and dislocation allowance to certain bachelor personnel in conjunction with a change of station. In a major departure from custom, the Congress included a provision in the act for future automatic increases in basic pay equal to over-all average increases authorized for civilian personnel of the Federal Government. Since in companion legislation automatic increases were provided for civilian personnel effective July 1, 1968; and July 1, 1969, the President on June 11, 1968, issued Executive Order 11414 increasing the basic pay of military personnel by 6.9 percent effective July 1, 1968.

Public Law 89-538 of August 14, 1966, authorized a savings deposit program for Service members on permanent assignment outside the United States or its possessions, under which deposits earn 10 percent interest computed quarterly. The law was designed to provide an attractive savings program for servicemen and help alleviate an adverse international balance of payments position. As of June 30, 1968, there were 109,984 accounts with deposits totaling \$104.8 million (25,501 officers with about \$55.1 million; 84,483 enlisted personnel with \$49.7 million). Almost 57 percent of the deposits belong to personnel in Vietnam. Monthly deposits have averaged \$10 million since January 1968, while withdrawals by returnees have totaled \$55.7 million over the fiscal year.

Public Law 90-330 of June 5, 1968, extended the authorization of 30 days of special leave and transportation at government expense to and from the leave site for members who voluntarily extend their duty tours in a hostile fire area for at least 6 months. The average transportation cost under this statute is about \$570.00. It is offset by reductions in the transportation of replacements and the relocation of their dependents.

Another Public Law, 90-207, of October 1, 1967, authorized the Secretaries of the uniformed Services to prescribe regulations authorizing convalescent leave travel allowances. Army members who become ill or suffer an injury while in Vietnam or another country and while receiving hostile fire pay are often evacuated to the United States for treatment and convalescence. When the patient's condition allows, leave may be granted, usually for a period of not less than 30 days, so that he may continue his convalescence at home. The regulations prescribed by the Army authorize one trip at government expense from a treatment facility to home and return.

In September 1966, the U.S. Army Audit Agency began auditing in Vietnam, and in February 1967 established an area office in Saigon with a permanent staff, which is occasionally augmented by the Pacific District office. Audits cover areas most important to the support of combat troops, while giving full consideration to a command's assessment of where the services are most needed. In fiscal year 1968, audits were conducted of ammunition management and accounting by the Republic of Vietnam; of the receipt and distribution of materiel by USARV; of the international balance of payments in Vietnam; of depot operations, maintenance facilities, and subsistence management in various subordinate elements of the 1st Logistical Command; and of

general purpose vehicles in USARV. Several others were in progress at yearend, and commanders have confirmed that these audits were of benefit to their commands and staffs.

The Army also participated in Department of Defense-wide audits, reviewing research and development contracts and international balance of payments transactions, as well as conducting internal Army audits to evaluate the efficiency and effectiveness with which resources are utilized in major mission activities.

Budget and Funds

The Army's budget request for regular appropriations for fiscal year 1968 totaled \$27.742 billion in new obligational authority. Following reviews by the Office of the Secretary of Defense and the Bureau of the Budget, the President requested \$23.629 billion for the Army. The Congress appropriated \$22.992 billion in regular funds, and another \$2.3 billion in a supplemental appropriation, for a fiscal year grand total of \$25.293 billion in new obligational authority. The chronological development of this budget is traced in the following table.

DEPARTMENT OF THE ARMY
CHRONOLOGY OF THE BUDGET ESTIMATE, FISCAL YEAR 1968,
NEW OBLIGATIONAL AUTHORITY

[In millions of dollars]

	Department of the Army	President's budget	Appropriated (PL 90-96)	Supplemental appropriations (PL 90-392)	Total fiscal year 1968
Military personnel, Army	7,986.7	7,870.0	7,760.3	65.0	7,825.3
Reserve personnel, Army	328.1	297.2	297.2	---	297.2
National Guard personnel, Army	348.2	345.0	345.0	---	345.0
Operation and maintenance, Army	8,406.4	7,103.0	6,942.4	¹ 1,182.2	8,177.4
				52.8	
Operation and maintenance, Army National Guard	252.6	241.0	241.0	---	241.0
National Board for the Promotion of Rifle Practice	.5	.4	.4	---	.4
Procurement of equipment and missiles, Army	7,515.0	5,581.0	5,462.5	¹ 937.5	6,400.0
Research, development, test, and evaluation, Army	1,774.7	1,539.0	1,505.7	---	1,505.7
Subtotal, excluding construction	26,612.2	22,976.6	22,554.5	2,237.5	24,792.0
			PL 90-180		
Military construction, Army	653.0	592.0	372.2	¹ 62.7	434.9
Military construction, Army Reserve	12.4	---	3.0	---	3.0
Military construction, Army National Guard	15.7	---	3.0	---	3.0
Subtotal, construction accounts	681.1	592.0	378.2	62.7	440.9
Total general accounts	27,293.2	23,568.6	22,932.7	2,300.2	25,232.9
Army Stock Fund	448.7	60.0	60.0	---	60.0
Total NOA	27,741.9	23,628.6	22,992.7	2,300.2	25,292.9

¹ Tentative amounts to be transferred from Emergency Fund, Southeast Asia.

VII. Logistics

The sale and disposition of large amounts of unserviceable and perishable stores still leave on hand an adequate supply of war material to meet any emergency that can possibly arise. The stock of clothing, equipage, quartermaster, subsistence, hospital, and ordnance stores, arms, ammunition, and field artillery is sufficient for the immediate equipment of large armies. The disbanded troops stand ready to respond to the national call, and, with our vast means of transportation and rapid organization developed during the war, they can be organized, armed, equipped, and concentrated at whatever points military emergency may require.

Report of Secretary of War Edwin M. Stanton
November 14, 1866

A century ago American military preparedness was geared to crisis. At the onset of an emergency the country gathered itself in a measured way to move gradually from a peacetime to a wartime footing. A return to peace meant a return to business as usual—a state of general unpreparedness. As a previous report suggests, readiness a hundred years ago could be fluctuating, unplanned, and dependent upon leftover stocks. Today it is deliberate, sustained, and dependent upon advance planning, regular appropriations, reserve stocks, long leadtimes, standby plant capacity, forward depots, prepositioned equipment, transport in being, and the myriad other considerations that go with modern military preparedness.

Logistical efforts in fiscal year 1968 were directed, in the larger sense, toward achieving a balance between the immediate demands of the war in Southeast Asia, the support of forces elsewhere, and the long-range programs related to future readiness and deterrence. This embraced actions to maintain and improve the materiel readiness of other than Southeast Asia forces; to reorient the Army's line of communications in Europe, further reorganize and streamline the logistics structure on the continent, and redeploy forces from Germany; and develop, during a period of rapid technological change and shift in Army mission requirements, the most efficient logistics system and management techniques for the future.

Procurement

The fiscal year 1968 program for procurement of equipment and missiles for the Army is the largest since the Vietnam war began; indeed, the \$6.556 billion available is the largest since 1952 at the height of the Korean war. About \$4.5 billion is for procurement that directly supports operations in Southeast Asia. The most significant increase over the previous year was for ammunition. Early deployments to Southeast Asia were supported primarily with mobilization reserve stocks of ammunition. As consumption increased and the production base expanded, ammunition procurement has mounted. The growth since 1965 is shown below:

[In millions of dollars]

	Fiscal year			
	1965	1966	1967	1968
Ammunition (all types) -----	360	1,317	1,306	2,457

Actual contract awards amounted to \$6.7 billion for the direct Army account (\$5.5 billion from fiscal year 1968 funding, and \$1.2 billion from fiscal year 1967 and prior years fund) and \$2.0 billion for other customers, totaling \$8.7 billion. This is a 19 percent increase over the \$7.3 billion awarded in fiscal year 1967 (\$5.5 billion for the Army and \$1.8 billion for other customers). The high level of procurement has made it possible for the Army to meet the demands of the war in Vietnam and increase support to allies there while improving the equipment posture of the whole Army.

The bulk of equipment delivered during fiscal year 1968, because of the leadtime required from placement of orders to deliveries from production, was primarily from fiscal year 1967 and prior year funding. The dollar totals on deliveries of major equipment and ammunition over the past several years (see chart) reflect the increases in inventory, even when considered in the light of consumption and loss.

Taking into account the deliveries made in 1968, the Army's estimated assets on hand as of June 30, 1968, were valued at \$19 billion against a requirement of \$29.4 billion. Although the increase in materiel requirements was occasioned by the Vietnam war, the simultaneous addition of temporary forces, the increased use of aircraft, an increase in ammunition requirements for new weapon systems, increased consumption of conventional ammunition, and increased costs resulting from accelerated production and inflation, all had their effect. The 1968 and 1969 funding will

MAJOR PROCUREMENT DELIVERIES

[In millions of dollars]

	Fiscal year 1965	Fiscal year 1966	Fiscal year 1967	Fiscal year 1968
Total	2,355	2,937	5,407	¹ 7,657
Firepower				
Ammunition	497	799	2,348	3,840
Missiles	451	362	392	436
Weapons and combat vehicles	409	322	467	498
Mobility				
Aircraft	290	520	687	999
Tactical and support vehicles	296	423	560	687
Communications and electronics	265	336	491	711
Other support equipment	147	175	462	486

¹ Includes procurement for military assistance and for U.S. Navy, Marine Corps, and Air Force.

reduce the gap between inventory and requirements. The fiscal year 1969 budget totals \$6,126 billion, excluding any potential supplemental requests.

Support of Operations in Southeast Asia

The logistics posture in Vietnam improved in fiscal year 1968 and the buildup of the logistic base was largely completed. That the demands of the field commanders are being met is evident in their volunteered assertion, repeated many times, that "operations have not been inhibited by any materiel shortages."

The transportation phase of the war is a predominant one. The buildup of an American force of upwards of 550,000 servicemen has been accomplished—including the regular replacement of personnel on the short tour basis that has come close to representing a complete annual turnover—and a capability to move over 500,000 short tons per month of materiel and supplies over an 8,000-mile pipeline has been achieved. In the process, numerous problems, many of them new and unique, have been faced and solved.

The greater part of the tonnage, as might be expected, was moved by ship. During fiscal year 1968, 9,219,800 measurement tons of Army cargo were shipped by sea into the area, 690,200 more than in the previous year. Of the total, 7,679,500 came from the United States, the balance from various points in the Far East. Another 198,600 short tons of Army cargo were shipped

by air, 150,900 of them from the United States, an increase of 41,900 over 1967.

Of Army-sponsored passengers, 877,800 were moved in 1968 to support operations in Southeast Asia, 126,700 of them intra-theater movements of the total, 760,900 moved by air, 116,900 by surface means.

Among several procedures used to expedite the movement of essential equipment, perhaps the best known is the Red Ball Express, described in previous reports following its establishment in December 1965 to move critical spare parts and other essential items to repair deadlined equipment. Over 20,000 short tons of cargo were airlifted by Red Ball between December 8, 1965, and June 30, 1967. In the last fiscal year, 22,560 short tons had been delivered by the end of June 1968.

One new shallow draft port became operational at Dong Tam in December 1967, increasing to 10—3 shallow and 7 deep draft—the number of Army ports in South Vietnam. The deep draft ports provide 23 military berths, augmented by opportune use of commercial berths at Saigon. The deep draft ports have a daily “throughput” capability of 21,000 short tons. (Throughput comprehends such factors as berth/anchor capacity, discharge, onward movement, and destination reception capabilities.) Improved port capabilities brought a reduction in the average time a deep draft ship waits for a berth in Vietnam from 20.4 days in 1965 to less than 2 days. Port congestion is no longer a problem.

During the first 3 months of the 1968 fiscal year, port throughput (discharge and outload combined) in Army-operated ports in South Vietnam averaged 730,000 short tons monthly, a 62 percent increase over the same period in 1967. This average increased to 745,000 short tons per month in the second quarter, and despite the Tet offensive in February 1968, throughput in the third quarter reached 785,000 short tons. This quarter was unique, for while a low of 663,000 short tons was reached in February, March was a monthly high of 870,000. During the fourth quarter, the average again increased, to 791,000 short tons per month. A contributing factor was the opening at Saigon in July 1967 of the U.S. Army Terminal, Newport, a military port installation operated by Army Transportation Corps units.

Before and immediately following the Vietnam buildup early in 1965, air transport played the major transportation role within South Vietnam. In the summer of 1965 ground transport came into the picture as eight company-size motor transport units

arrived in Vietnam. By the end of that calendar year, seven more had been added. Additional units were needed as the volume of cargo and personnel increased.

Motor transport units in South Vietnam move cargo and personnel from beaches, airports, and water ports to destinations as distant as 315 miles. They move combat soldiers to operational areas, supply them, and make deliveries virtually to the foxhole. Their work is complicated by the inadequate road network, swamps, rugged mountains, sand, monsoon rains, and enemy activity. Conventional vehicles have proven inadequate under some conditions and the GOER family of high-wheeled, high-flotation vehicles have been quite effective. The overland road tonnage and the number of routes that can be used to move cargo and personnel have increased considerably since early 1966. The monthly average hauled from April to October 1966, for example, was 622,700 tons, while that for the period May 1967-April 1968 was 1,183,400 tons.

Closely allied to the transportation phase of military operations is supply support. Current consumption factors for U.S. Army personnel in South Vietnam average 94.04 pounds of supply (all classes) per man per day as compared to 45.34 pounds per man per day consumed during World War II in the Pacific theater.

Approximately 93 percent of the meals served to soldiers in Vietnam are hot, consisting primarily of fresh meats, vegetables, and fruits. The remainder are packaged meals for troops engaged in operations, the individual combat meal, long designated as "C" rations, containing an entree, beverage ingredient, dessert, and accessory items, and may be eaten hot or cold. Several newly developed freeze dehydrated foods and the dehydrated food long-range patrol packet were field-tested in Vietnam with highly favorable results; several million have been furnished to U.S. forces there. Initial tests were conducted on a dehydrated 25-man uncooked meal unit, designed to replace the canned "B" ration, and if additional tests prove as successful, this meal will replace the "B" ration in certain combat areas.

Some 450 different types of ammunition are being supplied to U.S. and allied forces in Southeast Asia. The Army's requirements are being satisfied by 23 Government and numerous privately owned plants within the United States and Canada. Four loading and two propellant production plants were reactivated to support Vietnam war requirements, while active plants accelerated production. These active plants represent a cross section of the economy; some are Government-owned and operated, some

Government-owned and contractor-operated, and some privately owned. About \$200 million in ammunition was consumed monthly by the United States and its allies in Vietnam during the year.

The Army, under the direction of the Secretary of Defense, has been gradually assuming direction of a common supply system in Vietnam for all military forces. Since March 1966 it has provided a limited supply of administrative and general house-keeping items, packaged petroleum products, and subsistence to all U.S. forces, free world military forces, and other third country elements in the Republic of Vietnam. Further expansion of this service will depend upon the Army's general supply posture.

Keeping equipment operational to support nearly half a million fighting men is a task of some magnitude. Although procurement of new equipment has increased by more than 200 percent to meet the Vietnam buildup, one of the greatest sources of supply is repair of unserviceable equipment. To support the added maintenance, procurement of spare parts has increased 2.5 times over pre-buildup levels. New management techniques and revision of some older ones have been required to handle priorities on the use of limited resources. A long and full supply pipeline, based upon pre-Vietnam rates, is no longer feasible or necessary, especially for high dollar value items. The objective is to keep the pipeline quantity low, and repair as close to combat operations as possible. The forces in Vietnam are supposed to accomplish as much of their own general support as possible, leaving complete overhaul work to depots in Japan and Okinawa. An important element of the logistics support of military forces in respect to the repair and return to use of critical items has been the closed loop support program. This was established in November 1966 to provide a framework for scheduling and controlling critical items through retrograde, overhaul, and return to the Army supply system. In October 1967 a regulation was published extending the program to all major commands. Conferences in the continental United States, Hawaii, Alaska, and Germany brought 81 major and 68 secondary items into the closed loop support system.

Another concept to improve supply and logistic support was initiated in February 1967, called Project Counter. It is designed to provide skilled technical personnel for technical assistance during extended periods of temporary duty. The first teams in the program, about 500 personnel, were trained at the Quartermaster School, Fort Lee, Va., and deployed to Vietnam in March 1967, where they operated until August 1967 and then returned

to the United States. Another team of over 150 specialists served from August to December 1967, followed by a third group whose stay in Vietnam would terminate around July 1, 1968. Smaller teams were also deployed to Thailand, Korea, and Europe. Their duties are to locate, identify, inventory, and record actual assets on hand by location and quantity and to establish and purify prescribed load and authorized stockage lists. They also instruct assigned personnel in logistics policies and procedures.

Historically, the United States has been left with huge surpluses as the aftermath of war. In other times, as Secretary Stanton's words at the head of this chapter show, such surpluses were considered as an indication of preparedness; today, because of the accelerated requirements of modernization, the costs of storage, and considerations of deterioration as well as obsolescence, war surpluses tend to be classified quickly as salvage. After the Korean war, for example, the U.S. armed forces were left with \$12 billion in surplus stocks.

To insure that this kind of situation would not follow the cessation of hostilities in Vietnam, the Secretary of Defense in November 1967 established a program for the utilization and redistribution of materiel (PURM) in the Pacific area. Its purpose is to redistribute excesses so that they are applied against approved military requirements elsewhere, thereby avoiding the inefficiency and waste of the past. The Secretary of the Army was designated executive agent for the Department of Defense.

This section of the report has provided only a general appreciation of logistical efforts in Southeast Asia. Practically all Army logistical functions are concerned with Southeast Asia support actions to some degree, as evidenced by the content of other sections of this chapter. Engineer activities and contributions are covered in chapter IX.

Support of Operations in Europe

In Europe, construction continued during fiscal year 1968 on facilities to replace those vacated in the military withdrawal from France. Costs were met out of regular fiscal year construction appropriations earmarked for storage facilities in Germany and with contingency funds available to the Secretary of Defense. Further requirements in this relocation of the line of communications in Europe will be met in the coming fiscal year. The estimated value of nonremovable U.S. Army real property in France was \$321.7 million. France will reimburse the United States for this real property at an amount to be mutually agreed

upon. On August 31, 1967, the Department of the Army assumed responsibility for the general direction of military liquidation activities in France, including the disposal of property.

The Army also funded, under the military construction program, the NATO Common Infrastructure Program, through which the international organization's member countries act to upgrade facilities to support cooperative operational plans. In the fiscal year 1968 budget, \$60 million was requested as the estimated U.S. share of the program's cost for the year. Congress authorized the full amount but appropriated only \$37.5 million. The NATO program included controlled humidity storage for the equipment of two U.S. divisions and 10 support units.

A significant logistical operation of the year was the movement to the continental United States of about half of the troops being deployed to the United States under the redeployment of forces from Germany (Reforger) program. About 28,000 troops and some 9,000 of their dependents are involved. Being returned are two brigades of the 24th Infantry Division (see ch. II). They will remain committed to NATO and will rotate European duty periodically with the brigade remaining in Germany. By the close of the year the prepositioning of their unit equipment at three locations in Germany was 60 percent complete. Construction of controlled humidity storage is planned to replace an existing outdoor/warehouse arrangement. The redeployment will permit a number of installations to be released to the Federal Republic of Germany.

The Commander in Chief, U.S. Army, Europe, has proposed that the logistic system in Europe be reorganized to provide a more effective and efficient use of resources to support U.S. forces there in peace or war. The structure would consist of a theater army support command and two corps support commands. The former would provide general support to Army and other designated forces; the latter would be responsible for area logistic support of units located in the corps zone. The concept would promote tactical flexibility without requiring logistic troop unit reorganization and would facilitate wartime deployment of the corps. It would take greater advantage of modern management techniques.

Support of Army Troops in Time of Civil Disorder

Because of the increase in civil disturbance and in requirements for Army troops to support civil authorities in quelling disorders, logistic support procedures for such operations were

reviewed and revised during the year. The logistic system proved responsive in sustaining large numbers of troops committed on an emergency basis to widely separated locations. The first step was to identify equipment and supplies most required by both civil and military authorities involved in civil disturbance operations. A survey was then conducted to determine availability and location, and instructions were issued to insure delivery to any location within the continental United States within 15 hours of receipt of a requirement by a depot.

While equipment issues during the April 1968 disorders confirmed the Army's capability to respond within this schedule, certain types of equipment were needed sooner than 15 hours, if loss of life and destruction of property were to be held down. The critical items proved to be those in short supply because of combat demands in South Vietnam—armored vests, riot control munitions, and protective masks. To insure that priority claimants are supported, the Army has at times placed controls over selected items, and issues are made on a case-by-case basis. Minimum quantities of selected equipment and munitions are being strategically positioned in the depot system across the continental United States against possible need.

Materiel Maintenance

The maintenance of materiel is as important to combat readiness as procurement of new stocks. In fiscal year 1968 the Army spent \$690.5 million for depot maintenance activities. Of this amount, \$477.8 million was used to overhaul, convert, renovate, modify, repair, inspect, and test materiel. The remaining \$212.7 million was used in programing and planning maintenance activities; for technical and engineering services; and for procurement of tools and equipment, modification kits, and basic issue items. Of the grand total, \$356.8 million was directly related to maintenance support of the Army buildup and operations in Southeast Asia.

During the year a materiel maintenance management program based on computer analysis became operational. Two existing reports, on equipment distribution and condition, and on materiel readiness, were consolidated, providing a means of measuring actual conditions against existing logistical capability. The Army Integrated Equipment Record Maintenance Management System (TAERS) continued as the means by which maintenance and supply information was collected to provide data for decisions.

There were some important actions in combat vehicle and

weapon maintenance during the year. A joint Army-industry team was established to collect and evaluate data on armored personnel carriers and tanks in Vietnam, to develop consumption and overhaul planning factors. Another program addressed the subject of battle damage to armored vehicles, with a view to developing a statistical foundation on which future doctrinal and materiel developments may be based. A logistical evaluation of artillery was initiated to develop a maintenance policy for current and future artillery in the Army inventory.

Army Aircraft

To attain a high degree of readiness and to measure aircraft readiness at any given time, the Army annually develops operational readiness standards. Standards are established for each aircraft system, based on logistic support priority, geographical location, and operating environment. Three elements are considered in developing aircraft operational readiness standards: The time an aircraft is out of action awaiting repair parts, the time an aircraft is down for maintenance, and the percentage of time an aircraft is ready to perform its mission.

The fiscal year 1968 worldwide standards were developed and implemented in the field, effective October 1, 1967. They were set at 81 percent for fixed-wing and 73 percent for rotary-wing aircraft. A weighted average of 75 percent was set for all aircraft. Over one-third of all Army aircraft operated in Vietnam during fiscal year 1968. During this period the Army attained actual readiness of 77.6 percent for fixed-wing and 69.3 percent for rotary-wing aircraft, with a weighted average of 71.3 percent. This was an improvement of 0.5 percent over the previous year, and was achieved in spite of considerable combat damage to aircraft in Vietnam. This combat damage has a large impact on worldwide operational readiness.

As a result of the major buildup of aircraft in Vietnam and the length of time required for surface transportation, air movement of aircraft and critical aircraft components to the Army in Vietnam became increasingly important. Aircraft losses in Vietnam during the fiscal year had to be replaced from continental United States production and overhaul resources. In view of the critical needs in the combat theater, aircraft were airlifted to Vietnam in C-124, C-133, and C-141 special mission planes; these cargo planes brought damaged and high use aircraft back to the United States for overhaul and repair. In addition to shipment of complete aircraft, some 115 critical air-

craft components were being intensively managed and airlifted to and from the theater to maintain a balanced supply position and marginal pipeline requirements.

The continued expansion in pilot training placed heavy demands on training aircraft. To hold down procurement, the Army Aviation Center took some steps to increase aircraft readiness. A tailored inspection and maintenance system was developed under which preventive maintenance techniques are tailored to specific aircraft, operating environments, and training needs. Adoption of these procedures decreased the down time for the UH-1 training fleet by 6.4 percent, with an estimated cost avoidance of approximately \$19 million. The system was extended to other Army aviation training activities, and, after evaluation, may well prove to be potentially useful in other areas of Army activity.

As reported last year, an Army aircraft maintenance facility aboard the Navy ship *Corpus Christi Bay* became operational in its general support aircraft maintenance role in Vietnam in April 1966. Although the Army's request for a second such ship has been indefinitely deferred, the Department is developing data to justify the conversion and activation. The floating aircraft maintenance ship, with an Army maintenance battalion aboard, can be deployed anywhere in the world on short notice. In addition to actions in this area, the Army now plans, programs, and budgets for expanded depot maintenance for all its aircraft. Under previous procedures they have been returned for depot maintenance only when repair and overhaul requirements were beyond unit general support capability or when the craft were crash-damaged.

Logistics Systems

The Department of the Army Board of Inquiry into Logistics Systems (Brown Board) recommended that new logistics concepts be tested and evaluated within combat divisions to improve support. These proposals involved use of automation and changes in operational procedures and organizational staffing, all designed to streamline resource management and reduce administrative workload while simplifying and standardizing concepts and procedures. Tests were conducted at Fort Hood, Tex., and in U.S. Army, Europe, during the year and were being evaluated as the year closed.

The Brown Board expressed concern over a trend toward executing changes in logistics organizations and systems before

field testing, evaluation, and analysis. The Board recommended that the recently adopted combat support of the Army (COSTAR II) concept be evaluated under field conditions before the administrative support theater Army (TASTA) concept was implemented. COSTAR encompasses the reorganization of combat service support for the field army and TASTA the reorganization for the theater army. The Army Maintenance Board was directed to conduct a worldwide evaluation of supply and maintenance procedures under COSTAR as they were operating in the field. A report was completed as the year closed, for staffing in July 1968.

Long-standing problems of achieving integrated management of all real property facilities activities and of merging facilities management with the centrally controlled logistics readiness system were given continuing attention during the past year. A contract study on the subject of program definition for the design and development of an Integrated Facilities System (IFS) was completed in March 1968. The IFS was thereby designated as a feasible and essential management information system, and developmental work will begin in July 1968. The system will cover the installation management functions related to facilities and provide data for planning, programing, and budget decisions through the Secretarial level. The data will be used to assess management and accomplishment, evaluate military real property facilities readiness, and determine the protection that should be given to the Army's \$11.4 billion acquisition cost.

A stationing capability system was under development during fiscal year 1968 to provide the Army with an automated analytical tool to be used in the preparation of station plans and capabilities studies, through which the Army assesses its capability to station various numbers and types of units in the United States during a given period. One of the major products of the system will be the determination of dollar costs associated with troop stationing plans. This system will ultimately be augmented and absorbed in the IFS.

In its final report, the Brown Board stressed the fact that primary responsibility for logistics doctrine rests with the Deputy Chief of Staff for Logistics (DCSLOG), and expressed concern over the divided responsibility at the General Staff level and the lack of definite guidance and direction from the DCSLOG for the development of logistics doctrine. As a result, a new staff element, the Logistics Doctrine and Systems Office, was

established within the Office of the DCSLOG (see ch. VI). One of its principal missions was to prepare a program for the development and management of logistics doctrine, and as the year closed, actions were in progress to that end. The first involved a review of current doctrine, installation of an information retrieval system, and an analysis to identify gaps. A long-range study of the wholesale logistics systems for 1980-85 followed, to develop systems objectives. A Logistics Studies Advisory Group and a Logistics Studies Steering Committee were established, the former to monitor studies with doctrinal significance, the latter to set systems objectives and provide executive-level guidance and advice.

A project has been going on to develop an improved control system for supply and maintenance activities financed principally from operations and maintenance funds. The object is to isolate performance indicators which, in conjunction with a simple and concise reporting system, could lead to development of comprehensive budgets by computers, requiring minimum input from staff and command levels. The management control system promulgated by this proposal recognizes that fixed expenses for installations are high and predictable. If key performance factors can be isolated for the major dollar volume budget activities, budget estimate preparation could become almost routine.

Supply and Depot Management

General expansion and wartime conditions inevitably complicate the management and distribution of Army assets, and additional procedures become necessary to insure effective support. Toward this end, the Department of the Army Distribution/Allocation Committee continued to exercise control over allocation of critical items of equipment to meet Army mission requirements and priorities worldwide. In addition, action has been taken to improve distribution planning so that the Army can make the most of what it has and is scheduled to receive. Thus the Army has initiated a worldwide analysis of equipment requirements, on-hand assets, scheduled production, and anticipated losses. From this data a 2-year distribution plan is made reflecting the planned asset position of major Army commands. This major item analysis is updated quarterly so that the latest changes in requirements, production schedules, and anticipated losses can be reflected.

In a period of competing demands for ammunition resources, formal allocation procedures assured equitable distribution to

all users. A Military Services Ammunition Allocation Board controlled ammunition apportionment among the military departments, while the Department of the Army Allocations Committee, Ammunition, handled the details for the Army.

The Army Stock Fund finances much of the materiel that flows through the Army depot system. Stock Fund purchase authority in fiscal year 1968 amounted to \$3.9 billion to support an issue program of \$4.0 billion. The purchase program was about 15 percent less than that of fiscal year 1967, while the issue program declined by about 10 percent. The improvement during fiscal year 1968 in supply management and supply control expertise in Southeast Asia resulted in a better definition of requirements, leading to decreased stockage levels and a reduced demand on the Stock Fund.

Army warehouse facilities operate under the Warehouse Gross Performance System, a program that measures manpower utilization and activity effectiveness. As the year closed the standard warehousing methods adopted for 13 Continental U.S. Army general supply depots were being extended to ammunition depot operations in the continental United States. A 1-year test of the system will be completed on July 1, 1968, at one depot in Europe and one in Japan before its extension to other depots in the European and Pacific command areas.

Modernization of the depot system in the United States began in fiscal year 1967 as part of a \$12.3 million 3-year program to equip depots with the most practical materials-handling systems and provide modern facilities, design capabilities, and layouts essential to effective storage operations. During fiscal year 1967, \$3.1 million was spent on procurement of storage handling equipment and for minor alterations to facilities. Because of the need to reduce expenditures in fiscal year 1968, additional procurement was postponed. Military construction totaling \$1.7 million for storage modernization was continued.

Installations

The fiscal year 1968 military construction authorization and appropriations bills, delayed in Congress, were approved on October 21 and December 8, 1967, respectively. Congress appropriated \$372.2 million and approved \$417.2 in new obligations; the \$45 million difference was to be made up from existing unobligated balances. To offset the appropriation reduction the Army deferred or deleted \$45 million in projects from the execution program, including \$15 million from prior years, \$13.9 for

construction not required in the fiscal year, and the remainder from lower priority projects.

Invitations to bid on authorized and funded projects from both the fiscal year 1967 and 1968 programs were tightly controlled and subject to approval of the Secretary of Defense or Secretary of the Army in the first half of the fiscal year; projects associated with new weapons for operations in Southeast Asia were released by the Secretary of the Army. In February 1968 the Secretary of Defense approved the release of fiscal year 1967 and prior year projects and the phased advertising, extending over 10 months, of 1968 projects not associated with new weapons development or Southeast Asia requirements. Total funds available for new starts during fiscal year 1968 were as follows (in millions of dollars):

Major projects excluding Vietnam and Thailand	376.9
Vietnam and Thailand	321.6
SENTINEL (including planning)	54.1
Infrastructure	37.5
General authorization	42.8
Total	832.9

Construction starts totaled \$185.6 million in areas outside of Vietnam and Thailand. Approximately \$173.3 million was obligated for new work in those two countries. In addition, \$30.6 million was obligated for infrastructure, \$14.1 million for Sentinel, and \$29.8 million for planning, minor construction, and access roads.

There were no changes in basic combat training capabilities during the year that required additional construction; actions in the two previous fiscal years appear to have satisfied requirements for training base facilities.

Appropriations for military construction in Southeast Asia in fiscal year 1968 included \$35 million in new obligational authority for construction in Vietnam. Almost an equal amount was provided from contingency funds to meet urgent requirements that were unforeseen and arose too late to be included in the budget cycle. Construction projects in the United States that are related to support of Southeast Asia operations totaled about \$50 million in the fiscal year. Over \$1.2 billion in regular, contingency, and military assistance program funds has been applied to military construction in Southeast Asia in the fiscal year 1965-68 period, about two-thirds allocated to South Vietnam, one-sixth to support projects in the United States, and the

remaining one-sixth to projects in Thailand, Okinawa, and Japan and to construction planning.

Over and above Vietnam, the Army's military construction program consists of two basic elements—replacement of aged and obsolete facilities and improvement or modernization of existing permanent facilities. Based upon an assumed long-range permanent Army peacetime strength of 925,000, there is a deficit in permanent facilities at permanent Army installations of between \$2 and \$3 billion. It is the Army's objective to invest about \$300 million in construction funds annually to overcome this deficit in the next 7 to 10 years. This has had to be deferred in favor of meeting requirements for Southeast Asia. The permanent assets at fixed Army installations have a total value of about \$10 billion; to apply 1 percent of this amount annually for improvements would mean an expenditure of \$100 million. Many deteriorating and obsolete facilities constructed during World War II and with a design life of 5 years must be replaced in an orderly and programed manner with modern permanent plant.

By systematic planning and stationing of units, the Army buildup has been accomplished without reactivating additional training installations. Despite the heavy utilization of installations, comprehensive studies and reviews have been continued to confirm the continuing need for existing installations and to eliminate those not essential to current operations. Thus during the fiscal year the Lordstown Military Reservation in Ohio was discontinued while Fort Totten, N.Y., the West Coast Relay and Radio Transmitting Station at Davis, Calif., and the West Coast Receiver Site at Middletown, Calif., were inactivated. The military ocean terminal at Bayonne, N.J., was acquired from the Navy.

Expenditures for real property maintenance at Army installations in fiscal year 1968 were approximately \$950 million, about 7.2 percent above the previous year. Army building space decreased by over 14 million square feet as the result of some active and inactive facilities being discontinued. The backlog of essential maintenance and repair at yearend was approximately \$270 million, about double that of the previous year because of the identification of unfinanced requirements in Europe not previously reported.

Implementation of the IFS (see above) concept in the real property maintenance area was furthered when the Office of the Secretary of Defense used centralized staff management procedure to manage facilities in Southeast Asia and the Army

established a functional manager for real property maintenance control at the departmental headquarters level.

Real property maintenance in Southeast Asia was accomplished primarily by contractors. In Vietnam, one firm with a work force of about 22,000 furnished all normal post engineer support to about 350,000 U.S. Army and allied assistance forces at 94 locations. The same firm, with a force of about 3,700 provided the same type of services to U.S. Army forces in four areas in Thailand. Another contractor operated and maintained power ships and distribution systems at five sites in Vietnam.

The Army, through the Corps of Engineers, provided construction support to numerous agencies and projects, among them the Air Force (including its Guard and Reserve), the National Aeronautics and Space Administration, various Department of Defense agencies, the military assistance program, the Agency for International Development, the Navy and Coast Guard, national cemeteries, and selected foreign governments. During the fiscal year, the Army Corps of Engineers contracted for \$403 million of construction for these and other U.S. agencies and foreign governments.

Around the world, the Army controls 13.7 million acres of land that, with improvements constructed after initial acquisition, cost \$11.5 billion. During the year, the Army disposed of 13,439 acres that, with improvements, had an original cost of \$74.3 million. Disposal of an additional 9,285 acres having an original cost of \$39.9 million, reported to the General Services Administration during the year, is in process. During the period approximately 1.5 million acres temporarily not required for military purposes were leased to private parties, and receipts in the amount of \$6.5 million were deposited in the U.S. Treasury.

As real estate agent for other Government agencies, the Army in fiscal year 1968 acquired 823 land tracts for the Air Force costing \$3.5 million and 966 land tracts for the National Park Service costing \$6.2 million. Real estate services were also furnished the National Aeronautics and Space Administration and the Atomic Energy Commission.

In December 1967 the Secretary of the Army was assigned responsibility for the Homeowners Assistance Program, under which financial assistance is given to owners of single or two-family dwellings located at or near military installations closed in whole or in part subsequent to November 1, 1964. The Army will administer the program, which was funded in December 1967.

Transportation

A total of 18,966,700 measurement tons of Army cargo was moved by ocean on Military Sea Transportation Service (MSTS) ships in fiscal year 1968. This exceeded by 1,645,800 tons the volume moved in 1967. Another 316,800 short tons of Army cargo were airlifted in Military Airlift Command (MAC) planes, 63,800 more than 1967.

During the year, 1,679,500 Army-sponsored passengers were moved overseas worldwide, some 315,000 more than the previous year. Of the total, 1,520,800 were airlifted and 158,700 moved on surface ships, a proportion reflecting the continuing Army policy of making maximum use of fast transportation to save man-days spent in travel.

Military Standard Transportation and Movement Procedures (MILSTAMP) were first placed in effect in 1963 and have been used since then to control shipments through the Defense transportation system. Originally designed to standardize transportation data, documentation, and control procedures, the system in fiscal year 1968 increased in value with expanded use and modification based on experience. A revised MILSTAMP was instituted in March 1967 with worldwide application for all users of the Defense transportation system, and the Services conducted field training, prepared directives, and appraised its operation at all levels. A series of on-site inspections of MILSTAMP applications in the continental United States and overseas was completed in January 1968, confirming that the system is basically sound.

Because of the frequent transfer of military personnel and their dependents, the movement and storage of their household goods is a logistics service of some importance in both convenience and morale. To improve the quality of service, a Personal Property Moving and Storage Council, composed of representatives of Department of the Army headquarters and major commands within the United States, was established in September 1967.

There were several actions related to transportation procurement during the year. In one, procurement of commercial design motor vehicles—sedans, station wagons, carryalls, pickups—was reduced by \$22.4 million as a result of the reassignment of Army funds to meet other priority requirements; the requirements were reprogramed for the next two fiscal years. In another development, the Army began to convert from existing cargo express containers to a new type, standard size (8'x8'x20') container with standard fittings that will be compatible with surface

shipment by various modes of transportation. The new containers and their associated equipment will be used to transport cargo from continental United States depots to Vietnam.

In fiscal year 1968 three air cushion vehicles were delivered to the Army. This vehicle moves on a cushion of air generated by a horizontal fan amidship, and operates on water as well as land. Water speed is 60 knots, land speed 40, and range is 175 nautical miles. The three vehicles were shipped to Vietnam, and as the year closed they were supporting U.S. troops in the Mekong Delta. The procurement of larger troop/cargo-carrying air cushion vehicles has been deferred pending an evaluation of the concept on which the tactical operation of the vehicle is based.

Support Services

While Army support services are routine, they are always important, especially so during wartime. The sheer magnitude is illustrated by the fact that the Army in fiscal year 1968 had 4,319 troop dining facilities in operation worldwide, with 30 central meat processing plants, 15 central pastry kitchens, 20 garrison bread bakeries, and many more in the field. Over 150 commissary stores were available to more than half a million Army families worldwide, with annual sales of \$511,775,917; another 115 issue commissaries supplied Army troop messes with subsistence totaling over \$500 million.

There were 64 laundries and 34 drycleaning plants at home and overseas; mobile units serviced the troops in Vietnam, especially in forward areas, while contractual service supplemented them.

There are 85 national cemeteries under Army jurisdiction. During fiscal year 1968 there were 38,732 interments in these cemeteries, bringing the cumulative total to 1,099,202. Of the past year's interments, 2,547 were casualties of the Vietnam war, buried in 65 cemeteries. As the year closed, gravesites were available in 57 cemeteries for the burial of eligible decedents.

During the year there was active consideration on the governmental level of proposals to transfer the National Cemetery System to the Veterans Administration. An advisory commission appointed by the Administrator of Veterans Affairs studied the subject and hearings were held before the House Subcommittee on Veterans Affairs in March 1968. No further Congressional action had been taken by the close of the year.

Meanwhile, the major expansion and improvement of Arlington National Cemetery continued, while funds for proposed ex-

pansion of five other cemeteries—in New Jersey, California, Kentucky, and Virginia—were withdrawn.

In the 12-month period of this report, excess, surplus, and foreign excess personal property with an acquisition cost of \$977,362,206 was turned over to property disposal activities for disposition. The inventory value of usable property sold was \$184,374,929. The proceeds from all sales, including scrap, amounted to \$40,161,960 while the total cost of operating the program was \$23,097,282.

VIII. Research and Development

The conversion of the smooth-bore guns into 8-inch rifles has progressed satisfactorily. The coiled wrought-iron tubes used in the conversion have been imported, but a trial of a gun with a tube of domestic manufacture has given the best results, and proved conclusively that our product is equal to the imported, notwithstanding the long experience in such work in English shops. Dependence can now be placed in the private enterprise and skill of our own people for the tubes for 8-inch rifles, and in the preparations of guns of that nature.

Report of Secretary of War James D. Cameron
November 20, 1876

The United States long ago exchanged its dependency on foreign talents in military weaponry for American skills. Where a hundred years ago we were importing arms, today American weapons are used by the armed forces of many nations, while our investment in research and development related not only to weapons but to all phases of military activity is probably equaled by only one other nation in the world.

Funding

During fiscal year 1968, research and development for the various Army programs were conducted within a budget of \$1.52 billion, an amount comparable to that spent during each of the preceding 4 years.

CONTEMPORARY FUNDING, R&D PROGRAM

	Fiscal year				
	1964	1965	1966	1967	1968
Research and Development (in millions of dollars) -----	1,409.0	1,414.5	1,515.5	1,589.2	1,522.2

Although the original appropriation was diminished by reductions in prior appropriations and by transfer of funds to finance activities in Southeast Asia, it was also augmented by the residue of funds previously apportioned, by a supplemental emergency authorization, and by an eventual rebate on funds to be transferred to Southeast Asia. These financial exchanges finally engendered the following funding program:

FUNDING OF ARMY R&D PROGRAM, FISCAL YEAR 1968

[In millions of dollars]

New appropriations	1,505.7
Recoupment from prior fiscal years	32.2
Emergency funds	52.0
Returned from transfer to Southeast Asia	32.4
Transferred to Southeast Asia	-100.0
Transferred to General Services Administration	-.1
Grand total	1,522.2

Firepower

The decision to deploy a ballistic missile defense system, necessitated by a potential threat from Communist China, was announced on September 18, 1967. This defense will incorporate certain NIKE-X components. Christened the Sentinel System (see ch. III), its research and development will be under the Sentinel System manager. The NIKE-X advanced development program, designed to develop new components to defend against more massive or more sophisticated attack, remains the responsibility of the chief of Research and Development.

A new surface-to-air missile system, known by the abbreviation SAM-D, continued its progress in a state of advanced development. Primary emphasis was placed on component development, including completion of configuration studies, continuation of experimental radar design, and initiation of the designs of a weapon system computer and an experimental model guidance section. The objectives of the advanced development program are to refine and validate system concepts, to assemble and demonstrate principal components, and to establish an effective government-contractor team for engineering development.

The CHAPARRAL system, a surface-to-air missile adapted from the Navy's SIDEWINDER, is presently being tested, while both missile and ground support equipment are under production. The Vulcan system, which provides CHAPARRAL with a companion 20-mm. gun, is an engineering redesign and modification of presently available components. Last year's progress centered on the gun feed system and integration of the weapon, vehicle, and fire control system. Engineering and service tests were under way at yearend. Looking into the future, an advanced forward area air defense systems program is examining systems to complement SAM-D by providing low altitude forward area defense of the field army. A family of weapons consisting of a man-portable, high proliferation missile system, a vehicle-carried

short-range missile system, and a gun-type weapon system is being considered. When perfected, these systems will be second and third generation successors to the current REDEYE, CHAPARRAL, and Vulcan systems.

Among surface-to-surface missiles, the ground support program initiated in 1967 to improve the road mobility and quick reaction capability of the PERSHING system progressed satisfactorily. Tracks have been replaced by wheels, and significant improvements have been registered in the program test station. Initial firings incorporating this new equipment were conducted during March 1968. In addition, the program inaugurated on April 7, 1967, to extend the range capability of the LANCE missile continued to progress. Current plans call for LANCE to be fielded once these range extension improvements have been completed.

Development of TOW and DRAGON, companion heavy and medium antitank weapons, was highlighted by the initiation of guided flight tests of DRAGON and action to classify TOW for limited production. No major problems have been encountered in the progress of DRAGON, while TOW's engineer and service testing revealed reliability comparable to and accuracy superior to that originally predicted by the Army. The fielding of TOW will enable the infantry to engage and destroy the heaviest known enemy tanks at ranges equal to or greater than the effective ranges of the enemy's guns.

The Army small arms program encompasses all weapons of .60-caliber or smaller and shotguns and infantry grenade launchers. Since its inception in December 1967, the program has included research, development, and product improvement in weaponry. There are presently 49 separate tasks within the program, divided into short-range, mid-range (1975), and long-range (1985) categories and including objectives which are continuous by nature and demand constant attention.

The Army's program to increase combat vehicle firepower was brought one step closer to completion through the concept formulation of the vehicle rapid-fire weapon system successor named Bushmaster. This new automatic cannon is the heir apparent to designated .50-caliber machine guns and the M-139 20-mm. gun. It is expected that Bushmaster will be adopted by the other Services and adapted to meet their needs.

Mobility

To improve the Army's mobility, research and development

in both aerial and surface systems continued. The AH-56A Cheyenne, an integrated aerial weapon system highly advanced in helicopter technology, was designed specifically to provide the Army with a high speed, heavily armed, escort helicopter. A computerized, continuous solution fire control and navigation system, plus night vision devices, will enable Cheyenne to respond quickly with direct, antiarmor fire support on an around-the-clock basis. Progress in developing Cheyenne has been satisfactory, with no major technical problems. Landmarks include its first flight (September 21, 1967), the Secretary of Defense's approved procurement of 375 of these helicopters (January 1968), and the scheduling of contractor air firing tests to verify weapon system accuracies (August 1968). Army engineering and service tests will begin in March 1969 and are expected to be completed by November 1969. Based on the Secretary of Defense's decision, the Army has exercised a production option in its Cheyenne development contract with Lockheed Aircraft Corporation. The first helicopters in production will be delivered in September 1969.

The AH-1G Hueycobra was developed to satisfy an immediate need for an interim armed helicopter suitable for operations in Southeast Asia. Hueycobra marks a dramatic improvement over the old UH-1 series helicopter, and features a small wing, armored crew seats, increased visibility and fields of fire, and relatively high performance. By August 1967 the first six aircraft were assembled and dispatched to Vietnam and initial deployment began in October. With testing now complete, the Hueycobra has been accepted as a standard item of equipment.

On the ground, the first five U.S. pilot model main battle tanks (MBT-70) have been completed in the cooperative development program with Germany, and this tank of the 1970's continues to progress. As mentioned in previous reports, the MBT-70 fires both missiles and conventional ammunition, and possesses greater cross-country capability than any predecessor.

The search to determine improvements for successor vehicles to the M-113 armored personnel carrier and the M-114 command and reconnaissance vehicle continued. The mechanized infantry combat vehicle, XM-723, when completed, will give the infantry the capability of fighting mounted or dismounted; the highly mobile armored reconnaissance scout vehicle, XM-800, will enable armored cavalry units to locate the enemy at night as well as by day.

Communications and Electronics

Equipping combat units in Vietnam with first generation night

vision devices is now virtually complete. These include the starlight scope (a rifle sight), a sight for crew-served weapons, a night observation device, and a 2.2KW Xenon searchlight, all now declassified and formally introduced to the public at a press conference on May 21, 1968, at Fort Monmouth, N.J.

During the past year, emphasis in the night vision program was placed on an accelerated development program designed to equip selected units in Vietnam with an integrated night vision system. The first contribution, four Mohawk aircraft with improved sensors, was deployed in the combat theater during March 1968.

Second generation equipment being improved includes night vision systems for rifles, crew-served weapons, aircraft, and ground vehicles. These new versions will provide better performance, greater ground range, lighter weight, smaller size, and less cost when compared with instruments presently in the inventory.

To improve the combat surveillance capabilities of forward area units under conditions of poor visibility or inclement weather, the Army has initiated development of an extremely lightweight (10 pounds), short-range radar capable of being transported and operated by one man.

Development of the omnidirectional countermortar radar (AN/TPQ-28) is nearing completion. This radar, currently undergoing tests at Yuma Proving Ground, Ariz., will be capable of detecting and tracking mortar projectiles in flight, then automatically computing the coordinates of the enemy weapon. The countermortar radar system will be accompanied in the field by a computerized omnidirectional acoustic weapons location system currently under development.

Project MALLARD, described in earlier reports, is proceeding under a Joint Program Management Board composed of representatives of Australia, Canada, the United Kingdom, and the United States. The United Kingdom, after a brief withdrawal, was welcomed back into the program during August 1967. Eleven technique and two system studies were awarded U.S. contractors during fiscal year 1968. Continuing on schedule, these system studies will be completed by the end of fiscal year 1969.

The unique, division-level random access discrete address (RADA) communications system constitutes the automatic radio equivalent of an automatic dial telephone system. Available for tactical use by both ground and mobile forces, RADA has continued to progress on schedule. Phase II of the advanced development contract was completed during December 1967 with the

erection of circuitry and laboratory models. Phase III, the assembly of a small quantity of advanced development demonstration models (three operator units and one relay) was inaugurated in January 1968. This phase is expected to continue into the spring of 1969.

The Tactical Satellite Communications Program (TACSAT-COM) is proceeding under the guidance of the Tactical Satellite Communications Executive Steering Group (TSEG), which was itself established under tri-Service charter. The Lincoln Experimental Satellite No. 5 (LES-5) was launched into orbit around the equator on July 1, 1967. Encouraging results followed its research and data-gathering mission, and most of the technical testing is now complete. Ground terminals tested with the LES-5 satellite have been assembled by the U.S. Army Satellite Communications Agency, and contracts have been awarded for 18 terrestrial terminals for eventual use with more sophisticated satellite vehicles.

The Army is responsible for certain phases of the Defense Satellite Communications Project, whose objective is to develop reliable, secure, and survivable communications to meet national defense needs. The project encompasses both space and surface activities connected with development of a satellite system, and the Army's role includes research, development, testing, evaluation, and procurement of ground terminals; the operation of specified ground terminals; and the conduct of tri-Service training for ground terminal operations. One stage in the developing system is the so-called Initial Defense Satellite Communications Program, which became operational in July 1967 with full Army participation. This system consists of satellites in a drifting equatorial orbit, ground terminals, and a control subsystem. In fulfilling its responsibility to develop, procure, and deploy the ground system, the Army has deployed 15 transportable satellite communications terminals for tri-Service use in worldwide locations.

Combat Support

When urgent requests were received from Southeast Asia, the Army accelerated the development of air crew protective body armor, then provided quantities sufficient to satisfy initial operational requirements. This air crew body armor is fabricated from composite ceramic-fiberglass materials, and offers protection from fragmentation munitions and small arms fire. Aircraft pro-

protective body armor was adopted as standard equipment on January 25, 1968.

In addition to air crew armor, the Army has designed an infantry bonus—adjustable body armor adaptable to whatever level of protection is needed for a particular combat situation. This armor consists of front and back ceramic-fiberglass plates and a ballistic nylon-felt fragmentation protective vest. These components can be worn so that five defensive options are available to the wearer. An operational evaluation of armor in Vietnam will be conducted during fiscal year 1969.

Another important contribution to field combat support was the development of the long-range patrol food packet. Designed for use on extended patrols and in remote areas, this lightweight (11 ounce) packet provides eight menus of 1,000 calories each, enough sustenance for periods up to 10 days. Gourmets will note that each menu is precooked, freeze-dehydrated, and flexibly packaged. The food packet was adopted as standard on October 19, 1967.

Other Significant Research Programs

Since research provides the base on which future developments will rest, the Army continued to support programs promising military application at some future date. The horizon of Army-sponsored projects extends from the purely theoretical to the most earthy and practical, and manifests itself in such diverse forms as new mathematical formulae and mechanically demonstrable end-products.

Under the aegis of the U.S. Army, Dr. John W. Tukey, a Princeton University research specialist, and associates have developed a procedure for reducing the time required for Fourier Analysis, a method necessary for the solution of a wide variety of scientific and engineering problems. Both faster and more accurate than the older method, this so-called "Fast Fourier Analysis" requires only .025 percent as much time, or the difference between 10 hours and 10 seconds in computer time. Popularization of this theory in scientific journals and at professional meetings will enable others to utilize this important contribution.

Night vision studies have led to extensive research on thermal imaging principles for use in new components and devices which permit night vision independent of any illumination and which emphasize military targets differing in temperature from their surroundings. A class of materials known as liquid crystals or mesomorphic materials shows great promise for obtaining these

thermal images. Sufficient compounds have by now been investigated to justify and validate a hypothesis linking molecular structure and mesomorphic behavior.

In response to a request from the Office of the Chief of Engineers, the Mathematics Research Center has developed and computerized an alternative criterion for determining the ability of a hardened site to withstand intensive surface bombings.

The technical feasibility of one day equipping infantrymen with transparent ceramic armor has come one step nearer through the discovery of an improved method of producing high-purity magnesium aluminate of fine particle size. By heating a hydrated magnesium aluminum sulfate to temperatures of 900° C., a magnesium aluminate over 99.95 percent pure is produced. An invention disclosure has been prepared; studies to discover the optimum condition for hot-pressing the material are in progress, and the technical practicality of preparing specimens for ballistic testing is being explored.

Wind tunnel testing of scaled models is an established practice for simulating the real aerodynamic flow field of conventional fixed-wing aircraft. Between 1963 and 1966, Dr. W.H. Rae of the University of Washington had investigated operational problems and techniques in the wind tunnel testing of vertical and short takeoff and landing (V/STOL) aircraft. Dr. Rae's research, conducted under Army sponsorship, was based on the interaction of downwash on the tunnel walls. Presented first during September 1966, his analysis revealed gross inaccuracies in the simulation of rotary-wing flight. During the course of his studies, he also determined the optimum shape and size of a tunnel, the maximum and minimum wind speeds which will yield meaningful results, the permissible downwash angles, and the positioning of the test vehicle in the tunnel. Conversely, for a given wind tunnel, he determined the maximum model size which can be tested with significant results. The immediate effects of Dr. Rae's research are the reevaluation of previous V/STOL model test and design data, the redesign of proposed new wind tunnels, and the establishment of proper model sizes for existing wind tunnel installations. So immediate was the success of this project that several new wind tunnel designs and test programs have been changed. These and future changes based on this work will influence the design and testing of several hundred million dollars in aircraft and wind tunnels.

Miniaturized flueric temperature sensors may prove to be the answer to another scientific problem. Flueric temperature sensors

have long been known as exceptionally rugged instruments with high temperature measuring capabilities and rapid response time. This latter quality, promising possible measurement of transient as well as steady-state temperatures, encouraged scientists to adapt this means to the measurement of two limited-knowledge environments—boundary layers in supersonic wind tunnels and turbojet engine flow. A miniature temperature-sensing oscillator was designed, tested, and found to perform satisfactorily at a temperature of 1068° F. and at an input pressure of 356 psig. Qualities found in the miniature sensor compare favorably with those of the larger instruments, and indicate that the theoretical model may now be applied to miniature sensor design.

Plastic or fiber may one day replace copper as the component of the rotating bands on artillery projectiles. Conclusions reached after limited research at the Army Ballistic Research Laboratories, reinforced by independent testing in the United Kingdom, suggest this possibility, although truly conclusive evidence to justify the changeover may take another 2 years to acquire. Successful development of the plastic bands will yield reduction in the use of copper and reduce stresses in gun tubes leading to longer tube life.

Difficulties encountered during the technological production of mortar fuzes focused attention on the heat powder block, which is the pyrotechnic component of the thermal battery. An investigation finally identified humid atmosphere during the chemical reaction of the ingredients as the cause of the trouble. Air conditioning was attempted as a remedy, and the yield soon rose from 30 percent functioning to over 95 percent. Costly shut-downs have been prevented, waste of high-cost iron powder avoided, and safety increased as a result of the new technique. Moreover, the Government has saved \$1.7 million on fuzes over a 3-year period through this innovation.

IX. Civil Works and Military Engineering

The already important and daily increasing trade of the great lakes and estuaries which encompass and indent the United States, demands the fostering care of the Government; but in order that its interference may be effectually and constitutionally exerted, it ought to be confined to such works as are of general utility, and not extended into every creek or inlet where a favored village may require easier access for a market boat. This abuse, which is calculated to bring the whole system into deserved disrepute, can only be remedied by directing a previous examination to be made by this department into the nature of the proposed work.

Report of Secretary of War Joel R. Poinsett
November 30, 1839

When these words were written over a century and a quarter ago, it is unlikely that any individual, no matter how prescient, could have foreseen the day when the Army's public works would comprehend not only improvements to rivers and harbors, but flood control, water supply, irrigation, hydroelectric power, pollution abatement, recreation facilities, and conservation of water, woodlands, minerals, fish, and wildlife.

Civil Works

Today the Secretary of the Army through the Corps of Engineers administers a broad civil works program involving all of these activities—a field of civil function that joins with military engineering to comprise the total Army engineering effort.

Water Resources Development

In the area of water resources development, the Army works in cooperation with a number of other Federal agencies, 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, as well as with state and local governments.

During fiscal year 1968, the Department of the Army continued its activities as a member of the Water Resources Council, which had become operational a year earlier. Upon recommendation of the council, the President by Executive order

established the New England River Basins Commission, the fourth such planning commission now in existence. Funds became available to initiate comprehensive framework studies in two regions for which commissions were established last year—the Souris-Red-Rainy and the Great Lakes Regions—bringing the total of such studies now underway to 10. Nine studies remain to be initiated.

Under its program of providing financial assistance to the states to increase their activity and capability to participate in development of comprehensive water and related land resources plans, the council received and approved 51 grant applications.

The council completed work on a national assessment of the adequacy of supplies of water to meet requirements in each water resource region in the United States.

The Chief of Engineers is also the Department of Defense member of the Marine Council's Committee on Multiple Use of the Coastal Zone, which held its initial meeting on September 6, 1967. The Army participates on this committee with 18 other Federal agencies to review existing and proposed legislation and Federal policies pertaining to the coastal zone of the United States. Among programs sponsored by the Army was one for long-range multiagency regional harbor studies. The Army also chaired a task force which made extensive recommendations for coordinating Government agencies active in the coastal zone.

During fiscal year 1968, the Army Corps of Engineers carried out its water resources development program under a controlled slowdown of construction and reduction in expenditures. In the allocation of funds, priority was given to urban flood protection, deep draft harbors, and major inland waterways, to reduce major hazards at populated and developed areas, and to meet the continuing needs of commerce and navigation.

Included in the water resources development program were 3,838 active projects with an estimated \$30 billion construction cost. Seventeen billion dollars had been appropriated and over \$13 billion remained to be funded as the year closed.

Based on median projections of population, gross national product, and industrial development, an estimated capital investment of \$23 billion will be needed to meet water resources needs to 1980. 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.

The Army had 85 authorized channel and harbor projects, 51 projects not specifically authorized, and 25 lock and dam projects

and 11 multiple purpose locks and dams under way during the fiscal year. The Army also participated in 12 beach protection construction projects. Navigational project construction costs, including multiple purpose locks and dams, totaled about \$398.7 million for the fiscal year.

Two ocean-going hopper dredges, part of a small fleet used by the Corps to improve harbors on the east and west coasts of the United States, continued to support the military effort in Vietnam. Each manned by 60 volunteer Department of the Army civilians, the dredges were used to widen, deepen, and maintain the entrance channels to coastal ports in the Republic of Vietnam.

Eight replacement structures with an estimated total cost of \$526 million were under construction during the year as part of a \$1.8 billion program to modernize canalized waterways. Replacement or reconstruction 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.

Progress on the Arkansas River navigation project on the Arkansas and Verdigris Rivers continued on schedule. Of the 17 locks and dams comprising the project, three are operational and the lower 50-mile reach of the navigational channel through Locks 1 and 2 is open to navigation. Based on the current construction schedule, navigation will be open to Little Rock, Ark., in calendar year 1968; to Fort Smith, Ark., in 1969; and to Tulsa, Okla., in 1970. The total estimated cost of work along the navigable reach is \$910 million, including \$133 million for bank stabilization and channel rectification.

Construction continued on the Dworshak Reservoir, highest straight axis concrete gravity dam in the United States. Located on the North Fork of the Clearwater River in Idaho, this major work was more than 27 percent complete at the end of the fiscal year. The main structures contract for this project is the largest ever awarded for civil works construction.

The country is reminded annually of the importance of flood control, and while protection has been provided against some ravaging water in recent years, the ever-increasing expansion of the population into many flood plain areas leaves much to be done. In the year just completed, the Army worked on 160 flood control projects. Since 1936, over 650 have been completed. Benefits of \$14.5 billion in damage prevention are 3.3 times the total amount of \$4.5 billion invested in the flood control program. Despite this progress, large sections of the country are still vul-

nerable to floods. The disastrous floods of the past year again provide evidence of the urgent need to translate protection plans into completed projects.

Supplementing flood protection construction is the nationwide Flood Plain Management Services program, which aims to reduce flood damages by the wise use of flood plains. The Secretary of the Army, through the Corps of Engineers, is authorized to compile and disseminate to states, local governments, and other Federal agencies, information on flood hazards, and to respond to requests for technical advice and guidance in planning to minimize flood damage susceptibility. Some 210 flood plain information reports have been issued and close to 1,000 responses to requests for special flood hazard information made. In the long run, this program, along with a Corps survey program and others, is expected to provide information on flood hazards in 7,500 communities. Relying on hazard information, joint planning—which includes preparation of flood plain regulations, flood-proofing possibilities, and other adjustments to floods as well as flood control—is going forward.

During fiscal year 1968, 70,000 kilowatts of generating capacity were placed in commercial operation at one Army hydroelectric project. As the period closed, 9,640,400 kilowatts of generating capacity were in operation at 47 projects located in 20 states, representing 3.6 percent of the total generating capacity and 20 percent of the hydroelectric generating capacity in the Nation.

Construction on hurricane flood protection projects continued at Raritan Bay and Sandy Hook Bay, N.J.; at Stamford, Conn.; and at Freeport, Port Arthur, and Texas City, Tex. Preconstruction planning continued for projects at Lake Pontchartrain, La.; New London, Conn.; New Orleans-Venice, La.; and Stratford, Conn.

In calendar year 1967 over 204 million people visited 212 reservoir and 174 waterway civil works projects, driving or cruising adjacent to more than 28,000 miles of picturesque reservoir shoreline, where they camped, picnicked, water-skied, or just enjoyed a complete change of pace and scenery. An equal number are estimated to have visited 250 small harbors, 750 commercial harbors, and other portions of the 19,000-mile navigable waterway system. In addition to about 2,600 public use areas provided by the Federal Government, there are over 400 state, county, and municipal parks located at civil works projects.

Through enactment of the Federal Water Project Recreation Act, non-Federal public bodies are encouraged to administer pro-

ject recreation resources and to participate on a cost-sharing basis in recreation development. Since passage of the act in 1965, non-Federal interests have indicated a willingness to assume these responsibilities at an additional 25 projects. To date, however, no agreements have been executed covering this item of required local cooperation.

The Corps of Engineers, through implementing instructions to the President's program for preservation and enhancement of our country's natural beauty, gives full consideration to land and water area developments to make them visually appealing and architecturally in harmony with the natural environment.

Effective fish and wildlife conservation and improvement projects are operating at most Army installations and at more than 200 civil works water resource development reservoirs. Over 1,250,000 acres are managed through the coordinated efforts of the Department of the Army, Department of the Interior, and the various state fish and game agencies, and provide the citizenry with fishing, hunting, and other outdoor recreational opportunities.

CIVIL WORKS APPROPRIATIONS FISCAL YEAR 1968

[In thousands of dollars]

Construction, general	967,599
Planning and design	20,025
Construction	947,574
Operation and maintenance, general	193,000
Mississippi River and tributaries	87,135
General investigations	598
Planning and design	150
Construction	58,987
Maintenance	27,400
General expenses	19,515
General investigations	34,445
Flood control and coastal emergencies	
Permanent appropriations (maintenance and operation of dams; hydraulic mining; payment to States)	3,293
Total	1,304,987

Pollution Abatement

Executive Order 11288, dated July 2, 1966, requires the executive branch of the Government to provide the leadership example in the nationwide effort to improve the quality of air and water through prevention, control, and abatement of pollution from Federal Government activities in the United States.

Army Corps of Engineers involvement in water pollution abatement includes controlling and reducing pollution originating on Corps-owned lands to the lowest level practicable, developing acceptable measures for projects, providing treatment facilities for Corps floating plant, controlling use of disposal areas by others by issuing permits, and devising methods for disposal of polluted dredged material.

The updated water pollution control plan for civil works projects was transmitted to the Bureau of the Budget as required by the Executive order. It lists installations and proposed corrective measures at some 250 water resource project locations, activities, and/or floating plant. Estimated cost of the program is \$10 million for fiscal year 1969 through 1972.

Aerobic, maceration-chlorination, and incineration treatment plants consisting of some 250 sewage units were installed on about 220 vessels operated by the Corps of Engineers as of June 30, 1968. Studies and design of sewage treatment facilities have been initiated and corrective measures were undertaken at public use areas with high public visitation.

The Department of the Army and the Department of the Interior continued studies under a jointly formulated program to devise means of disposing of polluted material dredged from Great Lakes harbors. An interim pilot program of experimental operations has been initiated at selected harbors with a view to developing alternative dredging procedures. Within the limits of its resources and authority, the Corps of Engineers is exercising positive leadership and using every available means at its disposal to abate or prevent such water pollution.

The initial water pollution control plan for Army military installations, submitted to the Bureau of the Budget in July 1966, consisted of 39 separate projects to be completed over a 5-year period beginning in fiscal year 1968 at a total cost of \$23 million. The first updated 5-year plan, submitted to the Bureau of the Budget in July 1967, consisted of 97 projects at a total cost of approximately \$39 million. Congressional authorization and appropriations were included in the fiscal year 1968 military construction program for 13 projects at an estimated cost of approximately \$9 million. Coincidentally, the current updated plan covering the years 1969-72 again contains 97 projects at an estimated total cost of \$34 million.

To improve the quality of air through prevention, control, and abatement of pollution, an updated air pollution control plan for Corps of Engineers civil works activities, transmitted to the

Bureau of the Budget, provided for installing air pollution abatement measures at 14 locations at a currently estimated cost of over \$4 million for the 5-year period from fiscal year 1968. A contract for one of the major items of the program, the incinerator for burning drift and debris collected from the New York harbor area, was awarded in June 1968.

The initial air pollution control plan for Army military installations submitted to the Bureau of the Budget in July 1967 consisted of 329 projects to be completed over a 5-year period beginning in fiscal year 1969 and concluding in fiscal year 1973 at a cost of \$51 million. The first updating of the 5-year plan, to be submitted to the Bureau of the Budget by July 1968, consists of 317 projects at a total cost of approximately \$64 million. The increase in the estimated over-all cost of air pollution abatement and control at military installations from \$51 million to \$64 million is due to additional pollution control requirements being established by the states and local regulatory agencies. The 5-year plan will be updated annually to reflect such requirements.

Emergency Operations

During fiscal year 1968, the Army exercised its responsibilities for emergency flood control operations through flood fighting, rescue operations, and repair and restoration of damaged flood control works. It also provided assistance, at the request of the Office of Emergency Planning (OEP), to civil authorities when natural disaster threatened or struck and the situation was beyond their capabilities to control.

In mid-August 1967, heavy rains totaling over 6 inches caused widespread flooding in the Fairbanks, Alaska, area from overflow of the Chena and Tanana Rivers. Total damages were estimated at about \$100 million, with a loss of six lives. Army personnel engaged in flood fighting and provided technical assistance. The President declared a "major disaster" in the affected area. At the request of the OEP, the Corps of Engineers undertook a disaster assistance program costing about \$6 million. This amount included reimbursable work performed by local interests.

In September 1967, three tropical storms—Beulah, Chloe, and Doria—developed into full-fledged hurricanes. Hurricane Chloe never threatened land areas, and Hurricane Doria caused only minor damage along the coast from New Jersey to North Carolina. But Hurricane Beulah moved inland just north of Brownsville, Tex., and its accompanying heavy rains caused widespread de-

structive flooding in extreme southern Texas and adjacent areas of Mexico. Damage was extensive and the President declared a "major disaster" in the 24 counties of Texas adversely affected by the hurricane. Corps personnel assisted local communities in their flood fighting efforts. The disaster assistance program was accomplished by local interests on a reimbursable basis at an estimated cost of \$3 million. The Corps role was limited to providing technical assistance as well as inspecting eligible work performed by local interests.

In mid-December 1967, flood flows from torrential rains in Honolulu, Hawaii, area caused damages principally in those streams flowing into Maunalua Bay between Diamond Head and Koko Head. Emergency repair work was necessary on five of the seven stream channels involved, and was undertaken by the Corps at an estimated cost of \$800,000. Local interests are accomplishing the work at the other two streams. Also, in late December 1967, heavy snowfall in the Cascade Mountains of Washington, followed by heavy rains and above normal temperatures, caused flooding in the Snohomish River Basin. Corps personnel assisted local authorities to reinforce weakened levees.

In mid-January 1968, an ice jam on the Raritan River between New Brunswick and Highland Park, N.J., posed a threat to inhabited areas in the vicinity from possible flood conditions. Army Engineers met with local and state officials to provide advice and assistance to alleviate the situation. The 6,000-foot-long ice jam was kept under constant surveillance until it passed downstream after being freed by a warming trend.

In March 1968, heavy rains in southeastern New England combined with some snow melting to cause floods of record proportions on many of the smaller streams in the area. Corps personnel provided technical assistance to communities and furnished about 90,000 sandbags to 31 communities. Corps-built projects are estimated to have prevented \$18 million in damage.

In mid-May, heavy rains in eastern Oklahoma and western Arkansas resulted in widespread flooding in those areas. Preliminary damage estimates in the Ouachita Basin, Ark., amounted to between \$15 and 20 million. The President declared a "major disaster area" for the counties adversely affected by the floods. Again in late May 1968, heavy rainfall caused major flooding in the Hocking and Scioto Basins in Ohio and moderate flooding in the Wabash and White Basins in Indiana. Corps personnel provided technical assistance and made damage surveys. The cofferdams at Cannelton and Uniontown Lock and Dam were

flooded. The President declared a "major disaster" covering the affected areas in Ohio. Also in late May, rainfall in amounts up to 5 inches in northern New Jersey and Metropolitan New York City caused flash flooding on most northern New Jersey streams and local flooding in areas of heavy rainfall. Corps personnel were dispatched to the most troublesome areas for reconnaissance and to provide technical assistance. The President once again declared a "major disaster" in the hardest hit areas in New Jersey. At the close of the year, Corps personnel were making surveys for OEP to determine work eligibility.

Nuclear Power Applications

In 1954, when the Army nuclear power program was formulated, it had as its primary objective the development of nuclear powerplants for use in remote and isolated areas where conventional fuel supply was a problem. This objective was met and fixed and portable plants were built and operated on the Greenland Ice Cap, in the Antarctic, in Alaska, and on a mountain top in Wyoming. The latter plant, the portable medium reactor No. 1, which was operated during the period February 25, 1962, through April 11, 1968, by the U.S. Air Force at Sundance, Wyo., attained a new record of continuous power operation of 4,101 hours which ended on February 27, 1967. This continuous power run exceeded the longest continuous power run in the United States, 3,758 hours, held by the Yankee nuclear power station, Rowe, Mass.

The original objective of the Army nuclear power program was later broadened to include investigation and development of nuclear energy to meet more general military applications. A small land-mobile plant to meet electrical requirements of the Army in the field was developed and successfully operated. However, this plant proved too costly for general military application. An energy depot concept, using nuclear energy to produce fuel or otherwise power Army vehicles and equipment in the field, was investigated and found technically feasible but too expensive to develop and use with current technology.

The latest plant to be developed under the program is the world's first floating nuclear power station, *Sturgis*. This plant can be towed to any port in the world to support military operations or provide electric power to communities hit by peacetime disasters. It is capable of producing 10 million watts of electricity for 1 year without refueling. A conventional fuel plant capable of producing this much electricity would require more

than 160,000 barrels of fuel per year. The reactor core for the *Sturgis* is a little larger than an oil drum.

The *Sturgis* reactor was brought critical (the point at which a self-sustaining nuclear reaction occurs) at Fort Belvoir, Va., on January 26, 1967. Since its acceptance from the Martin Company in June 1967, the nuclear plant has undergone extensive nuclear and power generating tests; as the year closed it was being readied for deployment.

The Army will continue to develop conceptual and detailed designs for nuclear powerplants to meet general and special requirements where nuclear power is shown to be feasible and economical, with the aim of reducing the Army's logistical burden of conventional fuels and generators. Nuclear power is not cost-effective at the present time for the majority of applications of interest to the Army. However, large barge-mounted plants can be economically competitive with similar plants using coal and oil, and will offer substantial operational and logistical advantages. Nuclear power in the smaller size range remains attractive for remote areas and for confined environments such as deep underground installations, hardened sites, and undersea facilities.

The Army is also investigating new concepts that show promise of significant cost reductions, extended operating time between refueling, and reduction of crew size. This will be a joint effort with the Division of Reactor Development and Technology, U.S. Atomic Energy Commission, and will involve continued operation of existing Army plants in order to develop more data on plant and component lifetime and reliability factors.

Along other lines, the Corps of Engineers, through its Nuclear Cratering Group, and the Atomic Energy Commission began in fiscal year 1963 a joint program to develop the technology and capability to use nuclear explosives for large-scale construction projects. The AEC is responsible for development of explosive devices, the execution of nuclear cratering experiments, production of design criteria, and nuclear explosives safety; the Army is primarily responsible for executing a corollary chemical high explosive cratering program and for developing engineering and construction techniques associated with the construction of large projects using nuclear explosives.

Major effort during the year was devoted to preparation and execution of high explosives experiments to test the feasibility of blasting channels in weak material with poor slope stability. Planning for a nuclear quarry experiment continued. Field and analytical studies of slope stability were emphasized.

The extremely successful execution of nuclear cratering experiments Cabriolet and Buggy in January and March 1968 gave great impetus to the program by demonstrating the ability to limit the radioactivity hazard from cratering events. The Army's Nuclear Cratering Group made detailed pre- and post-shot investigations of the crater sites.

Active research into the effects of nuclear weapons continued during the year, including terrain evaluation to assess the effects of nuclear craters on ground mobility and investigation of the vulnerability of various types of troop shelters under blast conditions. In the latter connection, several shelters for use in Southeast Asia were evaluated. One shelter model will be tested in Canada in August 1968 as part of a large conventional explosive experiment.

Military Engineering

During fiscal year 1968 a major study of military engineering support of the Army in the period 1967-75 was conducted to establish new policies and procedures that would insure optimum engineer support in that period. Eight functional areas were addressed: Command and staff relationships, combat engineering, facilities engineering, contract construction, geodesy and topography, civil works, research and development, and non-Army support. The study was completed in February and acted upon by the Chief of Staff in May 1968, and as the year closed, approved findings were being implemented.

Engineer Operations in Southeast Asia

Engineer combat and construction support are essential to the tactical mobility and staying power of the U.S. fighting forces and were proving so in Vietnam in the past year. Although a large share of the effort of engineer troop units was devoted to developing coastal and inland bases, they continued to perform a variety of close combat support tasks—mine clearing, road and bridge rehabilitation, and destruction of enemy tunnels and fortifications were regular missions.

Engineer combat and construction troops were in the vanguard when Army units first deployed into the I Corps tactical zone in the northern section of South Vietnam. Difficult environmental conditions faced the engineers in the spring of 1968 as they developed beach facilities and roads for deploying Army forces,

such as intense rainfall, heat, abrasive sand and dust, weak soil, and a scarcity of rock sources for gravel.

The constantly expanding troop construction program, coupled with the extension of engineer combat support into new regions, necessitated changes in the organization for control of engineer operations. In March 1968, a new engineer command control element, Engineer Troops, Vietnam (Provisional), was activated to replace the Engineer Command, Vietnam, which had been in existence since November 1966. The U.S. Army Engineer Construction Agency, Vietnam, was also activated provisionally in March 1968, to improve management of military construction operations and to improve control of engineer service support in real estate and repair and utilities.

In something less than 3 years, Army engineer troops have constructed the initial essential facilities required to support the rapid deployment of major U.S. combat units and the buildup of supplies and equipment to sustain operations. Engineer troops developed forward troop bases, airfields, and roads for combat operations; port facilities to berth ocean shipping and lighterage capable of unloading nearly 20,000 short tons of cargo per day; bulk petroleum supply, storage, and distribution facilities with over 61 million gallons of tankage and 170 miles of pipeline; airfield and heliport pavement with a total area of nearly 6 million square yards; more than 20 million square feet of covered and open storage and 1 million cubic feet of refrigerated storage; nearly 1,700 miles of roads within and between base areas and ports; and more than 17 million square feet of troop housing, administration buildings, and hospitals.

The 44th Engineer Construction Group, assisted by the Royal Thai Army Engineers, supported U.S. Army and Air Force units in Thailand. There in December 1967 a 124-kilometer military road was completed linking the port of Sattahip on the Gulf of Thailand with roads to Korat and northeast Thailand. A 41-kilometer section of highway between Korat and Kabin Buri was near completion as the year closed. Other construction continued on roads, open storage areas, buildings, pipelines, and tank yards at Korat and in the northeast; on an Army cantonment and logistical complex at Sattahip; and on cantonments, roads, ammunition storage areas, weapons ranges, and an airfield for the Royal Thai Army and Volunteer Forces near Kanchanaburi on the River Khwae.

New land-clearing equipment introduced into Vietnam in the last year was used effectively to reduce enemy jungle refuges.

Land clearing increased in direct ratio with the improvement in operator skills and clearing techniques. Several main supply and maneuver routes that had been untenable were made relatively secure from enemy ambush through the use of tree-cutting equipment.

Virtually all divisions in Vietnam were supported with air-mobile engineer equipment as the year ended. Sets were assigned to various supporting units subject to the call of field force commanders. Such equipment as sectionalized tractors and scoop loaders can be airlifted by helicopter.

In September 1967 the Chief of Engineers was directed to develop and test protective shelters and fighting bunkers for use in areas of heavy shelling in Vietnam. Two bunker designs were selected, one a reinforced concrete arch modular structure, the other a corrugated metal pipe arch structure. By March 1968 both had been tested, the latter selected, and procurement initiated.

Airfield and heliport construction and repair continued to be a major engineer function in Vietnam. Prefabricated surfacing materials expedited the task; thus far 133 million square feet of steel landing mat, 40 million square feet of aluminum landing mat, and over 65 million square feet of nylon membrane surfacing have been supplied in support operations in Southeast Asia. Soil and dust stabilization is another problem, and to date almost 200,000 barrels of binders and dust palliatives have been supplied.

The need for protective structures for Army aircraft became apparent early in Southeast Asia operations. Airfield and heliports were attacked with increasing frequency as the enemy attempted to destroy the aircraft so actively used against them in airmobile operations. Engineer troops, using steel landing mat, constructed revetments to protect Army aircraft, and further research on portable protective materials went forward in the United States.

The Viet Cong have conducted operations from elaborate and well hidden tunnel complexes, and U.S. Army engineers have worked with the tactical forces to locate and destroy these facilities. The Army Engineer Waterway Experiment Station at Vicksburg, Miss., conducted research in this field and produced a "tunnel rat explorer device" by means of which troops could communicate with a man searching a tunnel and map an underground complex accurately. Six such devices were manufactured and sent to Vietnam in April 1968 for evaluation.

Mapping and Geodesy

During fiscal year 1968 the Army topographic community continued to provide Army and other Department of Defense users with mapping, geodetic, and military geographic intelligence support. Some 60 million copies of 5,725 new or revised map sheets and reprints at various scales were published.

A major element of the program continued to be cartographic support of Vietnam operations, and comprehensive geographic intelligence was produced for the U.S. armed forces in Southeast Asia. Since the basic mapping of the area had been completed in past years, attention centered on special projects and map supplements. In one Vietnam project, a 1:25,000-scale orthophoto product overprinted with a special navigation lattice was published to provide a position-fixing capability. Its favorable acceptance and utility led to development and production of an ortho-pictomap, a refinement of the pictomap process that eliminates distortion due to relief. It is accurate as a topographic map and may be used for fire direction purposes.

The U.S. Army continued to support the United Nations in Korea, revising 50 sheets of 1:50,000-scale maps and producing 98 sheets of the demilitarized zone at the 1:25,000 scale, the degree of detail needed by small unit patrols.

As part of a command post exercise, the quick response capability of the Army Map Service was tested in a project requiring the production of a pictomap, using available source materials on an unannounced and previously unmapped area. A fully satisfactory product was prepared within 41 hours, faster than the 48-hour test objective.

The upswing in civil disorder raised extensive requirements for city maps with intelligence overprints. Of a 144-sheet total requirement, 52 sheets of high priority had been produced as the year ended and the remainder were in process.

Geodetic field operations were continued in Africa and the Middle East during the 1968 fiscal year, including control surveys to support Department of Defense requirements and operations connected with cooperative mapping agreements with host nations. Operations in the Sudan were discontinued in August 1967, having proved infeasible in the aftermath of the Arab-Israeli war.

In Latin America, cooperative mapping programs with 15 nations were conducted by Inter-American Geodetic Survey, a subordinate element of the U.S. Army Southern Command. Operations in Costa Rica were completed, and it is anticipated that

those in the Dominican Republic, Nicaragua, and Guatemala will terminate in 1969.

The geodetic satellite connection between Tokyo and North American datums was completed under sequential collation of range (SECOR). SECOR operations continued eastward on the worldwide equatorial belt from Japan across the United States and the Atlantic into Africa, thereby connecting North and South America with Japan and Africa. The optical satellite program, with a 43-station primary network, has produced 27 station positions between Japan and Iran. Connection to Antarctica is the next major objective.

Mapping and geodetic data reduction are increasingly dependent on the electronic computer, and the Army contracted for a commercial study to analyze and modernize the computer capability. At yearend, plans were underway to carry out a series of recommendations that will produce a computer complex with a 10-year life span, a facility that will enable the Army topographic community to continue to enjoy a worldwide reputation as one of the world's foremost mapping organizations.

During the year the Army also continued to support the National Aeronautics and Space Administration, evaluating photography from 1967 lunar probes for possible use in small-scale maps of the visible portions of the moon and medium-scale maps of selected landing sites.

X. Special Functions

Panama is a sparsely settled country, with few laborers available. The great majority of those employed must be imported. For every laborer brought in at least one person more will come who will be dependent on him. We must therefore count on an alien population of 50,000 to be distributed along the line of the canal for 47 miles. To get the best work out of the laborers, they must have pure, good water to drink, and the filth and noisome drainage caused by such a collection of human beings must be taken care of, so as not to promote disease. Finally, Panama has a history of awful loss of life among workmen engaged in the construction of the railroad and the canal from yellow fever and malaria, and these two diseases must be stamped out. Many of these things—indeed almost all of them—ought to be done before the “dirt begins to fly.”

Report of Secretary of War William H. Taft
December 9, 1905

These few words from a previous annual report illustrate the nature of the problems faced by the Canal builders and point up the Army's interest and early participation in their solution.

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 is referred to as the “Stockholder” of the Panama Canal Company, a corporated agency of the U.S. Government, which is responsible for the maintenance and operation of the Panama Canal. The Governor of the Canal Zone, traditionally a general officer of the Corps of Engineers, is charged with the actual administration of the Canal Zone government; to carry out this function he serves as president and director of the Panama Canal Company, under the over-all supervision of the Secretary of the Army.

Following the trend of the previous year, Panama Canal traffic increased in fiscal year 1968 to a new record of 14,807 transits of oceangoing ships and toll revenues of approximately \$93.2 million, which includes credits for transits of U.S. Government vessels. In fiscal year 1967 there were 13,385 transits and \$82.3 million in tolls. This increase was aided by transits of Government vessels which increased to 1,504 in 1968 compared

with 879 in 1967. The latter increase was largely due to operations in Vietnam.

Although annual interest payments are made, increasing canal revenues provide no direct financial profit to the United States 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.

During the year, projected future capital programs for improving the Panama Canal and expanding its capacity were considered on a cost-effectiveness basis. Also considered were the effects a new sea level canal might have on existing operations. In connection with the long-range planning effort, the Secretary of the Army monitored the negotiations regarding a new treaty on the existing canal, as well as a treaty on a proposed sea level canal, and a treaty to cover the defense of both. Negotiated drafts of these treaty instruments were submitted to the United States and Panamanian Governments for review.

Interoceanic Canal Study

The Secretary of the Army, in conjunction with the Secretary of State and the Chairman of the Atomic Energy Commission, continued to serve on the Advisory Council of the Atlantic-Pacific Interoceanic Canal Study Commission. The Chief of Engineers, designated Engineering Agent for the Commission, continued to study the engineering feasibility of a sea level canal across the American Isthmus. The study involves on-site investigation of possible routes and a determination as to the most feasible location for such a canal, along with its cost and method of construction. The study requires the coordinated efforts of elements of the Army, the Atomic Energy Commission, the Environmental Science Services Administration, the State Department, and other Federal agencies.

Administration of the Ryukyu Islands

Pursuant to Article 3 of the Treaty of Peace with Japan, the Ryukyu Islands are under U.S. jurisdiction. Because of their strategic location, the United States has developed an important Western Pacific defense base on Okinawa, the largest island in the Ryukyu archipelago. The U.S. military base protects free world security interests in the Far East and Western Pacific.

The Ryukyu Islands are administered by the Department of

the Army in accordance with an Executive order which provides for a civil administration headed by a High Commissioner who is a member of the armed forces. The Executive order also provides for an indigenous government of the Ryukyu Islands, with legislative, executive, and judicial branches.

Fiscal year 1968 was a period of marked advance in promoting increased autonomy for the Ryukyuan people. In line with their desires for increased home rule, the United States on January 31, 1968, authorized the selection of their Chief Executive by the electorate rather than indirectly by the legislature of the Ryukyu Islands. The first election under this new procedure will be held in November 1968.

Cooperation between the United States and Japan in Ryukyuan affairs was broadened during the year. An advisory committee to the High Commissioner, composed of representatives of the three interested governments, was established in March 1968 to promote the further identification of the Ryukyuan people and their institutions with Japan and to further their economic and social welfare. The establishment of this committee grew out of a meeting between Japan's Prime Minister Sato and President Johnson at Washington in November 1967. Also recognized at this meeting was the vital role played by the U.S. military base on Okinawa in assuring the security of Japan and other free world nations in the Far East.

Progress was made toward satisfying certain claims against the U.S. Government resulting from acts and omissions by U.S. armed forces in the Ryukyus in the period between the surrender of Japanese forces at the close of World War II (August 15, 1945) and the date when the Treaty of Peace with Japan took effect (April 28, 1952). This progress was made possible when Congress in fiscal year 1967 appropriated \$21.04 million to adjust 180,000 claims. Claims still pending at yearend are expected to be disposed of by October 15, 1968.

Labor relations in the Ryukyus were improved when the Secretary of Defense in April 1968 delegated to the High Commissioner the authority to establish rates of compensation, including fringe benefits and conditions of employment for Ryukyuan employees of the U.S. forces on Okinawa. A Joint Service Labor Committee, composed of representatives of the Services based on Okinawa, was authorized to enter into collective bargaining and written agreements with union representatives. As a result, an initial management-labor memorandum of understanding was agreed upon in May 1968.

Further emphasis was given to programs to assist the Ryukyuan community to broaden and strengthen its capabilities in the fields of government, agriculture, business, industry, public health, education, and vocational training. Under these programs, 862 selected Ryukyus were given special training outside the Ryukyus, many of them in the United States.

The Ryukyuan economy continued to register impressive gains. The Gross National Product rose to \$521.7 million, a 19.4 percent increase over 1967. Adjusting for price increases, the growth in real terms was about 13 percent, roughly the same as in the 2 previous years.

The 90th Congress increased the annual aid authorization for the Ryukyu Islands for \$12 to \$17.5 million, to promote the health, education, and social welfare of the Ryukyuan people.

The Army approved construction of a 160-megawatt electric generating plant for the Ryukyu Electric Power Corporation on Okinawa. Eleven of 15 American and Japanese entrepreneurs who were invited to submit proposals indicated an interest in financing and constructing the facility. The new plant, which will utilize steam turbines, is scheduled for completion in 1971. In addition to this plant construction, the Army approved the procurement of two 15-megawatt gas turbine generators and a 33-megawatt thermal-type unit.

An agreement between the Department of Defense and the U.S. Interagency Textile Administrative Committee, providing for a voluntary control system for Ryukyuan cotton textile exports to the United States, was extended to September 30, 1970. The basic agreement included an export ceiling for fiscal year 1968 of 12,626,250 square yards, and its extension establishes levels which reflect the normal 5 percent annual growth for succeeding fiscal years.

The Agricultural Commodities Agreement between the United States and Ryukyuan Governments for calendar year 1968 was signed on May 29, 1968. It provides for the sale of agricultural commodities valued at \$537,000.

On January 11, 1968, the U.S. Government agreed to a Japanese aid program, proposed by the Japanese Government for the Ryukyus, amounting to \$42.7 million during the period April 1, 1968—March 31, 1969. It includes a \$7.8 million loan for industrial development, marking the first time since the inception of Japanese financial assistance to Okinawa that a major portion of the program will consist of loans.

Promotion of Rifle Practice

The Secretary of the Army, acting on recommendations from the National Board for the Promotion of Rifle Practice, has the mission of promoting practice in the use of rifled arms among able-bodied citizens of the United States not reached through training programs of the active components of the armed forces. This includes promotion of matches and competitions in the use of such arms, ammunition, and targets, and the award of medals and trophies to winners. The purpose is to develop instructors and qualified marksmen among individuals who may be called upon in time of war, and to foster a public sentiment favoring marksmanship training as an element of national defense.

The National Board for the Promotion of Rifle Practice is authorized 25 members, military and civilian, with a president designated by the Secretary of the Army. Action was taken to broaden membership of the board to include other agencies of the Government. A Director of Civilian Marksmanship, an Army officer, supervises the board's program.

During fiscal year 1968 over 5,755 civilian rifle and pistol clubs participated in the program. Some 2,600 were senior clubs, while more than 3,100 were junior, collegiate, or school clubs. Members of these clubs totaled 350,000.

The National Rifle and Pistol Matches at Camp Perry, Ohio, culminated the 1967 civilian and military marksmanship training program. Attending the matches were 6,530 competitors. Another 4,910 persons attended the Small Arms Firing School conducted by the U.S. Army Marksmanship Training Unit. Achievement in the National Trophy Matches was recognized by awarding 40 trophy plaques and special prizes and 2,639 medals and Army qualification badges. Rifle teams were sent by 49 states, and 48 states sent pistol teams to the 1967 matches. Travel expenses of these civilian teams were partially defrayed by board funds.

The NBPRP sponsored 41 regional "Excellence in Competition" matches during fiscal year 1968, where civilian and military personnel competed to earn credits toward award of the Distinguished Rifleman or Distinguished Pistol Shot badges. Awarded were 37 distinguished badges and 73 excellence in competition badges.

The NBPRP assisted the shooting team that represented the United States in the Pan American games at Winnipeg, Canada. The U.S. team won six gold medals and set a new world record in the Free Pistol Match. The board awarded 12 U.S. Distin-

guished International Shooter badges to qualifying team members.

Army support of the 1968 National Matches was withdrawn because of budgetary reasons. During fiscal year 1968 the Secretary of the Army reoriented the civilian marksmanship program for 1969 to give the program more tangible military relevancy. The major changes were withdrawal of support for the pistol program, withdrawal of support for senior clubs that have no junior division, limiting free ammunition support to junior clubs, and modifying the weapon sales program to include only the National Match M-1 rifle and spare parts. Junior clubs may purchase limited quantities of .22-caliber ammunition. Under the new arrangement, no other ammunition may be sold.

XI. Military Assistance and Foreign Liaison

Under . . . "An act to provide assistance to the inhabitants of Cuba, and arms, munitions, and military stores to the people of the Island of Cuba, and for other purposes," approved May 18, 1898, large quantities of subsistence stores, ordnance and ordnance stores, medicine and medical supplies, and engineer property, as contemplated by the above act, were sent to the Island of Cuba under the direction of the Major-General Commanding the Army.

Report of Secretary of War Russell A. Alger
November 29, 1898

For as long as the United States has provided military assistance to friendly or less fortunate nations to promote their economic development and stability while furthering our foreign policy objectives, just so long has the Army been an instrument in administering the aid. In 1968 the Army continued to provide training and logistical support in various forms.

Foreign Military Training

Funds for foreign military training exceeded \$23 million for grant aid and Service-funded training plus some \$3.8 million for foreign military sales training. These funds supported about 9,000 training spaces in the United States, 3,800 spaces overseas, 60 orientation tours for senior military personnel, 108 mobile training teams, and 67 field training personnel.

Military assistance program training for Ceylon was begun in the year when instruction was provided in U.S. Army schools in the United States for nine Ceylonese students.

Devaluation of Peru's currency resulted in that country's loss of dollar instruments to defray per diem and salary costs of students programed for out-of-country training. Because of the lack of funds, Peru in October 1967 canceled all remaining fiscal year training in the continental United States and Panama, a loss of 10 students in the United States and 154 at the U.S. Army School of the Americas in Panama.

A deteriorating situation in Nigeria led to suspension of the military assistance training program for that country during the year, but all students in the United States remained to

finish their scheduled training, and four participating in university schooling completed their undergraduate work.

Training for Vietnam continued with over 676 students receiving instruction in the United States in the fiscal year. Efforts were directed toward providing Republic of Vietnam Army personnel with training on new and more advanced weapons. Thus the program of instruction in the leadership course at Fort Knox, Ky., was amended to include training on the M-16 and recoilless rifles, and pilots were trained on new models of helicopters. To help the Republic of Vietnam acquire some of the managerial and technical skills required in a modern army, 26 Vietnamese officers are attending U.S. universities to study and obtain degrees in such fields as economics, engineering, and business administration.

International Logistics

The materiel portion of the 1968 Army military assistance program totaled \$246 million and included varying degrees of support for 32 countries and international organizations. Grant aid recipients received \$448 million in materiel during the fiscal year.

Grant aid is regularly adjusted by Congress and the Department of Defense to meet changing world conditions. The increased tempo of the war in Vietnam led to sharply increased support for Thailand and Laos. Because of the influence of the Vietnam war on these two programs, with a resultant heavy burden on limited military assistance appropriations, support for Laos and Thailand was transferred on July 1, 1967, from the military assistance program to the regular defense budget of the military Services. Planning, programing, and supply continued essentially as before, with the receipt of \$63 million in orders and delivery of \$48 million during the year in addition to that shown above for grant aid.

By continuous review and close scrutiny of requirements, gold flow resulting from the grant aid program was reduced to a minimum. Foreign currencies instead of U.S. dollars were used wherever possible, offshore procurement was reduced, and overseas travel was curtailed. In a further economy move, the Military Assistance Institute, a contractor-operated training facility for Military Assistance Advisory Group personnel of all the Services, was closed on June 30, 1968. Residual training will be assumed by the military departments and unified commands.

Continued improvement in the economic position of some

countries has led to a reduction in grant aid and their increased participation in cooperative programs. The Republic of China, for example, is co-producing transport vehicles, rebuilding combat vehicles, and expanding in-country munitions production; Turkey is rebuilding unserviceable tanks; Italy is producing ammunition for other U.S. grant aid recipients in return for U.S. materiel.

Materiel assistance for the Republic of Korea was accelerated as a result of the *Pueblo* incident and increased infiltration by the North Koreans. Additional construction equipment was supplied to the Philippines, and grant aid for Indonesia was continued on a limited scale. The suspension of shipments to Greece of selected major items continued through fiscal year 1968, while shipments to Jordan, suspended in June 1967 due to the Middle East conflict, were resumed in May 1968. Ethiopia was scheduled to receive some combat vehicles, weapons, and ammunition, other African nations received some minor amounts of materiel through grant aid, and an improved communication system was completed in Iran on a cost-sharing basis.

During the fiscal year the Army sold materiel and services valued at \$348.3 million to 64 foreign countries and six international organizations under the Foreign Military Sales Program. This included missile systems, weapons, tanks, vehicles, helicopters, aircraft engines, communications equipment, rifles, production machinery, machineguns, howitzers, engineer equipment, and repair parts and support equipment. Orientation tours were arranged for key foreign military personnel, country programs were reviewed, and a case closeout program moved forward.

The U.S. Army participated in co-production programs with the North Atlantic Treaty Organization, the Federal Republic of Germany, Japan, the Netherlands, Norway, and, as noted above, the Republic of China and Italy. Valued at \$1.4 billion, these programs will result in an estimated \$965.5 million investment in goods and services in the United States. Production includes the M-113 armored personnel carrier and the M-60A1 tank (Italy), the HAWK and NIKE-HERCULES missile systems (Japan), the M-109 self-propelled howitzer (Netherlands), the UH-1D helicopter (Germany), and the M-72 light antitank weapon (NATO through Canada and Norway). Discussions were held with NATO on production of an improved HAWK missile system.

Logistic support for U.S. equipment being used by the mili-

tary forces of friendly foreign countries is a major element of the Cooperative Logistics Program. Under supply support arrangements, repair parts and related services are furnished to a participating country on a continuing basis, using the U.S. Army logistics system. The United States is reimbursed for the costs incurred. Supply support arrangements were made with three additional countries during the year, bringing to 17 the number of such arrangements and increasing to \$115 million the value of stocks on hand and on order for supply support arrangement customers at the end of fiscal year 1968.

Foreign Liaison

Numerous foreign dignitaries visit the United States annually as guests of the Secretary of Defense, the Secretary of the Army, the Chairman of the Joint Chiefs of Staff, or the Army Chief of Staff. The Army's Foreign Liaison Office administers their tours, some of which are for "Very Important Persons," some connected with the military assistance program, and others, orientation for various purposes.

There were 14 VIP tours in fiscal year 1968, and 104 tours connected with the military assistance and military sales programs involving 1,850 allied officers. Another 9,762 visit requests were received from foreign military attaches for visits by foreign nationals to various U.S. military installations and commercial facilities.

XII. Summary

In fiscal year 1968 both over-all Army strength and deployments to Vietnam began to level off, and the general direction of Army effort began to shift from activations and deployments to sustaining the forces in the theater of war. The stabilization did not, however, portend a decrease in manpower requirements. The active Army will require regular infusions of new personnel on a continuing basis to replace men completing 2-year tours begun earlier in the buildup and to meet the short tour turnover in Vietnam. The magnitude of the need is suggested by the fact that the Army closed the fiscal year with an actual strength of 1,570,300 and with 355,000 troops in Vietnam. The strength objective for fiscal year 1969 remains above 1.5 million.

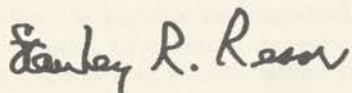
As the year closed, certain broad lines of action were in progress. In Vietnam, emphasis was being placed on training and equipping South Vietnamese forces to prepare them to assume broader responsibilities for the conduct of the war. In Korea, priorities in both personnel and funds were elevated to meet an upsurge in hostile incidents by North Korea; anti-infiltration measures were being taken along the demilitarized zone. In Europe, redeployment of about 28,000 troops was in process. And at home, the strategic reserve was being maintained at appropriate levels to insure a timely response to further contingencies involving United States commitments and interests.

Also at home, the Army's civil disturbance program was being expanded against the possibility of future disorders of a magnitude requiring active Army employment. The new Directorate for Civil Disturbance Planning and Operations will carry the weight of activity in this field, relieving those who are responsible for operations in Vietnam and elsewhere around the world of an excessive domestic burden.

The 1969 fiscal year Army budget requests a total of \$25.2 billion in new obligational authority. It is designed to balance the immediate needs of the Vietnam conflict against the longer range programs that are necessary to maintain a credible deterrent into the future. Competing demands for funds are rec-

ognized in its formulation; certain desirable programs have been deferred. The procurement request is the largest since the Korean war—\$6.376 billion, of which \$3.7 billion is for direct support of operations in Southeast Asia. The research and development request, again larger than the previous year because of urgent war requirements, but also designed to support the Sentinel program, is \$1.66 billion. The operation and maintenance appropriation request, \$8.2 billion, provides annual sustaining costs for all U.S. forces in Vietnam and elsewhere. A military construction request for \$704 million is applied to operational requirements of all kinds but especially to those associated with weapons systems and war support.

As this report indicates, fiscal year 1968 was a year of general improvement in the Army's posture, a year when capabilities moved generally into line with requirements after an extended period of buildup. Complete stabilization was not achieved—indeed, it is rarely attained in peacetime much less wartime, for national defense involves competing demands, the acceptance of risk, and adjustment to external threats. But within terms of the conditions outlined in this report, the Army may be said to have ended fiscal year 1968 in "highly respectable" condition.



STANLEY R. RESOR,
Secretary of the Army.

Annex

ANNUAL REPORT

of the

OFFICE OF CIVIL DEFENSE

July 1, 1967, to June 30, 1968

Introduction

Civil defense, a vital part of the national defense system, must start with the blunt assumption that an all-out nuclear attack would claim millions of lives. Given this fact, the primary civil defense program objective in simple terms is to plan and implement reasonable measures that will maximize life-saving without changing the basic institutions of the Nation.

From the start of a formalized nationwide civil defense program with the passage of the Federal Civil Defense Act of 1950, the rapidity and magnitude of changes—A-bomb to H-bomb, bombers to missiles, hypothetical danger to actual threat—complicated attempts to define the potential and limitations of civil defense.

Then, on May 25, 1961, President Kennedy discussed civil defense in a special message to the Congress on "Urgent National Needs." He recommended the initiation of a nationwide long-range program of identifying existing fallout shelter capacity and providing shelter in new and existing structures to protect millions of people against the hazards of radioactive fallout in the event of a large-scale nuclear attack. He announced his intention to assign major civil defense responsibilities to the Secretary of Defense.

Defense Department studies of a wide range of hypothetical nuclear attacks against the United States show that in large-scale nuclear attacks a fallout shelter system has a greater lifesaving potential for the investment involved than any other element of strategic defense, and that it complements the damage-limiting effectiveness of other strategic defense measures.

Active offensive and defensive systems are designed to deter enemy attack, or if this step should fail, to limit damage, especially from the immediate weapons effects, against which fallout shelters can provide only peripheral protection. Should the deterrence fail, the fallout shelter-oriented civil defense program at this time is the fundamental means of limiting damage to our population from widespread effects of radioactive fallout.

In discussing this complex subject of defensive systems against nuclear attack, President Johnson 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 lives, and the one which has clear value even without other systems."

Highlights

Highlights on the development of the Nationwide Fallout Shelter System during fiscal year 1968, included the following:

1. Public fallout shelter space for 16.3 million additional persons was located in 13,557 facilities, increasing the national inventory to more than 176.5 million fallout shelter spaces in 189,053 facilities.

2. There were 9,257 facilities licensed for use as public shelter in an emergency. This increased the number of licensed facilities to 109,725, with aggregate shelter space for about 108.9 million persons.

3. There were 6,438 facilities marked with standard fallout shelter signs. This increased the number of facilities marked to 107,456, with a total capacity to protect approximately 101.1 million persons.

4. Survival supplies issued to 8,033 facilities increased the total number of facilities stocked to 91,075. These have the capacity and sufficient supplies to accommodate 88.1 million persons for 8 days, or 52.7 million for 14 days.

Other highlights were:

1. Community shelter planning (CSP) contracts were executed to cover 37 additional large communities. This brought the total number of executed contracts to 194, which provided for development of emergency shelter use plans for 49.8 million people living in 244 counties throughout the United States. In smaller community areas, a total of 481 counties with a population of 10.9 million people had started development of shelter use plans.

2. Home fallout protection surveys in 26 states, two New York counties, and the District of Columbia resulted in the identification of 1.8 million shelter spaces with a Pf 40 or higher and 28 million spaces in the Pf 20-39 category.

3. The direct mail shelter development system, a procedure for contacting owners and architects of specific new buildings and offering them technical assistance for incorporating fallout protection in the design of the project, was tested in Arizona, Florida, Louisiana, Massachusetts, Tennessee, Texas, and Wisconsin for program effectiveness in increasing available shelter space.

4. The fallout shelter analysis course was completed by 2,745 architects and engineers, bringing the grand total of fallout shelter analysts to more than 16,500.

5. The Civil Defense telephone and teletype system (NACOM 1) was augmented by installation of Automatic Digital Network (AUTODIN) terminals for secure on-line communications at three OCD regions.

6. The National Warning System (NAWAS) was strengthened by increasing the number of warning points from 893 to 986. In 369 of these locations, backup installations have been provided in protected areas to support emergency operations. Also, using matching funds, there were 255 NAWAS extensions which had been installed by fiscal year-end.

7. The Civil Defense radio system (NACOM 2), serving as a backup system to NACOM 1, was extended to three additional states, making it operational in 42 states, the District of Columbia, Puerto Rico, and the Canal Zone. Agreements have been signed with six additional states and American Samoa.

8. The Emergency Broadcast System (EBS), with 2,762 broadcasting stations had 629 participating with OCD in a fallout protection program to insure operational capability in emergencies. A total of 535 radio stations had

completed construction for fallout protection and 471 had been provided with required equipment by yearend.

9. The nationwide radiological monitoring network was expanded by a net gain of 2,690 monitoring stations, increasing the cumulative total to 65,833. Shelter radiological monitoring capability was strengthened by placing monitoring equipment in 10,135 additional shelters making a combined total of 94,266 so equipped. The combined total of monitoring stations and shelters with monitoring equipment is 160,099.

10. State and local Emergency Operating Centers (EOC's) totaled 3,001 by June 30, 1968. This total included 75 additional state and local centers financed during the fiscal year with Federal matching funds.

11. The damage assessment system was updated to develop the best possible estimates of the potential range of damage to resources and population during and after a nuclear attack in order to provide a basis for the conduct of effective emergency operations to achieve national recovery.

12. Annual program papers and related semiannual progress reports were submitted by the 50 states and more than 4,300 local governments during the fiscal year, with these localities including some 87 percent of the total U.S. population.

13. The OCD Staff College trained 1,123 civil defense personnel and instructors during fiscal year 1968, making a cumulative total of 52,169 so trained at OCD schools since fiscal year 1951. A total of 52,673 state and local civil defense personnel received training through the Civil Defense University Extension Program (CDUEP), making a cumulative total of 240,961 participants since CDUEP was started in fiscal year 1963.

14. Emergency operations systems development (EOSD) emphasis was continued on developing systems for the orderly increase of civil defense readiness in periods of heightened international tension and on providing guidance to state and local governments on actions to take during such periods.

15. A national civil defense exercise (CDEX-67), designed to exercise the concepts expressed in the National Civil Defense Emergency Operations Plan and the supporting Continuity of Operations Plan, was conducted with 48 states and approximately 2,200 local jurisdictions participating.

16. CSP emergency public information plans were funded by OCD for distribution to 5 million people in 98 local jurisdictions throughout the United States.

17. Radiological monitors trained by the Army (CONARC), in the CDUEP, and through the Civil Defense Adult Education Program (CDAEP) during the fiscal year, totaled 33,658. In addition, 3,031 instructors were trained.

18. Increased understanding and involvement of public and private sector leaders and leadership groups in community action for civil defense resulted from knowledge acquired from various social science research findings together with numerous field activities during fiscal year 1968.

19. In public education, 374,441 persons were trained in personal and family survival, and 5,102 teachers were trained and certified to teach the course. This brought the total number of graduates, including teachers, to more than 2.3 million. More than 2.3 million persons were trained in medical self-help, making a cumulative total of about 8.3 million so trained.

20. Rural civil defense information was presented on 1,169 television programs and 10,460 radio broadcasts, and there were 10,561 press releases to rural newspapers. There were 5,880,000 copies of rural civil defense materials

distributed upon request or in connection with educational programs during fiscal year 1968.

21. Research progress and important technical data acquired during fiscal year 1968 was accomplished by a system of coordinated studies in shelter research, support systems, postattack, and systems evaluation research based on assumed attacks on five selected urban localities. This effort promises to improve methods of analyzing attack effects and civil defense planning. It will also provide guidance for establishing future requirements.

22. Emergency public information activities during fiscal year 1968 were directed primarily to planning, preparing, reviewing, evaluating, and issuing information that the public would need in a period of rising international tension. Important byproducts and a secondary purpose of these activities were also realized as much of the information was adapted for current use in informing and training the public in survival measures.

23. Civil defense information was given to the public in many publications and periodicals, motion pictures, spot radio and television announcements, and by nationwide use of exhibits and posters.

24. Industry participation 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 civil defense publications.

25. Labor support of the civil defense program was increased by continual liaison with the labor trade unions, principally through the American Federation of Labor and the Congress of Industrial Organizations.

26. Participation in international civil defense activities of the North Atlantic Treaty Organization and the Central Treaty Organization and special arrangements with Canada provided for a meaningful exchange of civil defense concepts.

The National Civil Defense Program

Development of the civil defense program during fiscal year 1968 was continued within the framework of the balanced program established by the Department of Defense in fiscal year 1962. The structure of the program is based upon elements of a comprehensive civil defense effort which includes (1) fallout shelter, (2) warning and emergency operations, and (3) those supporting activities necessary to the successful execution of the substantive program elements. In support of practically every element of the civil defense program, some type of financial assistance to state and local governments is available, whether directly or indirectly.

Major Emphasis

During fiscal year 1968, primary emphasis continued on the performance of engineering surveys of existing structures across the United States to identify the fallout protection inherent in such structures and to make the most efficient use of shelter space located. This program is the core of our total civil defense program, as damage-limiting studies of potential attacks against both military and population targets have consistently concluded that this effort offers substantial lifesaving potential at the lowest cost.

A national fallout shelter survey (NFSS) was started in late 1961 to lo-

cate potential fallout shelter space in large structures—space meeting DoD shelter standards and capable of accommodating 50 or more persons in the event of attack. In addition, the survey identifies fallout protection in smaller buildings, other than one-, two-, and three-family homes (shelter capacity of 10 to 49 persons), where needed. Surveys are also being carried to private householders under the home fallout protection survey (HFPS) aimed at the more than 25 million U.S. homes with basements. These surveys are highly automated, with the Army Corps of Engineers managing the NFSS survey and the U.S. Bureau of the Census the HFPS survey for OCD.

Not all of this shelter space is well located in terms of population distribution. Part of this shortage can be filled by promoting the voluntary design of improved fallout shielding in new buildings. Many architects and engineers have been trained under Department of Defense standards as fallout shelter analysts; they are professionally skilled in the use of "slanting" techniques incorporating fallout protection in the design of new structures without adversely affecting the normal function, appearance, or cost of the buildings. In addition, the direct mail shelter development system (DMSDS), a systematic procedure for contracting owners and architects of specific new buildings and offering them technical assistance for incorporating fallout protection in the design of the project, is administered by the OCD and was tested in seven states during fiscal year 1968.

To develop practical procedures in each jurisdiction for efficient use of the best available fallout protection, the OCD community shelter planning (CSP) program was started in fiscal year 1966. CSP, the foundation of local emergency readiness, informs each citizen on where to go and what to do, and prepares each department of local government to support the plan and meet its responsibilities in time of major disaster.

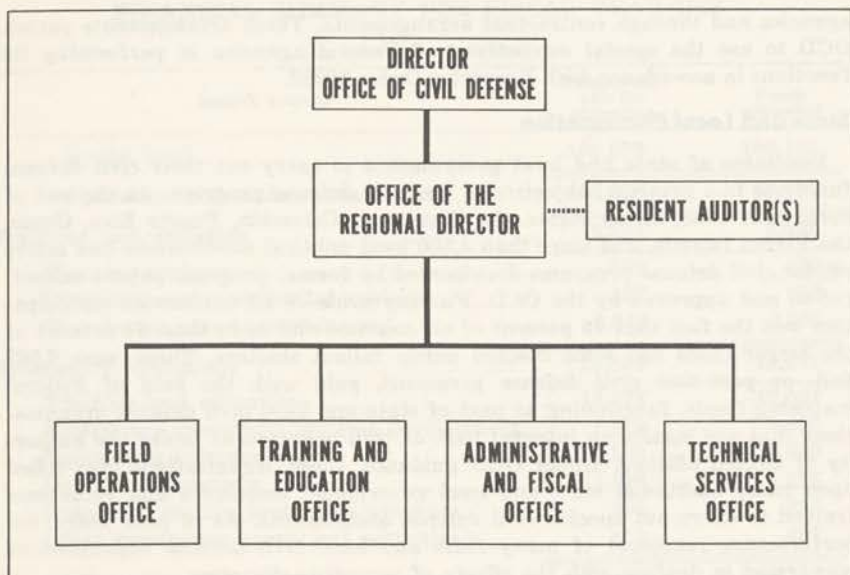
Organization and Management

The Office of Civil Defense (OCD) is responsible for conducting the civil defense program at the Federal level. The Director of Civil Defense is directly responsible to the Secretary of the Army. The organizational structure at the end of fiscal year 1968 is shown below. The manpower authorization as approved by Congress was 831 permanent civilian positions or 18 fewer than in fiscal year 1967. The decrease resulted when personnel spaces were transferred to the Office of the Secretary of the Army (OSA) in support of an agreement that OSA perform all personnel, security, and certain office service functions for OCD. The 831 OCD personnel spaces authorized at the end of the fiscal year were distributed as follows: 357 at the departmental level, 419 at eight OCD regional offices (see chart), and 55 at various other field locations.

Federal Resources

Resources of the Department of Defense, including those of the armed forces, as well as those of numerous other Federal agencies were widely used in developing and operating the civil defense program. For the seventh consecutive year, the OCD continued to develop and coordinate this support at the Federal level.

During fiscal year 1968, the adjutants general of the 48 contiguous states continued their military support of civil defense pre-attack planning func-

*Figure 2.*

tions under the planning guidance of the CONUS Army commanders. Policy direction and guidance for pre-attack and postattack military support of civil defense is provided by DoD Directive 3025.10, dated March 29, 1965. The Services issued implementing regulations and the Joint Chiefs of Staff approved the joint basic plan for defense, other than aerospace defense, of the continental United States and military support of civil defense. In Alaska, Hawaii, Puerto Rico, and other oversea areas of the United States, military support of civil defense is provided by the appropriate unified commander.

The Army, with DoD approval, authorized USCONARC and CONUS Army commanders to establish reinforcement training units (RTU's) for civil defense, or military support of civil defense, pre-attack planning, and training. These RTU's are not intended to be postattack operational units, and membership in an RTU can in no way impede mobilization of a U.S. Army Reserve member as a reinforcement for the Army during an emergency. Membership in an RTU is restricted to members of the Individual Ready Reserve. Establishment of RTU's is authorized for one of four possible purposes: (1) Planning and training for military support of civil defense within a state; (2) planning and training for military support of civil defense above the state level; (3) planning and training for civil defense at state level or below; and (4) planning and training for civil defense at the OCD regional and national levels.

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 assigning civil defense responsibilities and emergency preparedness functions to various departments and

agencies and through contractual arrangements. These arrangements permit OCD to use the special competence of Federal agencies in performing its functions in accordance with Executive Order 10952.

State and Local Participation

Readiness of state and local governments to carry out their civil defense functions is a principal objective of the civil defense program. At the end of fiscal year 1968, all 50 states, the District of Columbia, Puerto Rico, Guam, the Virgin Islands, and more than 4,300 local political subdivisions had active official civil defense programs documented by formal program papers submitted to and approved by the OCD. Further evidence of nationwide participation was the fact that 76 percent of all counties and more than 94 percent of the larger cities had some stocked public fallout shelters. There were 5,962 full- or part-time civil defense personnel, paid with the help of Federal matching funds, functioning 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 Assistance

In accordance with the Federal Civil Defense Act of 1950, as amended, the OCD provided approximately \$9.7 million to state and local governments during fiscal year 1968 for civil defense supplies, equipment, training, and emergency operating centers. Over \$5.5 million of this total was for emergency operating centers. Other obligations were mainly for communications and warning equipment and for training activities. In addition, the OCD made available approximately \$18.5 million to help state and local governments pay essential personnel and administrative expenses.

Surplus Property

Since authorized by Public Law 655, 84th Congress, property having an acquisition value of approximately \$402 million has been transferred to state and local governments. Property valued at approximately \$27 million was donated to state and local governments during fiscal year 1968.

Financial Summary

Funds available during fiscal year 1968 for carrying out civil defense operations totaled approximately \$108.6 million—\$86.1 million of new fiscal year 1968 appropriations, \$0.2 million in reimbursable orders from other agencies, and \$22.3 million carried over into fiscal year 1968 from prior year appropriations. Of this total, \$105.8 million was apportioned by the Bureau of the Budget early in the year for execution of the fiscal year 1968 program and \$2.8 million was apportioned at yearend to finance part of the fiscal year 1969 program.

Table 1 shows the planned application of the funds programed for obligation in fiscal year 1968, and the actual obligations for specific budget activities. The Office of Civil Defense obligated \$100.1 million or 95 percent of the \$105.8 million programed for obligation.

FINANCIAL SUMMARY FOR FISCAL YEAR 1968

[In thousands of dollars]

Budget activity	Funds available for obligation	Funds obligated
Grand total	105,803	100,135
Operation and maintenance total	66,225	65,900
Warning and detection	5,837	5,789
Warning systems	933	930
Detection and monitoring systems	957	953
Warehousing and maintenance	3,947	3,906
Emergency operations	19,396	19,271
Training and education	12,072	12,034
Emergency operations systems development	1,413	1,410
Emergency information	3,558	3,499
Damage assessment	1,528	1,515
Broadcast station protection program	366	356
Other emergency operations activities	459	457
Financial assistance to States	28,198	28,147
Personnel and administrative expenses	18,500	18,451
Survival supplies, equipment, and training	4,130	4,128
Emergency operating centers	5,568	5,568
Management	12,794	12,693
Research, shelter survey, and marking, total	39,478	34,139
Shelters	31,738	26,789
Shelter survey and marking	15,534	12,265
Shelter provisions	230	21
Warehousing and transportation	3,114	2,363
Federal regional emergency operating centers	6,034	5,754
Shelter development	6,823	6,389
Improvement of shelters	3	(3)
Research and development	7,740	7,350
Construction of facilities, total	100	96

Fallout Shelter

Operational Gains

Public fallout shelter space for 16.3 million additional persons was located during fiscal year 1968, increasing the national inventory of surveyed space to more than 176.5 million. Operational gains were also made in licensing, marking, and stocking public fallout shelters. A summary of fiscal year 1968 progress is given in the following table.

SUMMARY OF PROGRESS IN PUBLIC FALLOUT SHELTER PROGRAM, FISCAL YEAR 1968

Program action	Number of facilities (in thousands)				Number of spaces (in millions)			
	End of fiscal year 1967	End of fiscal year 1968	During fiscal year 1968		End of fiscal year 1967	End of fiscal year 1968	During fiscal year 1968	
	Total	Total	Gain	Percent gain	Total	Total	Gain	Percent gain
Located	175.5	189.1	13.6	8	160.2	176.5	16.3	10
Licensed	100.5	109.7	9.2	9	98.7	108.9	10.2	10
Marked	101.0	107.5	6.4	6	92.7	101.1	8.4	9
Stocked	83.0	91.1	8.1	10	47.1	52.7	5.6	12
Rated capacity of facilities stocked					78.4	88.1	10.3	12

These accomplishments in a major program started in September 1961 indicate that progress is being made in: (1) A continuing nationwide survey to locate public fallout shelter space within existing and new construction; (2) evaluation of existing food and water supplies and sanitary water disposal accommodations; (3) identification of shelter spaces where air circulation could be improved by OCD ventilation equipment; (4) marking and licensing of acceptable shelter space for public use; (5) stocking of licensed shelters with survival supplies; and (6) location and protection factor calculation of shelter in private homes.

Survey operations—The purpose of a fallout shelter program is to provide enough shielding to reduce radiation doses to nonfatal or non disabling levels. Public fallout shelters in this program fall into two categories: (1) Those with space for at least 50 persons and a minimum protection factor (Pf) of 40, and (2) those with space for 10 to 50 persons and a PF of at least 40. The survey was further expanded in late fiscal year 1967 and continued in fiscal year 1968 to locate fallout protection in structures excluded previously in the basic national fallout shelter survey because they did not meet the minimum criteria of Pf 40.

During fiscal year 1968, survey operations continued to be principally of an updating nature. The operations consisted of adding new facilities to the inventory, deleting those which had been demolished or would no longer qualify as shelter facilities, and adjusting records as required by structural modifications. These operations increased the nationwide shelter inventory by 13,557 facilities, increasing the grand total to 189,053 facilities with an aggregate capacity for about 176.5 million persons.

Special shelter surveys and other techniques were also used to help locate additional shelter space where needed. Results of survey operations were made available to state and local planning officials to help them provide fallout protection for the people in their area of responsibility.

Licensing and marking operations—Before stocking public fallout shelters with survival supplies, the OCD requires that property owners and the local government officials sign a fallout shelter license or privilege form. During fiscal year 1968, licenses were signed for 9,257 facilities with an aggregate capacity for about 10.2 million persons. This increased the grand total to 109,725 licensed facilities, with an aggregate capacity for 108.9 million persons. (See table on page 290.)

There were 6,438 facilities, with an aggregate capacity for 8.4 million persons, marked with standard fallout shelter signs during fiscal year 1968, making an approximate total of 173,300 exterior and 592,300 interior signs in use. This increased the grand total to 107,456 marked facilities, with an aggregate capacity for 101.1 million persons.

Stocking operations—Survival supplies were issued to 8,033 facilities during fiscal year 1968, increasing the grand total of stocked facilities to 91,075. The survival supplies issued during the fiscal year would be sufficient to take care of more than 10 million persons for 8 days or almost 6 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 88.1 million persons for 8 days or 52.7 million for 14 days. In addition, during the year 10,135 shelters were furnished with at least one radiation detection and monitoring kit, increasing the total so equipped to 94,266 facilities. As of the end of the fiscal year, the capacity of shelters with radef kits showed a cumulative total of 91.5 million persons.

An OCD objective is to assure that survival supplies available to each licensed public fallout shelter would be sufficient to take care of shelter occupants for a 14-day period. Shelter occupants 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 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 shelter occupant capacity. Shelter spaces stocked with federally procured supplies during fiscal year 1968 averaged 60 percent of the rated capacity of the facilities stocked.

The survival supplies placed in licensed public fallout shelters are food, sanitation and medical supplies, water storage containers, and radiation detection equipment. These supplies were developed and procured by the Federal Government. An important specification was that they remain usable after long periods of storage. They are adequate to take care of normally healthy persons while in shelters and to enable them to resume productive activities upon emergence.

Food, sanitation kits, and medical kits, procured and delivered to Federal warehouses since the inception of the program in fiscal year 1962, would be sufficient to take care of 63 million shelter occupants 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 through 1968, pending distribution of stocks procured. About 9 percent of these supplies was placed in shelters during fiscal year 1968; 75 percent was placed in shelters in prior years, and, at the end of fiscal year 1968, the remaining 16 percent, for use in filling requisitions, was at warehouses. Radiological kits had been furnished to 94,266 shelters by yearend. During fiscal year 1968, the average cost to the Federal Government of shelter stocking, including associated warehousing and transportation, continued to be approximately \$2.43 per shelter space.

By fiscal yearend, 779 ventilation kits had been placed in shelters under the pilot program. With the 1,462 ventilation kits previously placed, and the 159 kits issued for nonshelter use, such as service testing and evaluation, training, and shelter occupancy studies, the pilot program was completed. By placing these kits in inadequately ventilated public shelters, the shelter occupant capacity was increased by a total of 202,000 spaces.

Initiated during fiscal year 1967, the civil defense quality check program was well underway during fiscal year 1968. The purpose of this program is to inspect fallout shelter supplies on a scientific sampling basis and obtain data relative to the serviceability and operational readiness of these supplies. A total of 1,892 quality check inspection reports was completed by the end of the fiscal year—523 inspections of shelters at military installations, 710 shelters in Federal buildings, and 659 civilian-owned buildings. Arrangements were made to convert the reports into punched cards for further processing and analysis, using automatic data processing equipment. Plans have been initiated to conduct a quality check inspection of 6,000 shelters during fiscal year 1969. A first step toward accomplishing this goal was a sample selection of 836 shelters located throughout the Nation. Plans have been coordinated with the OCD regional offices and various civil defense organizations, and instructions have been issued to the veterinary personnel who will conduct the initial inspections.

Community Shelter Planning

The OCD community shelter planning (CSP) program is the foundation of local emergency readiness and the basis for development of practical procedures in each jurisdiction for efficient use of the best available fallout protection in the event of attack, for informing each citizen, and for preparing each department of local government to support the plan and meet responsibilities in a major disaster.

Adequate shelter will save many lives in the event of attack. The community shelter plan enables a local government to help people survive nuclear attack by answering the questions, "Where do I go?" and "What do I do?" Under the plan, individuals are allocated to specific public shelters, thus insuring optimum use of the best shelter. This information is made public by a printed community shelter plan which includes maps and guidance. The document is updated when shelter changes and population shifts make it necessary. Those people for whom public shelter is not available are provided information about constructing or improving shelter.

In large communities, OCD, through the U.S. Army Corps of Engineers, contracts with local governments or planning agencies for the development of community shelter plans. At the end of fiscal year 1968, a cumulative total of 194 contracts had been negotiated. These contracts provide for the development of emergency shelter use plans in 244 counties with a population of nearly 50 million people.

The Federal Government makes funds available to obtain the services of a professional planner who serves as state CSP officer (CSPOS). The CSPOS gives technical assistance to local nonurban governments in small communities where shelter allocation and movement to shelter are uncomplicated in the development of their shelter plans.

Forty-six state CSP officer contracts were in effect at fiscal yearend. Rhode Island, being an urban state, has no CSPOS, but it is covered by a single statewide CSP contract. By the end of fiscal year 1968, a cumulative total of 481 smaller communities with a population of nearly 11 million persons had started community shelter plans.

Home Fallout Protection Survey

After active development and testing for several years, the home fallout protection survey (HFPS) was first deployed in Rhode Island in early 1966. Using Bureau of the Census techniques, the survey collects data from householders to identify and inventory the amount and quality of fallout protected space in home basements. The identification of fallout protection in homes is of significant value to the householder as well as to community shelter planners, as a shortage of acceptable public fallout shelter exists, particularly in residential areas, in many parts of the country. Technical aspects of the program were developed in close cooperation with the Subcommittee on Radiation Shielding of the Advisory Committee on Civil Defense, National Academy of Sciences.

Under OCD sponsorship, the Bureau of the Census conducts the survey by mailing a questionnaire to householders in one-, two-, and three-family homes. These are filled out and returned to the Census Bureau for computation of protection factors in each home with a basement. Usually, places of less than 10,000 population, where addresses are not available, are covered by

enumerators. The information on each home is confidential to the householder and the Census Bureau. For the majority of householders, the survey provides information for the first time on whether or not fallout shelter protection exists in the basements of their homes.

Every respondent whose home has a basement is mailed a specially prepared booklet entitled "Fallout Protection for Homes with Basements," H-12, which provides information on the degree of fallout protection in the basement and means of improving this protection. If the home does not have the minimum protection suggested, Pf 40, the family is provided several alternatives for improvement. The alternatives include actions which could be taken in a relatively short time during a period of increased tension. In addition, a return card is included for requesting detailed fallout protection construction plans and a list of materials with approximate costs.

Families responding, in homes without basements, are furnished an emergency information booklet entitled "In Time of Emergency," H-14, and are advised to seek public shelter in an emergency and to contact their local civil defense authorities for additional information.

Statistical summaries of home fallout protection are furnished to the state and local governments for use in local shelter planning. The total cost averages \$1 per home covered in the survey.

By the end of fiscal year 1968, surveys had been completed in the states of Rhode Island, Minnesota, Maine, Utah, Nebraska, Iowa, Kansas, West Virginia, Wyoming, Vermont, New Hampshire, Idaho, Colorado, Washington, Wisconsin, Montana, North Dakota, South Dakota, Alaska, Michigan, Oregon, and the counties of Nassau and Suffolk in New York.

Toward the end of fiscal year 1968, the HFPS was begun in Connecticut, Massachusetts, Delaware, Maryland, Virginia, and the District of Columbia. For all previous surveys and these surveys which were completed after the close of the fiscal year, a total of 1.8 million Pf 40 shelter spaces were identified for occupants of 496,161 homes, and Pf 20-39 protection for 28.0 million occupants of 8.1 million homes. The majority of homes with Pf 20-39 protection could readily be improved to Pf 40 or better. (See table on page 295.)

Direct Mail Shelter Development System

Administered by the OCD, the direct mail shelter development system (DMSDS) is a systematic procedure for contacting owners and architects of specific new buildings and offering them technical assistance for incorporating fallout protection in the design of the project. The DMSDS uses direct mail techniques combined with personal contact by state or local government authorities and university service centers. The state or local authorities confer with the building owners; the professional advisory service centers assist the project designers. Contacts are made early in the design phase while there is still time to incorporate fallout protection into the building design at little or no extra cost through slanting techniques.

Under the DMSDS procedure, a letter is sent to each building owner of a selected project, urging him to have his architect examine the possibility of including fallout protection in the building. At the same time, another letter is sent to the architect informing him of the technical assistance available from university service centers for incorporating fallout protection in the design. The state civil defense directors are kept apprised of projects selected in their states so that they (or the local civil defense official) can follow up

HOME FALLOUT PROTECTION SURVEYS, THROUGH FISCAL YEAR
1968

[In thousands, except percents]

Completed states	Homes covered	Mail questionnaires			Homes cov- ered by enumer- ators	Shelter space identified ¹	
		Delivered to homes	Mailed back	Percent response		Pf 40 or higher	Pf 20-39 ²
Total	15,626	8,696	6,448	74	6,928	1,817	28,021
Rhode Island	223	223	162	73	(13)	66	472
Minnesota	934	420	358	85	514	76	2,302
Maine	251	251	203	81	---	44	501
Utah	249	149	114	77	100	8	441
Nebraska	420	151	118	78	269	16	766
Iowa	816	301	225	75	515	37	1,780
Kansas	661	335	249	74	326	30	833
West Virginia	505	141	101	72	364	24	352
Colorado	532	349	265	77	183	34	779
Wyoming	87	35	26	74	53	2	132
Idaho	184	55	43	78	129	4	288
New Hampshire	188	67	48	71	121	23	447
Vermont	112	18	13	72	94	12	289
Washington	847	493	381	77	355	22	889
Wisconsin	1,155	583	464	80	571	115	3,066
Montana	186	66	49	74	120	7	332
South Dakota	181	47	38	81	134	4	415
North Dakota	160	43	33	77	117	3	420
Alaska*	36	36	26	72	---	0.5	26
Nassau-Suffolk (N.Y.)	612	466	365	77	146	91	1,340
Michigan	2,299	1,453	1,099	76	846	222	4,619
Oregon	549	245	193	79	303	11	419
Virginia ³	1,128	518	392	76	610	81	855
Maryland ³	886	607	418	69	279	290	1,245
Delaware ³	131	131	94	72	---	43	162
District of Columbia ³	122	122	71	58	---	62	113
Connecticut ³	745	484	333	69	261	142	1,606
Massachusetts ³	1,425	907	567	63	518	341	3,133

* Fairbanks excluded because of flood, a major natural disaster.

¹ Based on number of occupants.² 97.3 percent are improvable at low cost to Pf 40.³ Completed after close of fiscal year.

with the building owner. This is usually accomplished through a personal visit to the building owner to discuss the vital importance of designing fallout protection into the new building to provide needed shelter for the community.

In each of the states serviced by DMSDS, a professional advisory service center exists to provide technical guidance and assistance to architects wishing to apply design slanting techniques to give maximum fallout protection in a specific project. In other cases, architects will be able to call on their own experience or that of a staff member if either is one of more than 16,500 fallout shelter analysts who have successfully completed the radiation shielding design and analysis course.

During fiscal year 1968, DMSDS was conducted as a test in seven states. The test included developing procedures for reaching owners and architects, for gaining owner and architect response, for determining advisory service effectiveness, and for measuring potential versus actual shelter gain and system effectiveness.

During fiscal year 1968, 5,226 projects were selected for mailing. Architects of 1,374 projects responded, 26 percent of the project mailing. Architects for 818 projects were contacted by the seven professional advisory centers. Results to date indicate that the average "slanted" building can yield 525 spaces in addition to 325 spaces inherent in the building at a cost to the building owners of one-half of 1 percent of the total construction cost of the buildings. Based on these test results, arrangements were made to expand the program in fiscal year 1969 to 37 states.

Other Surveys and Design Techniques

In addition to the home fallout protection survey and the direct mail shelter development survey described above, other surveys and design techniques were used to locate or develop additional protective space in areas with unfilled requirements for standard fallout shelters.

Best Available Shelter Survey (BASS)—This survey located facilities which afford better fallout protection than homes but do not meet the OCD minimum criteria for public fallout shelters. The protection factors are generally in the 10-39 range.

During fiscal year 1968, pilot projects were started in Mississippi, Oklahoma, Arkansas, and South Carolina. In three of these pilot studies, facilities with protection factors of 5-9 were also surveyed, but Arkansas was limited to Pf 10. More than 2,000 facilities were surveyed at an average unit cost of about \$50. All survey work was conducted in counties where community shelter plans were being prepared or were scheduled. New contracts were awarded at the end of fiscal year 1968 to Oklahoma, Mississippi, and Florida.

Federal buildings—The objective of this program is to make "slanting" for maximum fallout radiation protection a standard practice in the design of all Federal construction. Professional consulting services for this purpose are available for Federal agencies responsible for the design and construction of new buildings. These services provide a review of requirements and architectural designs to determine the need for fallout protection in a proposed building, the feasibility of providing it economically, and the adequacy of funds requested for it.

Fiscal year 1968 appropriations authorized the incorporation of fallout protection in 15 specific Federal buildings. These buildings, as well as 22

Federal buildings for which similar appropriations were authorized for fiscal year 1967, were included in those covered by the OCD advisory service on slanting techniques.

Schools—The U.S. Office of Education, Department of Health, Education, and Welfare, agreed with OCD on a program to encourage state and local school construction officials to use design techniques to increase fallout protection in new school construction. This effort was supported by an assessment of state practices in school construction by the Council of Educational Facility Planners.

During fiscal year 1968, the National Commission on Safety Education completed a project in Los Angeles, Calif., for locating, analyzing, and utilizing shelter in existing schools. The commission also developed procedures for using the services of qualified shelter analysts.

Military construction—The Secretary of Defense has issued a directive providing guidance on objectives, policies, and criteria for determining the nature of fallout shelter requirements and for developing a plan for fallout shelter programs on DoD installations.

Section 610 of the Military Construction Act of 1967, as amended, provides that construction authorized under the annual military construction acts is to be designed to maximize public fallout protection where such can be done at little added cost and without impairing the purpose for which the construction is authorized. Thus the Department is exercising leadership in showing that fallout protection should be considered an important part of all new construction.

Professional Support of Architects and Engineers

Building committees, property owners, and others initiating construction projects rely heavily on the Nation's architects and engineers for design. The architect and engineer development program provides practicing architects and engineers with appropriate technical knowledge and capabilities so that effective, low-cost shelters are incorporated into on-going design projects. The ultimate goal is to qualify one or more architects or engineers in fallout shelter analysis in each design firm and government agency employing such professionals. Another goal is the qualification of one or more professors to teach appropriate courses in shielding analysis and/or other phases of protective construction as a part of the curriculum in architectural or engineering departments of all colleges and universities.

Professional development—Through 186 classes conducted in fallout shelter analysis during fiscal year 1968, 2,745 architects and engineers completed the course, increasing the cumulative number of fallout shelter analysts to more than 16,500. The fallout shelter analysis course was taught at several universities and professional schools on a semester basis, as well as by traveling instructor teams. It was also taught by the U.S. Navy Civil Engineering Officers' School at Port Hueneme, Calif., and the U.S. Army Engineer School, Fort Belvoir, Va. Several other courses were offered during the year, including one in protective construction given 27 times, with a total of 586 participants. A course in environmental engineering was offered in 31 classes, attended by 667 persons.

There were 175 institutions that have cooperated in having selected architectural and engineering faculty attend special OCD-sponsored programs to

become highly qualified in nuclear defense design technology. As of June 30, 1968, 584 qualified instructors were available to OCD for conduct of professional development courses.

Architectural and engineering development centers—Established during fiscal year 1965, these centers, one of which is located in each of the eight OCD regions, provide planners, architects, and engineers with information on the latest techniques for providing protection from fallout. 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 centers are designed to offer programs to integrate the technical capabilities of the institution to serve civil defense requirements.

Student fellowships—The graduate student development fellowship program established during fiscal year 1966 by OCD in cooperation with the American Society for Engineering Education enables graduate students of architecture, engineering, urban design, applied mathematics, and related nuclear sciences to pursue courses of instruction in areas of radiation shielding or architectural studies related to radiation protection. The OCD Fellows study under the guidance of faculty members who have been certified by the DoD as qualified instructors of fallout shelter analysis. By fiscal yearend, a total of 70 fellowships for students in 49 universities had been authorized and awarded. Applications for fellowships had been received from 120 institutions through the 1968-69 academic year. In addition, there are 37 fellowships authorized for the 1969 academic year. Seven of these grants support students working toward Ph.D. degrees. The remaining students are working toward masters degrees. Two candidates have completed the requirements toward the Ph.D. degree.

Faculty development—A total of 108 faculty members from 90 universities, colleges, institutes, and Service schools participated in summer institutes during the year. This increased to 175 the number of institutions eligible to conduct fallout shelter analysis courses and related activities for architects, engineers, faculty members, and students. The number of qualified instructors throughout the country was increased to 584.

The faculty development program is administered for OCD under contract by the American Society for Engineering Education, which is responsible for arranging for the programs through subcontracts with qualified universities. During the summer of 1967, institutes on nuclear defense design were conducted by the Universities of Puerto Rico, Washington, and Wisconsin and by Kansas and Pennsylvania State Universities.

Technical publications—A total of 54 technical publications on protective construction have been distributed, and 8 new technical publications were prepared during the fiscal year for distribution early in fiscal year 1969. These include manuals, guides, technical memoranda, and reports. In addition, six publications were revised, brought up-to-date, and reprinted.

Honor Awards—The American Institute of Architects continued an awards program for OCD during fiscal year 1968. This program recognizes examples of good architecture recently completed incorporating dual-use fallout shelter. Results of the 1966 awards program were published in a brochure titled "Buildings with Shelter." The brochure was disseminated to architects, engineers, and other interested persons throughout the Nation. In addition, production was begun on an architectural film of the results of the program for use by the American Institute of Architects. A contract was awarded to the

American Institute of Architects for a second awards program in fiscal year 1969. These awards programs further demonstrate that buildings with shelter can be designed without adversely affecting their function, appearance, or cost.

Warning and Emergency Operations

Well-defined operational systems that make the effective use of fallout shelters possible are: (1) Civil defense alerting and warning, (2) command, control, and communications, (3) radiological monitoring and reporting, and (4) emergency operations support.

Civil Defense Alerting and Warning

The alerting of Federal agencies and state governments to developments that require action to strengthen the Nation's readiness posture is a responsibility of the Office of Civil Defense. Procedures for carrying out this responsibility are tested weekly at the national level and quarterly at the regional level, either separately or as a part of military or civil defense exercises.

The U.S. Army Strategic Communications Command (USASTRATCOM), under OCD policy control, maintains, operates, and tests Federal warning systems designed for disseminating 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. From three civil defense warning centers, continuously manned and operated for OCD by USASTRATCOM warning officers, warnings and warning information can be passed to OCD regional offices and to 986 warning points within a few seconds. These warning points are in key Federal locations, state capitals, and other cities. The primary National Warning Center is in Cheyenne Mountain, Colorado Springs, Colo.; alternate centers are the National Two Warning Center at Federal Center, Denton, Tex., and the National Three Warning Center near Washington, D.C. During fiscal year 1968, there were 93 warning points added to NAWAS to improve warning service to Federal installations and local areas. Separate warning systems interfaced with the Continental Warning System serve Hawaii, American Samoa, Guam, Puerto Rico, and the Virgin Islands.

The design of an experimental automatic radio warning system has been completed. This would be a low-frequency radio station network to provide warning information directly from the three national warning centers to all levels of government in the continental United States. Through the use of nine distribution transmitter control facilities, written and voice warnings could be transmitted, and outdoor sirens could be sounded automatically at locations with special terminal equipment. In providing a direct warning from Federal to local levels, the response time nationwide using this low frequency radio system would be 30 seconds.

Protection of warning points—During the fiscal year, the warning point fallout protection program was completed. By June 30, 1968, 185 warning points had completed construction and installation of equipment; 74 stations that had previously signed agreements to provide shelters were dropped from the program because of their inability to complete a facility within the funds allotted. In addition to the 185 stations, 22 warning points had met the OCD requirement without Federal funds. Fallout protection for the remaining

warning points is being accomplished by the installation of alternate equipment in established emergency operating centers.

Command, Control, and Communications

OCD Federal regional centers—Each regional office is an operating center at the Federal level, and will be the site of civil defense emergency operations in case of a nuclear attack. These buildings house the peacetime operational staff of the OCD and the Office of Emergency Planning. OCD plans to provide permanent protected sites for all of the eight regional offices. The Region Five center at Denton, Tex., became operational in February 1964, and the Region One center at Maynard, Mass., in March 1968. These buildings are underground structures built and equipped to afford protection to their occupants against some of the effects of a nuclear weapon. The buildings will contain food, water, and other supplies for up to 30 days.

The construction contract for Region Eight was awarded in June 1967 and the project was 85 percent complete at the end of fiscal year 1968. Construction contracts were awarded for Region Six in July 1967, and Region Two in June 1968. Region Six construction was 90 percent complete by June 30, 1968. During fiscal year 1968, final plans and specifications for the Region Three center were completed, and preliminary plans for Regions Four and Seven were 30 percent complete by June 30, 1968.

State and local emergency operating centers—Federal matching funds totaling approximately \$5.6 million were obligated to assist state and local governments in the establishment of protected emergency operating centers. These funds were used for the planning, design, construction, and equipment of such centers. By June 30, 1968, a total of 3,001 EOC's had been established or were in the process of being established. The number of federally funded state and local EOC's was increased by 75. This brought the total of federally funded centers to 1,044, of which 633 have been completed. In addition, 68 centers were established or were being established this fiscal year without the use of Federal funds, increasing the total of nonfederally funded centers to 1,957, of which 1,756 have been completed.

Operational communications—Effective communications systems are required for conducting civil defense operations on a nationwide basis. Two communications systems are maintained and operated by the U.S. Army Strategic Communications Command (USASTRATCOM) in accordance with the policy guidance and requirements furnished by OCD.

The Civil Defense telephone and teletype system (NACOM 1) is the primary system for transmitting OCD operational communications. This system is designed for speed, flexibility, and continuity of service required for civil defense emergencies between the OCD national headquarters and the eight regional headquarters, and between OCD regional headquarters and the state civil defense offices. Automatic Voice Network (AUTOVON) circuits are used for NACOM-1 communications between OCD national and regional headquarters. All OCD regions now have AUTOVON circuit preemption capability. All OCD regional communications centers have access to the Automatic Digital Network (AUTODIN), a defense communications system of teletype circuits. Fiscal year 1968 improvements included the installation of AUTODIN terminals for secure on-line communications at OCD Regions One, Four, and Five. The remaining five regions are programed as they are relocated into their new regional centers. Dedicated full-period private voice

and teletype circuits are used between OCD regional and state civil defense offices.

The Civil Defense radio system, NACOM-2, is the backup system for NACOM-1. NACOM-2 is a high frequency radio network for transmission of voice, code, or radio-teletype messages. Control facilities for both NACOM-1 and NACOM-2 are located together to make them readily available. Fiscal year 1968 improvements included installations in three more states making NACOM-2 operational in 42 states, the District of Columbia, Puerto Rico, and the Canal zone. Agreements have been signed with six additional states and American Samoa.

Emergency Broadcast System—This system is designed for use by the President and national, state, and local officials to reach the public promptly with emergency information preceding, during, and following an enemy attack. The EBS plan is based on the requirements of the White House, the Office of Emergency Planning, and the OCD. The EBS is managed by the Federal Communications Commission in cooperation with the broadcasting industry under the authority of Executive Order 11092, February 26, 1963. Actions will continue to tie EOC's to the EBS. At the end of the year, a total of 2,762 broadcasting stations had national defense emergency authorizations to participate in the EBS. Throughout the year, OCD continued the broadcast station protection program. This program provides fallout protection, emergency power when needed, and programing equipment to selected key EBS stations enabling them to remain on the air under fallout conditions and provide nationwide coverage for Presidential programing. A total of 629 stations was selected for participation in this program. As of June 30, 1968, 535 had completed fallout protection, and 471 of the 535 had also provided required equipment.

Damage assessment—The damage assessment system is designed to develop the best possible estimates of the potential range of damage to resources and population during and after a nuclear attack. These estimates are based upon enemy capabilities and a variety of civil defense postures. The information emanating from the system provides a basis for the conduct of effective emergency operations to achieve national recovery.

Major accomplishments and developments in damage assessment during fiscal year 1968 include the following:

1. The OCD manual damage estimation system was deployed. This system enables each region and state to make broad-scale estimates of casualties and housing damage following a nuclear attack.

2. A project was initiated with the Bureau of the Census for the development of a new national location code based upon the 1970 censuses of population and housing.

3. Under a contract with the Department of Health, Education, and Welfare, a project was undertaken by the Dallas City Water Department to develop a prototype emergency water supply plan for determining methods of providing water to surviving population and industry after nuclear attack.

4. A feasibility study of electric power systems was initiated to determine the capability of the systems to provide adequate power to postattack survivors.

5. The input/output study being developed by the Office of Business Economics, Department of Commerce, was expanded to include data on special industries.

6. A pilot study was initiated to analyze the critical elements of oilfield systems.

7. A pilot study, conducted by the Public Health Service, Department of Health, Education, and Welfare, was made of the critical elements of sewerage systems using a sample of systems serving areas with more than 50,000 population.

8. The Bureau of the Census prepared a listing of the radiological monitoring stations identified by latitude and longitude for each station.

9. The Department of Transportation made an assessment of available transportation data that would be necessary for postattack analysis of civilian transportation capability.

10. Through the Census Bureau, the Office of Oil and Gas, Department of Interior, continued to collect information on petroleum storage at local levels.

11. The Bureau of the Census continued the project of developing current year estimates and future year projections of the population of each county in the United States, invaluable information for many civil defense programs.

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 following a nuclear attack. An effective system for detecting and monitoring radiological fallout is essential to ensure the optimum saving of lives. Under various combinations of attack and weather, any area of the country may be subjected to a serious fallout situation. Radiation emitted by the fallout could cause tens of millions of casualties, prevent the carrying out of emergency postattack operations, restrict the survivors' ability to work, and prevent the use of some areas and facilities for weeks or months. A nationwide radiological monitoring system has been designed for the collection, evaluation, and dissemination of radiological information to all levels of government. Major operational elements of this system include radiological monitors and equipment in public fallout shelters and at strategically located monitoring stations 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 total of 65,833 Federal, state, and local radiological monitoring stations were operational by the end of fiscal year 1968. This included 12,529 Federal and 53,304 state and local stations. The total net gain for the year was 2,690 stations.

Radiological defense instruments distributed during fiscal year 1968 totaled 161,954, making a cumulative total of almost 3.5 million. Contracts were awarded during fiscal year 1968 in the amount of \$0.6 million to procure replenishment repair parts for radiological monitoring instruments, and selected items of electronic test equipment for the state maintenance and calibration shops.

Emergency Operations Support

There is an important need to have effective emergency operational support systems both for community shelter planning and for over-all government emergency operations planning. Government authorities and the general public must be warned of impending disaster to implement their plans. They

must be provided information and instructions concerning the hazards and actions to take, and must have the necessary equipment in operating condition to make necessary decisions. Also, they must have the required services support to assure the effective implementation of their plans by using the most reliable information, systems, equipment, and facilities available.

Emergency Operations Systems Development (EOSD)—The EOSD program bridges the gap between research and operations. People, facilities, equipment, and supplies are the basic components of state and local systems. The EOSD program seeks to provide the systems which will combine these components in the most economical and effective ways. Specific projects during the year included the following:

1. *Emergency Operations Planning.* Guidance on preparing local government civil defense emergency plans was prepared during fiscal year 1968, and was reviewed by local, state, and Federal personnel.

2. *Fire.* Based on the results of EOSD studies, several components of an austere nuclear fire defense system were being reviewed and field tested.

3. *Law enforcement.* Based on results of an EOSD project on the maintenance of law enforcement, and with the assistance of the International Association of Chiefs of Police and the National Sheriffs' Association, OCD prepared and reviewed guidance materials to help chiefs of police and sheriffs develop plans and programs for law enforcement operations in civil defense emergencies.

4. *Public Works Engineering.* Work was begun at the end of the fiscal year to develop a "Federal Civil Defense Guide" chapter and supporting appendices on public works engineering operations during civil defense emergencies.

5. *Rescue.* Drafts of "Federal Civil Defense Guide" materials on rescue were prepared.

6. *CSP shelter allocation.* The Phase II EOSD study on a "Community Shelter Planning Shelter Allocation Traffic Assignment Model" was completed.

7. *Radef.* The second phase of the study of the radiological defense system was completed and tested during fiscal year 1968.

8. *Military support.* Complementary studies were completed by OCD and the Army Institute of Combined Arms and Support Research Office.

9. *Health-Medical.* Basic guidance materials for support of emergency health-medical operations in a civil defense emergency were developed in April 1968.

10. *Emergency manning.* A final EOSD report was received in fiscal year 1968 on identification and assessment of emergency period manpower and material support capability, availability, and organizational effectiveness of 100 selected national voluntary agencies, nongovernment organizations, and professional associations.

Integrated Management Information Systems—Management of all aspects of Federal assistance to state and local governments by OCD is accomplished through the use of annual program papers and the dissemination of information obtained from them and from other sources. This document is used alternately as a program paper and a progress report at 6-month intervals and contains sufficient data to operate IMIS.

Each participating local government is provided a preprinted program form listing the specific activities and elements of a balanced civil defense program, with appropriate provisions for reporting each item quantitatively.

This form is then computer-processed, so that updating action only is needed before returning it to headquarters.

In addition to the 50 states, Puerto Rico, American Samoa, Guam, and the District of Columbia, more than 4,300 political jurisdictions, covering about 87 percent of the U.S. population, submitted annual program papers and related semiannual progress reports in fiscal year 1968.

The program management information system of the Office of Civil Defense is a computer-based information system which includes the procedures for data input; a data bank for storage of information required for the system; and the routines for preparing management reports. A series of system development projects provides additional knowledge needed in helping state and local governments develop and strengthen their civil defense programs.

Studies and experiments to determine the control requirements for the operation of civil government in an emergency were initiated in fiscal year 1966 and continued in fiscal years 1967 and 1968. A successful full-scale test of the system, including participation by 48 states and nearly 900 local governments, was conducted during the October 1967 civil defense exercise, CDEX-67. The increased readiness information system, which resulted from these studies, experiments, and the test in CDEX-67, serves as a base for decision-making by key national officials concerning increased readiness actions by state and local governments during periods of increased tension. In addition, the system provides significant information concerning public response to these activities throughout the Nation. The system has been designed for state and local reporting of information each evening during periods of increased tension. The information is relayed to state, regional, and national officials by the next morning.

The standard OCD publications medium for issuing official civil defense policy and operational guidance to state and local governments, to other Federal agencies—including the military Services—is the Federal Civil Defense Guide. This publication brings together the results of applicable Office of Civil Defense research programs and operational analyses. The Guide conveys Federal policy and guidance on operational systems and techniques for practical application in Federal, state, and local civil defense programs. Various other OCD publications of an operational nature are keyed to the Guide. During fiscal year 1968, 20 FCDG issuances, and two publications keyed to a specific part of the Guide were distributed.

Other technical assistance and guidance—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) contract arrangements for American National Red Cross advisory services; (3) the maintenance of the OCD inventory of emergency water supply equipment; and (4) the continuation of an agreement with the National Defense Transportation Association (NDTA) that helped local governments gain the assistance of local NDTA chapters in civil defense efforts.

Support

An informed public, the cooperation of industry and national organizations, constant program development through research, and a nationwide and worldwide program perspective are important requirements of a successful civil defense program. Major supporting activities that contribute to these are discussed in the ensuing paragraphs.

Emergency Public Information

Emergency public information activities were directed primarily to planning, preparing, reviewing, evaluating, and issuing information that the public would need in a period of rising international tension. Important by-products and a secondary purpose of these activities were also realized as much of the information was adapted for current use in informing and training the public in survival measures.

A major priority during fiscal year 1968 was the guidance provided state and local governments in planning and implementing the public information aspects of community shelter planning. Civil defense information support was provided through materials issued as guidance to state and local governments and other organizations, as well as through fact sheets and editorial and illustrative material issued to newspapers, magazines, and other public media. The OCD developed informational material to support the home fallout protection survey (HFPS). A model information package developed for the West Virginia HFPS continued to be made available to other states planning similar surveys.

During the year, 19 OCD Information Bulletins were issued to transmit information on national civil defense and related military defense policies to state and local governments. In addition, a constant flow of civil defense information to individuals, families, organizations, and public officials was maintained through interviews, conferences, and correspondence in response to individual inquiries. A publication entitled "Status of the Civil Defense Program," MP-46, first developed and released in January 1967, was revised to highlight civil defense information as of April 1968. Designed for quarterly updating, this new publication is distributed upon request to Members of Congress, to representatives of newspapers and other communications media, and to the public.

Five public information films were released for use in fiscal year 1968, and production began on four others. The new films released included "It Happened in Texas," a 9-minute documentary report on the hurricane-tornado-flood disaster that struck the Rio Grande Valley in September 1967, and "Port Preparedness," a 23-minute film featuring preparations being made by American seaports to resume emergency operations following any major disaster. Also released in fiscal year 1968 were three short films on which production had been completed during the previous year; "Slanting," "Once to Make Ready," and "Briefly, About Fallout." "A Day in September," a 28-minute film about the incorporation of fallout shelter in Federal buildings, was completed and approved for release in August 1968. The Army Pictorial Center reported that 33,985 requests for OCD motion pictures were received during fiscal year 1968.

Two television announcement kits, "Shelter Stocking" and a revised version of the Emergency Broadcast System announcement, were released to all commercial and educational television stations in the United States. Civil Defense Emblem color slides were also sent to all stations. A radio transcription kit, containing eight transcribed announcements on the Emergency Broadcast System and nine on general civil defense subjects, with matching live copy, was prepared and distributed to all AM and FM stations.

Community Services

During fiscal year 1968, OCD continued to place major emphasis on the de-

velopment of leadership guidance, program materials, program aids, publications, exhibits, and activities to gain maximum public and private sector active participation at the community level in community shelter planning, the home fallout protection surveys, and in other civil defense programs.

A series of publications for use by community resource groups remained in demand during fiscal year 1968. The H-11 series includes "Community and Family Service for Civil Defense," H-11; "Community Involvement in Civil Defense," H-11A; "Committees for Community Shelter Planning," H-11-B; and the four volumes of "Meetings That Move," H-11-1, 2, 3, and 4, using the seminar workshop technique to enlist support of community organizations. This marked the fifth year of expansion and distribution of the H-11 series since the publication of "Community and Family Service for Civil Defense" in February 1964. Nearly a quarter of a million of these publications were distributed during the fiscal year, making a cumulative total of 2,360,000.

During the fiscal year, exhibits were placed at various locations throughout the Nation with a total potential audience of 40 million persons given the opportunity to learn about civil defense. These exhibits were produced for use at national organization conferences and conventions, and at state and county fairs.

Industrial Participation

Through industrial participation activities, OCD continued to furnish managers of industrial and commercial enterprises with information and guidance on civil defense preparedness in their facilities. Preparations for the protection of life and property during civil defense emergencies included those designed to (1) protect industrial personnel and facilities, (2) preserve production or service capabilities, and (3) assist the local government or community in its civil defense efforts.

Federal agencies, with OCD encouragement and assistance, continued to develop and distribute civil defense information and guidance materials adapted to the needs of those industries with which they conduct business regularly. Altogether about 425,000 copies of industrial civil defense publications applicable to business and industry were distributed through state colleges and universities, state and local civil defense offices, other Federal agencies, individual companies and business firms, and national professional and trade associations during the fiscal year. An important publication entitled "Emergency Preparedness Guidelines for Credit Unions," prepared by the U.S. Department of Health, Education, and Welfare, Social Security Administration, Bureau of Federal Credit Unions, in cooperation with OCD was distributed during the fiscal year. This 39-page publication was designed to assist credit union officials in making emergency plans appropriate for their particular credit union. Some 55,000 copies were distributed to credit union officials during the year.

Another booklet entitled "Emergency Operations Guide for the Natural Gas Transmission and Distribution Industry," prepared by the Emergency Advisory Committee for Natural Gas at the request of the Department of the Interior, was reprinted by OCD. This 51-page booklet with a multicolor fold-out map of the pipelines in the United States was prepared to assist the gas industry in its preparations to continue to supply gas during a national emergency, including nuclear attack. Approximately 10,000 copies have been supplied to officials of the gas transmission and distribution industry, and other industries needing this type of guidance.

Documentary motion pictures produced in previous years were widely used by state and local civil defense directors during the fiscal year. Especially well received were "Port Preparedness," which shows civil defense preparations in four U.S. ports; "Memorandum to Industry," about industrial civil defense preparations in well-known U.S. corporations; and Mutual Aid, the U.S. in Industry," which shows how one industrial mutual aid association operates.

Approximately 30,000 business, professional, educational, and other civic leaders obtained civil defense guidance and information through industrial civil defense conferences, seminars, and training sessions conducted primarily for civil defense purposes. These included two classes in industrial civil defense management offered at the OCD Staff College and at conferences and meetings conducted by 111 state and local governments. These meetings were held at 40 locations throughout the Nation. The OCD provided civil defense information and guidance materials, and by request, participated directly in the conferences as keynote speakers or panel moderators. Many guest lecturers from business and industrial firms told about their company civil defense plans.

More than 3,800 military officers and key industrial and civic leaders who attended national security seminars conducted by the Industrial College of the Armed Forces in seven metropolitan areas heard lectures about civil defense and industrial readiness and obtained civil defense material provided by the OCD. Courses conducted for industrial executives in government and industry by the U.S. Army Military Police School, Fort Gordon, Ga., continued to provide civil defense information and guidance materials.

Labor Support

Organized labor within the American Trade Union Movement accelerated its support of civil defense during fiscal year 1968, in the area of labor leadership training. Some major examples of this support follow:

1. Labor civil defense seminars were attended by 3,520 labor leaders during the year, resulting in a cumulative total of 10,269 labor leaders throughout the United States trained in the 1¼-hour course entitled "Labor's Supporting Role in State, County, and Local Civil Defense."
2. Leadership in the Postal Services responded by training 880 members in the 1¼-hour course, "Labor and the Postal Worker in Civil Defense." This brought the number of key postal union officials so trained to a cumulative total of 1,715.
3. As a result of the labor leadership training seminars, 40,050 copies of the labor civil defense 10-point manual "How Does This Affect You?" have been distributed to labor officials throughout the Nation. In addition, 30,050 copies of the Spanish translation of the manual were distributed to Puerto Rican labor groups. Approximately 363,000 of these 10-point manuals have been distributed since it was first prepared in 1966.
4. A new 8-point exhibit depicting labor's participation in civil defense was viewed by 206,734 persons at the AFL-CIO Union-Industry Show, held in Philadelphia, Pa.
5. The AFL-CIO Ladies Auxiliaries affiliated with the Postal Service Unions continued to show increasing interest in the labor civil defense seminars. Members of auxiliary chapters attended seminars in McAlester, Okla., Laramie, Wyo., St. Cloud, Minn., and Jackson, Mich., during fiscal year 1968.

Research and Development

Research by the Office of Civil Defense has as its purpose the production of information that will enable planners and policymakers to improve the effectiveness and efficiency of civil defense programs. To fulfill this purpose, the best available scientific knowledge and principles are applied to the solution of civil defense operating problems. This program is carried out principally through contractual agreements with government, educational, and private research organizations.

Research program planning establishes goals believed to be consistent with information needs. The program emphasizes systems evaluation and the necessary supporting applied research. A part of the effort supports currently approved programs, but most is directed toward an improved capability for estimating the cost, effectiveness, and feasibility of alternative civil defense systems of the future.

Three basic types of future civil defense have been under study: (1) Systems similar to the current civil defense posture that offer substantial improvement yet lie within the general framework of present national security policy; (2) systems designed to provide a high degree of protection against attacks on urban populations; and (3) systems designed to alter the vulnerability of population and resources by actions taken during a period of deteriorating international relations.

Selection of the most capable contractors, along with careful screening of proposed studies, have resulted in some noteworthy achievements. Following are percentages of funds committed to the various research groups during fiscal year 1968 and previous years:

	Percent	
	<i>Fiscal years 1962-67</i>	<i>Fiscal year 1968</i>
Department of Defense (DoD)	16.5	12.6
Federal agencies, exclusive of DoD	11.1	9.0
Educational institutions	9.4	13.4
Private organizations, including industrial laboratories, research institutes and foundations, and quasi-government agencies	63.0	65.0
Total	100.0	100.0

Functional categories—In fiscal year 1968, 93.3 percent of the available \$7.1 million was programed for research in four functional categories. The balance was used to obtain technical advisory management and support services from lead laboratories to aid in managing selected areas of research. The breakdown of funds for research and services follows:

	Percent
Shelter	31.3
Support systems	23.9
Postattack	19.8
Systems evaluation	18.3
Management and support services	6.7
Total	100.0

For the past 3 years, a significant research effort has involved a comprehensive analysis of hypothetical attack effects and effectiveness of civil defense countermeasures. Through a system of coordinated studies in each of the four research categories, using assumed attacks on five selected urban localities, much technical data are being acquired. This effort promises to improve methods of analyzing attack effects and civil defense planning. It will also provide guidance for establishing future research requirements.

Training and Education

Federal, state, and local civil defense personnel, industrial executives, educators, urban planners, military support personnel, and others trained at OCD Staff College, Battle Creek, Mich., totaled 1,123 for fiscal year 1968. This brings the number of OCD graduates since fiscal year 1951 to a cumulative total of 52,169.

During fiscal year 1968, the civil defense university extension program (CDUEP) brought civil defense training to 52,673 state and local personnel, making a total of 240,961 participants in the program since its inception in fiscal year 1963. Using the existing extension capability of educational institutions, the program in fiscal year 1968 included contracts with 54 universities and colleges in 50 states, the District of Columbia, and Puerto Rico. Through 518 conferences, a total of 26,039 state and local officials, key community leaders, and personnel in business and industry were briefed on civil defense. In 385 classes, 5,653 instructors were trained—2,622 in shelter management and 3,031 in radiological monitoring. In addition, refresher training in radiological monitoring was given to 310 instructors in 31 classes. Staff and operations training was given to 2,214 key staff personnel in 151 classes in civil defense management, for 1,310 radiological defense officers in 114 classes, and for 1,372 key staff personnel in 82 plans and operations courses. End-product training was conducted for 4,390 shelter managers in 265 classes, 3,744 radiological monitors in 255 classes, and 6,798 public officials received training in 162 simulation of emergency operations classes.

OCD continued its community shelter planning training by contract with the University of Tennessee during fiscal year 1968, through workshops, conferences, and seminars. During the year, 132 persons were trained in nine CSP workshops for urban planners, 67 persons were trained in three CSP workshops for officials, 95 persons attended six noncontract process courses, and 100 previously trained persons attended four conferences for planners. During the fiscal year, the first of a series of workshops was held for faculty members of universities with urban planning departments, and 26 persons attended. These conferences are designed to show faculty members how they can incorporate CSP in their curriculum.

Since its inception on a trial basis in four states in fiscal year 1960, the civil defense adult education program has expanded to now include 48 states, the District of Columbia, and Puerto Rico. During this time, almost 2.3 million adults and teachers have completed the personal and family survival course, and 96,200 radiological monitors have been trained. The scope of the program was further increased during the year to include training of shelter managers in direct support of the community shelter planning program. As a result of this expanded training effort, 8,577 shelter managers were trained. 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 approximately 2.3 million persons, making a total of approximately 8.3 million trained since this nationwide program was started in fiscal year 1963.

Started in fiscal year 1963, and managed by OCD under contract with the Field Extension Service of the U.S. Department of Agriculture, the rural civil defense information and education program extends to an audience of approximately 70 million persons, most of whom reside in cities and towns of less than 10,000 population. During fiscal year 1968, the Field Extension Service held approximately 68,235 educational meetings which incorporated some phase of RCD into the program. More than 1,490,000 persons attended. The Field Extension Service also stressed RCD through other educational media, including 1,169 television programs, 10,460 radio broadcasts, and more than 10,560 press releases to rural newspapers. Exhibits featuring RCD information at fairs, field days, and similar events totaled 4,896. Finally, 5,880,000 copies of RCD materials were distributed either upon request or in connection with educational programs during the fiscal year. Almost half of the participants at field extension RCD educational meetings were members of 4-H clubs. This age group (9-19) has shown an active concern for survival from radioactive fallout and is an important influence on families to take active measures for fallout protection.

Because of the close tie between housing and farm structures and rural fallout shelters, agricultural engineers have played a significant role, particularly in those eight states which employ RCD agricultural engineers. After attending the fallout shelter analysis workshops, agricultural engineers conducted 44 rural shelter analysis workshops in 10 states and trained 737 persons. The engineers also developed technical reference materials and participated in the training of agriculture staff at public education meetings.

Concluding Statement

Over the past 6 years, the Office of Civil Defense has developed, on an orderly basis, a substantial civil defense capability at all levels of government. Through the maximum use of existing resources, both physical and organizational, a capability exists to increase measurably the likelihood of survival in event of a nuclear attack.



JOSEPH ROMM,
Director of Civil Defense.

1. Introduction

Annual Report

of the

SECRETARY OF THE NAVY

July 1, 1967, to June 30, 1968

Contents

Chapter	I. INTRODUCTION	Page 313
	II. PROGRAMS AND EXPENDITURES	315
	Programs	315
	Expenditures	316
	III. NAVY AND MARINE CORPS OPERATIONS AND EXERCISES ..	317
	Major Fleet Operations	317
	Exercises	323
	Marine Corps Major Operations	323
	Employment of Forces and Tempo of Operations ..	326
	Accomplishments	328
	Special Projects	330
	Operational Developments	331
	IV. SEAPOWER CAPABILITIES	333
	Naval Warfare Capabilities	333
	Naval Resources	343
	Material	350
	Health and Medical Services	362
	Construction and Logistics	363
	Family Housing	365
	Military Sea Transportation Service	365
	Chaplains	367
	Legal Services	368
	V. ECONOMY AND EFFICIENCY	370
	Management Improvement	370
	Automatic Data Processing System	372
	Analytical Studies	373
	Marine Corps Analytical Studies	374
	Activation of Marine Corps Finance Center	375
	Contracting	375
	Inventory Management	376
	Military Standard Programs	378
	Manpower Utilization	379
	Cost Reduction	382
	Resource Management in the U.S. Marine Corps ..	382
	VI. CIVILIAN ECONOMY RELATIONS	383
	Industrial Facilities	383
	Merchant Marine	383
	Community Relations	384
	VII. CONCLUSION	385

I. Introduction

Throughout fiscal year 1968 the Navy and Marine Corps continued to meet their worldwide commitments, demonstrating to the fullest measure the value of seapower to the security of the United States. The war in Vietnam has highlighted their ability to wage conventional war with the unique capability of employing land, sea, and air power as a finely controlled instrument of national power. While the focus has been Vietnam, the POLARIS Program achieved its full force goal this year, providing a continuing unseen deterrent to strategic war. The driving power behind this year of successful endeavors has been the dedication, determination, and courage of the men and women of the Navy and Marine Corps. The commitment of naval forces around the world has required an increase in technical skills, long, hard hours of work, and extended deployments. In order to maintain the high tempo of combat operations in Southeast Asia, there has been some reduction in readiness elsewhere. The Southeast Asia challenge continues to be met by the efficient control of resources and by the leadership, dedication, and performance of our military and civilian personnel.

This report provides a summary of progress in all principal Navy and Marine Corps operational and support functions which, collectively, contributed to national defense and to the support of national objectives.

Our success in meeting the combat requirements of Vietnam during recent years has demonstrated once more the value of seapower to the United States. While airlift continues to play a vital role in the rapid delivery of supplies to Vietnam, the bulk of material resources required there continues to be moved by sealift. As in past years, this dependable and responsive operation has continued to move 98 percent of all material sent to Southeast Asia. The ability to use the seas at our discretion is a clear indication of the importance of sea service strength.

Aboard the attack carriers at Yankee Station in the Gulf of Tonkin, in the coastal areas where naval gunfire support ships operate against trans-shipment targets, through the muddy inland waters of South Vietnam, and in the mountainous jungles, Navy and Marine Corps forces kept strong and constant pressure

on the enemy. Flight crews flying from attack carriers achieved a degree of precision in bombing never before seen in naval warfare, even though done against a most intense and sophisticated defense. Following the partial bombing halt in force during April, the coastal bombardment and carrier striking forces concentrated their efforts on the North Vietnamese logistic network in the southern panhandle. Until that time, the round-the-clock air strikes forced the enemy to divert substantial manpower and resources to the task of repairing and defending his supplies, transportation, and communications network. Marine assault forces aboard amphibious transports kept the enemy off balance by striking at concentrations along the South Vietnamese coast. The anti-infiltration patrol, MARKET TIME, effectively reduced the enemy's ability to supply his forces in the south from the sea. GAME WARDEN, including counter-guerrilla groups, operated with river craft and armed helicopters in the rivers of South Vietnam to stifle enemy operations in-country.

In January 1968, Navy and Marine forces combined with Army, Air Force, and the armed forces of the Republic of Vietnam to thwart the Tet offensive and inflict substantial casualties on the Viet Cong and North Vietnamese. Later in the same month, U.S.S. *Pueblo* was seized by the North Koreans in international waters. Two attack carriers and an ASW carrier with escorting forces were immediately dispatched to the Sea of Japan without derogating the Tonkin Gulf effort. During April, a combined Marine Corps-ARVN unit was surrounded at Khe Sanh by a formidable enemy force. By the combined effort of artillery, close air support, and USAF B-52's, heavy casualties were inflicted on the enemy, forcing him to withdraw, leaving substantial quantities of weapons, supplies, and dead on the battlefield. Early in June, a nuclear submarine, U.S.S. *Scorpion*, was declared lost at sea after one of the most intensive searches in naval history.

Despite the focus of activity in Vietnam, our forces patrolled the Atlantic and Pacific in fleet ballistic missile submarines; kept watch in the Mediterranean in carriers, amphibious groups, and escort ships; took part in CENTO, NATO, and SEATO exercises, and carried on a variety of projects from Operation DEEP FREEZE in Antarctica to basic research for the future. Backing the spearhead of the Navy and Marine Corps power in Vietnam is an array of imaginative leadership, dedicated military and civilian manpower, and carefully managed resources. The report which follows discusses these matters in detail.

II. Programs and Expenditures

Programs

Department of the Navy programs for fiscal year 1968 totaled \$21.2 billion in direct obligational authority. Of this amount, \$12.2 billion, or 57.2 percent, was concentrated in one program, general purpose forces. The amounts identified with each major program, together with comparable figures for fiscal years 1967 and 1966, are shown in the table below.

FINANCIAL SUMMARY BY PROGRAM, FISCAL YEARS 1966-68 TOTAL DIRECT OBLIGATIONAL AUTHORITY

[Dollars in millions]

	1968		1967		1966	
	Amount	Percent	Amount	Percent	Amount	Percent
Strategic forces	1,611.7	7.6	1,102.4	5.2	762.7	4.0
General purpose forces	12,179.5	57.2	13,378.5	62.7	12,152.0	63.4
Intelligence and communications	607.2	2.9	588.7	2.7	500.9	2.6
Airlift and sealift	5.5		15.6	.1	41.9	.2
Guard and Reserve forces	625.2	2.9	572.5	2.7	597.1	3.1
Research and development	1,076.6	5.1	1,065.6	5.0	1,013.9	5.3
Central supply and maintenance	2,057.5	10.0	1,804.1	8.5	1,464.2	7.6
Training, medical, et cetera	2,570.8	12.0	2,220.5	10.4	1,891.5	9.9
Administration and associated activities	336.8	1.5	410.7	1.9	488.1	2.5
Military assistance	170.7	.8	180.3	.8	277.3	1.4
TOTAL	21,241.5	100.0	21,338.9	100.0	19,189.6	100.0

Expenditures

Expenditures in fiscal year 1968, which totaled \$22.1 billion, are shown in the table below, with comparative figures for 1967 and 1966.

EXPENDITURES BY FUNCTIONAL TITLE

[Dollars in millions]

Functional title	1968		1967		1966	
	Amount	Percent	Amount	Percent	Amount	Percent
Military						
personnel -----	\$ 5,721	25.9	\$ 5,232	27.1	\$ 4,639	28.9
Operation and maintenance -----	5,164	23.4	5,058	26.2	4,057	25.3
Research, development, test, and evaluation -----	2,003	9.1	1,791	9.3	1,407	8.8
Major procurement -----	7,992	36.1	6,485	33.6	5,237	32.7
Military construction -----	93	.4	523	2.7	452	2.8
Revolving and management funds -----	1,134	5.1	202	1.0	233	1.5
Total -----	22,107	100.0	19,291	100.0	16,026	100.0

III. Navy and Marine Corps Operations and Exercises

The value of the ever-lengthening arm of mobile seapower to the United States was clearly and forcefully demonstrated during fiscal year 1968. Vietnam is the obvious example of how the United States has demonstrated its capability to exercise the full scope of seapower. In no other part of the world has the need for seapower been more apparent, nor has its application been more artfully tailored than in Southeast Asia. From classic naval gunfire shore bombardment of the Vietnamese coast to the search and destroy operations of the Mobile Riverine Force, the Navy maintained constant pressure on the enemy, and in so doing demonstrated conclusively the flexibility of seapower.

While the focus of attention was concentrated necessarily in Vietnam, Navy efforts were by no means confined exclusively to that area. The unique ability of the Navy to project national policy was clearly evident in its deterrence role and in the security against the submarine threat provided by Antisubmarine Warfare Forces. The Nation's interest in scientific cooperation was exemplified by Navy support of Operation DEEP FREEZE in Antarctica and increasing emphasis on deep ocean research.

The operations, exercises, accomplishments, projects, and developments discussed in succeeding paragraphs illustrate the variety of efforts pursued by Navy and Marine Corps during the past year.

Major Fleet Operations

During fiscal year 1968 attack carriers (CVA's) continued to be employed at a high tempo. The 16 attack carriers and the antisubmarine warfare carrier *Intrepid* in a limited attack role were used to maintain two in the Sixth Fleet in a peacetime role and five in the Seventh Fleet in combat. The major contribution of the Navy to the combat operations in Southeast Asia was provided by three carriers continuously maintained on Yankee Station in the Gulf of Tonkin. The high tempo of naval air activity was characterized by around-the-clock flight operations and daily replenishment of ammunition, fuel, and stores alongside ships of the Service Force. CVA's from both the Pacific

and Atlantic Fleets were deployed to Southeast Asia in order to share the combat mission. The order of the commitment resulted in CVA's coming back to the continental United States from the combat area and returning to Southeast Asia in an average of approximately 5½ months. During turnaround, crews were busy with upkeep and retraining in preparation for the next deployment.

The major combat effort of the Navy has been provided by naval aviators operating from CVA's on Yankee Station. Normally, CVA's conducted flight operations either from midnight to noon, from noon to midnight, or throughout daylight hours in order to maintain around-the-clock pressure on North Vietnam. Navy aircraft typically engaged on three large CVA's and two *Hancock*-class carriers include squadrons of F-4 Phantoms, F-8 Crusaders, A-6 Intruders, and A-4 Skyraiders. The total is over 300 tactical fighter and attack aircraft. These aircraft focused combat effort against the heavily defended areas in North Vietnam until bombing was restricted to the area south of 19° N. latitude. The good weather months were devoted to large-scale efforts in the northeast sector of North Vietnam, with carrier aircraft executing as many as three major strikes each day. The winter months of 1967-68 saw an unprecedented number of night/all-weather strikes by A-6 aircraft in the high threat area.

The record for fiscal year 1968 is illuminating. In the high risk northern part of North Vietnam, the Navy flew 57 percent of all attack sorties. Navy losses to hostile action, however, were less than half of the total. Attack aircraft were normally accompanied by aircraft for flak suppression. Air combat support efforts also included Target Combat Air Patrol (TARCAP), electronic countermeasure (ECM) support, and tanker support.

A reverse situation existed in the southern part of North Vietnam and in South Vietnam. Here, the Navy flew about 36 percent of the attack sorties and the Marine Corps flew 15 percent.

During the most of the period the targets were bridges, transportation facilities, thermal powerplants, land and waterborne shipping traffic, petroleum storage areas, and military installations. Tactical employment of airpower during the latter part of the year became a concept of interdiction to prevent the flow of resources southward. Targets were land and water traffic control points as well as trucks and barges.

Navy flight crews with Task Force 77 normally completed two 7-month tours in Southeast Asia. Flying against targets pri-

marily in North Vietnam, many of these crews completed over 200 combat and combat support missions. These missions were conducted against the heaviest, most sophisticated anti-aircraft gun and missile threat in the history of warfare.

Fiscal year 1968 also marked the advent of new aircraft and weapons. The A-7 made its combat debut on *Ranger* in December, the A-4F on *Ticonderoga* in January. Deployment of the first EKA-3B's gave the CVA a much improved electronic warfare capability. Introduction of new, Navy-developed weapons has increased the effectiveness of our strike/interdiction program during the past year. The Walleye guided bomb has proven highly effective. Use of the A-6 airborne moving target indicator (AMTI) bombing system has demonstrated great potential against night vehicular traffic.

Marine air operations accelerated throughout the year to match the increasing tempo of III Marine Amphibious Force ground operations and to support ARVN and other free world forces. Marine fighter, attack, reconnaissance, and electronic warfare aircraft were flown in North Vietnam in support of the 7th Air Force and Task Force 77. In-country operations, mainly in the I Corps area, provided close air support, direct air support, and reconnaissance for Marine, Army, Republic of Korea (ROK) Marine, and Republic of Vietnam Army (ARVN) units. Marine A-6A Intruders based at Danang and Chu Lai provided night/all-weather attack support in North Vietnam and in-country. The Marine air support radar teams (ASRT's) utilizing the TPQ-10 radar provided an accurate method for delivering ordnance at night and during periods of poor weather. These ASRT units controlled more than 4,000 ordnance drops per month during the Tet offensive and the siege of Khe Sanh.

In July a Marine Air Control Squadron interfaced its Marine Tactical Data System (MTDS) with the Task Force 77 Navy Tactical Data System (NTDS). This continuous, 24-hour exchange of information is the first real-time tactical data link in a combat environment. Later in the year MTDS was linked with a Marine HAWK battalion and the Air Force Tactical Data System, providing digital data exchange for air defense.

On March 10 Marine fixed-wing strike and reconnaissance aircraft and their associated control assets were placed under the 7th Air Force to provide single manager (Air Force) control of tactical air resources throughout South Vietnam.

Marine helicopters continued to enhance Marine flexibility, mobility, and maneuverability with an increased number of

CH-53's and the introduction of the CH-46D with a greater load-carrying capability. The Marine helicopters attached to the 1st Marine Aircraft Wing and aboard the Special Landing Forces flew more than 500,000 sorties in support of Marine, ROK Marine, ARVN, and other free world forces.

Sharing importance with the attack carrier operations were the amphibious operations along the coast of South Vietnam. Eighteen search and destroy amphibious assault operations were conducted during the year by the Navy and Marine Corps in operations which employed ships of the two Amphibious Ready Groups. These groups are each capable of conducting assault over the beach by landing craft, by helicopter envelopment, or by a combination of the two. Since the initial landings in March 1965, 50 battalion-size operations were conducted.

These ready group operations effectively demonstrated the value of both the Navy's newest amphibious ships and the helicopter-borne assault force. The mobility of these groups and their ability to strike on short notice kept the enemy off balance, disrupted his logistical support, and denied him access to many profitable coastal areas.

Augmenting the pressure applied to the enemy by the carrier striking force and amphibious operations was the naval gunfire operation. The degree of this effort was evidenced by the fact that more than 80,000 rounds were fired per month by Seventh Fleet ships in naval gunfire support in South Vietnam and in naval bombardment of North Vietnam during fiscal year 1968. In the past 3 years, cruisers, destroyers, and rocket-firing ships fired in excess of 1,500,000 rounds in support of U.S. and allied operations in South Vietnam.

Surface interdiction operations in North Vietnam are termed SEA DRAGON. The operation began in October and originally included only the interdiction of water-borne logistic craft along the coastline of North Vietnam. At its inception, an average of 50 logistic craft was sighted daily. However, by the end of fiscal year 1967, this number had been reduced to an average of 10. In February 1967 SEA DRAGON operations were expanded to include the interdiction and destruction of military targets ashore. Ships participating in SEA DRAGON operations averaged over 10,000 rounds fired per month since the operation began. SEA DRAGON forces destroyed or damaged more than 2,500 water-borne logistic craft and over 290 shore batteries.

With the cessation of attacks north of the 19th parallel by the United States in April, the SEA DRAGON operating area

was reduced by one-third. This permitted SEA DRAGON forces and their carrier-based aircraft counterparts to concentrate their efforts on the North Vietnamese logistic network in the southern panhandle.

MARKET TIME, an anti-infiltration patrol along the 1,000-mile coastline of South Vietnam, continued to be one of the war's most effective operations. Patrolling forces included destroyer escorts, mincraft, Coast Guard cutters, and gunboats. Coordinated with the Vietnamese Navy's coastal force, and supported by airborne surveillance, MARKET TIME operations provided 24-hour coverage extending from the coastline to 50 miles seaward. During the past year, an average of 60 ships and craft were involved continuously in MARKET TIME. This force detected nearly 900,000 ships and junks, boarding and inspecting over 530,000, and destroying in excess of 300 enemy craft. MARKET TIME forces effectively curtailed any significant supply of the Viet Cong from the sea.

Surveillance and inspection activities are not confined to coastal waters. GAME WARDEN, the Navy's river patrol operations, operated with specially designed river craft and armed helicopters along the many waterways of the Mekong Delta, the Rung Sat Special Zone, and the I Corps Tactical Zone (CTZ).

GAME WARDEN forces included nearly 200 shallow-draft river patrol boats and minesweeping craft, augmented by Navy crews manning Army-supplied gunfire support helicopters. In 1967, the Navy added units of its specially trained SEAL (Sea, Air, Land) teams to GAME WARDEN forces to increase the scope of operations to include counter guerrilla operations. GAME WARDEN forces interdicted guerrilla logistic traffic, thwarted Viet Cong tax collecting activities and troop movements, foiled mining attempts, and conducted psychological warfare.

GAME WARDEN patrols detected over 912,000 river craft last year, of which 477,000 were inspected and boarded, resulting in 1,600 enemy craft destroyed. Since GAME WARDEN began in April 1966, the River Patrol Force killed more than 2,000 enemy troops and sank, captured, or damaged more than 4,000 sampans. Although the accomplishments of MARKET TIME and GAME WARDEN during the past year have been impressive, a major contribution is the denial of the seas and waterways to the enemy as a means of logistic support.

The newest naval force in South Vietnam is the Riverine Assault Force, the naval element of the joint Army/Navy Mobile Riverine Force. In addition to having the capability of

transporting a large force by water to a target area, the Riverine Assault Force can move on short notice along the navigable waterways of the Mekong Delta and the Rung Sat Special Zone. Activated in February 1967, the Mobile Riverine Force has been effective in denying the enemy many of the areas where he had previously operated with impunity. Mobile Riverine Forces killed or captured more than 330 Viet Cong and destroyed more than 750 bunkers during some months.

Approximately 800 underway replenishments were required each month to provide Seventh Fleet ships POL, ammunition, and provisions. During a recent record underway replenishment, the fast support ship, U.S.S. *Sacramento*, provided U.S.S. *Enterprise* with 806,000 gallons of jet fuel oil, 810 tons of ordnance, 74 tons of provisions, 3 tons of stores, 8 tons of fleet freight and mail, and 91 personnel in less than 4 hours. While U.S.S. *Enterprise* was being supplied, U.S.S. *Sacramento* also replenished three destroyers.

While many Navy and Marine Corps units were operating under direct combat conditions, there were other important subordinate Navy commands involved in the Vietnam war. Without these units, the operations of the combat forces would have been greatly curtailed.

The naval support activity at Danang has been of key importance in supporting U.S. Navy and Marines plus other free world forces battling the Communists in the northern I CTZ of Vietnam. Established in October 1965, this bustling organization encompasses a full-fledged deep sea port which handled more than 250,000 tons of cargo monthly. From support of the small units brought into the country during the early stages of the conflict, the activity grew rapidly and was supporting a military population of more than 134,000 by the end of this period. Support rendered by this organization enabled the Marines to carry out their many successful campaigns against the enemy from the Danang area to the DMZ, and kept the MARKET TIME forces supplied as they sealed off the coast from infiltration.

The naval support activity at Saigon provided logistic support for all the Navy's task forces in the Mekong Delta and Rung Sat Special Zone, as well as MARKET TIME forces along the lower coastline.

A major support activity is the 3d Naval Construction Brigade—the Seabees. Navy construction comprised approximately one-third of the total military construction in Vietnam. Since their arrival in 1963 to help the Army's Special Forces with camp

construction, 12 Seabee battalions of 700 men each have accounted for more than 10 percent of all civilian and military construction in the country.

While there were many operational gains recorded this year, the Navy suffered losses in men and material which will be sorely missed.

On February 6, U.S.S. *Bache*, a destroyer serving with the Sixth Fleet, grounded in the harbor of Rhodes, Greece, when her anchor dragged in a severe storm. As a result of the damage sustained, the ship was beyond economical repair and was stricken from the naval vessel register on March 1.

On June 5, U.S.S. *Scorpion*, a nuclear attack submarine with a crew of 99 officers and men, was declared lost after one of the most intensive searches in naval history. The submarine had been overdue since May 27 when it failed to arrive at its homeport of Norfolk, Va., following a regular deployment with the Sixth Fleet.

Exercises

BLUE LOTUS, a major First Fleet exercise, was conducted off the southern California coast from November 28 to December 9, 1967. More than 50 ships, including two aircraft carriers and three cruisers, participated in this extensive exercise which covered many areas of naval warfare.

CORAL SANDS II, a joint Army-Navy amphibious exercise, was conducted on the island of Molokai, Hawaii, in August. Six thousand soldiers and sailors participated in the 10-day exercise which involved naval gunfire and air support of Army amphibious operations.

SPRINGBOARD 68 was a combined exercise which included ships of the Atlantic Fleet and 28 naval units from Brazil, Canada, Ecuador, Germany, the Netherlands, and the United Kingdom. The exercise lasted 13 weeks with more than 200 ships participating. The exercise, designed to take advantage of the favorable climate in the Caribbean during winter months, was considered an unqualified success and contributed significantly to the readiness posture of the Atlantic Fleet.

Marine Corps Major Operations

During fiscal year 1968 the enemy was unable to win a significant military, political, or popular victory in I Corps Tactical Zone. The three simultaneous operations of III Marine Amphibious Force (MAF) continued to prove their worth. Large-unit

operations were focused primarily on destroying main force and regular units. The counterguerrilla campaign rooted out and destroyed the guerrilla. The revolutionary development programs helped the Government of the Republic of Vietnam consolidate local governmental control and assisted the peasant to find a safer and more secure way of life.

The enemy had sound reason for focusing his combat power in the five northern provinces. There, the Marines' balanced approach to the task of defeating his main force units while simultaneously weeding out the guerrilla infrastructure and accelerating the progress of pacification eroded the enemy's influence. It was also in I CTZ that the enemy's logistic and infiltration lines were the shortest, and where he had an area well suited for drawing the war away from the heavily populated areas along the coastal plain.

During July 1967, the enemy attempted an invasion across the demilitarized zone (DMZ) which was characterized by heavy weapons fire support from his North Vietnam sanctuary delivered against Marine installations near the DMZ. On July 2, a Marine company made initial contact with this enemy force 2 miles north of Con Thien. Operation BUFFALO was launched to counter this threat. It was complemented by two Special Landing Force operations which involved flanking maneuvers to thwart the enemy's attack. By mid-July, the enemy had withdrawn to the north after having suffered over 1,300 killed.

Again, in September the enemy attempted another invasion, which was generally directed at the Marine strongpoint at Con Thien. This attack was characterized by the largest volume of heavy weapons yet fired on the Marines. Each time the enemy crossed the Ben Hai River in strength, the III MAF and Army of the Republic of Vietnam (ARVN) forces, supported by the full spectrum of available firepower and the Special Landing Forces of the Seventh Fleet, successfully drove him back. The enemy's heavy weapons, positioned in the north of the DMZ, failed to provide him any lasting measures of success. A total of 2,408 enemy were killed by III MAF forces in the five northern provinces during September. Two large unit and two Special Landing Force operations in the DMZ area against the enemy invasion attempts accounted for 764 of this total.

Contact with the enemy during the last 3 months of 1967 consisted primarily of small unit engagements around Con Thien and Gio Linh areas.

Despite the enemy's defeats and his substantial losses in terms

of both personnel and material during the first half of the year, he still retained the capability of conducting a major invasion of Quang Tri Province at the end of 1967.

On January 29, the enemy launched his lunar new year attack. Included in this Tet offensive was the occupation of the city of Hue, which resulted in the most violent and sustained combat of the war to date. During the conduct of Operation HUE CITY, which lasted 30 days, 1,943 enemy were killed and 657 of his weapons captured.

A total of 15 unit operations were conducted in March by the five divisions (two Marine and three Army) under the operational control of the III Marine Amphibious Force and the two Special Landing Forces of the Seventh Fleet. These operations, centered primarily in the DMZ area and along the lines of communication to I CTZ, accounted for a total of 5,456 enemy killed.

During April, an 18-battalion combined U.S./ARVN operation was conducted in western Quang Tri Province into the Khe Sanh area to exploit the effects of U.S. tremendous fire support during the monsoon period. The combined effort of artillery and close air support, augmented by B-52's of the U.S. Air Force, inflicted heavy casualties on the enemy encircling Khe Sanh and caused the enemy to withdraw the bulk of his forces prior to the operation. Following the operation, directed against remnants of this besieging enemy force, there were enormous caches of abandoned weapons, supplies, and unburied dead left on the battlefield.

Although major combat activities continued in northern Quang Tri Province, large-scale action with the enemy also took place in Quang Nam Province during May when Operation ALLEN BROOK accounted for 700 enemy killed. A total of 18 large-unit operations were conducted by the III MAF in the five northern provinces, accounting for over 8,500 enemy killed and the capture of 326 enemy troops and more than 5,000 of his weapons—all new monthly high marks for battalion or larger size operations.

Fifteen large-scale operations were conducted or were still in progress during the month of June. The bulk of the enemy suffered substantial losses in troops and personnel. Elsewhere, III MAF continued to confiscate large amounts of enemy supplies and equipment, including 49 vehicles, 427 individual weapons, 302 rounds of 75-mm. recoilless rifle ammunition, and over 100,000 rounds of small arms ammunition, in addition to miscellaneous weapons, ammunition, and equipment.

In spite of the enemy's efforts in the I CTZ during fiscal year

1968, including his all-out Tet offensive, III MAF and ARVN forces retained firm control of the situation.

Integrated with and complementing the success of III MAF large-unit operations in fiscal year 1968 were the Special Landing Forces of the U.S. Seventh Fleet. Taking advantage of the flexibility inherent in amphibious doctrine, Special Landing Forces operations in fiscal year 1968 were employed to meet the specific needs of the Vietnam conflict. It is in the latter role that the most noteworthy results are achieved, employing the "hammer and anvil" technique to trap enemy forces already pinioned ashore, or to drive the enemy into a prepositioned blocking force. Employed almost exclusively in this manner to support and influence a scheme of maneuver ashore, the Special Landing Forces accounted for a total of 1,381 enemy killed in 20 amphibious operations during fiscal year 1968.

Employment of Forces and Tempo of Operations

Navy

Fifty-four percent of the 932 commissioned ships of the Navy were assigned to the Pacific Fleet. Of these, more than 200 ships, including five attack carriers, were assigned to the Seventh Fleet in Southeast Asia and spent an average of 78 percent of their time at sea, compared to a 39 percent average for all ships assigned to the Pacific Fleet. Approximately 35,000 personnel aboard about 75 ships in the Tonkin Gulf were directly involved in combat operations. By yearend, there were also more than 35,000 naval personnel serving ashore in Vietnam.

Of the 429 ships assigned to the Atlantic Fleet, approximately 50 ships, including two attack carriers, were continuously assigned to the Sixth Fleet. These ships spent 62 percent of their time underway while the same at-sea period for the remainder of the Atlantic Fleet was 30 percent. The Sixth Fleet spent approximately 50 percent of its underway time in the central Mediterranean, with the balance divided equally between the eastern and western portions. The presence of this fleet in the Mediterranean took a new significance as a result of increased Soviet activity in that part of the world. Although heavily committed in the Mediterranean, Caribbean, and the Atlantic, the Atlantic Fleet continued to contribute significantly to support operations in Southeast Asia. During fiscal year 1968, 31 Atlantic Fleet ships were rotated to duty in the Pacific. Since 1965, 116 ships have deployed to that area, including 29 which were transferred permanently.

Marine Corps

In addition to those Marine Corps forces committed to combat or maintained aboard Amphibious Ready Group shipping of the U.S. Seventh Fleet, the continuing unit deployments maintained by the Fleet Marine Forces were three—Landing Force Sixth Fleet, Landing Force Caribbean, and the Guantanamo Bay Ground Defense Force.

A battalion landing team was maintained in the Mediterranean aboard U.S. Sixth Fleet ships. This deployed force, known as Landing Force Sixth Fleet, placed a combat-ready, quick-reaction element in position to protect U.S. lives and property in addition to conducting training exercises jointly with other U.S. forces or as combined operations with our allies. Such exercises were conducted on an average of one per month at locations including Aranci Bay and Porto Scudo, Sardinia; Almeria and Carboneras, Spain; Timbakion, Crete; Malta; Lova Santa, Corsica; and Saros Bay, Turkey.

Landing Force Caribbean—Landing Force Caribbean has been maintained in or near the Caribbean since February 1959. This organization, maintained on a rotational basis, was aboard amphibious shipping except during period ashore on the island of Vieques or during jungle training at Fort Sherman, Panama. Landing exercises were conducted periodically to insure that the Landing Force and the Amphibious Ready Group as a whole are ready for any emergency.

Revolutionary Development in III MAF Area—In spite of the heavy drain on U.S. Marine forces required to contain the enemy buildup in the demilitarized zone area, Marine forces continued their efforts to pacify and secure the coastal plan of I Corps, thus opening the way for development of local government and a viable local economy. U.S. Marine forces conducted an aggressive program of local security and harvest protection designed to root out the Viet Cong infrastructure and protect the valuable rice harvest from Viet Cong confiscation and taxation.

The Marine Combined Action Program was designed to combine the local knowledge and language skills of Vietnamese Popular Forces personnel with the aggressiveness and military skills of U.S. Marines to produce an effective professional local defense force. It was a significant stabilizing factor during the enemy Tet offensive and was further expanded to include an increased number of villages and hamlets.

Marines continued to conduct aggressive civic action programs within their tactical areas of responsibility. An average of

123,430 medical treatments were given per month, and a monthly average of 166 local Vietnamese medical personnel were trained. Marines and Seabees worked with the Vietnamese to improve roads, build bridges, construct schools, dig wells, and construct sanitary facilities, as well as to provide training and self-help kits to assist the local population become self-sufficient. Areas under Marine protection expanded to include more than 2,000 square miles, 230 villages, and 1.3 million people. Government of Vietnam activities in revolutionary development increased substantially during fiscal year 1968, with a major portion of the ARVN forces in I CTZ assigned to support this program. More than 150 Revolutionary Development Teams are now supported directly by approximately 70 percent of the Vietnamese armed forces in I Corps.

Accomplishments

Corsair II (A-7A) Deployed to Vietnam—In November 1967, the Navy deployed its newest light attack aircraft aboard U.S.S. *Ranger* operating in the Gulf of Tonkin. The A-7A, specifically designed for close support and attack missions, has an exceptionally long endurance which can be utilized for either long-range or lengthy "loiter" time in vicinity of a target. The aircraft can carry more than twice the load of bombs—or the same load twice as far—as any other lightweight jet attack aircraft. Combat results fully supported the anticipated capabilities of this newest addition to the attack carrier striking force.

FBM Submarine Force Completed 500th Patrol—The Navy's fleet ballistic missile submarine force completed its 500th successful patrol on February 13, 1968, when U.S.S. *Patrick Henry* returned to Holy Loch, Scotland, after 60 days of operations. By yearend, the 41 submarines of the POLARIS fleet had logged over 30,000 days on patrol. Each submarine completed at least three patrols and all successfully demonstrated the POLARIS system by actual missile launching.

Navy Researchers Achieve Record Low Temperature—Scientists at the Naval Research Laboratory, Washington, D.C., achieved the lowest temperature ever recorded—one-millionth of a degree above absolute zero. Absolute zero, the point where all molecular motion ceases, is -459.67° Fahrenheit. The previous low was 1.3 millionths of a degree above absolute zero. The freezing experiment was part of a study of forces between nuclei which change sharply as temperature is lowered. Scientists concluded that at near absolute zero even the tiniest variation in

temperature makes a significant difference. To achieve the record low temperature, scientists cooled a bundle of fine copper wires utilizing a special salt and a magnetic cooling technique called nuclear cooling.

Communications Station in Australia—The world's second most powerful communications station has been put into operation by the Navy on Australia's North West Cape. The 28-square-mile installation will broadcast messages to fleet units in Southeast Asian waters and the Indian Ocean. The 1-million-watt transmitter, which became operational on September 1, was 7 years from concept to completion and is second in power only to the Navy-operated communications station in Cutler, Maine.

SEALAB III Aquanauts Dive to Record Simulated Depth—Two members of the Navy aquanaut team dived to a world record simulated open ocean depth of 1,025 feet in the high pressure complex of the U.S. Naval Experimental Diving Unit at the Navy Yard in Washington, D.C. The aquanauts wore neoprene "wet suits" and were equipped with breathing apparatus. The dives were made in preparation for SEALAB III, one of a continuing series of ocean experiments designed to provide information on men performing useful work for extended periods at deep ocean depths.

Navy Provides Disaster Assistance—The following are representative of disaster assistance provided by the Navy during fiscal year 1968:

Following Hurricane Beulah in September, the Navy ferried food, water, and medicine to isolated areas along the lower Rio Grande River. When flood waters crested at 47 feet on September 28, the Navy provided over 300 personnel, 11 aircraft, and assorted vehicles to assist in evacuating the refugees.

In October, two tornadoes slashed inward from the Gulf of Mexico across the Florida/Mississippi coastal area. Navy Seabees provided considerable recovery assistance in Mississippi and several hundred sailors provided aid in the Pensacola area.

On November 6, helicopters from U.S.S. *Coral Sea* rescued 37 persons from the 10,000-ton Liberian merchantman, S.S. *Loyal Fortunes*, aground in the South China Sea.

Following earthquakes in Sicily in January, Navy Hercules aircraft ferried 20,000 pounds of food, 400 gallons of milk, and 28,000 pounds of clothing from Naples to Sicily. Planes from the naval air facility at Sigonella, Sicily, flew numerous reconnaissance flights and delivered an additional 2,000 pounds of clothing and 400 gallons of milk to the disaster region.

In February, helicopters from U.S.S. *Wasp* rescued 14 crewmen and passengers from the Liberian freighter, S.S. *Pegasos*, foundering in the Atlantic as a result of severe storm damage.

On March 3, S.S. *Ocean Eagle*, a Liberian oil tanker, with a cargo of almost 6,000,000 gallons of crude oil, grounded and broke into two sections immediately outside the harbor entrance to San Juan, Puerto Rico. As a result of timely action by Navy and commercial salvage activities, pollution of the harbor was minimized by emulsification of the leaking oil and pumping the remaining oil from the tanker into barges.

Special Projects

The following are illustrative of the special projects supported by the Navy during the year:

DEEP FREEZE 1968—For the 13th year, the Navy Provided logistic support for the National Science Foundation's Antarctic research program. Commander Task Force Forty-Three, U.S. Naval Support Force, Antarctica, is the senior U.S. representative and as such is responsible for determining the feasibility and safety of Antarctic operations as well as insuring their success. The projects, over 60 in number, are designed to determine human adaptability and survivability in a remote, cold environment. A significant scientific achievement occurred in January 1968 when a deep-drilling ice project at Byrd Station successfully penetrated the Antarctic ice sheet at a vertical depth of 7,101 feet. At breakthrough, the bottom ice was estimated to be 48,000 years old.

Navy Navigational System Approved for Commercial Use—Based on a Navy recommendation to improve worldwide navigational aids for civilian use, the President approved release of the Navy Navigation Satellite System for use by civilian ships and for commercial manufacture of the shipboard receivers. The all-weather system, in use by the Navy since 1964, enables ships to accurately establish their positions anywhere on the world's seas.

Deep Submergence Rescue Vehicle Specifications Available to Foreign Navies—A Navy-prepared document entitled "Submarine Requirements for Deep Submergence Rescue" was made available to foreign navies. It will enable interested nations to modify their submarines for mating with a U.S. rescue vehicle and enhance survival in the event a submarine is disabled beneath the sea. The document provides details and technical specifications for modifying submarines to accommodate the deep submergence

rescue vehicle being developed by the Navy's Deep Submergence Systems Project to conduct search and recovery operations as deep as 3,500 feet.

Project HANDCLASP—Navy combatant ships transport, on a space available basis, donated materials to oversea ports of call. During the past year, over 1,800 tons of material were distributed to the needy people of friendly foreign countries.

PRIME in the Navy—Project PRIME is the first of several resource management systems to be implemented within the Services. It concerns operations and focuses primarily on expenses such as military and civilian labor, material, and services.

During fiscal year 1968, PRIME was tested at the Naval Air Training Command and the Marine Corps Development and Education Command. On July 1, 1968, it was implemented Department-wide, within existing resources, pursuant to Congressional direction (H.R. 5807, dated July 1, 1968), and subject to restrictions imposed in House Report 1531.

An extensive training effort was undertaken to train managers and nonsupervisory personnel at all levels in the uses of PRIME data and in the techniques of amassing it. During the year, over 8,000 people received such training.

Operational Developments

U.S.S. New Jersey Recommissioned—On April 6, U.S.S. *New Jersey* was recommissioned after 9 months of reactivation. Following her commissioning, the ship sailed to her new home port of Long Beach, Calif. The ship later joined the Seventh Fleet where her nine 16-inch guns and twenty 5-inch guns augmented naval shore bombardment forces.

New Fire-fighting Agent for Carriers—Light Water, which floats on the surface of liquid fuels, and Purple K powder, a flame-quenching chemical, were combined by the Navy into a new fire-fighting agent now installed aboard our attack carriers and amphibious assault ships. The new agent is dispensed from fire-fighting trucks, two of which are located on the flight deck while a third is positioned on the hangar deck. The new compound has extinguished fuel fires in as little as 21 seconds during tests.

Drone Helicopter Aids Naval Gunfire—A reconnaissance observation system providing transmission of real-time television information, using a remotely controlled drone helicopter, was employed successfully in Southeast Asia to spot naval gunfire. Designated Snoopy, the system can perform search, specific area

search, small area reconnaissance, target detection and identification, and indirect fire adjustment.

OMEGA Navigational System Approved—Four stations for the Navy-developed OMEGA navigation system were approved. The facilities, located in Bratland, Norway; Port of Spain, Trinidad; Haiku, Hawaii; and Forestport, N.Y., provide navigational coverage to an area greater than one-fourth of the world. OMEGA is an all-weather, general-purpose navigational aid which continuously provides very accurate navigation information for both aircraft and ships. OMEGA has a potential of providing continuous worldwide position information accurate to 1 mile during the daytime and 2 miles at night.

Royal Navy and U.S. Navy Satellite Communications Compatible—Successful tests of the compatibility of Royal Navy and U.S. Navy satellite communications terminals represented a landmark in allied naval communications. Voice and teletype communications were achieved using shipboard terminals mounted ashore at Portsmouth, England, and San Diego, Calif.

IV. Seapower Capabilities

Naval Warfare Capabilities

Strategic Retaliatory Forces

Fleet Ballistic Missile Weapon System Program—The funded program through fiscal year 1968 provided for 41 SSBN's and five tenders.

Operational Status—The Nation's sea-based deterrent strength continued to increase during fiscal year 1968 despite the return of earlier FBM submarines for overhaul. Not only were there more SSBN's at sea than in any previous year, but more were equipped with the new, longer range A-3 POLARIS missiles. At the end of fiscal year 1968, 32 SSBN's were deployed for operational patrols, 28 with A-3 missiles and 4 with A-2 missiles.

FBM operations continued from four tender support sites with SSBN squadrons operating from Holy Loch, Scotland; Rota, Spain; Cooper River, S.C.; and Guam, Marianas Islands.

Command and Control—The vital link connecting the national command authorities and the Navy's strategic retaliatory forces is provided by an extensive and reliable command and control system. This arrangement, consisting of many radio transmitting and receiving stations located throughout the world, provides constant and reliable communications with U.S. FBM forces when they are fully submerged on patrol.

Overhauls, Conversions, and Material Support—The first FBM submarine deployed in November 1960 and redeployed after its first overhaul in June 1966. By the beginning of fiscal year 1968, the entire 598 class of SSBN's had completed overhaul, with four of the five submarines redeployed. These five ships had all been converted to POLARIS A-3 missile-carrying capability. By the end of fiscal year 1968, the entire 608 class, plus the lead ship for the 616 class, had completed their respective overhauls, retaining POLARIS A-2 missile-carrying capability. Of the five SSBN's presently in overhaul, two will retain POLARIS A-2 and three are undergoing conversion from POLARIS A-2 to POLARIS A-3 capability.

Two SSBN's were outfitted for their initial patrols during the

year and 137 refits were performed for deployed submarines by the FBM submarine tenders at the four replenishment sites.

Development and Demonstration

Development—Fleet ballistic missile system development proceeded in two main areas during the year—improved POLARIS A-3 (A-3T) missile and POSEIDON C-3 missile.

Development effort on the improved POLARIS A-3T missile continued during the year. The operational systems development of the POSEIDON missile system continued as planned during fiscal year 1968. Development of subsystems progressed with increased confidence that the technological goals for the POSEIDON missile would be met within the desired time frame.

Demonstration—FBM weapon system testing continued during the fiscal year. At Cape Kennedy, Fla., FBM submarines fired POLARIS A-2 and POLARIS A-3 missiles in demonstration and shakedown operations (DASO) prior to each ship's initial or post overhaul deployment. By the end of the fiscal year, a total of 49 POLARIS A-2 DASO missiles had been fired with 42 successes, and a total of 59 POLARIS A-3 DASO missiles had been fired with 57 successes.

The POLARIS A-2 and POLARIS A-3 Follow-on Operational Test (FOT) Program, wherein the weapon system is tested under simulated tactical conditions, was carried on in both the Atlantic and Pacific with excellent results.

U.S. and U.K. POLARIS Program—There were no major obstacles to successful program accomplishments. Effort was directed toward weapon system equipment deliveries for United Kingdom submarines and the manufacture and delivery of POLARIS A-3 missiles. The deployment of H.M.S. *Resolution* on her first deterrent patrol and launching of H.M.S. *Repulse* and H.M.S. *Revenge* highlighted the program milestones.

Future Strategic Systems

Offensive—Investigations of advanced sea-based strategic systems were pursued in the past year. Two promising systems, an advanced ship-based and an advanced submarine-based strategic weapon system, were further defined as future potential contributors to the U.S. strategic force mix.

Defensive—The Navy conducted extensive investigations in fiscal year 1968 of a very promising baseline design, the Sea-Based Ballistic Missile Intercept System (SABMIS). From a sea-based antiballistic missile system accrue the advantages of mobility,

early midcourse intercept, and defense-in-depth, as well as a capability against the Fractional Orbital Bombardment System (FOBS).

Attack Carrier Strike Warfare

Carrier Program—The attack carrier (CVA) force level for fiscal year 1968 remained at 15 with 6 assigned to the Atlantic Fleet and 9 to the Pacific Fleet. *Intrepid* (CVS-11) continued to deploy regularly to Southeast Asia in a limited CVA role. The Atlantic Fleet also assisted the Pacific Fleet by the periodic assignment of a CVA with an embarked attack carrier air wing to the Seventh Fleet.

The antisubmarine warfare support carrier (CVS) force level for fiscal year 1968 remained at eight with four each assigned to the Atlantic and Pacific Fleets. One CVS with carrier anti-submarine air group was continuously assigned to the Seventh Fleet from the Pacific Fleet, and periodically an ASW carrier was assigned to the Sixth Fleet.

The Seventh Fleet had five carriers assigned almost continuously for the conduct of tactical air operations in Vietnam. Three CVA's regularly conducted strike operations from Yankee Station in the Gulf of Tonkin. However, during the height of the *Pueblo* crisis, six attack carriers and two ASW carriers were assigned to the Seventh Fleet for a brief period.

The Sixth Fleet readiness posture was maintained by the continuous assignment of two CVA's and their embarked aircraft.

New Construction

U.S.S. *John F. Kennedy* (CVA-67) was launched on May 22, 1967, for commissioning on September 7, 1968.

In May 1967, a contract was awarded for construction of the Navy's second nuclear-powered aircraft carrier—U.S.S. *Nimitz* (CVAN-68). The keel was laid June 22, 1968, and launching is planned for October 1970 with delivery in mid-1972.

Carrier Aircraft Program

Continuing problems with weight, shipboard handling characteristics, and the engine/airframe interface led to cancellation of the F-111B program. Total deliveries will include seven aircraft which will be utilized in test programs applicable to new weapon developments and determination of contract performance with regard to F-111B termination proceedings. Limited carrier testing will be included in the latter. Supporting the decision to cancel

procurement of the F-111B were preliminary studies of a smaller, lighter, and more versatile carrier-based fighter aircraft, subsequently designated the VFX-1. This aircraft will utilize a variety of air-to-air weapons, including the PHOENIX missile and is intended to replace current fighter aircraft.

Modernization of the Crusader (F-8) fighter aircraft continued in fiscal year 1968 to provide improved combat capability for *Hancock*-class aircraft carriers.

The A-6 Intruder continued to enhance its reputation as probably the finest and most effective all-weather ordnance delivery vehicle operating against North Vietnam. Its employment during the foul weather in that area enabled fleet commanders to keep constant pressure on the enemy regardless of the environment. During the past year, limited deployment of a modified weapon system for advanced air ordnance further increased its versatility.

Although gradually giving way to the Corsair II, the Skyhawk (A-4) continued to be the primary light attack aircraft in the fleet during fiscal year 1968. An engine with increased power improved the performance of earlier models of this aircraft.

The Skyraider (A-1) was retired from service in the attack carrier striking forces on February 20, 1968, after 20 years of distinguished Navy service.

Destroyer Forces

During the past year the Navy continued to press forward with a new construction destroyer program to develop and produce a large new family of destroyers and frigates. In development are three 30-knot ship classes, standardized with each other to the maximum extent possible—the DX, DXG, and DXGN. All have a strong ASW capability with DX optimized for this mission. DX also has the mission to provide gunfire support for Marine Amphibious Forces.

In November 1967 a destroyer ship development plan was approved, and in February 1968 a request for proposals was released to industry for contract definition (CD) of the DX. Congress appropriated \$30 million in fiscal year 1968 for this purpose. In July 1968, CD contracts for the DX were signed with Bath Iron Works Corporation, General Dynamics Corporation (Quincy), and Litton Industries, Incorporated. DX is expected to be ready for contract award in August 1969. Since sizable numbers are needed, a large series production is anticipated. This program applies new design procurement and management techniques in a total ship acquisition approach. Investment and operating

costs will be minimized while increasing the reliability and effectiveness of these new ships.

In March 1968, a decision was made to proceed with the construction of two nuclear guided missile frigates, and funds were released for these ships. At the same time, it was decided to proceed with the development of a new class nuclear frigate, called DXGN, to meet future fleet requirements for these ships for attack carrier escort and independent missions. Contract definition of DXGN began in early 1968 with substantial industry assistance. This ship will be designed to meet the threat of the late 70's and to have low life-cycle costs.

Modernization of the DLG-6 and -16 class frigates continued for these 19 first line ships.

Antisubmarine Warfare

Surface Ship Antisubmarine Systems—The major elements of the surface ship ASW capability include AN/SQS-29 sonar, AN/SQS-23 sonar, and AN/SQS-26 sonar, and various associated weapon delivery systems including MK44/46 torpedo, ASROC (antisubmarine rocket), and DASH (drone antisubmarine helicopter).

The predominant sensor on our ASW capable ships, SQS-23, was retrofitted during overhaul with TRAM (test, reliability, and maintainability) features to increase its operational availability. Additionally, development of PAIR (performance and integrated retrofit) neared completion and will provide significant performance gains to ships with this sonar. Installation of PAIR in SQS-23-equipped ships will commence in fiscal year 1970.

The largest and most complex of our surface ship sonars, AN/SQS-26, was introduced into the fleet on new construction DE/DEG/DLG ships. This sonar provides protection in the deep ocean against submarines positioned below the surface thermal layer by utilizing diverse propagation paths.

U.S.S. *Barry* (DD 933) completed an ASW modernization in April 1968. She was the first of nine DD 931/945 class destroyers to receive this modernization. Her ASW equipment includes the SQS-23 sonar, ASROC, and two triple torpedo tubes.

ASW weapon systems for surface ships improved significantly during this period. The MK-46 torpedo was added to fleet inventory and is capable of combating high-speed, deep-diving submarines. It possesses a higher acquisition probability than other torpedoes currently in inventory. A program was commenced to double the current range capability of the antisubmarine rocket

(ASROC), a quick reaction, long-range weapon for delivering either torpedoes or depth charges.

Installation of an ASW command and control system which is capable of acquiring, processing, displaying, and communicating tactical information in a clear, concise, and timely manner was completed on selected ships and commenced an at-sea evaluation.

Use of the surface expendable bathythermograph system was expanded to all our ASW-capable ships, providing temperature-versus-depth profile to 1,500-foot depths. This system was also adapted for use by helicopters and submarines.

Aircraft Antisubmarine Systems—The main contribution to the Navy's air ASW capability was the developmental testing of the new P-3C and its integrated ASW system. These new aircraft will enter the fleet operationally in late fiscal year 1969. New methods of control and dissemination of information to carrier-borne ASW aircraft and helicopters added a significant ASW capability. The development of a new carrier aircraft, VSX, reached the contract definition stage.

Antiair Warfare

Fleet antiair warfare capabilities improved during fiscal year 1968 with the addition of seven guided missile ships. Additionally, modifications to existing ships and systems contributed to improved antiair warfare posture in the fleets. The first modernization was completed when U.S.S. *Leahy* (DLG-16) was recommissioned in May 1968.

The Basic Point Defense Surface Missile System Operations Evaluation was satisfactorily completed aboard U.S.S. *Bradley* (DE-1041) in September 1967 resulting in approval for Service use. A procurement contract was awarded for subsequent installation on selected ships.

First production deliveries of the STANDARD missile began in June 1968. This missile will gradually replace the older TERRIER and TARTAR missiles.

The first F-4J squadrons deployed aboard *Independence* (CVA-62) and *America* (CVA-66) in April 1968. The AWG-10 pulse doppler search radar in the F-4J provides improved detection and acquisition capability. The introduction of a modified SPARROW III missile, designated the AIM-7E-2, decreased the minimum range for firing to one-half the previous requirement and improved the air-to-air capability of the F-4. Initial assets of this missile, known as the DOGFIGHT SPARROW, were obtained for Southeast Asia by modification of existing missiles.

Development of the Junior Participating Tactical Data System continued. This system will provide small ships with the basic elements of a Navy Tactical Data System (NTDS).

Amphibious Assault Forces

The Navy continued the program of replacing old World War II amphibious assault forces with modern, fast, versatile ships. Contract definition of the large general purpose amphibious assault ship (LHA) has been completed, with Litton Industries selected as the building contractor. The introduction of this ship into the fleet commencing in fiscal year 1973 will increase our amphibious capability and flexibility by providing faster response times.

A high level of combat readiness was maintained by conducting amphibious exercises in both oceans as well as combat assault landings in Southeast Asia. The two Amphibious Ready Groups which operated off the coast of South Vietnam, each carrying a battalion landing team of Marines, merit special note. These forces conducted 25 separate combat assaults during this period.

Combat operations of the Mobile Riverine Force were maintained at a high tempo, with the combined Army/Navy force constantly seeking out enemy concentrations and base areas throughout the Mekong Delta. The quickly designed and modified LCM's, except for deficiencies in speed and maneuverability, proved to be rugged and immune to small arms fire, and capable of sustaining repeated hits and remaining in action. Only two of these rugged craft were lost to enemy action. During the Tet offensive, the COMUSMACV and President Thieu of the Republic of Vietnam credited the Mobile Riverine Force with having saved the delta area of South Vietnam.

Mine Warfare

Mine countermeasures forces in the Western Pacific significantly contributed to the defense of the Republic of Vietnam. Ocean minesweepers (MSO) and coastal minesweepers (MCS) operated continuously on MARKET TIME, the antisea infiltration patrol, while the smaller minesweeper boats (MSB) swept the Long Tao River from the South China Sea to Saigon. The effectiveness of this mine countermeasure effort was amply demonstrated, and no commercial vessels were lost to river mines. In recognition of their extraordinary heroism in action against Communist insurgents (Viet Cong) in the Rung Sat Special Zone, the MSB division in-country was awarded the Presidential Unit Citation.

The new variable-depth mine-hunting sonar (AN/SQQ-14) was installed in sufficient quantities to enable deployment of MSO's with this equipment in each division deployed to the Western Pacific. All new construction and modernized MSO's will be so equipped to increase fleet mine-hunting capabilities. At the present time, MSO's (5 LANT, 12 PAC) are equipped and available for oversea deployments.

Support Forces

During fiscal year 1968, the naval support activities at Danang and Saigon continued to provide highly responsive logistic support to combat forces in spite of increased enemy harassment and the Tet offensive.

Cargo Operations—The naval support activity at Danang provided common-user support for some 200,000 military personnel in the I CTZ by the end of the fiscal year. Danang handled an average of 250,000 short-tons per month and as high as 350,000 short-tons during the Tet offensive. These operations continued unabated in spite of terrorist and harassing mortar and artillery attacks.

Much of the military cargo off-loaded in Danang must be further transhipped by sea lines of logistics to the Cua Viet/Dong Ha, Tan My/Hue, and Chu Lai enclaves. The enemy recognized the essentiality of these operations and endeavored in every way possible to disrupt the flow of support to our combat forces in the I CTZ. The most hazardous of these sea lines of logistics were the Cua Viet River, just south of the demilitarized zone up to Dong Ha, and the Perfume River from Tan My to Hue. These ports averaged 40,000 and 30,000 short tons per month, respectively. Both exceeded this average by 10,000 tons during the Tet offensive. Enemy operations continually subjected the shuttle craft transiting these rivers to ambushes, rifle, rocket, and mortar fire. From time to time, the enemy attempted mining these rivers with but little success to reduce the flow of ammunition, fuel, supplies, and construction material to the I CTZ. In spite of enemy efforts and difficulties from monsoon weather and typhoons, the logistic support in the I CTZ met all the needs of expanded military operations in this critical area.

Navy support operations centering in Saigon were primarily concerned with providing for MARKET TIME, GAME WARDEN, and Riverine Forces in the II, III, and IV CTZ's. Using both air and water lines of logistics, military cargo

arriving in Saigon was transhipped to the activities along the coast and throughout the Delta region.

The small organic airlift capability, composed of three transport-type aircraft and two helos, available to NSA Saigon carried an average of just over 3,000 passengers and 350,000 pounds of cargo per month. During the Tet offensive, this lift reached a record high of 3,440 passengers and 410,000 pounds of cargo.

Resupply of NSA detachments serving MARKET TIME and GAME WARDEN operations is normally accomplished using AKL, YW-type craft, and LCM's. Resupply of NSA detachments serving riverine operations is normally accomplished by LST's.

Port Improvements—During the year, port improvements were made at Tan My, Chu Lai, Cua Viet, and other activities to ease the port congestion and improve the flow of support material.

River Patrol Boat Operations—Support rendered the river patrol boats (PBR) was excellent during fiscal year 1968. Two mobile PBR bases were established, one at Tan My in the I CTZ and one in the Delta region. These mobile bases provided complete logistic support for PBR's, including berthing, messing, and minor repairs. Resupply of the mobile bases is by Navy logistic craft (ARL, LCM) and by Army craft. The facilities to provide major repairs to PBR's and other logistic craft were increased by the addition of boat repair units at several minor ports in the II, III, and IV CTZ's. However, the major boat repair activities were centered at Danang, Cam Ranh Bay, and Catlo.

Construction Battalion Operations—Seabees played a vital role in support of combat forces, primarily in the I CTZ. Starting with 9 battalions at the beginning of the year, 12 battalions were operating in-theater by the end of this period. Two additional reserve battalions were activated to provide a total Seabee force of 21 battalions for rotation purposes. Seventy-five percent of the construction projects at the start of the year were enclave-type projects. After the Tet offensive, emphasis was shifted, and about 70 percent of Seabee efforts were tactical projects by June 1968. Major efforts during the year included the completion in 37 days of a 5,000-foot runway and an 180,000-square-foot parking apron at Quang Tri. Seabees also constructed the Gia Le combat base near Phu Bai now quartering 40,000 Army troops. Construction battalions upgraded about 100 miles of Route 1, including over 40 bridges, between Phu Loc and Dong Ha and Route 9 between Dong Ha and Landing Zone Stud, 5 miles from Khe

Sanh. Landing Zone Stud was built in 15 days by Seabees and was used for the relief of Khe Sanh.

Medical Support—Medical assistance to combat operations was another important support. As a result of the quick response provided by helicopter evacuation of wounded from the battlefield, it was not uncommon for the wounded to be undergoing treatment at the main naval support activity hospital at Danang or aboard the hospital ships *Repose*, *Sanctuary*, and amphibious assault ships within minutes after they were hit. The Navy doctors and hospital corpsmen attached to Marine combat units deserve special credit for the treatment of wounded while still under fire, and Navy nurses continued their outstanding work at the major hospitals and aboard the hospital ships.

General Readiness—The general over-all readiness of deployed forces of the Navy remained relatively constant. However, the readiness of nondeployed forces deteriorated to some extent. Stability in the readiness of the Pacific Fleet was at the expense of other fleet assets and resources, particularly in the Atlantic Fleet. Improvements in supply and personnel training procedures were offset by a decline in material conditions, shortages of personnel, and a lack of opportunities for unit underway training.

Material Readiness—Over-all material readiness declined during the year. Improvements in material management programs related to overhaul, maintenance, and repair helped overcome the adverse effects of the high tempo of operations, increasing age of fleet units, shortage of personnel, and the difficulties associated with maintaining more complex equipments.

Personnel Readiness—A personnel shortage was the principal contributing factor to a deterioration of over-all readiness of nondeployed units. In the Atlantic Fleet, the deficiency resulted in placing a number of ships in a reduced operational, or non-combat-ready, status. Shortages existed in both the number of personnel and in the skills to maintain and operate ships and equipments.

Training Readiness—Shortages of personnel and funds for training equipment made it difficult to maintain a satisfactory state of training readiness. However, despite these deficiencies and such factors as shortened training cycles and inadequate submarine services for training, intensive effort reduced the impact on the level of training readiness. Better coordination of training efforts resulted in some important training improvements, particularly in the areas of damage control, navigation, and electronic warfare.

Supply Readiness—Based on analysis of usage and demand, responsiveness to fleet requirements for available items remained approximately the same as the previous fiscal year. Some serious equipment shortages persist in such areas as electronic warfare systems and selected munitions.

Underway Replenishment Ships—Underway replenishment ships continue to be heavily committed, with those serving in support of Southeast Asia operations carrying the heaviest workload. Two new ships, U.S.S. *Niagara Falls*, a combat store ship (AFS), and U.S.S. *Camden*, a fast combat support ship (AOE), commenced operations with the Seventh Fleet for the first time in April and June 1968, respectively. These new ships provide a greatly enhanced underway replenishment capability over their predecessors through increased stowage capacity, faster speeds for underway replenishment and transiting, and through improved transfer rates. U.S.S. *Nitro*, an ammunition ship (AE), rejoined the Atlantic Fleet after an extensive conversion which improved her missile stowage and transfer capability. Although these new ships have somewhat improved the underway replenishment capability, the fleet is still faced with the problem of utilizing older ships. Among these are the AO-22 class oilers which are now 25-29 years old and have a significantly lesser capability than other oilers in cargo capability, pumping rates, and replenishment speeds. There are 22 of these old oilers still in the fleet. The underway replenishment ships are hard-pressed to provide support to the Sixth and Seventh Fleet units as well as those support requirements for training in the First and Second Fleets. These problems have been further compounded by efforts to maintain deployment, rotation, and upkeep/repair/overhaul schedules for Service Force ships. Increased tempo of operations required increased recycling with attendant sacrifice of training and upkeep/repair time.

Support Ships—The capabilities of major and minor fleet support ships have been heavily taxed in meeting fleet requirements. The increased efforts by repair ships (AR) to improve services to the fleet have pointed up an urgent need to initiate a construction program with the goal of providing repair ships that can meet the repair/maintenance requirements of all fleet units.

Naval Resources

Navy Manpower (Military)

Navy military manpower increased 13,838 from an end fiscal

year 1967 strength of 751,619 to an end fiscal year 1968 total of 765,457, or about 1.8 percent. The Operating Forces increased by 20,655 billets. These forces comprised 64.4 percent of Navy's total manpower resources. Since the increase in Operating Forces was greater than the end strength increase, selected drawdowns against other functions existed. Navy's portion of Southeast Asia in-country operations increased by 24 percent, and the remaining increases provided to operational forces were largely for functions directly related to Southeast Asia. Support billets were reduced by about 4,500 billets, and training and miscellaneous categories remained relatively stable. WAVE strength showed a total of 520 officers and 5,200 enlisted at the end of the year. The civilian substitution program began on July 1, 1967. Navy's target was the replacement of 15,381 Navy military personnel by 12,699 civilians during fiscal year 1968. Although all military billets were deleted by June 30, 1968, only 11,912 civilian replacements had been effected by the end of the fiscal year. Tight labor markets and funding limitations hampered the success of the program.

The Naval Reserve Forces consisted of 588,173 personnel, 108,960 of whom were on active duty at the beginning of the fiscal year. This number decreased to 566,784 by June 30, 1968, with 108,535 on active duty. The ratio between pre-active and post-active duty personnel continued to improve, and the optimum goal of 30/70 was achieved. A total of 88 percent of Reserve enlisted personnel went to active duty in pay grade E-3.

Six Naval Air Reserve squadrons were recalled to active duty in January 1968 and were phased into the fleet carrier rotational base. In May, Naval Reserve Mobile Construction Battalions 12 and 22 were recalled to active duty and scheduled for deployment to Southeast Asia.

Project 100,000 moved into Phase II (October 1967-September 1968) during fiscal year 1968. The purpose of Project 100,000 is threefold: First, greater equity in spreading the opportunities and obligations of military service; second, recognition of the unique capability of the military establishment to produce fully satisfactory servicemen among culturally disadvantaged men who had previously been deferred; and, third, provision of foresighted military manpower planning by the input of a balanced portion of enlisted men from the lower mental group range to gain more experience in motivation, training, and use of this group.

In the DOD-sponsored program to attract ex-servicemen to

the police forces of the Nation, 31 Navy men were recruited during the year.

Project Transition was established by the Secretary of Defense in response to a 1967 Presidential request to assist servicemen who have not gained necessary skill or knowledge for a productive return to civilian life. Counseling, training, education, and job referral services were available to enlisted volunteers with 6 months or less of active service remaining who indicated an intent to return to civilian life. The Navy presently has 14 Project Transition sites at various Naval stations.

The Variable Reenlistment Bonus (VRB) Program was initiated on January 1, 1966, as an outgrowth of an earlier Navy proposal. The VRB is in addition to the normal reenlistment bonus and may be up to four times the normal bonus. The maximum amount payable (normal and VRB) is \$10,000. The program has been a successful system aimed at improving first-term reenlistments in critical skills and in alleviating critical career shortages. For fiscal year 1968, of the Navy first-term population eligible to reenlist, 65 percent were eligible to participate for the VRB. About 19 percent took advantage of the program by reenlisting, compared to a reenlistment rate of 13 percent for those not eligible to participate.

Marine Corps Manpower (Military)

The programed and estimated actual yearend distribution of Marine Corps manpower was as follows:

	<i>Programed Strength</i>	<i>Yearend Strength</i>
Officers -----	24,878	24,555
Enlisted -----	284,301	282,697
Total -----	309,179	307,252

Officers totaled 8.0 percent at yearend and noncommissioned officers averaged 42.9 percent during the year. The programed total included 270 woman Marine officers and 2,700 enlisted woman Marines.

At the beginning of fiscal year 1968, the Marine Corps was authorized an end strength of 294,900. Early in the fiscal year it became apparent that a higher state of readiness was desired in Marine CONUS forces. Accordingly, an increase of 7,000 additional Marines was granted on December 3, 1967. Coincident with this action, Regimental Landing Team 27 was deployed to Vietnam in February 1968, and an increase of 9,700 Marines was approved on May 3, 1968.

The Marine Corps portion of Project 100,000 moved into Phase

II (October 1967–September 1968) during fiscal year 1968. The purpose of the project is to provide opportunities to those who had previously been unable to enlist in the Services because of cultural disadvantages and lower test scores.

The police recruiting program realized approximately 160 Marines. It is anticipated that this program of separating Marines early in order to join civilian police forces will be expanded in the future.

The Marine Corps' pilot program was conducted at Camp Lejeune, N.C., in late 1967, and in 1968 the program was expanded to include Marine Corps Development and Education Command, Quantico, Va.; Marine Corps Base, Camp Pendleton, Calif.; Marine Corps Air Station, El Toro, Calif.; and Marine Barracks, Treasure Island, Calif.

Navy Civilian Resources

On June 30, 1968, the Department of the Navy employed 430,205 direct-hire civilians, an increase of 20,263 for the fiscal year. Support of the operations in Southeast Asia accounted for the major portion of the increase.

Full-time employment increased 21,341 during the year, while part-time and intermittent employment decreased 1,078. Employees in full-time permanent positions increased from 387,375 on June 30, 1967, to 410,941 at the close of fiscal year 1968. Of the total work force, 44 percent were in graded positions and 56 percent in ungraded at the end of fiscal year 1968.

Geographical distribution of civilian personnel and increases over June 30, 1967, are shown in the table below.

Area	June 30, 1967	June 30, 1968	Increase
United States	371,150	387,322	+16,172
Graded	161,570	175,723	+14,153
Ungraded	209,580	211,599	+2,019
Territories and possessions	¹ 7,185	² 7,410	+225
Graded	2,650	2,797	+147
Ungraded	4,535	4,613	+78
Foreign countries	³ 31,607	⁴ 35,473	+3,866
Graded	11,022	12,368	+1,346
Ungraded	20,585	23,105	+2,520
Worldwide	409,942	430,205	+20,263
Graded	175,242	190,888	+15,646
Ungraded	234,700	239,317	+4,617

¹ Includes 580 foreign nationals.

² Includes 629 foreign nationals.

³ Includes 28,324 foreign nationals.

⁴ Includes 31,983 foreign nationals.

Recruitment—Fiscal year 1968 was a successful recruiting year for most naval activities. This was particularly true in the competition for college-trained professionals. The use of work-study, planned professional development, and training programs together with subsidized graduate education offset the generally higher salaries offered by industry.

Coordination of college recruiting visits and combined recruitment campaigns resulted in a more efficient program. Through these methods we were also better able to project to the campus the image of Navy as an employer.

In spite of vigorous recruiting programs, the Navy continued to have significant problems attracting employees to occupations for which there are general shortages of qualified eligibles. Examples include doctors and specialists in the paramedical fields, naval architects, operations research analysts, and in the trade areas, such as welders and shipfitters.

Overseas Recruitment and Return Placement—Navy participated with the Department of Defense in developing the DOD Automated Overseas Employment Referral Program which became operational in June 1968. Interested employees registered in an automated "talent bank" for assignment to designated "hard-to-fill" jobs at DOD activities overseas. By providing applicants a convenient means of registering through their local civilian personnel offices, the program was designed to increase the numbers of qualified candidates and to speed the hiring process as overseas vacancies occur.

The return replacement program for employees continued to serve as an effective device for improving the general image of Navy employment overseas and for improving the morale of our overseas employees. As overseas returnees were successfully placed in jobs at home, interest grew among employees in the United States to accept challenging overseas assignments. U.S. activities to which they returned benefited from the additional skills and the broadening of perspective. The over-all result was improved overseas recruitment. Of a total of 239 Navy overseas employees registered in the system, 86 had been placed, 66 had either returned to other jobs in the United States or had withdrawn from the system, and 87 remained registered.

Transitional Appointments of Vietnam-Era Veterans—Navy actively participated in a new appointment, staffing, and training program for Vietnam-era veterans. As a result of Executive Order 11397, a program for transitional appointments for Vietnam-era veterans was implemented in May 1968. These

appointments were made at GS-5 level and below or the equivalent. The appointments led to competitive status and career or career-conditional tenure upon completion of specified amounts of education and training. During the first 2 months of the program, Navy made 195 such appointments.

The Navy, in cooperation with other DOD agencies, is in the process of establishing an automated system providing for registration and referral for employment consideration of Vietnam-era veterans of the armed forces who are eligible for transitional appointments in the Federal service and who desire assistance in obtaining such appointment.

Summer Employment 1968—To meet its 1968 summer employment goal of 4 percent nationwide and 6 percent Washington metropolitan area employment, it was estimated Navy would need to employ 15,010 young people. As of July 22, 1968, a total of 16,390 appointments had been made, exceeding our goal by approximately 9 percent. The restriction on employment of sons and daughters of agency personnel and the requirement for increased emphasis on the employment of disadvantaged youths posed problems to many activities because of their geographical location. In spite of these obstacles, the 1968 Summer Employment Program was highly successful.

Base Closure Personnel Impacts—Placement efforts continued for Navy employees affected by base closure announcements. The five activities closed in fiscal year 1968, added to the 13 closed in preceding years, brings the total to 18 closed activities with 18,453 employees. Activities closed in fiscal year 1968 were:

<i>Activity</i>	<i>Civilian personnel</i>	<i>Date of closure</i>
U.S. Naval Air Station, Sanford, Fla.	188	June 1968.
Naval Air Facility, Litchfield Park, Ariz.	685	July 1967.
U.S. Naval Supply Center, Bayonne, N.J.	1,773	July 1967.
Naval Supply Research and Development Facility, Bayonne, N.J.	80	July 1967.
Military Sea Transportation, Service Atlantic Area, Brooklyn, N.Y. (Maintenance & Repair Department only).	62	Sept 1967.

Of the Navy employees affected by closing bases, 9,965 were placed in new jobs, 5,010 through the DOD Centralized Referral

System. At the end of June 1968, only 47 Navy employees were registered in the system for placement.

Conversion Program, Contract Engineering Technical Services (CETS)—The CETS program terminated on March 31, 1968, with 93 percent completion. A total of 5,509 positions were allotted for CETS, 5,115 of which were filled either by converting contractor personnel (1,757) or by utilizing other recruitment (3,358). Most contractor employees were reluctant to accept Civil Service jobs, and qualified technicians were not readily available. Extensive recruiting, which included paid advertising, was required to fill the 3,358 positions.

Career Management and Planning

Executive Management—During fiscal year 1968, the Navy established and began operation of its first over-all system of centralized management of high-level civilian personnel and positions. The Civilian Executive Management Board, under the chairmanship of the Under Secretary, met four times during the year, approving operational guidelines for the Navy's participation in the President's Executive Assignment System and undertaking a comprehensive review of executive positions subject to quota controls.

Career Plans—Development of a Navy-wide career plan in a number of fields continued, and a career program for civilian intelligence, counterintelligence, and cryptographic personnel was established. The objective is to maintain and improve intelligence capabilities.

Other Navy-wide career plans underway included a career plan for facilities engineering and management personnel and a career management program for the RDT&E community.

Labor Relations Program—During the past year, union organizations continued their growth in Navy and Marine Corps activities. The total number of units in which unions had exclusive recognition was 375, with a population of 197,000 employees. This was an increase of 83 units and 27,000 employees over the past year; 216 of the 375 units, with a population of 147,000 employees, were covered by negotiated agreements. This was an increase of 46 units and 24,000 employees over the previous year.

Management Improvement

Position Management—Naval shore activities continued the systematic appraisal of civilian positions against position man-

agement standards. Over 290,000 positions were covered. Many benefits have been reported as a result of the program, such as personnel freed for higher priority work, correction of organizational deficiencies, cancellation of requests for new positions, and improvements in job design and work procedures.

Equal Employment—The Navy completed a series of Secretary of the Navy survey teams instituted in April 1966. During an 18-month period, 210 activities employing about 200,000 personnel in 17 geographical areas of the country were surveyed. There was significant improvement in the movement of minorities into both entrance levels and higher levels, including supervisory positions. The number of Negroes and other minority employees in the apprentice program markedly increased.

Cost Reduction

Incentive Awards Program—During fiscal year 1968, 55,253 suggestions were received from civilian employees. During the same period, 19,614 suggestions were adopted which resulted in a savings of \$28,724,151 and awards to employees of \$1,027,288. The savings reported for superior accomplishments also amounted to over \$13,649,000; more than 11,000 awards were approved, and over \$1,522,000 in awards was granted.

Safety—During fiscal year 1968, the civilian injury rate (2.85 disabling work injuries per million man-hours) decreased 3 percent from fiscal year 1967. However, the injury severity rate (days lost per million man-hours) increased by 41 percent. For the same period, military injury frequency and severity rates increased by 86 percent and 98 percent respectively. The average number of miles driven per accident in fiscal year 1968 decreased from 115,184 in fiscal year 1967 to 112,466 in fiscal year 1968.

Material

Secondary Item Inventory Trends

The value of the Navy's secondary item inventory rose approximately \$411 million during fiscal year 1968. The rise from \$6.127 billion to \$6.538 billion (7 percent) reflected increases of \$349 million in APA (Appropriation Purchases Account) material and \$62 million in NSF (Navy Stock Fund) material. It should be noted that \$120 million of the APA increase reflected a change in categorization of some POLARIS missile support material from principal item to secondary item status. Thus,

the actual net increase in comparable APA secondary item inventories was \$229 million, or 5 percent.

The total increase in secondary item inventory values during fiscal year 1968 is considered to be within acceptable parameters. In the past 5 years, the value of major end items (ships, aircraft, and missiles) to be supported increased from \$35.8 billion to \$46.8 billion. The secondary item inventories supporting these end items have increased only 4 percent during the same time period, from \$6.3 billion to \$6.5 billion.

Aviation material accounted for the major portion of the increase in the APA secondary item inventory, going from \$2.478 billion to \$2.628 billion, an increase of \$150 million. Again, this inventory increase was in line with corresponding increases in the value of aircraft being supported.

The \$62 million increase in Navy Stock Fund inventories during fiscal year 1968 is primarily attributed to the capitalization of an additional 100,000 items into the retail item category managed by the Fleet Material Support Office and a slight increase in stocks of critical electronic cable.

SECONDARY ITEM MANAGEMENT ASSIGNMENTS

<i>Managing ICP Material Category</i>	<i>Value of inventory as of June 30, 1968 (in millions of dollars)</i>
Ships Parts Control Center:	
NSA:	
Ordnance repair parts	29.8
Ships repair parts	189.1
APA:	
Ordnance repair parts	475.1
Repair parts for FBM ordnance equipment	41.6
Ships repair parts	199.7
Repair parts for FBM hull equipment	66.9
Construction equipment and repair parts	1.6
Expendable ordnance material	1,649.8
Subtotal	<u>2,653.6</u>
Electronics Supply Office:	
NSA: Electronic repair parts	104.5
APA:	
Electronic repair parts	76.5
Electronic repair parts for NAVORD equipments	305.3
Electronic repair parts for FBM equipment	8.2
Training devices repair parts	5.8
Subtotal	<u>500.3</u>

Managing ICP Material Category

Value of inventory
as of June 30, 1968
(in millions of dollars)

Fleet Material Support Office:

NSA:

DSA retail commodities (except provisions and clothing) ..	268.6
Retail provisions	60.4
Special and resale clothing	21.7
RIS	37.8
Subtotal	388.5

Aviation Supply Office:

APA: Aeronautical material	2,627.5
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Navy Publications and Forms Center (Phil.)

NSA: Forms and printed material	10.8
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Navy Ships Store Office:

NSA: Ships store and commissary store stock	49.9
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Fuel Supply Office:

NSA: Fuel	146.0
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Clearances and SysCom material	161.2
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Grand total	6,537.8
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SECONDARY ITEM INVENTORY TRENDS

[In millions of dollars]

	End fiscal year 63	End fiscal year 64	End fiscal year 65	End fiscal year 66	End fiscal year 67	End fiscal year 68
By account:						
NSA	1,195.3	935.9	796.3	777.3	866.6	918.6
APA	5,090.7	4,904.2	5,045.3	4,989.1	5,260.8	5,619.2
TOTAL	6,286.0	5,840.1	5,841.6	5,766.4	6,127.4	6,537.8
By principal ICP:						
SPCC	3,351.9	3,039.2	2,767.9	2,597.2	2,597.9	2,656.2
ESO	226.9	175.2	428.6	436.6	450.1	505.9
ASO	2,370.5	2,212.4	2,228.1	2,253.1	2,436.1	2,639.1
FMSO:						
(DSA						
material)	254.3	240.7	240.7	276.3	344.5	348.0
(RIS)					29.1	34.8

Material Availability

Material availability is defined as the percentage of demands for standard stock items that are filled from stock on hand in the Navy supply system. The following tabulation provides data regarding system stock availability for fiscal years 1966, 1967, and 1968. With the exception of ships repair parts, all categories of material availability improved over last year.

SYSTEM STOCK MATERIAL AVAILABILITY
(FULL YEAR)

	Percent		
	Fiscal year 66	Fiscal year 67	Fiscal year 68
Ships Parts Control Center:			
Ships Repair Parts	67.6	66.5	63.9
Ordnance Repair Parts	84.7	83.4	84.8
Electronics Supply Office:			
Electronic Repair Parts	83.3	79.1	87.2
Aviation Supply Office:			
Aeronautical Material	77.7	77.2	79.3

Effective Utilization of Inactive Ships Assets

Naval Supply Systems Command and Naval Ship Systems Command, under sponsorship of Chief of Naval Material Command, implemented the Inactive Ship Supply Overhaul Program with the goal of improving coordination of efforts of type commands, material commands, and inventory control points to strip ships stricken from the register and to provide an accurate inventory of installed equipments for inactive ships with the highest mobilization potential. Experience gained during fiscal year 1968 proved this program to be extremely cost effective and valuable. This program consists of the following elements:

a. Phase I—Contractor identification, cataloging, and redistribution of assets obtained from stricken ships (equipment, repair parts, and consumables).

b. Phase II—Contractor effort to validate equipment and to inventory the repair parts on ships being retained for possible reactivation.

c. The feasibility of this concept was proven by processing the ex-U.S.S. *Tarawa* as a pilot project. Total costs to process the ship amounted to \$58,822 and the value of the material redistributed were nearly \$1.5 million, or a ratio of 25:1.

At the present time, contractors are working at four inactive ship maintenance facilities on contracts to process 42 ships at a cost of \$185,418. Contracts for two remaining sites are pending. All future contracts will be awarded on an annual basis instead of a lot basis.

New Navy Work Uniform

A new Navy work uniform, consisting of a light blue pullover workshirt and dark blue conventional style trouser, made of rugged, quick-drying nylon/cotton fabrics, was developed and

adopted to replace the standard cotton denim dungaree trouser and chambray workshirt. This garment meets the recommendation of the Navy Retention Task Force for development of work clothing of improved appearance and durability. It also meets the requirement of the CNO Damage Control Training Plan Conference to combine work clothing and protective clothing into a single uniform.

Navy Facilities Planning and Operations

Increased emphasis was placed on the master planning of naval shore activities to insure maximum utilization of existing assets and to provide for the orderly development and multiyear programming of facilities to meet mid- and long-range mission requirements. The rapid technological development of sophisticated weapon systems and the impact of multimillion-dollar military construction programs, such as shipyard modernization, personnel support facilities, cold iron, and naval air rework facility modernization, have made it imperative that the Navy intensify its facilities planning procedures. A 5-year program for the development of comprehensive master plans for a total of 134 naval complexes and large single activities was prepared.

Vehicle cost per mile continued a downward trend, and Navy again had the lowest cost of all military Services.

In-house design work was completed for projects totaling approximately \$20 million. About one-half of this effort was in support of forces in Vietnam and for DEEP FREEZE projects in Antarctica.

The PM-3A, nuclear powerplant, McMurdo Station, Antarctica, operated throughout the year and achieved its best availability status of 86.24 percent, exceeding the 80 percent goal. Electric power production for the year totaled 9,500,000 KW hours.

The water distillation plant at McMurdo operated throughout the austral winter for the first time since its installation, and produced a yearly total of 2,459,781 gallons of potable water. The distillation plant was operated on nuclear plant generated steam to reduce fuel oil requirements.

Austere funding resulted in the total Navy O&M maintenance backlog increasing from \$145 million at end fiscal year 1967 to \$167 million at end fiscal year 1968. Of this total backlog, \$106 million in fiscal year 1967 and \$124 million in fiscal year 1968 were for major repairs.

Land Acquisition at Naval Weapons Station (Concord)—Au-

thority and funds were received to purchase 5,021 acres of land and improvements, including the town of Port Chicago, surrounding the ammunition outloading piers at the Naval Weapons Station, Concord, Calif. The acquisition of this property is underway and will result in the relocation of approximately 3,000 inhabitants whose lives might have been endangered. The acquisition will also relieve the pressure of encroachment from new housing developments.

Proof Firing Facility for 16-Inch Guns—Reactivation of *New Jersey* required a facility for reworking and proof firing of the 16-inch guns. The most economical solution was to establish a proof firing range at the National Reactor Testing Station, Arco, Idaho, a former Navy proving ground. A contract for operation of the range and an agreement with the Atomic Energy Commission for use of the land were negotiated during February and March.

Marine Corps Facilities

The Marine Corps fiscal year 1968 military construction program as approved by Congress totaled \$67,435,000. This program included 87 line items at 18 activities and was the largest Marine military construction program in recent years.

The Marine Corps identified its military construction requirements to support present approved force levels as \$1,025 billion. An orderly program to provide these facilities has been developed at an approximate annual funding level of \$100 million. The Marine Corps planned to make every possible effort to achieve this level of funding since it is essential to reduce the large backlog of facilities requirements. It was also evident that the present total of \$1,025 billion will increase due to price escalation and new requirements.

The Marine Corps military construction program submitted to the Department of Defense for fiscal year 1969 included approximately \$46.4 million worth of billeting and messing facilities. These items were to eliminate critical deficiencies rather than to improve substandard facilities. Congress approved five line items for construction totaling \$6.3 million.

Backlog of Essential Marine Corps Maintenance and Repair—In fiscal year 1968 the Marine Corps completed one-third of a 5-year program to reduce the backlog of essential maintenance and repair at Marine Corps ground activities.

Thus far, the reduction has been from \$9.0 million (in fiscal year 1965) to \$5.9 million (at end of fiscal year 1968).

Research and Development

Present world conflicts have presented the Navy research and development effort with a continuing challenge. With the \$1.9 billion appropriated by Congress for fiscal year 1968, the Navy pursued programs to meet this challenge. Weapon systems were released to the fleet, on-going projects were further developed, and new endeavors were undertaken.

Research—Significant advances were made in many fields. In marine geology and geophysics, for the first time, a 32-million square kilometer chart was prepared of the Indian Ocean area enabling preparation of charts with adequate bathythermic information. Sediment thickness maps were completed for the South Pacific, Atlantic, and Indian Oceans, and parts of the Antarctic region.

Progress was made in the development of a theory to explain propeller erosion. Improvements were also made in a frozen blood process, yielding a reduction in time and effort to prepare frozen blood for transfusion. A major expansion in underwater medical research was initiated.

Exploratory Development—New types of bombs and mines were under development with a capability to distinguish between foliage and the ground. A buoyant body armor for personnel was developed. One type is a flak jacket weighing only 9 pounds which provides buoyancy as well as protection against fragmentary explosives. A heavier type, weighing 30 pounds, provides buoyancy as well as protection against direct hits by 30-caliber small arms.

A fluidic analog computer was produced for use in the pneumatic hovering system of nuclear submarines and promises high reliability as well as insensitivity to shock, vibration, and temperature variations.

Work proceeded on design of a full-scale test section which represents a glass-reinforced plastic minesweeper. Use of this material is expected to reduce structural weight and maintenance as compared to a wooden ship.

Undersea Warfare—Command and control system development has provided antisubmarine warfare ships with a prototype computerized ASW combat direction system to assist in localizing and conducting attack operations against submarines. The system will be compatible with Navy Tactical Data System-equipped ships. A second digital system, designed for installation at the headquarters of force and area ASW commanders, will interface with the afloat systems.

Programs were underway to increase the ranges of ASW ships' weapon delivery systems to match the increase in detection ranges of improved sensors.

A comprehensive program to improve safety of submarines has been pursued since the loss of *Thresher* and, of 131 tasks initiated, approximately 90 have been completed. A voice alarm system (using a taped female voice) was being evaluated in *Sea Wolf*. The system will automatically report any one of a large number of hazardous situations.

Aircraft, Weapons, and Missiles—Development of an advanced fighter aircraft (VFX-1 or F-14A) to replace the F-111B has been initiated. Proposals from industry were received in December 1968. Three of the original five proposals were eliminated, leaving McDonnell-Douglas and Grumman in competition.

Proposals from five contractors for development of the carrier-based ASW aircraft (VSX), to replace the S-2 aircraft series, were evaluated. In August 1968, the Navy narrowed the competition to two contractors, Convair and Lockheed, for the completion of the contract definition phase.

Development of the X-22 VTOL research aircraft was in process. The variable stability system was installed and is undergoing preliminary evaluation. It should be a valuable research tool in studying VTOL aerodynamic parameters and the interface of VTOL aircraft with conventional aircraft.

Investigation of the reverse velocity rotor (RVR) concept for helicopters progressed and offers promise that pure helicopters may be developed with a speed of 350-450 knots.

The All-Weather Carrier Landing System became operational when U.S.S. *Kennedy* (CVA-67) joined the fleet in calendar year 1968. This system provides safe, reliable, and fully automatic (hands off) approach and landing capability for jet aircraft in every type of weather, day and night.

A Basic Point Defense System has been approved for service and was in production.

Navy Communications—The long-range OMEGA navigation system was placed in a limited operational status with stations in New York, Hawaii, Trinidad, and Norway. Eight stations are required to provide worldwide coverage.

A semi-automatic message processing and distribution system was tested in U.S.S. *Oklahoma City* (CLG-5) and placed in operation. It is capable of handling 4,000 messages per day and enables the reduction of communications watch personnel by 20 percent.

CONUS testing of the interface plan for Southeast Asia commenced in June 1968, and, when operational, will satisfy the continuing requirement to exchange air control information on a real-time basis among the various Service systems.

By use of solar radiation satellites, the Navy found it was possible to give high frequency communicators advance warning of forthcoming ionospheric disturbances that were serious enough to interfere with communications.

Ships and Guns—For nuclear attack carriers of the future, development of the two-reactor propulsion plant progressed satisfactorily. This plant was included in the fiscal year 1967 ship-building program for the attack carrier U.S.S. *Nimitz* (CVAN-68).

Automatic control of ship machinery increased in importance. A fluidic boiler combustion and feedwater control system was completed and has performed excellently. An automatic generator synchronizing control was developed and demonstrated aboard ship. A comparative analysis of the complexity of automating steam, gas turbine, and diesel propulsion plants was made.

Shipboard tests to determine the desirability of using distillate fuel in place of Navy standard fuel oil were conducted. Improvement in boiler overhaul schedules is expected to offset the increased cost of fuel. A double probe system for oil hoses has proved to be expeditious for conventional refueling of aircraft carriers.

Development of the 5"/54 lightweight naval gun progressed on schedule. Technical evaluation of the first digital gun fire control system was completed. This system was prepared for operational evaluation with 5"/54 in 1968.

Paralleling this effort was the rocket assisted projectile (RAP) program for significantly improving the range and lethality of the rounds for all 5"/54 and 5"/38 guns. The 5"/38 rounds became available to the fleet in June 1968.

Research and development progressed on new ammunition for long-range bombardment. New techniques with propellants and projectile design offered range increases of over 100 percent in major calibers.

Astronautics—Application of space technology to the fields of navigation, communications, and surveillance continued. The navigation satellite improvement program achieved a reliable four-satellite constellation in April. The experimental aircraft navigation satellite receiver was delivered, and preliminary tests showed almost the same accuracy as shipboard receivers. The rapid navi-

gation readout project, a new concept, proved that accurate real-time fixes could be obtained by measuring the phase delay between receivers and a satellite.

The Navy installed seven shipboard terminals for use with the Defense Communications Agency Satellite Communications System. Navy also participated in joint Service testing of the Lincoln Experimental Satellite No. 5, using terminals installed in a submarine, in a surface ship, in aircraft, and ashore.

The Gravity Experiment (DODGE) Satellite was launched in July and provided a stable platform for a camera that took the first color pictures of the earth from space. Eight CVA's were configured to receive cloud pictures transmitted from meteorological satellites which provided afloat forces with one direct readout series of pictures per day.

Marine Corps Research and Development

Ground and air liaison officers from the Marine Corps Developmental and Education Command ordered to III Marine Amphibious Force during fiscal year 1968 proved valuable in that capacity. Monthly reports from these officers gave up-to-date information on the progress of projects under evaluation in III MAF and on projects by other Services in Southeast Asia.

In April 1968 the Commandant initiated a project to identify and provide quick response to short-term research and development needs of USMC forces in Southeast Asia. The project was called Special Procedure for Expediting Equipment Development and gave high priority and visibility to projects identified under the system.

Significant equipment development programs during the past year included:

a. The multi-shot portable flame weapon is a four-tube clip-loaded flame weapon. It launches an encapsulated pyrophoric agent to an effective range of 300 meters, and was developed to replace the present flamethrower, yielding an increased capability and reduced weight.

b. The LVTPX-12 is an aluminum-hulled armored amphibian capable of carrying 25 troops or 5 tons of cargo in assault. The vehicle will make 8 miles per hour in the water or 40 miles per hour ashore and is propelled by water jets when in the water or by tracks when ashore. The Marine Corps desired to replace the standard LVTP-5 and the command and retrieval models of the LVTP-5 family.

c. The marginal terrain vehicle is a combat service support

vehicle capable of carrying 1.5 tons or 14 troops. Its suspension is pneumatic track and it attained speeds of 40 m.p.h. ashore and 7 m.p.h. in the water. This vehicle was developed for optimum operations where tracked/wheeled vehicles cannot obtain traction, e.g., in swamps, sand, snow, tundra, etc.

d. Two hand-held radios were developed. The first is the AN/PRC-75, a 9-pound, ultra high frequency transceiver for use by forward air control parties which will replace a 45-pound radio. The second is a pocket-size AN/PRC-68, an FMF radio operation between 30 and 80 Mhz which will be used at platoon level and below.

e. The first production model of the OV-10A Bronco, light armed reconnaissance aircraft was accepted on February 23, 1968, and a detachment was deployed to Southeast Asia in May.

f. Development was completed and production commenced on an improved beach matting, trade name Mo-Mat, which will replace the wire mesh matting now in use as an aid to wheeled vehicles crossing landing zones. The mat is made of prefabricated glass and reinforced resins, can be laid quickly, and is reusable.

g. Procurement action was taken on the MK-15 Mod O ordnance locator. This instrument will detect the presence of any magnetic substance and will be employed as a search aid only, since a positive indication with this device must be followed by visual verification.

Education and Training

Broad-based demonstration programs to accelerate computer-aided instruction were initiated at the U.S. Naval Academy, Annapolis, Md.; U.S. Navy Training Center, San Diego, Calif.; Naval Air Technical Training Command, Memphis, Tenn.; and Naval Medical Research Institute, Bethesda, Md.

To best meet a constantly expanding requirement for training while remaining within manpower and other resource constraints, the Navy intensified use of advanced instructional techniques and materials. Programed instruction packages, developed to increase the efficiency of classroom instruction, have been extended to ships.

Significant developments for improved shore based training included: Updating of the universal submarine simulator to enhance casualty recovery and submarine safety training, as well as installation of a more realistic periscope simulation system; construction of the tactical combat direction and electronic warfare trainer at Dam Neck, Va.; establishment of three new

major antisubmarine warfare weapon systems courses and material maintenance management courses.

Additional achievements in the area of higher education were: Graduation of 80 enlisted students in the associate degree completion program in which over one-quarter achieved academic honors; enrollment of 476 medical officers in residency training at military institutions plus 38 medical officers in postgraduate instruction in civilian hospitals and institutions; establishment of the first minority group school NROTC at Prairie View A&M College, Tex., and expansion of the Junior ROTC program to 55 Navy and 18 Marine units in 25 states.

Marine Corps Training

The basic specialist training program, specifically designed to provide soft skill training in a minimum training period, continued to be expanded and improved. Basic specialist training was conducted in 25 occupational fields, with an output of approximately 57,000 trainees. A total of 34,000 enlisted Marines were also trained in hard skills through the formal school training program.

Officer input to professional military schools was at a reduced level because of a shortage of assignable officers, particularly aviation officers. Requirements for special education training were met, and management training for officers increased during fiscal year 1968.

The program requiring Western Pacific replacement personnel to undergo a prescribed training prior to their overseas movement was expanded. During calendar year 1967, approximately 72,000 Marines received replacement training at Camp Pendleton, Calif., and an additional 12,500 were trained at their home stations.

A high intensity Vietnamese language training course was instituted for officers at Marine Corps Development Education Center, Quantico, Va. This course trained 120 selected graduates of the basic school per year prior to their assignment to Southeast Asia.

The Marine of today is the best trained in the history of the Corps. However, as a result of Marine Corps participation in Project 100,000 and the Department of Defense-wide review of entry-level electronics training, additional attention has been focused on innovations in training methodology. The Marine Corps studied a systems approach to training which included, first, a thorough task analysis of field performance requirements,

and then, the development of a general training plan designed to achieve desired training goals. This plan guided the training progression from entry level through supervisory level for each occupational field. This ambitious but worthwhile program was a long-range undertaking and was intended to be incrementally implemented. Action has already been taken to initiate the systems approach to training in selected enlisted formal school training courses.

Health and Medical Services

The incidence rate of disease and the mortality rate among wounded personnel demonstrated that preventative medicine measures and methods of treating casualties were increasingly effective.

Facilities and Construction—Nine former station hospitals were redesignated and commissioned as naval hospitals. Two new naval hospitals at Jacksonville, Fla., and Oakland, Calif., were completed; a construction contract was awarded for a hospital at Memphis, Tenn.; and new hospitals were planned at Chelsea, Mass., Newport, R.I., and New London, Conn.

The total operating bed capacity of afloat and shore-based medical facilities in the Far East which directly support Vietnam operations was increased to 3,815, including an increase to 600 beds at the naval support activity hospital in Danang and the activation of 282 beds at the Asan Point Annex to the Guam Hospital, raising the number at that facility to 823.

Dentistry—The 5-year dental equipment replacement program continued toward completion. Preventive dentistry progressed to 1 million three-stage stannous fluoride treatments a year and was extended to dependent children. A program of preventive periodontics was also initiated. Progress was made in the testing and use of new mobile dental care units for preventive dentistry and for other dental care.

Blood Program—In January, 10 naval hospitals collected and shipped 975 units of whole blood each week to support Southeast Asia operations. In April the effort was centralized at the San Diego, Great Lakes, and Beaufort hospitals, which have large numbers of potential donors. Other supporting hospitals were placed in a standby status. In May the Navy quota was raised to 1,125 units a week and was filled.

Frozen blood facilities to provide a source of compatible blood as a backup to the fresh whole blood program were in operation at Danang and on U.S.S. *Sanctuary* and U.S.S. *Repose*.

Research—The Surgical Research Unit at Danang conducted studies to improve the management of critically wounded combat casualty cases. Emphasis was placed on resuscitation and the treatment of shock, and on the provision of an increased range of physiological data for use in the control of therapy. The data constituted the basis for recommendations on the optimal selection of resuscitative fluids. Improvements were made in the procurement, processing, and preservation of freeze-dried tissues for the treatment of battle casualties. The Naval Medical Research Unit No. 2 systematically studies fevers of unknown origin among patients in Vietnam.

Since 68 percent of the malaria cases in Vietnam were *plasmodium falciparum* infections that were often resistant to standard chloroquine therapy, research continued to improve therapeutics. Regimens employing quinine, chloroquine, pyrimethamine, dapsone, sulfanomides, and occasionally parental chloroquine, in various combinations, have proven therapeutically effective.

Aerospace Medicine—The aviation selection test battery was modified to enable more valid prediction of aviation training performance. A multitask computer-linked test booth for future studies of learning, problem solving, and motor performance under conditions of stress was evaluated. A system for receiving a continuous information feed-back system from the fleet on the operational performance of naval aviators was being established.

Preventive Medicine—A Preventive Medicine Unit at Danang provided expert advice and assistance on communicable disease control, vector and rodent control, and field sanitation to all military forces in the I Corps area and to the various civic action programs. The Navy Disease Vector Control Center at Alameda, Calif., trained Navy and Air Force technicians to assist the Public Health Service in rodent inspection to prevent importation of plague-infected rodents into the United States with retrograde cargo from Vietnam.

Construction and Logistics

The design development phase of the Defense office building at Bolling/Anacostia was essentially completed and authority to proceed with preparation of final plans and specifications was issued. Estimated cost of construction will be approximately \$112 million.

Other construction achievements during fiscal year 1968 include:

a. Three 2,500 KW diesel electric generators were relocated from Sugar Cove, W. Va., to NRS Tarlac, Philippines.

b. Two 2,000 KW diesel generators were installed at NRS Totsuka, Japan.

c. Twenty-three hundred feet of wharf space in Subic Bay was completed at estimated cost of \$6.5 million.

d. The 400-bed replacement hospital for Jacksonville, Fla., authorized at \$7,400,000 was dedicated on December 9, 1967.

e. The 650-bed replacement hospital for Oakland, Calif., authorized at \$14,500,000 was dedicated on June 29, 1968.

f. At the U.S. Naval Academy, construction of the \$7,606,000 science building was brought to 89 percent completion stage, and construction of the new \$3,000,000 central heating plant was advanced to more than 60 percent complete.

g. At the Naval Ordnance Laboratory, White Oak, Md., the world's largest indoor, underwater missile-firing range was completed at a cost of approximately \$3,406,000.

During fiscal year 1968, contract awards for barracks totaled \$73,023,251 and provided for 38,526 spaces. Of this total, 27,422 spaces were new at a cost of \$60,548,929 and 11,104 spaces were rehabilitated or modernized at a cost of \$12,474,322.

During the same period, contract awards totaled \$18,480,094 for 2,924 BOQ spaces. Of these, 1,867 spaces were new at a cost of \$15,041,094 and 1,075 spaces at a cost of \$3,439,000 were rehabilitated or modernized.

These figures include line items authorized in the fiscal year 1966, 1966S, 1967, 1967S, and 1968 military construction programs.

Seabee Battalions—A dramatic change in the nature of Seabee construction developed during fiscal year 1968. The main effort shifted from construction of major logistic support enclaves to direct tactical support of Marine and Army maneuver battalions along the heavily contested Demilitarized Zone. Twelve augmented mobile construction battalions were deployed to Vietnam at the end of fiscal year 1968 in the I Corps area; these units were supported by nine battalions in the United States including two reserve battalions recalled in April 1968.

The total Seabee effort accounted for over 1.5 million man-days direct labor. Major projects included:

a. Development and expansion of major combat bases along the DMZ at Dong Ha, Quang Tri, Khe Sanh, and Hue/Phu Bai.

b. Developing and upgrading of a critical logistics chain from

Danang to Dong Ha by road and across the beach opposite Dong Ha, Quang Tri, and Phu Bai.

c. Continued improvement to the established major enclaves at Danang and Chu Lai.

In addition, two construction battalion maintenance units did outstanding work along the DMZ, including the 40-man detail at Khe Sanh during the siege and two units in the delta in support of Navy riverine warfare bases.

Fiscal year 1968 saw the Seabee teams, the Navy's "Peace Corps," increase in number from 8 to 15. The success of the teams' civic action/counterinsurgency efforts in the II, III, and IV Corps was attested to by the desire of State/AID to increase the program in fiscal year 1969.

Family Housing

Construction of family housing included extension of the deferred fiscal year 1966 program and the fiscal year 1968 program. The fiscal year 1966 program consisted of 3,430 units at 17 locations, of which 1,030 units were placed under contract in fiscal year 1967, 2,016 under contract in fiscal year 1968, and 384 units not yet awarded. The fiscal year 1968 program consisted of 2,890 units at 27 locations, of which 348 units at two locations were placed under contract. The remainder will be under contract by mid-year fiscal year 1969.

Construction was started on a 250-unit rental guarantee housing project at Rota, Spain.

The utilization rate for all Navy's family housing assets exceeded DoD occupancy criteria. Income loss during the year has been reduced substantially and is currently at the lowest point recorded.

Military Sea Transportation Service

Fiscal year 1968 was the largest year in MSTS history with respect to volume of business. There were 445 cargo ships and craft in the MSTS inventory on June 30, 1968, as compared to 418 on June 30, 1952. During the peak year of the Korean war, fiscal year 1953, MSTS transported 28.5 million M/T cargo worldwide for a workload accomplishment of 110 billion M/T miles. During fiscal year 1968, MSTS transported nearly 29.0 million M/T worldwide, accomplishing a workload well in excess of 150 billion M/T miles. Dollar volume rose to approximately \$1.3 billion for the fiscal year.

In December 1967, the new roll-on/roll-off ship GTS *Admiral*

William M. Callaghan was accepted from American Export-Isbrandtsen Lines under long-term time charter and sailed on her maiden voyage. The ship is powered by aircraft gas turbine engines, has a sustained sea speed in excess of 25 knots, 165,000 square feet of deck space, and 25,000 M/T capacity. On her third voyage, commencing February 28, she made the passage from Delaware Light Vessel to Bishop's Rock, 3,371 miles, in 5½ days at a record speed for cargo ships of 25.6 knots. *Callaghan's* performance in the east coast/north Europe operation is equal to that of six Victory ships. She has averaged round voyages of 18 days and two-way lift of more than 28,000 M/T.

Commencing with the Tet offensive in January, MSTS-controlled and MSTS-interest commercial vessels were subjected to radically increased direct enemy action in the Republic of Vietnam. Several MSTS military and contractor personnel and merchant seamen were killed or injured in these attacks. Twenty-six vessels were hit. Except for the GAA *Cuba Victory*, which suffered extensive underwater damage at Cat Lai on May 25, and the large A.B.&T. Barge 557, sunk at Chu Lai on June 23, damage sustained has not been serious.

In July 1967, a reversal in the long-existing shortage of capability became firmly established as a result of improvement in the quantity and quality of shipping assets available, improved utilization due to expanded RVN port capabilities, and a leveling off of requirements.

During the year, 20 marginal GAA ships were returned to the Maritime Administration. Twenty-nine other GAA ships were placed in and withdrawn from reduced operational status at various times during the year to adjust for variations in cargo generations. During the second half of the year, requirements increased again making it necessary for all GAA's still allocated to MSTS to be in full operating status at the end of the year. The total number of time-chartered cargo ships in the controlled fleet on June 30, 1968, was 165 compared to 172 on July 1, 1967. The quality of the chartered fleet was markedly improved, there being 16 new fast C-4's in the inventory at the end of the year compared to 6 at the beginning. Nine C-4 troop ship conversions came on hire during the year, as well as the aforementioned GTS *Admiral William M. Callaghan*. The number of older, less reliable, chartered cargo ships in the inventory was reduced by 26 ships.

Utilization of containerized cargo movement continued to rise rapidly during the year. Containerized cargo traffic increased

from 1.4 million M/T in fiscal year 1967 to an estimated 2.4 million M/T in fiscal year 1968. Container service from the west coast to Vietnam commenced in July 1967, augmenting the established service to the Philippines and Okinawa. Shipper services were all studying the benefits of containerization as it relates to their particular problems. The Navy studied the system from the viewpoint of the effect it will have on present break bulk ship assets.

MSTS provided five vessels in support of Project APOLLO. Three of these moonships, USNS *Vanguard*, USNS *Mercury*, and USNS *Redstone*, are converted World War II tankers, each crammed with some \$45 million worth of the most sophisticated tracking, communications, and other electronic gear available. The other two ships of the APOLLO support mission are smaller Victory ship conversions, USNS *Watertown* and USNS *Huntsville*. Included in the electronic gear aboard the moonships is SATCOM (Satellite Communications) equipment, providing direct, instantaneous communications with all other tracking facilities in the APOLLO network.

MSTS also served the American space effort by transporting components of the giant Saturn rockets from the west coast to the New Orleans-Cape Kennedy complex. This ticklish job is done by the specially configured USNS *Point Barrow*. *Point Barrow* looks somewhat like a floating quonset hut and provides the space vehicles with a stabilized, weathertight, dehumidified environment for their voyage.

Other ships of the MSTS special projects fleet were and are involved in such programs as acoustic, oceanographic, and hydrographic research; oceanographic surveys; telemetry and recovery of missiles; Antarctic research; support of survey teams; support of various types of Army units by prepositioning of equipment; and communications research.

USNS *Mission Capistrano*, a converted tanker, now carries the largest underwater sound transducer ever to go to sea. This acoustical device weighs hundreds of tons and stands five stories high. *Capistrano* conducted a research program to determine the feasibility of active acoustic ocean surveillance. *Mission Capistrano* also conducted work on the Office of Naval Research's Project ARTEMIS.

Chaplains

The end strength of U.S. Navy chaplains for fiscal year 1968 was 1,082 chaplains providing a liturgical, sacramental, and

counseling ministry for Navy and Marine Corps personnel. In fiscal year 1968, the feasibility of continuing our education program for chaplains has been demonstrated in both professional and managerial subjects. Sixty-five chaplains have been trained in a supervisory pilot course and another 65 have received training in professional courses such as marriage counseling and hospital chaplaincy, varying from 4 weeks to 10 months in length. Over 300 received 1 week of professional training. The total cost of all training programs was \$54,000.

Special Projects Office of the Navy made available to the Chief of Chaplains \$403,000 for a 3-year research and development project in the lay ministry and POLARIS submarine environment operations. Two years of the project have been completed, and it has demonstrated the effectiveness and economy of centralized religious programing. Individual participation in such programs is possible with growth and personal religious loyalty and also an increased understanding for other faiths.

Religious changes and developments in the civilian communities must be reflected in military life. Equal religious opportunity in the Navy and Marine Corps necessitates increased programs of continuing education for chaplains which required training billets and funding. Such opportunities also require central funding for the development of new and effective programs through which all personnel may express their religious, moral, and spiritual convictions. Static programs are quickly antiquated, irrelevant, and unappealing.

Legal Services

By the end of fiscal year 1968, the total of courts-martial of all types convened within the Navy and Marine Corps was 28,962; this compares with 31,431 in fiscal year 1967 and 26,936 in fiscal year 1966. However, there has been an increase of 34 percent in general courts-martial and 5 percent in BCD-special courts-martial. The U.S. Navy-Marine Corps judiciary activity furnished law officers to sit on 949 general courts-martial, the highest in its 6 years of operation, and judiciary officers to sit as president on 49 special courts-martial.

Increasing domestic and international pressures for far-reaching changes in the law of the sea required a heavy emphasis on this broad area during fiscal year 1968. Highlighted by the U.S.S. *Pueblo* seizure and an awakened interest within the United Nations, in the deep seabeds, legal issues examined ranged from the relatively near-shore legal regimes of the territorial

sea and contiguous zone to active participation in discussions of future regimes for the deep ocean floor.

Under the program of asserting claims against tortiously liable third parties for the cost of medical care furnished to military personnel and their dependents, the Navy's collections totaled \$1,530,044.02, an increase of 17 percent over fiscal year 1967 and a 151 percent increase over fiscal year 1965. The figure for fiscal year 1968 closely parallels the number of claims processed in that time period.

The success of the Navy's first Law Center at the Norfolk Naval Base in providing a broad range of professional legal services to fleet and shore activities in the Norfolk, Va., area has resulted in the opening of a Law Center at San Diego, Calif., on August 1, 1968.

V. Economy and Efficiency

Management Improvement

Organization Changes

Pursuant to Public Law 90-168, the position of Assistant Secretary of the Navy for Manpower and Reserve Affairs was established, effective January 1, 1968. The Assistant Secretary is responsible for all matters related to manpower and reserve component affairs of the Department of the Navy, including policy and administration applicable to both military (active and reserve) and civilian personnel.

The Assistant Chief of Naval Operations (Safety) was established to emphasize centralized direction and supervision of the planning and implementation of safety programs throughout the Department of the Navy.

Several program coordinators were established within the Office of the Chief of Naval Operations for the purpose of providing a single point of Navy Department contact and for exercising central program coordination, e.g., Nuclear Powered Attack Carrier (CVAN) Program Coordinator.

The Special Projects Office was redesignated the Strategic Systems Project Office. The new organizational responsibility now includes technical support for all future Navy strategic systems rather than only for the POLARIS/POSEIDON program.

The Naval Security Group Command, responsible for the Service-wide cryptologic system, was activated July 1, 1968, under the command of the Chief of Naval Operations. Separate command status for the Naval Security Group Command was necessary to eliminate administrative complexities which had existed within the Naval Communications Command.

Rapid Development Capability for Warfare Systems

Experience in Southeast Asia has demonstrated that a method for expediting development, test, evaluation, and production of systems meeting high priority operational requirements was needed. Accordingly, a Department of the Navy policy on rapid

development capability (RDC) was established by the Secretary of the Navy in October 1967. Application of RDC is limited to specific projects.

Ship Standardization and Configuration Management

Ships in the Navy are not alike. An analysis made several years ago showed that of the approximately 180,000 hull, mechanical, and electronic equipments in more than 900 active ships, 57,000 were unique to one ship and that many more were installed in only two or three ships. This condition caused a proliferation of spare parts and technical data, complicated maintenance and personnel training, and was not economical. A vigorous standardization program has been put into effect.

Shipyard and Aviation Rework Facility Modernization

Machine tools, many of them acquired before World War II, are wearing out, while major advances in technology require new tools, facilities, and industrial processes. A large-scale, long-range effort was initiated to modernize the naval shipyards and aviation rework facilities into integrated complexes by 1975.

Ammunition Testing at Naval Weapons Laboratory

Reduced samplings for ballistic and acceptance testing of ammunition and ammunition components resulted in major reductions in the cost of these tests. Based on accumulated statistical data, the number of rounds per lot to be subjected to acceptance testing was significantly reduced, and improved instrumentation procedures allowed multiple component ballistics testing vice firing of separate rounds to test such components as primers, cases, and powder.

Joint Use of Manuals

The Navy Publications and Printing Service has introduced a procedure wherein technical manuals originated by prime equipment manufacturers, which are jointly used by the Navy and Air Force, are being procured by the Navy. The joint manuals are procured under a single order and the costs are pro-rated, thereby saving each of the Services approximately 50 percent of the setup costs.

Consolidation of Communications Facilities

Navy communications facilities were consolidated at Naval Air Station, Barbers Point, Hawaii; Naval Supply Depot, Seattle, Wash.; and the Headquarters of the Commander in Chief, Pacific

Fleet. Army-operated Defense Communications System facilities in Hawaii were shifted to Navy operation and the Army facilities were phased out. In the west coast complex, Army-operated Defense Communications System facilities were shifted to the Navy and Air Force.

Automatic Data Processing Systems

A number of important steps were taken within the Navy to strengthen management of information systems, automatic data processing systems, and associated resources. Stemming from a need to improve all aspects of the ADP systems cycle, these improvements embraced both organizational changes and specific policy and procedural changes.

In view of increasing attention to the sizable investment, efficient use, and widespread impact upon the organization, steps were taken to provide for greater centralization of management control at the secretarial level.

Established June 30, 1967, the Automatic Data Processing Equipment Selection Office (ADPESO) completed its first year of operation. A secretarial staff office, ADPESO has responsibility for the evaluation and selection of ADPE for the Department of the Navy as well as attendant contract negotiations and awards. The office provided staffing and consultation in some 160 procurement actions with an annual rental dollar equivalent of \$28 million.

Specific steps taken during fiscal year 1968 included:

a. Significant progress was made toward consolidation of existing policy and procedures into a single ADP manual.

b. Initial work was accomplished on a systems inventory by which automation information systems were identified as to size, applications, data elements, and data flow.

c. Consolidation of a planning, review, and approval discipline was achieved to assure systems development and future modification in consonance with approved policies and objectives.

d. Significant progress was made in the attainment of relatively machine-independent programming through use of higher level languages.

e. A program manager was established to develop information on systems standards.

As of June 30, 1968, the Department of the Navy had 764 computers and 511 ADP installations; 502 computers were owned, representing a \$200 million investment. The remaining

262 were leased at an annual rental of \$42 million. Located both ashore and afloat, Navy's predominant data processing effort—445 computers—was engaged in business and logistics applications. Scientific and engineering uses occupied 239 computers and the remaining 80 computers processed military applications—command and control, intelligence, and communications.

Before a determination is made to procure equipment for an activity, a thorough investigation is made of opportunities for sharing other Government activity computers.

Fiscal year 1968 saw increased emphasis in another area—the ADP Service Center—which improved computer utilization. By satisfying numerous and diverse computing requirements within a geographic locale through a small number of large-capacity installations, unit processing costs were reduced as well as associated direct and overhead costs.

Analytical Studies

Analytical studies in the Navy Department study program were conducted under two major headings, "Chief of Naval Operations Warfare Research (Studies and Analyses)" and "Center for Naval Analyses (Navy and Marine Corps)."

Chief of Naval Operations Warfare Research

Under this program, the Chief of Naval Operations, the Chief of the Naval Material Command, including the Systems Commands, the Office of Naval Research, and the various Navy laboratories are engaged in the analyses of naval operations, weapons systems, support systems, war gaming, etc. This is a continuing program of research, studies, and investigations of problems in naval warfare in the broadest sense. The program includes cost effectiveness analyses of current fleet operations and readiness; proposals for applications of new developments and technology; studies of development and procurement; and long-range requirements for equipment, material, personnel, and supporting services. Major study areas or projects conducted under this program included work on advanced warfare systems, antisubmarine warfare analyses, undersea systems, airlift/sealift requirements, logistics requirements, ocean resources, fleet escort requirements, etc. The Navy maintained this program of research at a cost of about \$11,359,000 of which \$1,200,000 was for Marine Corps studies.

Center for Naval Analyses (CNA)

CNA is a nonprofit contract analysis group. The contractor is the University of Rochester, Rochester, N.Y.; the Navy contract officer is the Chief of Naval Research. The mission of CNA as the Navy's principal study contract organization is to conduct studies, analyses, and evaluations of conceptual and technological factors which may affect naval operations in order to provide the Secretary of the Navy, Chief of Naval Operations, and Commandant of the Marine Corps with sound bases for decisions related to force structure, force employment, logistic support, and manning levels in support of national policies and objectives. CNA maintained a staff of about 205 civilian professionals of which 21 were permanently located with the operating forces. Additionally, about 30 naval officers were assigned to CNA on a full-time basis to contribute professional experience to the organization. Among the studies and analyses conducted by CNA were those dealing with tactical aviation, amphibious warfare, threat analyses, war at sea concepts, Navy's role in exploitation of the oceans, aircraft pipeline, ship cost and design, and personnel manning and readiness. In addition, various lesser studies were conducted and about 20 research papers were produced. The Navy maintained this program of research at a cost of about \$8,890,000 of which \$800,000 was for Marine Corps studies.

Coordination of the Study Program

The Chief of Naval Operations consolidated responsibility for coordinating the Navy Department study under the Director, Navy Program Planning, and directly within the Systems Analysis Division (OP-96). Under the guidance of the Director, Systems Analysis Division, studies conducted within the above two programs do not duplicate, but rather complement each other.

Marine Corps Analytical Studies

Marine Corps studies and analyses provide the quantitative and rational basis on which programming decisions must be based in order to satisfy current management requirements and to support the concepts of the Marine Corps mid-range and long-range plans.

Among the contract studies completed were those in areas

concerning a seismic system to locate artillery and mortar firing positions and the definition of a Marine expeditionary force intelligence data handling base.

The Marine Corps Development Center completed studies on areas including: The parachutist personnel pod, determination of operational requirements for large escape trunk, amphibian artillery, Fleet Marine Force capabilities for antitank warfare, helicopter requirements for landing force operations ashore, landing force embarkation requirements for amphibious assault shipping, concept of employment and support of communications requirements, general support artillery weapon, V/STOL performance goals, mobility of the Marine expeditionary force, engineer support for amphibious operations, and silenced small arms weapons and tactical aircraft survivability.

The Marine Corps Operations Analysis Group submitted final reports on the aerial refueler/assault transport study and on landing force helicopters for minesweeping.

The Marine Corps Development Center conducted studies and analyses on areas such as position location and navigation system, the control of naval shore fire support, surface ship-to-shore movement, and nuclear munitions.

Activation of Marine Corps Finance Center

The Marine Corps Finance Center was activated on August 1, 1967. All disbursing functions excepting those directly related to Headquarters Marine Corps were relocated to the Finance Center during the period August 1967 to February 1968. This activity will provide for the centralized payment of allotments, retired pay, claims, drill pay to reservists, and active duty pay to other regular personnel.

Contracting

Contract Awards

The Navy's fiscal year 1968 performance in the following areas of procurement is noteworthy:

<i>Area</i>	<i>Fiscal year 1967</i>	<i>Fiscal year 1968</i>
Total obligations	\$13.3 billion	\$12.7 billion.
Price competition	35.2 percent	31.5 percent
Total advertised	15.8 percent	11.5 percent.
CPFF contracts *	11.5 percent	10.1 percent.
Small business	17.2 percent	17.0 percent.

* Objective is reduced usage of CPFF contracts.

Navy Industrial Management Reviews

The Navy conducted industrial reviews of four major Navy contractors (Aerojet-General Corp., Azusa, Calif.; Westinghouse Electric Corp., Sunnyvale, Calif.; Boeing Vertol Division, Morton, Pa.; and Newport News Shipbuilding and Drydock Company, Va.). These reviews were designed to improve government/contractor working relations and make recommendations for improvement in contractor management policies and practices which resulted in improved, more economical contractor performance of government contracts.

Inventory Management

Navy Policy and Standards for Supply Management

On May 25, the Assistant Secretary of the Navy (Installations and Logistics) approved a publication to govern management actions at all levels of the Navy. The contents cover basic policy regarding the functional areas of supply operations, and it will be used by inventory managers as guidance in the control and management of inventories under their cognizance.

High Value Item Management

A General Accounting Office review at the Aviation Supply Office, and a concurrent Navy Supply Systems Command Navy-wide supply management policy review, disclosed significant deficiencies in the previous High Value Item Management Program. The deficiencies resulted principally from the complexity of the program.

The purpose of the program is to achieve inventory economies without impairing combat readiness through intensive management attention to the small percentage of items representing the major segment of the annual procurement dollar expenditures of the Department of the Navy.

PWRS (Prepositioned War Reserve Stock) Interrogation and Readiness Reporting System (PIRR)

During fiscal year 1968 Navy Supply Systems Command developed and implemented Phase I of the PIRR System. This automated system provides, within 72 hours, readiness information with respect to advanced base functional components prepositioned in support of CNO special projects. Additionally, quarterly summary reports of the readiness status of all ABFC's

are provided. These interrogation replies and reports are stated in terms of requirements, assets, and deficiencies by Federal stock number and cognizance symbol and also listed by CNO special project.

Management of Repairable Items

The number and value of repairable items in the Navy have increased in recent years as a result of the introduction of highly sophisticated and modular designed weapons systems. In view of the investment levels involved, the effect of repairable items on fleet readiness, and the potential available for significant savings through application of improved management techniques, proper management of these items is of considerable importance.

Integrated/Inter-Service Weapon System Support

In accordance with the recommendations of the Joint Army Material command, Naval Material Command, Air Force Logistics Command, and Air Force Systems Command commanders, the Air Force assumed integrated management responsibility on March 1, 1968, for approximately 5,500 Joint Support List items used on the RF/F-4 weapon system. Under this concept, Navy retained no wholesale stocks, and Navy reporting activities requisition material directly from the Air Force. A test of the management of some 100 repairables was also conducted to ascertain the feasibility and capability of single Service management of this type of item. The principles of integrated management developed for the RF/F-4 were applied in the management of the A-7/OV-10 weapon system for which the Navy was designated supporting Service.

Consolidated Casualty Reporting System

The Consolidated CASREPT (Casualty Report) Reporting System progressed during fiscal year 1968 from an embryonic interim system to a useful and growing information source with wide usage and acceptance. While a great deal remains to be developed, the accomplishments to date include: (1) Reports which are extensively used by the Systems Commands and their field activities in the identification and isolation of equipment problem areas, and (2) preparation of data which, in conjunction with the Navy Maintenance and Material Management (3-M) System data, were used as a priority indicator in allowance parts lists reviews and changes.

Military Standard Program

Uniform ADP Afloat System (UADPS-AFLOAT)

UADPS-AFLOAT is rapidly being implemented in fleet issue, carrier, and tender type ships. The uniform U-1500, which encompasses many advanced features of inventory management, is part of the standard Maintenance and Material Management System (3-M) and was designed for use in carriers and tenders. The first successful uniform tender prototype was installed in U.S.S. *Shenandoah* (AD-26) in February 1968; the uniform carrier prototype is scheduled for early calendar year 1969. In addition, the interim U-1500 computer system is now operational in 32 Atlantic/Pacific fleet ships. The U-1004 computer system, which has been revised to include better inventory management techniques, is installed in 3 AFS (combat store ship). A second generation AFS computer system for supply and accounting has been developed and submitted to the fleet for approval.

Item Entry Control Program

The Navy portion of the Department of Defense Item Entry Control Program was fully implemented on June 1, 1967. A DTRA (Defense Tactical Review Activity) was established at the Navy Aviation Supply Office for the eight FSC's (Federal supply classes) assigned to the Navy by the Assistant Secretary of Defense (Installations and Logistics). The eight classes consist of 250,000 items with a yearly growth rate of 25,000 items.

FOSATs (Fitting Out Supply Assistance Teams)

FOSATS were established and became operational on July 1, 1967, under the management control of the Naval Supply Systems Command. During the first year of operations, FOSATs provided assistance to more than 100 ships undergoing reactivation, conversion, or new construction. The FOSATs primary responsibility is to review and evaluate the logistic support status of each ship to ensure that all required tasks are completed in a timely manner.

NAS OCEANA Retail Aviation Consolidated Allowance List (AVCAL) Pilot Program

During fiscal year 1968, the first steps in the establishment of a wholesale/retail aviation supply system were taken with the development of procedures for a retail AVCAL pilot program at the Naval Air Station, Oceana, Va.

Item Management Coding

The Navy segment of the DOD Item Management Coding Program was completed on schedule. This program began July 1, 1965, and continued for 30 months ending December 31, 1967. Of an estimated total of 360,000 Navy items to be coded, Navy has coded 220,000 for integration to the Defense Supply Agency, 97,000 items were retained, and Navy interest was withdrawn on 43,000 items.

Manpower Utilization

Increased emphasis was placed on effecting improvements in the utilization of military, civilian, and contract employees throughout the Navy. To further generate interest in sound manpower management, the following actions describe some of the efforts taken in better utilizing Navy manpower resources.

Ship Manning Document

A new manning document was developed by the Chief of Naval Operations for some ship classes. It features a methodology which applies selected work study techniques to quantitative criteria for maintenance, operations, support, and administrative functions. The ship manning document (SMD) displays in detail the rationale for manning predicated on configuration, computed workload, and specified operating profile. The level of manning developed in the SMD is termed "battle manning," which is analogous to the term "complement" currently in use by the Navy.

Manpower Validation Program

The Navy's Manpower Validation Program experienced two significant changes in the last quarter of the fiscal year. Afloat emphasis was directed toward assisting in the development of ship manning documents by an input of work samplings of allowances under varying conditions of readiness. Second, the Vice Chief of Naval Operations approved the return of the program from the Naval Inspector General to the Deputy Chief of Naval Operations (Manpower and Naval Reserve).

Navy Work Study Program

The Navy's Work Study Program, through the use of industrial engineering/management techniques, conducted detailed analyses of present operating and maintenance procedures and,

where applicable, recommended new and improved methods and procedures. These studies have been applied to three major areas within the Navy—design for new construction, manpower utilization, and fleet operational problems. The Work Study Program is also providing input to the Navy's Ship and Shore Manning Document Programs.

Deprived Military Occupational Specialty Study

The increase in manpower requirements for the Western Pacific has decreased turnaround time between unaccompanied overseas tours for all Marines. The rotational pattern for enlisted Marines with certain skills will not allow 24 months between unaccompanied rotations without the use of corrective actions (grade and MOS substitutions, etc.). These skills are designated "Deprived MOS's." Comprehensive studies were conducted to determine the actions necessary to alleviate the problem in these MOS's. Data required to initiate actions were computerized to allow quarterly updating of the projected status of all enlisted skills in relation of rotation requirements. The constant emphasis and study directed to this problem have resulted in excellent progress toward complete resolution.

Marine Corps Manpower Management Information System

The sheer volume of data required to manage an expanding Marine Corps and the accelerated tempo of operations in Southeast Asia reduced the responsiveness of the Marine Corps' automated Personnel Accounting System. The G-1 Interim Manpower Management Information System data bank was established in 1967 to provide manpower managers an accessible, responsive data base encompassing active duty personnel.

Advanced Degree Program

The onboard inventory of officers possessing advanced degrees, including those obtained through the Special Education Program, was not sufficient to meet current skill requirements. Therefore, the Advanced Degree Program permits career officers to complete requirements for an advanced degree in educational disciplines which will provide highly qualified officers for assignment to billets requiring special education.

Variable Reenlistment Bonus Program

Implemented on January 1, 1966, and expanded in March of that year, the Variable Reenlistment Bonus Program has con-

tinued to assist the Marine Corps to retain personnel in designated critical skills. The effects of the program are favorable with respect to the length of reenlistments. Approximately 75 percent of all first-term reenlistees awarded a variable reenlistment bonus in fiscal year 1968, reenlisted for 6 years.

Meritorious Combat Promotions (Enlisted)

During fiscal year 1968, the Marine Corps continued to promote Marines meritoriously for outstanding performance of duty in combat. This flexible authorization, originally established in June 1965, assigns quotas for accounting purposes. Approximately 6,500 Marines have been promoted under the Meritorious Combat Program since its inception, thereby assisting the Marine Corps in its continuing endeavor to recognize outstanding performance, fill existing vacancies in rank structure of combat units, and enhance retention efforts.

Military/Civilian Conversion Program—Phase II

The purpose of this program was to provide for the utilization of additional Marine Corps personnel to Vietnam by substituting civilians in U.S. billets not requiring a military skill. Originally a 5-year program, Phase I was compressed into a 10-month period concluded in December 1966.

Implementation of Phase II of the military/civilian conversion program was directed by the Department of Defense to begin July 1, 1967. The number of enlisted military billets converted to civilian status was 522. The program was completed on June 30, 1968.

Utilization of the Woman Marines Study

In August 1964, the Marine Corps convened a study group to conduct an in-depth survey of the woman Marines program. Implementation of the study group recommendations continued throughout the year, and final action has been taken on 80 of the 82 recommendations. One result of the study was to establish woman Marine units at the following locations: Marine Corps Air Station, Iwakuni, Japan; Camp Butler, Okinawa; and Marine Corps Air Facility, Futema, Okinawa.

Vigorous effort was placed on the cost reduction portion of the program during fiscal year 1968. Intensification of effort is evidenced by the fact that Navy participation was expanded, resulting in more than 1,000 additional reports being received this year over last year. The dollar value of the savings was approxi-

mately \$270 million. The 3-year effort of the actions taken during fiscal year 1968 reflects an accomplishment of \$603 million.

These accomplishments, in effect, provided the Navy with \$270 million more military capability during fiscal year 1968 by reprogramming funds saved into other priority areas.

Cost Reduction

The Navy assigned to the Marine Corps cost reduction goals of \$4,556 million for fiscal year 1968 and \$6,967 million for fiscal year 1968-70 total 3-year effect. The Marine Corps reported cost reductions in excess of \$13 million for fiscal year 1968.

Resource Management in the U.S. Marine Corps

During fiscal year 1968, numerous actions were initiated in preparation for implementation, on July 1, 1968, of that portion of the Department of Defense Resource Management Systems identified as Project PRIME.

A service test of Project PRIME was conducted at the Marine Corps Development and Education Command, Quantico, Va., which provided essential data and experience needed to support Marine Corps-wide implementation of Project PRIME.

VI. Civilian Economy Relations

Industrial Facilities

The Navy continued to reduce holdings of Government-owned industrial facilities in favor of private industry. Its inventory of industrial plants decreased from 83 to 70 as of June 30, 1968.

Plants Sold:

Todd Shipyard, New Orleans, La.—DOD-138

Bethlehem Steel, San Francisco, Calif.—DOD-46

Plants with Expired National Security Clauses:

ARMCO Steel Corporation—DOD-145

Chambersburg Engineering Company, Chambersburg, Pa.—
DOD-333

Collins Radio Company, Cedar Rapids, Iowa—DOD-124

Fairbanks Morse, Inc., Beloit, Wis.—DOD-433

Hyde Windless Company, Bath, Maine—DOD-142

ITE Circuit Breaker, Philadelphia, Pa.—DOD-364

Kerotest Company, Pittsburgh, Pa.—DOD-365

Todd Shipyard Company, Products Division, Houston, Tex.—
DOD-395

Westinghouse Electric Corporation, Electronics Division,
Friendship Airport, Baltimore, Md.—DOD-482

Grumman Aircraft Engineering Corporation, Beth Page.,
N.Y.—DOD-237

United Aircraft Corporation (Pratt Whitney Aircraft Division), East Hartford, Conn.—DOD-57

Merchant Marine

The strategic importance of ocean transportation in wartime dictates that the United States must have under its control sufficient active merchant shipping to meet initial emergency sealift requirements. It is Navy policy to provide maximum feasible support to the objective of maintaining a large, modern, and well balanced U.S. merchant marine.

Recognizing the importance of the merchant marine, during 1968 the Navy continued to schedule maximum U.S. flag merchant ships for Department of Defense sealift cargoes. All responsive

U.S. flag vessels were used. A combination of nonsubsidized ships plus Military Sea Transportation Service (MSTS) nucleus and General Agency Agreement ships carried 63 percent of the military dry cargo, berth liners carried 35 percent, and some 2 percent had to be allocated to foreign flag bottoms.

Block obsolescence continues to have deteriorative effects on the U.S. merchant marine. As of March 1968, 7 percent of the U.S. flag privately owned fleet was in excess of 25 years of age, and an additional 62 percent are between 20 and 24 years of age. By 1975, under current maritime policies, the nonsubsidized liner and tramp fleets will have largely disappeared.

Community Relations

Navy community relations is that command function which evaluates public attitudes, identifies the mission of a military organization with the public interest, and executes a program of action to earn public understanding and acceptance.

The Navy's community relations efforts are directed primarily at local command levels under the supervision and guidance of the cognizant naval district commandants. The Office of Information assists the districts and individual commands in such programs as the annual space fair, Pt. Mugu, Calif.; Navy week in New Orleans, La.; Navy League convention in Honolulu, Hawaii; Navy combat art exhibits; and other activities.

Marianas Clearance Project

Since World War II, the presence of unexploded ordnance has created a safety hazard on certain islands in the Marianas group. The Marianas Clearance Project, under the direction of NAVORD-SYSCOM, commenced in June 1967 to clear World War II unexploded ordnance from the islands of Tinian and Saipan. Approximately 4 million pounds had been cleared by June 30, 1968, and completion is expected by April 30, 1969. The project is under the local direction of Naval Magazine, Guam, supervised by a civil service employee, and employs a local labor force averaging approximately 75 workmen.

VII. Conclusion

The events of fiscal year 1968 provided a background on which the Department of the Navy again demonstrated the broad spectrum of its capabilities. While fully meeting its responsibilities in the prosecution of the war in Southeast Asia, the Navy maintained the steady, vigilant watch required of the sea-based strategic retaliatory forces. In its response to the *Pueblo* incident and the smoldering situation in the Middle East, the multipurpose forces of the Navy and Marine Corps have demonstrated their continuing ability to maintain a high state of readiness for rapid, decisive, and effective employment whenever directed by the President. Perhaps never before in the history of warfare has such devastating power been so selectively and precisely applied in support of carefully defined national objectives.

While the conflict in Southeast Asia continued to require a high level of Navy and Marine operational involvement, our worldwide commitments demanded a more resourceful and skillful management of resources and personnel to remain within asset limitations and yet maintain an effective posture.

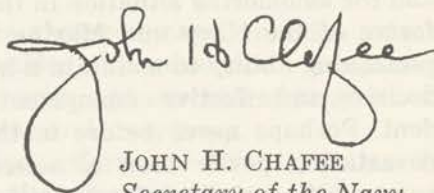
In the area of operations, we were gratified to note the increasing momentum of success on the allied side in South Vietnam. The casualties and damage inflicted upon the enemy during the Tet offensive may have dramatic significance when viewed in retrospect in the years ahead. The gallant Marine stand at Khe Sanh demonstrated our ability to impose prohibitive conditions on the enemy strategy of consolidating forces for a massed assault such as he employed at Dien Bien Phu in the French struggle.

While our research and development efforts continued to yield significant advances for naval warfare of the future, the cost in material, personnel, and logistics has become dramatically expensive and complex. As these factors grow, the competition for limited money and assets becomes more intense, demanding a perceptive scrutiny of our objectives to remain consistent with national goals. The Department of the Navy has made considerable gains in its ability to analyze and achieve the optimum within monetary, material, and management constraints.

In the final analysis, however, the success of our efforts has

depended upon our personnel. As our responsibilities have grown, our assets have, in some cases, lagged behind. The margin of difference to overcome these problems has come from our personnel, military and civilian, who have provided the edge in long hours, hard work, technical skills, and dedication. The manner in which they have responded has been superb and merits recognition.

It has been my pleasure to associate with many of these people, both in and out of uniform. They are the foundation upon which the Department of the Navy has sustained its high reputation over the years. This report constitutes a record of their achievement which I support and forward. I am most pleased to report that the Navy is a formidable, reliable, and ready component of the Department of Defense.



JOHN H. CHAFEE
Secretary of the Navy.

Annual Report
of the
SECRETARY OF THE AIR FORCE
July 1, 1967, to June 30, 1968

Contents

Chapter		Page
I.	INTRODUCTION	391
II.	STRATEGIC FORCES	392
	Strategic Missiles	392
	Strategic Aircraft	394
	SAC Command and Control	397
III.	DEFENSE FORCES	399
	Interceptors	400
	Surveillance and Warning	401
	Proposed Air Defense System	402
	Missile and Satellite Warning	403
IV.	GENERAL PURPOSE FORCES	405
	Forces in the United States	405
	Forces Overseas	407
	Tactical Exercises	408
	Tactical Aircraft Production	409
	Tactical Missiles	411
	Tactical Command and Control	411
	Special Air Warfare	412
V.	AIRLIFT FORCES	414
	Operations	415
	Force Modernization	418
	Other Airlift Support	421
VI.	SPECIALIZED FORCES	423
	Audio-Visual and Photomapping Services	423
	Rescue and Recovery	424
	Weather	426
	Communications	427
VII.	THE U.S. AIR FORCE IN VIETNAM	430
	The Air War Against the North	430
	The Air War in the South	431
	Organization and Force Structure	433
	Air Bases	438
	Civic Action	438
	Allied Air Forces	439
VIII.	MANPOWER AND TRAINING	440
	Manpower Strength	440
	Manpower Controls	441
	Officers	441
	Airmen	442
	Equal Opportunity	443
	Family Housing	444
	Civilian Personnel	445

	Page
Military Training	446
Health in the Air Force	452
Chaplains	457
Judge Advocate General	459
Chapter IX. RESEARCH AND DEVELOPMENT	461
Southeast Asia Requirements	461
Space	463
Engineering Development	466
Missile and Aircraft Technology	467
Basic Research	473
Ranges and Equipment	474
Human Resources Laboratory	475
X. MANAGEMENT	476
1968 Budget	476
1969 Budget	478
Cost Reduction	478
Data Automation	479
Procurement and Production Management	481
Military Assistance Program	483
Logistics Management	484
Supply	485
Maintenance	486
Transportation	487
Base Maintenance	489
Inspections	490
Safety	491
Security	492
Management Evaluation	493

146	William T. ...
147	...
148	...
149	...
150	...
151	...
152	...
153	...
154	...
155	...
156	...
157	...
158	...
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I. Introduction

The Department of the Air Force maintains many types of forces in constant readiness to counter any threat to our national security ranging from all-out nuclear warfare through many types of conventional action. National policy objectives are supported by a large and complex aerospace force designed to deter but capable of fighting successfully at any level of conflict. The size of this force is impressive—in fiscal year 1968 the U.S. Air Force employed over 1.2 million military and civilian personnel and operated with a budget of \$23 billion. Efficient management of this vast enterprise poses a continuous challenge but is a prime prerequisite of national security.

The following report discusses Air Force activities during fiscal year 1968 under several categories. Combat forces are covered under the headings of Strategic Forces, those designed to deter or, if necessary, fight a general war; Defense Forces, which provide active and passive defense of the United States proper and our military forces at home and abroad; General Purpose Forces, dedicated to maintaining a readiness in the broad band of possible conflicts below general war; and the special subject of Air Force operations in Vietnam. The vital support areas are divided into Airlift Forces, Specialized Forces (i.e., weather, communications), Manpower and Training, Research and Development, and Management. The last area has received increasing emphasis as our activities have grown more complex and new tools and techniques have become available.

Aerospace forces represent only one part of our national military structure. Each military Service is a specialized increment of our over-all defense posture; the individual Service does not exist as an end in itself. Rather, each Service is programed and operated in close coordination with the others and with national diplomatic and economic policies.

II. Strategic Forces

The United States maintains nuclear forces to deter attack against itself and its allies. If potential aggressors know that U.S. strategic forces can survive a surprise attack and still inflict unacceptable damage on the attacker, they will be deterred from deliberate nuclear assault. The Air Force component of the deterrent force is the Strategic Air Command (SAC), which had 1,054 intercontinental ballistic missiles (ICBM's) and about 600 B-52 and B-58 strategic bombers as of June 30, 1968. All of the ICBM's, and some 40 percent of the bombers were maintained on continual alert.

Strategic Missiles

At the beginning of fiscal year 1968 the SAC missile force contained 1,000 MINUTEMAN missiles in six wings with 20 squadrons—14 MINUTEMAN I and 6 MINUTEMAN II. Six additional squadrons had a total of 54 TITAN II missiles. Current plans called for the eventual replacement of all MINUTEMAN I missiles with either MINUTEMAN II's or III's. In October 1967 the wing at Whiteman AFB, Mo., completed its conversion to II's, and a squadron at Malmstrom AFB, Mont., had undergone a similar change by June 1968. (The other MINUTEMAN wings are at Grand Forks AFB, N. Dak., Ellsworth AFB, S. Dak., Minot AFB, N. Dak., and Warren AFB, Wyo.) As a result, the number of MINUTEMAN II's rose from 300 to 400 while the I's decreased from 700 to 600. Most of the remaining I's were scheduled to be replaced in future years by the MINUTEMAN III under development. The III would also replace, at a reduced rate, the II's launched in operational tests.

In January 1968 the Air Force suspended follow-on operational testing of the MINUTEMAN I, which had begun in January 1966, and started a special test series to obtain detailed information on system performance. Operational testing was to be resumed after completion of the special series. Three MINUTEMAN I missiles carrying special payloads were launched in support of the research and development program.

The MINUTEMAN II, currently in production, has a number

of features that improve the missile accuracy and employment options. MINUTEMAN II research and development flight testing was completed in February 1968. Of the 39 launchings in this series, 8 took place in fiscal year 1968. The demonstration and shakedown operations program, begun in August 1966, was about 80 percent completed by the close of the year. These tests were curtailed for almost a year, between April 1967 and March 1968, while the Air Force undertook a special evaluation to validate several engineering changes and verify missile accuracy. In May 1968, the Arnold Engineering Development Center began 6-year tests of the MINUTEMAN II second-stage rocket motor to analyze its rate of deterioration in a silo and determine its life expectancy.

MINUTEMAN III, an almost entirely new missile under development, will have a more powerful third-stage motor than earlier versions and will be able to carry larger payloads for greater distances. A post-boost propulsion vehicle, also planned for the missile, will have improved guidance and control subsystems. Finally to insure penetration of enemy antiballistic missile defenses, MINUTEMAN III will have multiple independent reentry vehicles (MIRV's) as well as penetration aids. The MIRV innovation will significantly increase the number of reentry vehicles in the missile force—without increasing the number of boosters. At the end of the fiscal year the manufacture and assembly of components for the first MINUTEMAN III were nearing completion.

In November 1967 the Air Force completed modification of all TITAN II silos, ending a program that had begun in 1965 to minimize maintenance and improve the operation of supporting equipment. The TITAN II force, located at Davis-Monthan AFB, Ariz., McConnell AFB, Kans., and Little Rock AFB, Ark., was scheduled to remain at full strength (54 missiles) after fiscal year 1970 instead of declining as previously planned. The fiscal year 1968 portion of the TITAN II follow-on operational test program, begun in May 1966, was completed on schedule. On April 2, 1968, a TITAN II which had been in a silo more than 11 months was successfully launched from Vandenberg AFB, Calif.

Operational readiness inspections indicated that the strategic missile forces were maintaining a high level of readiness. The Air Force conducted 19 such inspections during the year; each MINUTEMAN and TITAN II wing was found operationally ready.

Since many of the UH-1F helicopters which transport men and equipment to dispersed missile sites had been withdrawn to meet the requirements of Southeast Asia, the Air Force requested and obtained approval to procure replacements.

Strategic Aircraft

Three B-52 D and E squadrons were deactivated as part of the continuing gradual phaseout of the B-52C through F bombers. Some of the aircraft of the deactivated units replaced the B-52D's in other SAC units, and these aircraft, in turn, were sent to the Pacific area.

The rate of utilization of B-52D's being used for Southeast Asia operations exceeded original flying hour programs. To insure the safety of these aircraft, and extend their service life, the Air Force in December 1966 undertook a modification program to strengthen their wings. A small number of B-52E's and F's were similarly modified.

A replacement training unit was established at Castle AFB, Calif., because of the increased rate of operations in Southeast Asia. On April 15, 1968, the first class of B-52E through H crews began cross-training in the B-52D.

Even though several squadrons of B-52E's and F's were deactivated over the last several years, there has been little change in the number of B-52's available to SAC. The Air Force assigned many serviceable aircraft from these squadrons to active units. In this "active" storage arrangement, no increase in regular crews was required, and only a minimum of maintenance and supply support added. Should an emergency arise, the Air Force would have ready and available replacement aircraft and a foundation upon which additional combat units could be formed quickly. Those B-52E's and F's that exceeded service-life criteria were put in "extended" storage. These aircraft will require major modification before they can be flown safely.

Modifications to all B-52G and H airframes, initiated in April 1966, were expected to be completed by March 1970. Other changes planned for the coming year included the incorporation of a stability augmentation subsystem to reduce aerodynamic structural loads and the installation of an improved generator to furnish additional power for the electronic countermeasures equipment. The changes should extend the service life of these bombers well into the late 1970's.

The Air Force made a number of improvements in its 80 B-58 bombers to meet changing operational requirements and to

add newly developed items. In addition, major fatigue points of the aircraft were strengthened to insure structural integrity.

Future plans called for the FB-111 aircraft to replace most of the B-52C through F bombers. The first FB-111 squadron was scheduled to be operational in the near future, but the delivery of some FB-111's was deferred until fiscal year 1971 to gain more time for development and to insure the readiness of the entire weapon system. As a result, phaseout of three B-52 squadrons will be delayed until they can be replaced by FB-111's on a squadron-for-squadron basis.

The later model B-52 G and H aircraft were to remain in the strategic force. Future programs called for some of these planes to be armed with the AGM-69A short-range attack missile (SRAM). The B-52G and H squadrons would also continue to carry the AGM-28B HOUND DOG long-range air-to-surface missile. As an eventual replacement for the B-52G and H, the Air Force continued to seek approval for development of the advanced manned strategic aircraft (AMSA).

Development of the FB-111 was expected to profit from the extensive testing and initial operational deployment of the F-111A tactical fighter. The FB-111 prototype (an F-111A modified to approximate the planned bomber configuration) made its first flight in July 1967 and attained a speed of Mach 2. In the ensuing months the prototype, equipped with external fuel tanks and dummy weapons, underwent stability and control flight tests. In March 1968 another F-111A, equipped with the Mark IIB avionic system, began service as a flying test bed for the FB-111. The results were favorable, indicating that the new aircraft should be superior to current bombers in speed, ability to penetrate enemy defenses, accuracy of weapon delivery, reliability, and ease of maintenance of avionic equipment.

Development of the AGM-69A SRAM continued. This missile was designed to be accurate and effective against a variety of primary targets, including airfields, control centers, and surface-to-air missile sites. In late 1967, B-52's began carrying and dropping dummy SRAM's for test purposes.

The Air Force operated the following strategic reconnaissance units: The 9th Strategic Reconnaissance Wing (SR Wg) at Beale AFB, Calif., the 55th SR Wg at Offutt AFB, Nebr., the 100th SR Wg at Davis-Monthan AFB, Ariz., the 82d Strategic Reconnaissance Squadron (SR Sq) at Kadena AB, Okinawa, and the 24th SR Sq at Eielson AFB, Alaska. The U-2, SR-71, and RC-135 aircraft in these units are capable of meeting a broad

range of national defense requirements. Supersonic SR-71 reconnaissance aircraft, in flights over the United States beginning July 1, 1967, provided crew training and system evaluation. On October 1, 1967, SAC completed operational testing of the aircraft, and on December 22 the first squadron was combat ready.

As in the past years, SAC remained sole operator of all KC-135 tankers in the Air Force. The tankers supported the nuclear bomber force, B-52's and tactical fighters in Southeast Asia, and aircraft of the Tactical Air Command and the Aerospace Defense Command. Tankers made possible the expeditious deployment of tactical fighters and interceptors to Korea following the seizure of the *Pueblo*. They also assisted in the rotation of oversea fighter units. In a year the KC-135's transferred nearly 24 billion pounds of fuel. The over-all KC-135 force did not change during the year. The KC-135 squadron at Glasgow AFB, Mont., was inactivated in June 1968 and the aircraft reassigned to Wright-Patterson AFB, Ohio, and Wurtsmith AFB, Mich. A replacement aircraft for the KC-135 was still under study at the end of the year.

To cope with a problem peculiar to the F-4 aircraft, the Air Force modified the tanker's refueling equipment so that the two airplanes could disengage without the likelihood of damage to either. Also underway were several projects for such devices as angle of attack indicators and instrument failure warning signals that would increase the efficiency of aerial refueling operations.

SAC conducted nine exercises jointly with the North American Air Defense Command (NORAD) to test and evaluate tactics and equipment and to provide realistic training for both the offensive and defensive forces. For example, on April 12, 1968, SAC aircraft participated in SNOW TIME 68-5 with bombers penetrating from the Pacific coast against defenses of the Western NORAD Region. KC-135's provided aerial refueling and weather scouting while EC-135's operated the SAC postattack Command and Control System. On May 10 SAC aircraft took part in a similar exercise, TOP RUNG 68-3-W.

In July 1967, SAC and the British Royal Air Force (RAF) conducted Operation BAKE to insure that their aerial refueling techniques were interchangeable. During this joint exercise a KC-135 from SAC's Spanish-based wing successfully refueled eight RAF fighters without difficulty.

On January 22, 1968, a B-52 with four nuclear weapons crashed and burned on the ice of North Star Bay, Greenland, while

attempting an emergency landing on Thule AB, 7 miles away. In cooperation with Danish authorities, the Air Force mounted a mammoth cleanup operation which was still under way at the close of the fiscal year. The contaminated ice was scraped and carted away to make sure that radioactive materials were eliminated.

In line with Department of Defense plans announced in 1964, SAC closed Dow AFB, Maine, and Glasgow AFB, Mont., on June 30, 1968. Operational units at these bases were either inactivated or transferred to other bases. Small caretaker forces remained at the bases until the Air Force could dispose of the facilities. The Aerospace Defense Command continued to use a part of Dow as a dispersed operating base while the University of Maine took over other portions of the base as an extension of its home campus. At the same time SAC transferred Homestead AFB, Fla., to the Tactical Air Command. B-52 units at that base moved to Wright-Patterson AFB, Ohio; the KC-135 squadron went to Loring AFB, Maine; and the 823d Air Division moved to McCoy AFB, Fla. SAC also transferred command responsibility for Altus AFB, Okla., to the Military Airlift Command on July 1, 1968.

SAC Command and Control

On January 1, 1968, after a final 3-month test period, the Air Force declared the SAC Automated Command Control System (SACCS) fully operational. The tests proved that the system fulfilled its basic operational requirement for data transmission, processing, and display. Meanwhile, steps were taken to modernize some SACCS items and to eliminate the remaining manual operations. Approval was also obtained to replace the SACCS computers, which were approaching the end of their service life.

Late in 1967, the 494L emergency rocket communication system became fully operational. On May 31, 1968, the 487L survivable low frequency communication system achieved an initial operational capability. This system provides a reliable and secure method for transmitting messages between the Joint Chiefs of Staff, the SAC Commander, and the SAC forces. By June 30, 1968, nearly all ground installations had been completed; their final operational capability was set for December, by which time all aerospace ground equipment and spares should be delivered.

The EC-135 aircraft, in several versions, provided a worldwide airborne command post system for the Joint Chiefs of Staff and

the Commanders in Chief of the Strategic Air, European, and Pacific Commands. Installation of the airborne launch control system on some of the SAC EC-135 command posts would permit the launching of MINUTEMAN missiles should they become isolated from their ground launch control facilities. The airborne portion of the 487L system was being tested and was expected to reach an initial operational capability in 1969.

Although the postattack Command and Control System is survivable and can launch the force, the Air Force has long recognized the requirement for more capable aircraft for controlling the strategic forces during a general war. The advent of airframes as large as the C-5A cargo aircraft makes possible longer endurance on station, larger battle staffs, and automatic data processing and satellite communication equipment aboard the aircraft. The concepts and objectives of an advanced airborne command post have been under study during the year.

III. Defense Forces

On September 18, 1967, national leaders authorized deployment of a thin antiballistic missile system for area defense against a possible threat from Communist China or from an accidental missile launching. This decision, coupled with the various warning systems in operation or under consideration, led to the organization in May 1968 of the Joint Continental Defense Systems Integration Planning Staff. This agency reviews plans relating to the systems used for the defense of the continental United States and recommends changes in development, deployment, and operation that would minimize interference between the systems or eliminate undesirable duplication. The Department of the Air Force is responsible for logistical and administrative support of the organization.

The North American Air Defense Command (NORAD) had been established on August 1, 1957, as an integrated headquarters exercising control over the air defense forces of the United States and Canada. The governments of the two countries agreed to continue the arrangement for an additional 4 years, beginning May 12, 1968. The agreement stated that Canada is not committed to participation in an active ballistic missile defense.

In May 1968 the Department of Defense announced that a planned modernization of the air defense forces, plus improvements in warning and control systems, would result in a realignment of the NORAD structure. The Southern NORAD Region, Gunter AFB, Ala., would be eliminated and its functions absorbed by other regions. The 30th NORAD Division headquarters and its direction center, Sioux City, Iowa, would also be closed and the mission assumed by three other NORAD organizations.

On January 15, 1968, the Air Defense Command, the USAF component of CONAD (the U.S. element of NORAD), was redesignated the Aerospace Defense Command (ADC) to reflect its growing role in space defense. In addition to its control and warning systems, supersonic interceptors, and surface-to-air missiles for defense against enemy missiles and aircraft, ADC was responsible for detection, identification, and tracking of all objects in space and for defense against hostile satellites.

ADC had four numbered air forces and 13 geographic air

divisions. On January 1, 1968, the Air Defense Weapons Center, Tyndall AFB, Fla., organized the previous October to develop tactics and doctrines for air battle, became the administrative equivalent of an air force. On July 1, 1968, the 9th Aerospace Defense Division, Ent AFB, Colo., which was responsible for detecting, identifying, and tracking space objects, became the Fourteenth Aerospace Force, and the 14th Air Force at Gunter AFB, Ala., was disbanded.

Interceptors

At the end of June 1968, there was a total of 26 ADC squadrons, equipped with 494 aircraft, including F-101's, F-104's, and F-106's. These aircraft were armed with air-to-air FALCON, GENIE, and SIDEWINDER missiles. One F-102 squadron equipped with FALCON missiles was deployed to the Alaskan Air Command. ADC also had six squadrons of BOMARC surface-to-air missiles for area defense. BOMARC's were launched periodically for combat evaluation from an auxiliary field of Eglin AFB on Santa Rosa Island, Fla.

ADC inactivated four interceptor squadrons as part of a continuing reduction of forces. An F-106 squadron at George AFB, Calif., and another at McGuire AFB, N.J., were discontinued during the summer of 1967. Some of the aircraft were transferred to two squadrons, one at McChord AFB, Wash., and the other at Dover AFB, Del., increasing their unit equipment from 18 to 24. By June 30, 1968, when Dow AFB, Maine, and Glasgow AFB, Mont., were closed, ADC had also inactivated an F-101 squadron at each of these bases.

In September 1967 ADC began to modify F-106's so that in an emergency they could deploy for air defense of U.S. forces overseas. Two squadrons were modified during the year with aerial refueling equipment, larger supersonic external fuel tanks, and better electronic countermeasure gear. A third was scheduled for the change by August 1, 1968.

In December 1967, F-106's flew nonstop from McChord AFB, Wash., to Tyndall AFB, Fla., for the first extended-range interceptor flight during which the aircraft were refueled in flight and fired missiles. Less than a month later, F-106's flew from Richards-Gebaur AFB, Mo., to Elmendorf AFB, Alaska. In March 1968, as part of the Korean buildup resulting from the *Pueblo* crisis, F-106's at McChord flew to the Western Pacific, conducting the first inflight refueling of F-106 interceptors during an overseas deployment.

The Air Force decided in September 1967 to improve the performance of its F-104 squadron by modifying 27 Starfighters with the J-79-19 engine. On November 30, 1967, the Air Force Systems Command completed testing of this more powerful and efficient engine at Edwards AFB, Calif. The change should sharply reduce the time needed for climbing to 50,000 feet and for accelerating to Mach 2 at 35,000 feet, while also reducing the rate of fuel consumption.

The Air National Guard (ANG) continued to make a large contribution to air defense, with 21 of its interceptor squadrons assigned to ADC maintaining a 24-hour alert and 1 squadron assigned to the Pacific Air Forces providing air defense for Hawaii. In January 1968 ANG began to train pilots and navigators for C-121 aircrews that would fly special ADC missions. In May 1968 the Air Force and the Air National Guard agreed that, beginning in July, as many as 32 ANG F-102 pilots could volunteer at one time for temporary active duty at various locations throughout the world. On July 1, 1968, ANG interceptor units assumed responsibility for three inactivated USAF installations. The Oregon ANG took over the military portions of Portland International Airport; the Wisconsin ANG, Truax AFB in Madison; and the Maine ANG, Dow AFB in Bangor.

Surveillance and Warning

As an essential safety measure to insure survival of the network controlling the interceptors defending the United States against manned bombers, the Air Force completed 14 backup interceptor control (BUIC II) centers that could act independently of the semiautomatic ground environment (SAGE) centers. Planned for further enhancement of the system is the installation by late 1969 of 15 larger capacity BUIC III centers—13 in the continental United States and 2 in Canada to operate under NORAD. During the year the Air Force progressed on installing and checking out the equipment for 11 BUIC III sites, including the 2 in Canada. BUIC II equipment was also removed from four operational sites to be renovated to the BUIC III configuration. No major technical problems were encountered.

Technological advances permitted a smaller, more effective, less costly warning and control system against enemy bombers. Consequently, in the spring of 1968, ADC closed 15 long-range radar installations, including 3 in the Goose Bay, Labrador, area and 2 ANG units at Greeley, Colo., and Salt Lake City, Utah. Operation of 71 gap-filler radars was also discontinued.

The Federal Aviation Agency (FAA) planned to use 14 discontinued long-range radar sites for air route traffic control. An FAA-Air Force study concluded that the joint use of certain radar and control centers would greatly reduce the cost of operating the national radar surveillance and control network. A group was appointed to draw up precise plans for joint use of the facilities.

On April 1, 1968, the Air Force closed the nuclear reactor station at Sundance AFS, Wyo., which had served as a pilot project for the production of electric power for a radar. The dismantling of the reactor was expected to take 1 year, with overview by Air Force health specialists to guard against any possibility of contamination.

Proposed Air Defense System

The current air defense system was designed to deal with an attack by enemy bombers penetrating U.S. defenses at high altitudes. Its existence has forced any would-be attacker to develop complicated tactics and countermeasures. However, to improve U.S. capabilities to identify and destroy hostile aircraft coming in at low altitudes, the Air Force requires an interceptor whose radar could distinguish reflections of attacking bombers from ground reflections and then, without changing altitude, fire an air-to-air missile against the target. With sufficient range and speed, such an aircraft could make repeated interceptions to destroy enemy bombers before they released their air-to-surface missiles. In November 1967, the Secretary of Defense approved the F-106X, a modified F-106, as the improved interceptor.

Modernization of the F-106 would consist of replacing the radome and making room for a larger radar antenna and a new look-down radar, miniaturizing the rest of the fire control system, and altering the missile bays to accommodate a new missile. Extensive fatigue testing indicated that the basic F-106 airframe would last through the 1970's. The engine would also prove adequate for this period.

The F-106X's, supported by C-130's or similar aircraft for the transport of ground crews and equipment to dispersed bases, would constitute the future manned interceptor force in the continental United States. An ANG F-102 squadron would continue to provide local air defense for Hawaii. In addition to the F-106X, two other elements of the modernized air defense system would be an airborne warning and control system (AWACS) and back-scatter over-the-horizon (OTH) radars. When the

AWACS and the OTH radars became operational, they would replace a large part of the current U.S. surveillance, warning, and control system for defense against bombers.

AWACS would be a computerized surveillance and control system aboard a large jet aircraft comparable to the C-135 or a commercial airliner. Virtually immune to destruction by an ICBM, AWACS would detect hostile bombers at great distances, track their flight at various altitudes, and direct interceptors to positions for an attack on the bombers before they released missiles or closed on targets. AWACS might also prove useful for control of tactical air operations in an overseas theater. Encouraging results from overland tests with scaled AWACS radar models led the Air Force to request approval to proceed with engineering development of the system.

Several years of experimentation revealed that a ground-based radar, using low frequency emissions, could see over the horizon by using the ionosphere to reflect radar energy. Back-scatter radar would permit detection of bombers still beyond the horizon, thereby denying the enemy bomber an undetected approach and acquiring data for positioning interceptors. In September 1967 the Air Force awarded a contract for design, construction, and installation of an experimental radar to verify the operational feasibility of this concept.

Missile and Satellite Warning

On November 3, 1967, the Secretary of Defense announced that the Soviet Union was developing a fractional orbital bombardment system (FOBS) which would permit an attack on the United States from routes over the South or North Poles. To augment the Ballistic Missile Early Warning System (BMEWS) against the new threat, the Air Force put the forward-scatter over-the-horizon (OTH) radar, still in the research and development stage, into interim operation. This OTH radar is capable of detecting the launching of missiles and satellites as well as of FOBS.

As early as April 1962 the Air Force had begun studies of an interim warning system against the threat of ballistic missiles launched from hostile submarines. In November 1964 the Secretary of Defense approved development of the 474N sea-launched ballistic missile (SLBM) detection system. To obtain the detection and surveillance segment of the SLBM detection system, the Air Force completed modification of six SAGE height-finder radars to the AN/FSS-7 configuration and planned to install a

seventh at a site under construction at Laredo, Tex. The missile warning display segment of the system will warn national leaders of SLBM launches by showing the information received from these radars and other sources.

The SPACETRACK system consisted of radars, cameras, and computers to detect, identify, and track all man-made objects—more than 1,300—in orbit, and make this information readily available. This farflung system was coordinated by the Space Defense Center located in the NORAD Combat Operations Center in Cheyenne Mountain, Colo. The Air Force proposed several modifications and additions to improve SPACETRACK. The FPS-85 phased-array radar, which could detect and track far more space objects simultaneously than earlier sensors, was undergoing testing at Eglin AFB, Fla., and was scheduled to become operational in December 1968.

IV. General Purpose Forces

U.S. Air Force general purpose forces are divided among five 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), Pacific Air Forces (PACAF), and Alaska Air Command (AAC). Each is assigned to a unified command in its geographic area—TAC to U.S. Strike Command, USAFSO to U.S. Southern Command, USAFE to European Command, PACAF to Pacific Command, and AAC to Alaska Command. The general purpose forces include fighter, attack, reconnaissance, airlift, special air warfare, and electronic warfare units. These, in combination with the strategic and defense forces, provide the means of meeting both the threat of nuclear war and the challenge of limited aggression.

Between 1961 and 1968 the Air Force increased the size of its programmed tactical fighter force to about 1,600 aircraft as it expanded from 16 to 23 wings. The new fighter aircraft acquired during these years more than doubled the amount of munitions the force could carry.

Forces in the United States

A major function of tactical fighter units based in the United States during the past year was support of the Vietnamese war. Twenty-one squadrons were replacement training units which provided combat crews for Southeast Asia. In many cases aircraft available in tactical units at home replaced those lost in combat. Of the tactical reconnaissance force in the United States, one RF-4C squadron deployed to Southeast Asia and two additional RF-4C units were activated for replacement crew training.

Southeast Asia operations demonstrated the importance of electronic warfare techniques to the survival of tactical aircraft. Accordingly, tactical aircraft were being equipped with self-protection radar threat-warning and electronic countermeasure equipment. Additionally, in December 1966, the Air Force began to organize an extensive tactical electronic warfare support (TEWS) force that contained EC-47 and EB-66 aircraft. During fiscal year 1968 a TEWS squadron served as a training unit, providing

replacement aircrews for Southeast Asia. The Air National Guard also converted one C-121 airlift unit to the TEWS mission.

The rising importance of night operations in Southeast Asia, coupled with the recent availability of improved illumination and sensing devices, led the Air Force to create special night warfare units in the tactical force. A number of C-130's were specially modified and equipped to provide floodlight illumination of large areas to assist fighter aircraft in bringing their firepower to bear on the enemy.

The special air warfare (SAW) forces in the United States, assigned to the Special Air Warfare Center at Eglin AFB, Fla., continued to perform their training functions in support of 18 SAW squadrons deployed in Southeast Asia, Latin America, and Europe. In addition, a SAW wing at England AFB, La., provided a U.S. reserve and contingency force. On July 8, 1968, the special air warfare forces were redesignated special operations forces (SOF).

On July 1, 1967, the ANG had seven tactical fighter wings with 23 groups, and three reconnaissance wings with 12 groups. Following the seizure of the U.S.S. *Pueblo*, the President on January 25, 1968, issued a call to activate two fighter wings (eight F-100 groups) and one reconnaissance wing (three RF-101 squadrons). The next day these forces were mobilized and assigned to TAC. The President issued a second call on April 11, 1968, and on May 13 the Air Force mobilized two F-86 groups. During May and June four F-100 units were deployed to Vietnam; two were scheduled to deploy to Korea on July 1, and two were transferred to Myrtle Beach AFB, S.C., to form an F-100 replacement training unit. The two F-86 units transferred to Cannon AFB, N. Mex., to provide forward air controller and air liaison officer training. The Air Force planned to deploy one RF-101 squadron to Japan late in July 1968. On June 30, 1968, the ANG general purpose forces not on active duty with the Air Force included five fighter wings with 13 groups, two reconnaissance wings with nine groups, and one electronic warfare group which had converted from an airlift mission.

The Tactical Fighter Weapons Center at Nellis AFB, Nev., the Tactical Reconnaissance Center at Shaw AFB, S.C., and the Tactical Air Warfare and Special Air Warfare Centers at Eglin AFB, Fla., focused on improving the capabilities of the Air Force general purpose forces. To increase their effectiveness the Air Force placed the four centers directly under Headquarters TAC. (Formerly, all but the two centers at Eglin AFB were assigned

to TAC numbered air forces.) All but the Special Air Warfare Center were relieved of crew training and base operating responsibilities so they could concentrate on their primary missions.

Forces Overseas

Since June 1966 the Air Force has studied the concept of dual-basing tactical forces to reduce the adverse international balance of payments between the United States and Europe. In October 1966 the United States, the United Kingdom, and the Federal Republic of Germany began discussing the idea and its relation to NATO defenses. Then, in August 1967, the United States, after consultation with its allies, decided to relocate approximately 35,000 military personnel stationed in Germany.

The Air Force portion of the relocation, planned for July 1968, included four tactical fighter squadrons, half of an air commando squadron, a portion of a tactical control group, and a casualty staging flight—a total of some 4,800 military personnel representing a gold flow saving of about \$16 million annually. The tactical fighter units involved were the three squadrons of the 49th Tactical Fighter Wing at Spangdahlem AB and the 417th Tactical Fighter Squadron at Ramstein AB. The three squadrons of the 49th Wing would deploy to Holloman AFB, N. Mex., and the 417th Squadron to Mountain Home AFB, Idaho. Half of the 7th Air Commando Squadron and 70 personnel of the 601st Tactical Control Group at Sembach AB would move to Otis AFB, Mass., and Bergstrom AFB, Tex., respectively, while the 18th Casualty Staging Flight would go from Rhein Main AB to Pope AFB, N.C. These units would continue to be committed to NATO and remain under the operational control of the Commander in Chief, Europe. Sufficient equipment would be retained at their German "home" bases to insure that the squadrons could be promptly redeployed to Europe whenever necessary. Annual transatlantic exercises were also planned to insure a high degree of readiness.

Air Force tactical strength in Europe on June 30, 1968, was assigned to USAFE's three air forces—the 3d in the United Kingdom, the 16th in Spain, and the 17th in Germany. USAFE completed the conversion to F-4 aircraft in November 1967. With this action, the tactical fighter force in USAFE consisted solely of F-4's and F-100's. The reconnaissance force was made up of RF-4C's and RF-101's. One MGM-13 MACE B surface-to-surface missile squadron remained in Germany.

Some progress was made in the Tab Vee program of balanced

active and passive base defense. A major step toward improving aircraft dispersal in Europe was taken in June 1968 with the awarding of contracts to reinforce the pavement on the dispersal bases. The pavement on these bases had been constructed in the 1950's for lightweight fighters and could not accommodate the much heavier aircraft currently in operation. Tab Vee plans for the future called for underground storage of aviation fuels and lubricants, improved runways and taxiways, aircraft dispersal, aircraft shelters, and security fencing.

A substantial portion of the USAF general purpose forces continued to be located in the Pacific areas. Under PACAF control were the 7th Air Force in South Vietnam; the 5th Air Force in Japan, Korea, and Okinawa; and the 13th Air Force in the Philippines, Thailand, and Taiwan. During the year eight F-4D squadrons were deployed to the Pacific to replace F-4C, F-105, F-104, and F-100 units.

The North Korean seizure of the U.S.S. *Pueblo* placed unexpected demands on the general purpose forces. Tactical fighter squadrons, a tactical reconnaissance unit, a TEWS detachment, and a tactical air control center, plus elements of a tactical air control system, moved swiftly into Korea from PACAF installations and from bases in the United States. F-4's and F-105's provided fighter support, RF-4C's undertook the reconnaissance responsibilities, and EB-66's were prepared to assist the strike and reconnaissance forces with electronic countermeasure protection against enemy radar-controlled weapons in the event of hostilities. The Air Force first used bases at Kimpo, Suwon, Osan, and Kunsan. Later, to reduce base congestion and vulnerability, it moved the aircraft from Kimpo, relocating the fighters to Taegu and Kwangju in Korea and the RF-4's and EB-66's to Itazuke AB, Japan.

Three squadrons of TAC's 4th Tactical Fighter Wing at Seymour-Johnson AFB, N.C., successfully deployed to Korea as integral, self-sustaining units. TAC had reorganized them under a decentralized maintenance concept in the spring of 1967; six additional tactical fighter wings were undergoing similar reorganization a year later. The elimination of nonproductive weight and bulk from mobile equipment and portable shelters enabled a number of tactical units to move quickly and efficiently to bare or austere bases in Korea.

Tactical Exercises

The demands of Southeast Asia limited Air Force participation

in joint training exercises. The Vietnamese conflict, however, showed how past exercises had improved Air Force ability to support the Army in battle.

The joint Army-Air Force Exercise LARGE PLAY took place in Europe on September 20-26, 1967. USAFE units provided close air and reconnaissance support to the U.S. Seventh Army in the largest and most thoroughgoing test of Army-Air Force teamwork undertaken by American forces on the continent since World War II.

Between October 2-8, 1967, USAF units participated in the annual NATO field training exercise, DEEP FURROW-67. The exercise involved Turkish and American paratroops, the air forces of both countries, and the U.S. Sixth Fleet. TAC's 19th Air Force furnished an air force headquarters, the ANG's 140th Tactical Fighter Wing sent 12 F-100's, SAC provided aerial refueling, and MAC augmented the task force deployment with C-133's and C-141's. An airmobile combat communication unit from MacDill AFB, Fla., provided communication support. The airborne operation took place in the vicinity of Mersifon in north central Turkey.

In December 1967 the 507th Tactical Control Group participated in GAMECOCK FIVE in conjunction with an Army airborne exercise. One of the group's squadrons deployed from Eglin AFB, Fla., to a position near Myrtle Beach AFB, S.C., and established a control and reporting post. At the same time, an element from another squadron deployed from Myrtle Beach to Roanoke Rapids, N.C., and set up a forward air control post. From these points and two units controlled aircraft from Myrtle Beach and Shaw AFB's, S.C., and Seymour-Johnson AFB, N.C.

During fiscal year 1968, the ANG's F-100's flew 970 hours and its KC-97's 600 hours in three JCS-directed exercises—one in Alaska, one in Hawaii, and the NATO exercise in Turkey. In GUARD STRIKE, a joint Army-ANG exercise in July 1967, approximately 9,000 ANG personnel from 30 states flew over 2,500 sorties, logging 4,645 flying hours. On May 1, 1968, ANG personnel, using their 15-day active duty tours, completed 1 year of refueling operations in Europe. This helped to meet USAFE aerial refueling requirements. Through June 30, 1968, these volunteers had delivered over two million gallons of fuel in 8,500 hookups.

Tactical Aircraft Production

The Air Force received the last of its F-4D's in April 1968. The F-4E, which entered the inventory in October 1967, in-

corporates a more powerful engine, an internally mounted 20-mm. Gatling gun, and a miniaturized radar system for better detection of low-flying aircraft. By June 30, 1968, the Air Force had accepted 146 F-4E's—3 aircraft ahead of schedule. The RF-4C procurement program remained on schedule, with the 362nd plane delivered by the end of the fiscal year.

In July 1967 TAC accepted the first F-111A's for testing and training at Nellis AFB, Nev. In October 1967—58 months after the start of development and 34 months after the first flight—the Air Force received its first operational F-111A; 23 more followed in the next 7 months.

The planned rate of F-111 production for the coming year was reduced to allow a more orderly phase-in of the F-111D with its superior avionic equipment. The British Government canceled its order for 50 F-111K's. The F-111C program for the Royal Australian Air Force continued on schedule.

By February 1968 an F-111 detachment completed required testing and training and on March 15, 1968, went to Southeast Asia with six aircraft, 11 crews, and support personnel. Combat results were very encouraging (see ch. VII).

The first flight of an F-111 test-bed incorporating reconnaissance equipment occurred on December 17, 1967. The first production model of the reconnaissance version, the RF-111D, was planned for mid-1971, with deliveries based on availability of the advanced avionic system.

In August 1967 the Office of the Secretary of Defense approved procurement of the A-7D, and the Air Force let a production contract in December. Among the major differences from the Navy A-7 versions were the TF-41 turbofan engine, a 20-mm. Gatling gun, and weapons delivery equipment. Two A-7D's, equipped with Navy TF-30 engines and without avionics, were accepted in April 1968 for initial flight testing. The A-7D is designed to provide better close support with its large load-carrying capacity, long range or increased loiter time, and high bombing accuracy. Additionally, the A-7D will be well suited for interdiction missions in areas of limited enemy air defenses.

A squadron of A-37A's was deployed to Southeast Asia for combat evaluation. The aircraft proved to be versatile, easily maintained, and requiring minimum training to upgrade qualified jet fighter pilots. In May 1968 the Air Force accepted the first production A-37B, a model that has a more powerful engine and can be refueled in flight.

In December 1966 the Air Force had ordered 145 O-2A's for

forward air control (FAC) and 31 O-2B's for psychological warfare. The O-2A order had subsequently been enlarged by 47 on June 30, 1967. Faced with increasing demands in Vietnam for FAC aircraft, the Air Force procured an additional 154 O-2A's from current funds with the option for 52 more—deliveries to begin in January 1969—and expected to purchase another 69 with fiscal year 1969 funds. This would provide continuous delivery of aircraft through December 1969 and a total of 467 O-2A's and 31 O-2B's.

The first OV-10 aircraft was accepted on September 29, 1967. Designed to serve as a replacement for the O-1, the OV-10 is a rugged, two-place, twin-engine, turboprop airplane, armed with four M-60 machineguns. The Special Air Warfare Center at Eglin AFB, Fla., received its first OV-10 in February 1968 and the following month began operational testing and evaluation in conjunction with training. By the end of the fiscal year the Air Force had accepted 36 OV-10's.

On February 2, 1968, the Air Force approved modification of C-119G and C-119K transport aircraft as gunships to augment the AC-47's which performed so successfully in Southeast Asia. The new gunships would have improved sensors and greatly increased firepower and endurance. The G model carried four 6,000-rounds-per-minute miniguns and the K model four miniguns and two 20-mm. Gatling guns. By June 30, 1968, the first AC-119G had been modified and was undergoing testing. Additionally, the C-130 gunship underwent a 4-month combat evaluation in Vietnam, and the Air Force recommended modification of more C-130's.

Tactical Missiles

Procurement of the AIM-7E SPARROW (a nonnuclear, air-to-air, radar-guided missile carried by F-4's) was increased to meet Southeast Asia requirements. In June 1968 the Air Force selected a contractor to proceed with development of the AGM-65A MAVERICK nonnuclear, air-to-ground missile. The contract called for a 3½-year development program and contained options for procurement of up to 17,000 missiles. The Air Force planned to use the MAVERICK with the F-111, A-7, and F-4 aircraft against such targets as armored vehicles, tanks, and buildings.

Tactical Command and Control

The first phase of an improved 407L Tactical Air Control System (TACS), begun in fiscal year 1965, was virtually com-

pleted during the year. The TACS provides mobile communications, electronic equipment, and operating facilities for the coordination and control of air forces deployed overseas, as well as communication and air traffic control facilities for operating contingency air bases. All the equipment is mobile, making it possible to select the type and amount of communication gear required to meet any level of conflict. By June 30, 1968, delivery was completed on all mobile radio centrals, ultra high frequency radios, forward air control post communication and operation shelters, and the first increment of tropospheric scatter radios. The control towers, 3-D radars, switchboards for the operation centers, and the operation centers themselves were undergoing prototype testing. Contracts were awarded for the communication complex, the high frequency single side-band radio, and gas turbine generators.

Experience in Southeast Asia demonstrated the need for aircraft from which tactical air strikes can be controlled. Forward air controller and strike control and reconnaissance (SCAR) aircraft seek out targets and provide an important part of the tactical air control system. A third airborne element of this tactical air control system is the helicopter, which provides mobility for ground-based elements of the system such as radars, control centers, and communication gear. In December 1967 the Air Force began evaluation of a portable radio for combat control teams and forward air controllers. The radio was 27 pounds lighter and one-seventh the size of the radio in current use, yet it provided twice as many communication channels and required one-tenth the power.

Special Air Warfare

The Special Air Warfare Center at Eglin AFB, Fla., began its seventh year of operations in April 1968. During the fiscal year the center readied 17,083 USAF personnel for duty in Southeast Asia in addition to training students from a number of developing nations in special air warfare skills.

The introduction of the A-37 and the O-2 during the fiscal year marked a major step in the modernization of SAW aircraft. Modernization was expected to continue in the coming year with the acquisition of AC-119 and AC-130 gunship units and two squadrons of helicopters. Additionally, the Secretary of Defense approved a sizable increase in the total force structure.

Civic action received attention equal to that given combat operations in SAW activities. In training foreign students, Air

Force personnel emphasized the need for civic action in nation-building. The 1st Air Commando Wing at England AFB, La., worked closely with the Department of Agriculture on techniques for eradicating the screwworm fly. The Air Force also dropped sterile male flies over areas of Nicaragua and Panama infested by the Mediterranean fruit fly.

V. Airlift Forces

The military airlift forces continued to support the worldwide operations of the Department of Defense and provided the capabilities to respond to multiple crises and conflicts. The Military Airlift Command (MAC) trained, equipped, and operated the strategic airlift forces, operated bases, and maintained an airlift command and control system. Its strategic airlift responsibilities were divided between the 21st Air Force, McGuire AFB, N.J., and the 22nd Air Force, Travis AFB, Calif. These air forces operated 432 aircraft, including C-124's, C-130's, C-133's, and C-141's. Certain specialized airlift functions were done by the 89th Military Airlift Wing, Special Missions, Andrews AFB, Md., the 443d Military Airlift Wing, Training, Tinker AFB, Okla., and the 1405th Aeromedical Transport Wing, Scott AFB, Ill.

Tactical airlift remained the responsibility of the Tactical Air Command (TAC) and the oversea theater commands. The reassignment of MAC C-130's to TAC provided attrition replacements and some expansion of the tactical airlift force. TAC operated 459 transport aircraft, including C-7A's and C-130's.

Early in 1968 the Air Force inaugurated the "associate unit" program, a new concept of training and utilizing reservists. On March 25, a C-119 unit, the 944th Tactical Airlift Group (Reserve), March AFB, Calif., was inactivated. On the same day, the 944th Military Airlift Group (Associate) was activated—without equipment—at Norton AFB, Calif., and began using the facilities and equipment of MAC's 63d Military Airlift Wing for training. Since the 63d Wing used the C-141, reservists received flying and maintenance training in one of the Air Force's newest transports. Thus, MAC not only continued to receive vital support but, equally important, the Reserve forces became increasingly capable of operating modern jets rather than outmoded piston-powered aircraft. The Air Force planned to inactivate four other C-119 tactical airlift groups and transfer the personnel into the C-141 associate unit program during the coming fiscal year.

The Air Force transferred eight C-130's to the Air Force Reserve (AFRes) and in March 1968 the Reserve forces assumed

the C-130 transition training unit mission. The 446th Tactical Airlift Wing (Reserve), Ellington AFB, Tex., began training aircrews for both the active and reserve forces.

Operations

Previous airlift records were surpassed in fiscal year 1968 as MAC, augmented by its reserve forces and civil air carriers, transported over 3.1 million passengers and 679,079 tons of cargo. These achievements represented workload increases of 27 percent for passenger movements and 13 percent cargo tonnage over fiscal year 1967. The requirements of the war in Southeast Asia and the Korean buildup contributed heavily to this workload.

In December 1967, the Air Force completed Operation EAGLE THRUST, the largest single aerial movement of combat troops in the Vietnam war. Flying 413 C-141 and C-133 sorties, MAC moved 10,024 soldiers and 5,357 tons of equipment belonging to the Army's 101st Airborne Division from Fort Campbell, Ky., to Bien Hoa AB, Vietnam, in 42 days. By assuming full emergency status MAC could have completed the operation in 21½ days. TAC C-130's flew 3,250 hours during EAGLE THRUST, to meet part of MAC's airlift commitments in Southeast Asia and Europe, allowing MAC to use its larger and faster C-141's for Vietnam troop deployment. By combining the airlift capability of the two commands, the Air Force was able to handle this extra workload and still conduct normal airlift and training.

The U.S.S. *Pueblo* crisis, and the resulting buildup of forces and materiel in South Korea, again proved the ability of the strategic and tactical airlift forces to perform their mission. Between January 23 and March 31, 1968, the aerial ports in South Korea handled 2,029 aircraft and 31,725 tons of cargo. MAC, TAC, and PACAF units contributed to the success of this airlift, with AFRes augmenting MAC. In January 1968 seven reserve airlift units (two wings and five groups) were activated and assigned to MAC. A second mobilization on May 13, 1968, placed three aerial port squadrons, one medical service squadron, one aeromedical evacuation squadron of the AFRes, and one aeromedical airlift group of the ANG within the MAC system. In addition, 23 ANG and 15 AFRes airlift groups not mobilized provided voluntary worldwide assistance to the over-all airlift effort.

The volume of airlift throughout the year placed a heavy burden on Air Force facilities in the United States and overseas.

To relieve this pressure at the most crowded overseas airfields, MAC spaced its deliveries and expanded the use of supplemental forward area air bases. At the same time, the development of multiple aerial ports of embarkation—made possible by long-range aircraft—helped relieve congestion in the United States.

On November 15, 1967, MAC aircraft departed Dover AFB, Del., for Da Nang AB, establishing a new route to Vietnam. In January 1968 MAC military and civil contract carriers began direct cargo missions from Dover to Phu Cat AB, Vietnam. Previously, cargo from the east coast of the United States destined for Phu Cat was transported to Travis AFB, Calif., prior to the flight across the Pacific. On January 15, 1968, the Air Force established Tinker AFB, Okla., as a MAC cargo aerial port on a 1-year test basis and scheduled regular flights to Guam and to Udorn, Korat, and U-Tapao AB's in Thailand.

The use of airlift to deploy and resupply forces overseas resulted in a large number of MAC aircraft returning to the United States partially loaded. In response to an Air Force request, OSD approved an 18-month evaluation of a tariff rate equal to 10 percent of the MAC common-user rate for all Services to move cargo from the Western Pacific to the United States. The Air Force interim report on March 20, 1968, recommended that these reduced rates on return cargo be adopted permanently throughout the world because (1) aircraft utilization had increased; (2) cargo movement to the United States had increased an average of 5,700 tons per month over 1966; and (3) the impact on facilities and workloads of the air terminals—with the exception of Southeast Asia—had been negligible. On June 19, 1968, OSD directed that the system be adopted worldwide.

In late fiscal year 1968 daily courier service between Dover AFB and Southeast Asia was established. MAC moved courier materiel from Dover to Anchorage AFB, Alaska, then to Yokota AB, Japan, and Saigon, Vietnam. Transit time dropped from 5 days to 48 hours and the cost per pound from 56.3 cents to 44.6 cents. Annual savings were significant since approximately 26,000 pounds were shipped weekly to Southeast Asia and some 19,000 pounds returned to the United States.

Both MAC and TAC airlift units participated in a number of joint airborne assault training exercises. TAC's 316th Tactical Airlift Wing deployed more than 300 personnel and 13 C-130E transports to Greece in September 1967 as part of SUNSHINE EXPRESS, a NATO exercise. Aircraft and crews from the

464th Tactical Airlift Wing, Pope AFB, N.C., and the 516th Tactical Airlift Wing, Dyess AFB, Tex., then on 90-day rotational duty in England, assisted them. At the same time, the U.S. Strike Command was conducting a joint airborne assault training exercise—BOLD SHOT 2-68—in four southwestern states. Thirty C-130's and C-141's participated in the parachute assaults on Fort Carson, Colo., and air-landing assaults on Fort Huachuca, Ariz., and Cannon AFB, N. Mex. A 4-day follow-on exercise, BOLD SHOT 3-68, in northern Florida during January 1968 included a mass airborne assault by some 800 paratroopers, jumping from C-130 transports. To improve the combat readiness of U.S. Army paratrooper units in Europe, the Joint Chiefs of Staff authorized the use of C-141's for airdrops. The first joint airborne training missions utilizing this aircraft took place on April 1-3, 1968, at Mannheim, Germany.

Twenty-three commercial airlines, operating under MAC contracts, carried about 29 percent of all cargo and approximately 93 percent of all passengers in worldwide movements. The cost, \$691.4 million, was only 1 percent higher than the fiscal year 1967 figure of \$684.9 million. Three-fourths of these funds went for operations in the Pacific area. During negotiations on the fiscal year 1968 contracts the Air Force had asked the airlines to submit data on past costs, projected cost estimates, and profit. This information helped determine the amount of business each carrier would receive and served to lower unit cost. The Civil Aeronautics Board established roundtrip rates for jet aircraft at 1.75 cents per passenger-mile and one-way cargo rates at 14.05 cents per ton-mile, decreasing passenger fares on intercontinental jets by 7 percent and cargo rates by 16 percent. Under fiscal year 1967 rates costs would have been approximately \$50 million higher.

The Air Force aeromedical evacuation system moved 295,878 patients during fiscal year 1968—250,631 intratheater and 45,247 intertheater. Intratheater aeromedical evacuation transported 62,291 within the United States, 169,168 in the Pacific theater, and 19,172 in USAFE. Intertheater movements carried 42,398 patients across the Pacific and 2,849 across the Atlantic.

The Air Force continued to emphasize the need for speed in aeromedical airlift. In August 1967, a C-141 aeromedical evacuation flight from Da Nang AB, Vietnam, to the United States was added, bringing to 17 the weekly number of these flights from Southeast Asia. This particular flight departs Da Nang, stops at Clark AB, the Philippines, Andersen AFB, Guam, and

Hickam AFB, Hawaii, and arrives at Travis AFB only 15½ hours later.

The ANG and the AFRes played an active role in aeromedical evacuation. During the year AFRes personnel airlifted 10,392 patients in 391 flights between both the European and Pacific areas and the United States and between various points within the United States. ANG crews flew 386 missions, transporting 3,308 patients within the United States, and between the United States and Alaska, Puerto Rico, Cuba, Bermuda, Labrador, Newfoundland, and the Canal Zone. To increase ANG capability, the Air Force decided to convert the mission of three ANG airlift units—each with eight C-121's—to aeromedical evacuation in July 1968.

The following data reflects the changes during fiscal year 1968 in commercial and military activities of MAC cargo, mail, and passenger services from the previous year.

Force Modernization

Larger, faster transports have increased strategic airlift capability by 270 percent since 1961. Measured in ton-miles, this capability will more than double between 1968 and the time the last C-5A enters the inventory. Improved airlift permits more effective use of military power at less cost. A military force can be centrally located in readiness for a variety of contingencies. The balance of payments can also benefit because reductions can be made in the numbers of troops stationed overseas in peacetime.

Air Force plans called for a strategic airlift force of 14 C-141 and six C-5A squadrons in the 1970's. The last of 284 C-141's was delivered to the Air Force in February 1968 and the 14 squadrons were all operational by the end of the fiscal year. All units, however, were not scheduled to operate at their full rate of 8 hours per day until December 1968. In June 1968 the C-141 fleet completed its one millionth flying hour—just 54 months after the aircraft began flying operationally.

On October 12, 1967, the Federal Aviation Administration (FAA) certified the all-weather landing system (AWLS) for the C-141. Developed jointly by the Air Force Systems Command and FAA, the AWLS increased the C-141's ability to make "pin-point" landings in bad weather. The system can bring the 145-foot long, 316,000-pound C-141 in for a landing within 12 feet of the center line of the runway and within 300 feet of a predetermined touchdown point.

TON MILES FLOWN (CHANNEL TRAFFIC)

[In millions]

	Passengers			Cargo-Mail			Totals		
	1967	1968	% Change	1967	1968	% Change	1967	1968	% Change
Military	92.4	103.1	11.6	1,850.5	2,724.5	47.2	1,942.9	2,827.6	45.5
Commercial	1,011.3	1,410.5	39.5	1,173.9	1,013.4	-13.7	2,185.2	2,423.9	10.9
Total	1,103.7	1,513.6	37.1	3,024.4	3,737.9	23.6	4,128.1	5,251.5	27.2

TONS CARRIED (SPACE ASSIGNED CHANNEL TRAFFIC)

[In thousands]

	Passengers			Cargo-Mail			Totals		
	1967	1968	% Change	1967	1968	% Change	1967	1968	% Change
Military	21.6	24.2	12.0	397.3	516.0	29.9	418.9	540.2	29.0
Commercial	214.3	275.8	28.7	201.9	163.1	-19.2	416.2	438.9	5.5
Total	235.9	300.0	27.2	599.2	679.1	13.3	835.0	979.1	17.3

The design, development, and manufacture of the C-5A, which made its first flight on June 30, 1968, proceeded on schedule. The world's largest airplane, with a gross weight of 728,000 pounds, the subsonic C-5A, is powered by four TF-39 turbofan engines. The first C-5A's will be assigned to Altus AFB, Okla., for crew training. Operational squadrons will be located at Charleston AFB, S.C., Dover AFB, Del., and Travis AFB, Calif. The C-5A will be able to transport heavy items, such as tanks and helicopters and the men who will operate them, from bases in the United States to semiprepared forward airfields in the theater of operations.

In November 1967 the Air Force's last C-135 airlift squadron completed its final mission. After 6 years of operation and a record of 130,000 accident-free flying hours, the Air Force inactivated the 40th Military Airlift Squadron at McGuire AFB, N.J., transferring eight of the unit's remaining aircraft to the Air Force Systems Command and two to the 89th Military Airlift Wing. Aircrew members entered C-141 transitional training.

Many tactical airlift aircraft—C-7's, C-123's, C-124's, and C-130's—required extensive repair and modification to continue to remain operational for an extended period. The strain of assault landings and heavy loads plus combat attrition in Southeast Asia reduced the life span of these planes. Consequently, the Air Force recommended acquisition of a new tactical transport. The aircraft's capabilities would include a speed of approximately 350 knots, a combat radius of at least 250 nautical miles, the ability to carry a 2½-ton truck and accommodate a payload between that of the C-130 and the C-124, plus the ability to make either vertical or short takeoffs and landings.

After C-130 combat losses increased from an annual rate of 11 to 24, immediate procurement of 18 C-130E's, plus 18 more in fiscal year 1969, was authorized.

In August 1967 the Air Force contracted to buy eight C-9A (formerly CX-2) medium-sized, twin-engine, jet aircraft to replace the C-118's and C-131's engaged in domestic aeromedical evacuation. Four additional aircraft were ordered in April 1968. A modified version of the commercial DC-9, the C-9A is designed to carry 30 litter patients or 40 ambulatory patients, or a combination of the two. The first aircraft was scheduled for delivery in August 1968, with one to follow each month thereafter.

The number of aircraft in the Civil Reserve Air Fleet (CRAF) increased during fiscal year 1968 from 396 to 414, of which

359 were allocated for international flights. For the first time all were jet-powered. Despite a reduction of three cargo-carrying planes, CRAF's international cargo capability increased by 54.9 million ton-miles. The addition of 38 passenger-carrying aircraft increased passenger-miles by 34 percent, from 1,256.4 million to 1,682.1 million. The number of aircraft allocated to the domestic CRAF fell from 72 to 55, but cargo ton-mile capability rose from 44.8 million to 47.7 million because of the reduction in piston-powered aircraft and the introduction of jet equipment.

Other Airlift Support

Air Force airlift units around the world participated in a number of activities not directly associated with their military mission. They flew in support of scientific projects, carried relief supplies to survivors of earthquakes, floods, and fires, and airlifted troops to quell civil disturbances.

In Operation DEEP FREEZE, the scientific exploration of Antarctica, now in its thirteenth year, MAC transport and contract carriers joined Navy, Coast Guard, and Army forces in providing supplies and transportation for civilian scientists working under the National Science Foundation's Antarctic research program. In support of the International Glaciological Expedition's study of the Greenland Ice Cap, the Alaskan Air Command in April 1968 moved 37 men and 10 tons of cargo from Sondrestrom AB, Greenland, to Dye II—300 miles inland.

On several occasions the Air Force helped to mitigate the disruptions caused by natural disasters within the United States. After flood waters engulfed Fairbanks, Alaska, and the surrounding countryside in August 1967, USAF helicopters immediately set to work lifting stranded inhabitants to safety. AAC C-130's flew 136 sorties to airlift over 750 tons of medical supplies, food, and equipment into the disaster area, while MAC C-141's and C-130's flew 25 sorties carrying 100 tons. As the flood waters receded, a PRIME BEEF (Base Engineering Emergency Forces) civil engineering team of electricians, plumbers, and steam fitters was airlifted from McChord AFB, Wash., to Eielson AFB, Alaska, to help rehabilitate the city. In December 1967 AFRes tactical airlift units, in conjunction with units from the active force, flew 1,331 sorties to rescue about 370 persons and deliver 221 tons of food and medical supplies to snowbound Indian communities in Arizona and New Mexico. Four aircraft relieved the isolation of Tuba City, Ariz., with an airdrop of

10,000 gallons of fuel, a communication jeep, and a control team. The Air Force also delivered six snowplows and 20 snowmobiles to Kirtland AFB, N. Mex., to speed the clearing of roads. On December 22, 1967, 26 AFRes C-119's flew 161 sorties, dropping 858 tons of hay to starving cattle in the area.

Overseas, two TAC C-130's delivered 12 tons of tents and medical supplies to La Paz and Cochabamba, Bolivia, to assist the thousands left homeless by floods which devastated the central part of the country. In August 1967 the Puerto Rico Air National Guard flew four mercy missions, carrying food, clothing, and medicine for relief of Venezuelan earthquake victims. The outbreak of fighting in the Congo during the summer of 1967 disrupted normal transportation and left areas of the country without food. At the request of the Congolese Government, the Air Force sent three C-130's to deliver emergency foodstuffs and general cargo. In addition, one C-130 assisted the International Red Cross in evacuating 330 people from Kisanga to safety. An airlift force of C-124 and C-130 aircraft, organized by USAFE in January 1968, delivered 423,054 pounds of food, tents, blankets, medical supplies, and other essential items to victims of an earthquake in Sicily. In April 1968 USAF C-130's airlifted nearly 900,000 pounds of food to starving people in the drought-stricken Loja Province in Ecuador. After severe flooding in southeastern Ethiopia a MAC C-141 on a routine flight made five flights into the area on May 14, 1968, delivering 88.5 tons of food and relief material.

Airlift requirements were levied on the Air Force as a result of civil disturbances in the United States during the summer of 1967 and the spring of 1968. Between July 24 and July 26, 1967, USAF transports made 327 flights into Selfridge AFB, Mich., in connection with the Detroit riot. These aircraft transported two Army battalions totaling 6,285 people and 2,041 tons of cargo. During the civil disturbances of April 1968 MAC in 8 days transported nearly 8,500 troops and 2,290 tons of equipment to the troubled cities.

On June 8, 1968, the Department of Defense made the Secretary of the Air Force responsible for directing all airlift resources used during civil disturbances. Consequently, the Air Force established a Civil Disturbance Airlift Center within the Air Force Command Post. The center began round-the-clock operation on June 18, 1968, and continues as an adjunct to the Air Force Battle Staff during periods of crisis.

VI. Specialized Forces

The Air Force has five specialized organizations to perform photographic, photomapping, rescue and recovery, weather, and communication functions. Four of these organizations—the Aerospace Audio-Visual Service (AAVS), the 1370th Photo Mapping Wing, the Aerospace Rescue and Recovery Service (ARRS), and the Air Weather Service (AWS)—are part of the Military Airlift Command (MAC). The fifth—the Air Force Communications Service (AFCS)—is a separate command reporting directly to the Chief of Staff, U.S. Air Force.

Audio-Visual and Photomapping Services

During June 1968 Headquarters AAVS moved to Norton AFB, Calif., as a result of the transfer of Orlando AFB, Fla., to the Department of the Navy. The Air Force planned to consolidate four major AAVS functions in the United States by moving the 1365th Photo Squadron from Orlando AFB, the 1356th Film Library Squadron from St. Louis, Mo., the 1350th Motion Picture Squadron from Wright-Patterson AFB, Ohio, and the 1352nd Photographic Group from Lookout Mountain AFS, Calif., to Norton. However, delays in facility construction at the California base forced postponement of these moves until fiscal year 1969.

AAVS controlled 34 units at 30 permanent locations and many temporary sites around the world. It retained responsibility for Air Force motion picture production, distribution and storage, documentary and instrumentation photography, commercial motion picture production contracting, television film production, and video-tape recording. In addition, since December 1965 AAVS has been responsible for all Air Force combat photography in Southeast Asia.

The 1370th Photo Mapping Wing sent a team with three RC-130 aircraft to Southeast Asia to provide aerial mapping services for a specific project. Subsequently, the Air Force expanded the assignment to include photomapping all of the Republic of Vietnam. The 1370th established a geodetic network using both aerial electronic surveying and stellar camera satel-

lite observation techniques to provide a basis for control of the photography.

Using photographs provided by U.S. Lunar Orbiter I through IV and Russia's Zond III, the Air Force's Aeronautical Chart and Information Center compiled the first extensive chart of the far side of the moon, picturing more than 75 percent of the area not visible from the earth.

Rescue and Recovery

Headquarters ARRS also left Orlando AFB in June 1968, relocating at Scott AFB, Ill. ARRS operations included four broad fields of activity—combat aircrew recovery, long-range search and rescue, support of manned and unmanned space flights, and local base rescue. ARRS operated and maintained 16 aerospace rescue and recovery squadrons with about 120 aircraft—HC-130's, HU-16's, HH-3's, HH-53's—and had, in addition, approximately 145 HH-43 aircraft assigned to small detachments on bases in the United States, Guam, the Panama Canal Zone, and 18 foreign countries.

The 3d ARR Group and its three squadrons were responsible for rescue and recovery activities in Vietnam. The Joint Search and Rescue Center (JSARC) at Tan Son Nhut AB coordinated and controlled the search and rescue (SAR) forces of the United States and its allies in that country. An Army liaison officer, assigned to the JSARC, coordinated Army search and recovery requirements and maintained direct communication with naval units in South Vietnam. When directed by the JSARC, HC-130P's controlled airborne SAR missions since the extensive communication systems on these aircraft enabled them to communicate with all aircraft involved in the mission—the rescue aircraft, escort aircraft, tactical fighters, and/or gunships. ARRS rescued or recovered 765 aircrew and 1,080 ground personnel in Southeast Asia between December 1, 1964, and June 30, 1968. In this same period, ARRS rescued or recovered 834 people in other areas of the world.

ARRS flew many missions not directly related to the combat situation. On July 29, 1967, a control aircraft reported that the aircraft carrier U.S.S. *Forrestal* was on fire in the Gulf of Tonkin. The control aircraft immediately diverted to a position over the vessel, and within 1½ hours two HH-3E's arrived and began shuttling oxygen and fire-fighting equipment between the carrier U.S.S. *Oriskany* and the burning ship. The two rescue craft carried injured personnel and physicians throughout the night.

In December 1967 a Philippine ship foundered approximately 120 miles northeast of Luzon, P.I. Shortly thereafter an ARRS HC-130 located eight survivors and successfully dropped survival gear, which sustained them until they were picked up by a surface vessel.

In support of the space program, ARRS used large helicopters to render assistance in the event of an abort during the launch phase and HC-130's to insure rapid recovery of orbiting vehicles returning to earth. In light of anticipated increased activity in this area and in global search and rescue requirements, the Secretary of Defense approved procurement of additional HH-53 helicopters and HC-130 airplanes.

The AFRes rescue and recovery squadrons—two of which converted from HU-16 to HC-97 aircraft—played an important part in air rescue operations. In July 1967, for example, an AFRes unit airlifted a Greek seaman from a tanker near Grand Turk Island in the Atlantic and transported him to a hospital. In August 1967 a number of aircraft searched Lake Erie for 19 sky-divers who came down in the water. The AFRes rescue squadrons flew precautionary patrol missions 150 to 300 miles off the Atlantic and Pacific coasts during NORAD exercises, NASA operations, joint exercises, and no-notice operational readiness inspections. Altogether these units flew 1,523 hours on 259 missions in support of the Air Force and NASA.

One AFRes unit, the 305th Aerospace Rescue and Recovery Squadron, joined the active forces on January 26, 1968, in support of the buildup following the U.S.S. *Pueblo* incident.

The Civil Air Patrol (CAP) continued to make an important contribution to rescue and recovery. CAP aircraft flew about two-thirds of all air search and rescue flying hours within the continental United States and Alaska. In addition, CAP participated in a number of relief operations such as Operation HAYLIFT—the dropping of food to snowbound cattle—during the winter of 1967.

In October 1967 the Air Force withdrew the HU-16B amphibian from combat rescue operations. Since it began participation in the Vietnamese conflict, this aircraft had recovered 62 survivors from the Gulf of Tonkin and the South China Sea. Its replacement was the HH-3E helicopter. Already established as an overland rescue aircraft, the turbojet HH-3E was able to assume a similar role over water after being equipped with an aerial refueling system. In July 1967 the Air Force placed the

first HH-3E in precautionary patrol over the South China Sea, to serve pilots downed north of the 17th parallel.

In October 1967 the Air Force began flight-testing the HH-53B helicopter in Southeast Asia. About twice the size of the HH-3E, it has greater speed, ceiling, payload, and range. It can fly at approximately 160 knots, has armor plating and auxiliary fuel tanks, and can refuel in flight. In December 1967 the HH-53B performed its first operational rescue. Since that time, its crews have recovered 80 downed airmen. The Secretary of Defense and Congress have approved Air Force procurement of an advanced model—the HH-53C—to meet a requirement for 46 of the new helicopters through fiscal year 1969.

Weather

The 11,000 men and women of the Air Weather Service continued to support Air Force and Army operations around the world by providing specialized ground-based and airborne meteorological observations, forecasts, and climatological services. AWS had seven ground weather wings, one group, and 25 squadrons, plus one weather reconnaissance wing with six squadrons.

Army requirements for weather support have tripled during the past decade. In Southeast Asia weather units were attached to brigades, rather than divisions, during combat operations, and additional observing equipment was required as Army airfields in Southeast Asia increased during the fiscal year from four rather austere forward airstrips to 20 airdromes. AWS added 12 MMQ-2 observing vans and five WTR-1 short-range weather radar sets to provide the appropriate weather support.

The 1st Weather Group provided weather service in Southeast Asia. Approximately 6 percent, or 650, of AWS personnel were stationed in the area. Additional support to Southeast Asia operations and related deployments and redeployments was provided by AWS personnel at the Asian Weather Central at Fuchu AS, Japan, and the Air Force Global Weather Center at Offutt AFB, Neb. The weather stations on Guam, Okinawa, and the Philippines also supplied observations and forecasts.

The AWS weather reconnaissance fleet consisted of 24 WB-47's, 14 WC-130's, 10 WC-135's, 6 RB-57C's, and 16 RB-57F's. These aircraft flew 56,000 hours during the year, an increase of more than 5,000 hours over fiscal year 1967. Missions fell into two general categories—weather reconnaissance and aerial (nuclear) sampling—and were flown in and around Southeast

Asia, out of South America, over the North Pole, and in storm and aerial refueling areas over the Atlantic and Pacific Oceans.

The first of 86 FPS-77 storm detection sets to be sited around the world was installed at Dover AFB, Del., in July 1967. This new weather radar permits AWS meteorologists to detect and observe severe weather over a 200-mile range and at altitudes up to 80,000 feet. A unique feature of the set is its ability to retain a storm picture on the radar scope until the operator chooses to erase it. This permits the meteorologists to develop a continuous storm movement pattern over a 3- to 4-hour period.

Experiments in weather modification continued. AWS conducted a number of fog-dissipation tests during the winter and spring of 1967-68—dropping dry ice from aircraft, releasing liquid carbon dioxide and propane gas from the ground, and using the exhaust heat from C-141 aircraft. The last method was partially successful. Four C-141's were spaced at 750-foot intervals along the runway at Travis AFB, Calif. After the engines had run for 5 minutes, horizontal visibility was raised from one-quarter to three-quarters of a mile. However, the fog quickly resettled. The most dramatic results were obtained with dry ice. WC-130's dropped dry ice over Elmendorf AFB, Alaska, and in 25 to 37 occasions the fog lifted off the runway, allowing 91 landings and 94 takeoffs that otherwise could not have been made.

From mid-August to mid-October 1967, AWS personnel maintained a 48-hour alert at Ramey AFB, P.R., ready to seed storm clouds with silver iodide as part of the Department of Defense-Department of Commerce experimental hurricane seeding program. Air Force aircrews flying at altitudes between 1,000 and 40,000 feet observed and recorded conditions before and after seeding.

Communications

AFCS operated from nearly 700 sites around the world, providing communications, air traffic control services, and air navigational aids for Government and civilian agencies. AFCS devoted a large part of its effort to supporting combat forces in Southeast Asia. During the Korean buildup AFCS quickly deployed communication and air traffic control personnel and facilities from bases in the Pacific, and within days augmented them with personnel and facilities from the United States. At the same time the Air Force mobilized 17 ANG and AFRes

communication units and sent 164 members of these units, who possessed critical specialty skills, to Korea.

In February 1967 AFCS assumed responsibility for developing a field maintenance capability for the newly installed Univac 1050-II computers in Southeast Asia. The contractor had agreed to provide only initial support for those computers. By November 1967 enough technicians were trained to begin maintaining the machines on a phased basis, and by April 1968 AFCS was servicing all 14 computers in South Vietnam and Thailand, with backup support provided by the contractor. Training courses to insure that competent maintenance personnel would be available during contingencies or emergencies for the Univac 1050-II's in other overseas areas were scheduled to begin in 1969 on 24 bases in the United States.

The Air Force continued to supervise the expansion of the Automatic Digital Network (AUTODIN), a worldwide common-user message communication network, for the Department of Defense. On February 18, 1968, the AUTODIN automatic electronic switching center at Andrews AFB, Md., began transmission after a 16-month shutdown to increase its capacity from 100 to 300 lines. This action completed the expansion and improvement of the AUTODIN system in the continental United States. The original system contained five centers with a 550-line capacity. As of June 30, 1968, there were eight switching centers with nearly 2,700 lines. A ninth station was functioning in Hawaii.

AFCS began operation of new AUTODIN switching centers at Croughton, England; Clark AB, P.I.; Korat AB, Thailand; Camp Drake, Japan; and Wildwood, Alaska. These were the first of 11 overseas switching centers planned to provide a global capacity for handling 40 million punched cards daily or the equivalent of about 600 million words a day.

Other communications improvements included the completion of the European-Mediterranean Communications System, a 100-site, 6,000-mile network linking the Mediterranean with central Europe and the United States. In Southeast Asia, AFCS supervised the laying of a 500,000 circuit-mile multichannel coaxial voice and teletype submarine cable running along the coast from Da Nang AB, Vietnam, to Sattahip, Thailand, with terminals and relay points at Qui Nhon, Na Trang, Cam Ranh Bay, and Vung Tau in South Vietnam. All terminals were tied into the integrated wideband communication system operated by the Army, providing communications throughout Southeast Asia.

An existing 696-mile submarine cable joined South Vietnam to the Philippines.

With the acquisition of the Military Affiliate Radio System (MARS) facilities at 34 SAC bases in May 1968, AFCS assumed management of all 450 MARS stations in the Air Force. Besides backing up the full-time communication system the MARS stations contributed greatly to service morale. The 19 MARS stations in Southeast Asia completed more than 10,000 phone patches each month over the past year between servicemen and their families in the United States.

During fiscal year 1968 approximately 6,500 AFCS air traffic controllers handled more than 18 million takeoff and landing operations throughout the world. Since AFCS was activated on July 1, 1961, its controllers have saved over 1,000 aircraft, including more than 800 military aircraft valued in excess of \$1 billion. Approximately 3,000 persons were aboard these aircraft. During fiscal year 1968, 233 aircraft (193 military and 40 civilian) valued at \$259,632,002 and carrying 728 people were saved from accident.

VII. The U.S. Air Force in Vietnam

U.S. air operations in South Vietnam and North Vietnam contributed to the over-all allied objective of halting the attempt by the Hanoi Government to dominate the Republic of Vietnam. A wide variety of U.S. and allied aircraft furnished support for friendly ground troops in the South. In the North, U.S. air operations impeded infiltration and resupply and increased the cost of aggression.

The Air War Against the North

On March 31, 1968, to limit the conflict in Southeast Asia and encourage North Vietnam to negotiate, President Lyndon B. Johnson halted all bombing north of the 20th parallel. Until this decision, key military targets in North Vietnam had systematically been attacked by U.S. aircraft. Following the bombing limitation, air attacks were restricted to the "panhandle" area north of the demilitarized zone where the enemy threatened allied forward positions.

Since the beginning of the air war against the North, Air Force crews have tried to avoid civilian casualties by careful identification and bombing of targets. The targets selected were lines of communication, supply and storage areas, military installations, industrial facilities supporting the war, and ground, air, and naval sites. Air attacks created serious logistical and manpower problems for North Vietnam. They compelled the Hanoi Government to divert an estimated 500,000 civilian and military personnel to the repair of damaged lines of communication and thousands more to the manning of antiaircraft and other defenses.

The Air Force conducted numerous significant strikes against major enemy complexes or targets. The Thai Nguyen thermal plant, 38 miles north of Hanoi, was knocked out on July 6, 1967. In a deep penetration on August 13, strike aircraft bombed the Lang Son railroad yards, less than 10 miles from the border of Communist China. The airfield at Phuc Yen, 18 miles from Hanoi, was bombed for the first time on October 24. On November 17 pilots struck through heavy antiaircraft fire at Bac Mai air-

field near Hanoi. In mid-December, F-105's severely damaged the Paul Doumer highway and railroad bridge during one of the many strikes against this important target.

Although urban centers and the agrarian economy were not targets, the air war was costly to North Vietnam. Aircraft destroyed an estimated 68 percent of all important bridges, 77 percent of ammunition storage sites, and all iron and steel, explosive, and cement plants. The destruction of about 67 percent of its bulk petroleum storage forced North Vietnam to disperse that vital resource.

North Vietnam strengthened its massive defense network of anti-aircraft guns, surface-to-air missiles, and MIG aircraft. Nevertheless, USAF aircraft destroyed an estimated 37 percent of the airfields and 62 percent of the principal radar sites. In air-to-air combat, they downed 92 MIG's since the beginning of the air war, including 22 in fiscal year 1968.

The Air War in the South

The primary mission of the air war within South Vietnam was to assist ground commanders. Air operations consisted primarily of close air support missions directed by forward air controllers, radar-directed all-weather strikes, and B-52 saturation bombings. Airmen in the South faced small arms and automatic weapons fire, not the MIG aircraft and surface-to-air missiles encountered in the war against the North.

During the fiscal year, U.S. and allied forces repelled several serious attacks on U.S. airbases in South Vietnam. In the Tet holiday attacks beginning January 31, 1968, Viet Cong troops fired rockets at Tan Son Nhut and other bases throughout the country and tried to penetrate them. On February 6, Phu Cat AB was hit by Viet Cong mortar fire, and on May 5 Tan Son Nhut again came under attack.

Tactical Strikes

The steady increase in air support of ground troops was indicated by the rise in the number of USAF attack sorties—from more than 92,000 in fiscal year 1967 to more than 130,000 in fiscal 1968. The influence of the air war was also reflected in the enemy's increased inability to mass his ground troops, resulting in far more small unit actions.

The Air Force played a major role in many ground operations. During the 6 months of Operation FRANCIS MARION, which ended October 12, 1967, Air Force aircraft supported Army

personnel on search and destroy missions with 4,935 tactical strikes. In the defeat of the enemy at Dak To in November, 7th Air Force units undertook 2,096 strikes, dropping 500-pound bombs as close as 55 yards from friendly forces; 750-pound bombs, 78 yards; and 1,000-pound bombs, 132 yards.

In NIAGARA, which began January 19, 1968, and continued for 73 days, airpower played a key role in preventing more than 20,000 North Vietnamese regulars from overrunning the U.S. Marine outpost at Khe Sanh. During this siege, USAF aircraft alone expended nearly three-quarters of a million rounds of ammunition and more than 72,000 tons of bombs—12,500 from tactical aircraft and 59,500 from B-52's. Of a total of 27,650 sorties, USAF aircraft flew 15,235—fighter and attack, 9,691; B-52, 2,548; reconnaissance, 1,398; and forward air controller, 1,598. Naval aircraft flew 5,337 sorties and the Marines, 7,078.

The 7th Air Force commander controlled the Khe Sanh air operation with redesigned C-130's which were used as airborne battlefield command and control centers to augment the ground-based tactical air control system. Despite extremely poor visibility during much of the operation, pilots delivered ordnance with great effectiveness. The enemy operated from covered bunkers, but general purpose bombs designed for deep penetration killed hundreds of them. The air strikes set off approximately 7,000 secondary explosions and destroyed about 1,000 structures and 250 trucks. While air attacks decimated the enemy, tactical airlift supplied the ground forces.

B-52 Strikes

The tasks of the B-52's in Southeast Asia were area saturation, denial of sanctuary to the enemy, and interdiction. Since their first mission in June 1965, SAC bombers have dropped almost 650,000 tons of bombs in approximately 26,500 sorties. About a third of SAC's B-52 crews have participated in the Southeast Asian conflict. Crews of the B-52D, the conventional strike bomber, formed the cadre wings in Southeast Asia, but B-52E through H crews also rotated to the combat zone.

By basing part of the B-52 force at U-Tapao AB, Thailand, the time of missions was cut to less than half that of the 12-hour, 5,000-mile trip from Anderson AFB, Guam. Forward basing not only permitted a more rapid response but also reduced operating costs.

Modifications allowed the B-52's to carry as many as 33 tons of bombs in various combinations, depending on target and ter-

rain. B-52's operated effectively at night and in any weather, delivered large bomb tonnages quickly, and released fighters for other missions. At Khe Sanh the B-52's were particularly useful because, guided by ground-based radars, they could strike from above the monsoon clouds as close as 100 yards from the base perimeter.

B-52's struck at enemy base camps, supply points, and troop concentrations. Missions were normally assigned 24 hours in advance, but friendly troops could be supported within hours by the SAC alert force or by aircraft diverted from other targets. B-52 raids seriously hampered the enemy's efforts to mass large concentrations of men and supplies and had damaging psychological effects on his troops.

KC-135 Refueling

SAC KC-135 tankers refueled USAF jet bombers, fighters, and reconnaissance aircraft during deployment to Southeast Asia as well as during strike missions. Between August 1964 and June 30, 1968, they flew more than 65,000 sorties, transferring almost three billion pounds of fuel to about 273,000 aircraft—22,000 bombers and 251,000 fighters. Although some tankers had to abort, replacements were always available, and the force never missed a scheduled refueling. In addition, KC-135's have been credited with more than 80 "saves" of fighters by emergency refueling.

Organization and Force Structure

The 7th Air Force Commander, also Deputy Commander for Air and Air Force Component Commander of the Military Assistance Command, Vietnam (MACV), had virtually complete responsibility for the prosecution of the air war within South Vietnam and the extended battle area. He exercised operational control over all USAF units in South Vietnam and Thailand, plus units of the U.S. Marine Corps, the Vietnamese Air Force, and other free world air forces. He also coordinated U.S. Navy air operations within the MACV area of responsibility. SAC B-52's worked directly with MACV and his Deputy Commander for Air. Requests for strikes went from MACV to a small SAC unit in Saigon and then to the 3d Air Division which carried out the bombing missions.

While MACV was responsible for operations in South Vietnam and the southernmost area of North Vietnam, the Commander in Chief, Pacific (CINCPAC), who had over-all control, was chiefly responsible for the war against the North. Aircrews of the 7th

and 13th Air Forces carried on the war in the North together with Navy airmen.

Tactical and Special Aircraft

A variety of aircraft flew the different missions required in Southeast Asia. Primarily, it was the F-105's and F-4's which struck targets in North Vietnam and fought enemy MIG's. A-1's, B-57's, and A-26's were also used against the North, and they, along with the F-100 and F-4, supported friendly ground troops in South Vietnam as well.

ANG units deployed to South Vietnam were rapidly and effectively integrated into the active Air Force structure. Within 5 months after their mobilization in January 1968, four ANG F-100 squadrons were engaged in combat and, by June 30, 1968, two squadrons had each completed 1,000 combat missions.

Numerous special purpose aircraft also served in the South. The AC-47 gunship, used to counter small-scale night attacks, was a C-47 that carried forty-five 2-million candlepower flares and three side-firing 7.62-mm. miniguns, each capable of firing 6,000 rounds per minute. For psychological warfare, the U-10B could drop 60,000 leaflets; the O-2B, 200,000; and the C-47, 1 million. These aircraft also conducted loudspeaker broadcasts. UC-123's carried out aerial defoliation operations which stripped the jungle undergrowth that hid enemy troops and installations. For air rescue, the HH-3E and the HH-53B helicopters were the primary vehicles, with HC-130P's used as control aircraft.

The major new aircraft to enter combat in Southeast Asia was the swing-wing F-111A. In March 1968 six F-111's deployed to Tahkli AB, Thailand, for operations and combat evaluation. One week after their arrival the first combat missions were flown and the aircraft demonstrated that they could attack targets at low level in bad weather and darkness. Despite three accidents in Southeast Asia, the F-111A safety record compared favorably with that of other advanced fighters in their early operational stages. In May the aircraft were grounded following an F-111 accident at Nellis AFB, Nev., which revealed a deficiency in a flight control system component. It was corrected by June and the F-111A's were released for flight. At the close of the fiscal year the aircraft had not resumed combat operations.

In August an A-37 squadron arrived at Bien Hoa AB, Vietnam, for combat evaluation. A trainer modified for combat, this small twin jet is relatively easy to maintain, has a high sortie rate, and can bomb accurately. It demonstrated the effectiveness of a

simple ground-attack aircraft when U.S. forces have air superiority.

The Gunship II, a modified C-130A, and similarly equipped AC-119 gunships, were developed to supplement the AC-47 force in Southeast Asia. In December 1967, the test-bed AC-130 completed combat testing and evaluation in South Vietnam, where it proved highly effective in the interdiction role.

Reconnaissance and Electronic Warfare

The USAF reconnaissance force in Southeast Asia flew RF-4C's, RF-101's, RB-57's, and O-2A's. The number of RF-4C squadrons in Southeast Asia rose from three to four when one squadron deployed to Udorn AB, Thailand, in October 1967. At the same time an RF-101 squadron at Udorn was inactivated and its aircraft distributed to other units. The twin-engine O-2A airborne forward air controller (FAC) aircraft was a major contributor of visual information. About 70 percent of the 10,000 FAC sorties flown monthly gathered visual reconnaissance data.

The Air Force developed new techniques and procedures for transmitting reconnaissance information more rapidly to ground and air forces. In August 1967 WS-430B photographic processing and exploitation vans were set up in Southeast Asia to read film from reconnaissance aircraft as soon as they completed their missions.

The tactical electronic warfare support force consisted of EC-47 and EB-66 aircraft. These aircraft provided electronic warfare support for strike and reconnaissance forces in operations against North Vietnam and for ground forces in South Vietnam, as well as maintaining surveillance of the electronic environment.

Air Defense

An integrated force of Air Force fighter interceptors and Army and Marine surface-to-air missiles provided air defense for South Vietnam. The fighter interceptor units, F-102 detachments from Clark AB, P.I., rotated into the theater where they came under the operational control of the 7th Air Force. These F-102 pilots also flew combat air patrol for SAC B-52's.

An Air Defense Command EC-121 unit on temporary duty in Vietnam provided airborne early warning radar coverage for aircraft flying combat missions. Known as "College Eye," this unit assisted fighters in downing enemy MIG's, in rescuing downed pilots, and in emergency rendezvous of fighters with tankers.

Intratheater Airlift

As ground troops moved inland and northward away from coastal points, airlift sorties became proportionately longer. More intense ground action, bolder enemy tactics in late 1967, and the Tet offensive of early 1968 caused a rapid rise in airlift requirements. The 7th Air Force's 834th Air Division provided the tactical airlift which permitted ground troops to sustain combat operations without first securing the roads and other land lines of communication. The division's aerial port group had three squadrons serving at 42 widely dispersed locations. Its air commando wing had three C-123 squadrons at Phan Rang, a fourth at Tan Son Nhut, and the UC-123 defoliation squadron at Bien Hoa. Its tactical airlift wing had six C-7A squadrons, two each at Cam Ranh Bay, Phu Cat, and Vung Tau. The 834th flew more than 32,000 sorties monthly into fields that varied from dirt roads to concrete runways, delivering more than 100,000 tons of cargo and more than 300,000 passengers.

Three C-130 detachments of PACAF's 315th Air Division, under the operational control of the 834th while in South Vietnam, rotated in and out of the country, normally flying for 2 weeks and then returning to their home base for maintenance. By March 1968 the C-130's had delivered 2,000,000 tons of supplies in Vietnam and more than 4,300,000 passengers. They also rotated to Thailand where they averaged more than 7 flying hours per aircraft daily.

The importance of tactical airlift in Vietnam was reflected at Khe Sanh, where it served as a lifeline to the embattled troops. C-130's and C-123's delivered more than 12,400 tons of supplies and moved almost 3,400 troops in and out of the area. During the first month C-130's and C-123's landed men and supplies at a crude airfield. Some C-123's continued to land throughout the siege, but monsoon weather and intense enemy fire compelled C-130's to airdrop personnel and cargo. Using the container delivery system, C-130 aircraft were directed by radar to the runway, then used their own guidance equipment to navigate to drop-release positions. Delivery by low altitude parachute extraction systems also was highly effective.

Munitions

In August 1967, F-4D aircraft in Southeast Asia began carrying the WALLEYE, a Navy-developed air-to-surface glide weapon. Once the pilot locked on the target and released the weapon, he could leave the area while the weapon guided itself to the target.

The WALLEYE proved highly effective against such North Vietnamese targets as bridges, docks, powerplants, and storage caves.

In South Vietnam the Air Force used general purpose, high-explosive bombs to penetrate bunkers and caves, cluster bomb units against troops in the open, and BLU (bomb live unit) weapons against targets in the immediate vicinity of friendly troops. Other weapons used for close support were the 2.75-in. rocket, 20-mm. cannon, and 7.62-mm. minigun. Two new fuzes were put into combat use, the FMU-26 for general purpose bombs and the FMU-54 used with the MAU-91 retarding fin which improved the low-level delivery of 750-pound bombs. Extensive tests were performed to qualify the new military explosive, Minol II, for use in general purpose bombs.

Command and Control

The semiautomatic centralized 416P Southeast Asia Tactical Air Control System controlled USAF aircraft in combat. During November 1967 two tactical air control centers (TACC's) became operational. Connected to each other and to Headquarters, 7th Air Force, they were also scheduled to tie in with Navy and Marine centers. The two TACC's had the same equipment as ADC's backup interceptor control system in the continental United States.

On January 6, 1968, OSD approved Project Seek Data II, designed to improve the 416P capability for collecting, interpreting, and disseminating the information used by the 7th Air Force Commander to prepare operational orders and manage airlift. The Air Force installed a computer at Hickam AFB, Hawaii, in June 1968 to check out the system before proceeding with the planned installation at Tan Son Nhut in August.

For special operations, such as Khe Sanh, the Air Force used a C-130 airborne battlefield command and control center (ABCCC) as an extension of the TACC. Combining the functions of both a TACC and its direct air support center, the ABCCC allocated new targets for strike forces and forward air controllers and diverted strikes to more lucrative targets when necessary. In November an ABCCC controlled the firepower of Air Force and Marine aircraft, Marine artillery, and Navy shore bombardment in an operation designed to weaken North Vietnamese attempts to mount an artillery attack against Marine positions south of the demilitarized zone.

The 834th Air Division's Airlift Control Center controlled the air movement of cargo and passengers within South Vietnam.

Its 12 permanent and temporary airlift control elements acted as coordinating units for allied forces in areas needing Air Force airlift. The center also listed the current status of some 170 operational and 125 abandoned or unserviceable airstrips and fields. Tactical airlift liaison officers, with functions similar to those of forward air controllers, served with Army units to insure that the ground forces received necessary supplies as quickly as possible.

Air Bases

Funds appropriated during fiscal year 1968 for construction to support Southeast Asian operations brought the cumulative total to \$733 million. Of this sum, \$393 million was for essential operational facilities in Vietnam, \$236 million went for work in Thailand, and \$104 million furnished the logistical support facilities at 11 bases elsewhere (4 in the continental United States, 5 in the Western Pacific, and 1 each in Alaska and Hawaii).

Six PRIME BEEF teams performed specific tasks that base civil engineers could not do, such as crew quarter and revetment construction and plumbing and electrical work. The teams were on temporary duty since the uncertainties of warfare did not allow the scheduling of these projects long in advance.

USAF security police and sentry dogs protected people and equipment at air bases from North Vietnamese and Viet Cong infiltrators. Magnetic and seismic devices to detect intruders were put into use, as well as motion detection radars for surveillance at a greater distance. A combat test of a model police security squadron was conducted to determine requirements for security police during the 1970's. The first sentry dogs to be used in Thailand arrived at Ubon AB in April 1968.

Civic Action

Better living conditions in South Vietnam could remove one of the underlying causes of insurgency and gain support for the government. The U.S. civic action program tried to promote social and economic development and encouraged the Vietnamese armed forces to undertake similar activities. During a typical 3-month period the 7th Air Force constructed about 250 schools, hospitals, dams, and other buildings and facilities. It furnished 41,000 medical and dental treatments and physical examinations and 1,600 English classes for 31,000 students. In a unique civic action a C-130 airlifted two anesthetized elephants from Ban Don to

Chu Lai on April 1, 1968. A Marine helicopter then transported the elephants to Tra Bang, where they hauled logs for a sawmill operated by 400 Montagnards.

Allied Air Forces

U.S. Air Force efforts to strengthen the Vietnamese Air Force (VNAF) have resulted in significant achievements. The VNAF had one A-1 squadron and one T-28 squadron in 1961; by 1968 it had five tactical wings equipped with F-5's and A-1's, plus O-1 and U-17 light aircraft, C-47's, and UH-34 helicopters. The U.S. Air Force planned to supply the VNAF with A-37's, replace C-47's with C-119's, and convert some C-47's to gunships. The VNAF received its first C-119 in February 1968. The usefulness of assigning USAF advisory teams to VNAF units continued to be shown, particularly when new equipment was introduced. As VNAF elements became increasingly able to operate without assistance, the total number of USAF advisors was decreased—by 5 percent in 1967. The VNAF flew 14 percent of all attack sorties in South Vietnam during 1967.

The Royal Australian Air Force (RAAF) had three squadrons in Vietnam—No. 2 Squadron at Phan Rang, equipped with Canberras; No. 35, a C-7A transport squadron at Vung Tau; and No. 9, a UH-1 helicopter unit which provided direct support to Australian ground troops. These RAAF units were under the operational control of the U.S. 7th Air Force.

The Royal Thai Air Force Victory squadron, stationed at Tan Son Nhut, provided aircrews for USAF C-123's and VNAF C-47's. Joint Thai-U.S. aircrews carried men and equipment in and out of small airstrips in forward areas and furnished air-drops to Special Forces camps.

VIII. Manpower and Training

The war in Southeast Asia dominated manpower planning and adjustments during fiscal year 1968. Although the buildup in South Vietnam and Thailand continued, there was only a small increase in over-all military manpower strength, most of which resulted from the callup of several reserve units.

Manpower Strength

Active duty Air Force military personnel increased from 897,494 to 904,850 during fiscal year 1968, an increase of 7,386 as compared to a rise of 10,141 the previous year and 62,691 in fiscal year 1966. As of June 30, 1968, the Air Force had 139,691 officers and 765,159 airmen and cadets (an increase of 4,206 officers and 3,150 airmen during the year). Of these, 35,250 officers and 250,672 airmen were stationed overseas.

Air Reserve Forces personnel, which included the Air National Guard (ANG) and Air Force Reserve (AFRes), totaled 492,547 at the end of June 1968, a loss of about 2,130. The decrease resulted from the mobilizations of January and May 1968, during which approximately 2,158 officers and 13,484 airmen were recalled to active duty. The Ready Reserve dropped from 204,020 to 191,167—11,274 of the loss being in airmen. Standby strength also decreased—from 144,007 to 101,214, including a loss of 5,028 officers and 37,425 airmen. The Retired Reserve increased from 63,779 to 124,905. The ANG, all in the Ready Reserve, decreased from 83,758 to 75,261, again largely because of the active duty recall. Although 115,906 of the 417,286 AFRes officers and airmen were classified as Ready, only 43,659 were authorized pay for inactive duty training.

The number of civilians directly hired by the Air Force decreased to 322,661 as compared to 328,711 at the end of June 1967. The June 1968 total included 163,875 Wage Board (blue collar) workers, or 51 percent of the civilian workers, about the same as a year earlier. The number of workers hired indirectly through civilian contracts or agreements with foreign governments totaled 25,700, about 700 less than the previous year.

Manpower Controls

Faced with the sustained demands of the Vietnamese war and other oversea commitments, the Air Force made an intensive effort to use its manpower, particularly rated personnel, most advantageously. A system was established to provide equitable distribution of pilots among the major commands according to their mission priorities. All pilot and navigator positions were closely examined and validated. A new quarterly aircrew requirements report and the use of computers to validate rated officer needs more rapidly and accurately resulted in a reduction of the total authorization by several hundred. Other savings in rated positions accrued from careful reviews in such fields as operations and control, training, operations planning, and squadron and base operations. Revised criteria to be applied in the first quarter of fiscal year 1969 were expected to save several hundred more rated officer positions.

Control was also tightened over enlisted positions to insure that a sufficient number, particularly in the critical specialties, were available for airmen returning from overseas. The Air Force attempted to reduce airman and increase civilian positions overseas. The conversion of military positions to civilian status was discontinued at home, and civilian rather than military positions were eliminated wherever military rotation requirements made it necessary. These efforts to improve the airman rotational base were only minimally successful, however, because of insufficient civilian authorizations under the current manpower ceiling. (For example, about 1,400 airman positions overseas slated for conversion could not be filled by civilians.) Future prospects were not encouraging, as the Air Force faced even tighter personnel ceilings.

Officers

The Air Force continued to lose many competent young officers who had served between 4 and 7 years, and among pilots it had difficulty holding men with as many as 14 years of service. Those requesting release increased from 3,735 in fiscal year 1967 to 4,108 in fiscal year 1968. The Air Force restricted losses by extending the separation of 362 regular officers into the next year. It expected about 5,655 to ask for release in fiscal year 1969 as a result of plans to adjust officer strength to meet the budget reduction ordered by Congress.

More than 10,000 officers were on permanent assignment to Southeast Asia, with another 1,200 on temporary duty (TDY)

there. No officer returned involuntarily for a second tour, but some commands, such as SAC, carried out their missions in Southeast Asia with men who were on TDY. If these men had completed a combat tour, they could not be sent back for another, but they could be returned on TDY for up to 60 days.

On March 31, 1968, the President directed the cessation of the bombing of North Vietnam above the 20th parallel. As a result, the Air Force suspended its policy of rotating aircrews out of the war zone after they had completed 100 missions over that country. Effective July 1 all aircrews, including those who had flown combat missions over North Vietnam, were required to serve a full 1-year tour in Southeast Asia.

The Vietnam war placed a great strain on available manpower. To continue the policy that no officer involuntarily serve a second tour in Southeast Asia until all others in a similar skill had served one, the Air Force substituted grades when possible, kept some lesser priority positions unfilled, increased the number of consecutive oversea tours, restricted long oversea tours until officers had served in Southeast Asia, increased assignment of second lieutenants to Southeast Asia, and withdrew officers from staff jobs in the United States for service in the combat theater. The Air Force also assigned 1,605 recent graduates from undergraduate pilot training to Southeast Asia; this practice was, however, carefully controlled to prevent diluting the competence of combat units. In addition, the Air Force revised the policy on WAF officer assignment, permitting them to go anywhere female civilians, nurses, dependents, or Red Cross employees were located or where suitable housing was available. WAF officer assignment in South Vietnam totaled 20, all to be based at Tan Son Nhut AB.

Airmen

The Air Force enlisted 98,422 personnel during the year, of whom approximately 4,500 had served previously. About 95 percent of the airmen were high school graduates.

Of the total airman force of approximately 761,500, more than 75,000 were in Southeast Asia and had to be replaced every 12 months. To meet combat theater and other oversea requisitions the Air Force made more than 355,000 separate airmen assignments, of which 19,000 were for immediate "out-of-cycle" demands in Southeast Asia. There was still a scarcity of skilled airmen to fill jobs in such specialties as intelligence, precision photography, photo interpretation, ground-air radio operations, aircraft maintenance, munition handling and maintenance, air

transportation, and civil engineering. Certain assignment restrictions had to be waived and numerous substitutions made in grades and skill levels to fill all technical positions.

During fiscal year 1968, 68.5 percent of the airmen served in the top six grades and 179,819 received promotions, in comparison with 61 percent and 173,023 in fiscal year 1967. On October 12, 1967, OSD agreed that in fiscal year 1969 the Air Force could increase these grades from 481,200 to 507,944 and make 227,976 promotions. This would place 69.9 percent of the airmen in the top six grades, within about 2 percent of current stated requirements.

A high portion—87.7 percent—of career airmen reenlisted, but less than 1 in 5—18.1 percent—first-term airmen chose to remain in the Air Force. First-term reenlistments were 1.2 percent lower than the previous year (16.8 percent) and too few to replace losses from the career force. Reenlistments in the 136 specialties covered by the variable reenlistment bonus (VRB) continued to run higher than in the skills not covered. Of the 10,594 first-term reenlistees, 7,001 were in specialties covered by the VRB.

A special study group concluded that it was feasible and desirable to increase the number of enlisted women to 2 percent (about 14,000) of the total airman force between fiscal years 1972 and 1976. The group also recommended that the number and types of jobs open to the WAF should be expanded; in July 1968 the Air Force increased them from 241 to 437.

Equal Opportunity

In its annual equal opportunity status report, the Air Force affirmed that in the area of off-base housing progress was being made in ending discrimination based on race or religion in communities surrounding each of the 118 installations having 500 or more personnel. There was also an almost complete absence of discrimination with respect to public accommodations, education, recreation, and public transportation. Replying to an OSD query of February 1968, the Air Force noted that a survey of more than 300,000 off-base housing units showed that approximately 88 percent were open. Craig AFB, Ala., Kirtland AFB, N. Mex., and Vandenberg AFB, Calif., were among 10 military installations cited by OSD in March for "outstanding performances" in expanding the number of open off-base housing units.

On June 20, 1968, the Secretary of Defense directed that after August 1 military personnel changing their residence could enter

rental agreements only when the facilities were listed with the local installation as open to all military personnel on a non-discriminatory basis. This rule applied to apartment houses or trailer courts containing five or more units. The Air Force immediately notified all of its base commanders to comply fully with the intent and spirit of the ruling.

On July 26, 1948, President Truman had ordered desegregation of the armed forces. All formal and substantial discrimination had been eliminated by 1955, but vestiges remained until the early 1960's when President Kennedy renewed the drive to eliminate them. In the middle and late 1960's, President Johnson and Secretaries of Defense McNamara and Clifford made a special effort to raise the number of Negroes in the higher officer and enlisted grades.

Between fiscal years 1949 and 1968 the percentage of black officers in the armed forces rose from 0.9 to 2.1 percent. The Air Force of 1948 had 310 black officers including 1 colonel; at the end of June 1968 it had 2,441 (about 1.7 percent of its officers) with 19 colonels and 1 lieutenant general. On June 30, 1968, blacks made up about 10.3 percent of the airmen and 10.8 percent of the top six grades.

Family Housing

At the beginning of fiscal year 1968 construction was in progress on 866 family housing units at eight bases; during the period contracts were awarded for 2,289 units at 12 bases. The cost of the first group totaled more than \$17.5 million. That of the newly awarded contracts was estimated at about \$45.3 million (for 1,875 units from the fiscal year 1966 housing program and 414 from the fiscal year 1968 program; there was no fiscal year 1967 program). Contractors completed 826 units at seven bases, leaving a carryover of 2,329 units on which construction was in progress and 3,651 for which contracts were to be awarded in December 1968. The value of the units completed was approximately \$17.2 million.

Construction of the 826 units completed the fiscal year 1965 and prior years' family housing projects, except for 180 units delayed by failure to obtain land. These were expected to be finished during fiscal year 1969 by using relocatable buildings. In February 1968 OSD approved the relocation of 200 units from Glasgow AFB, Mont., to Mountain Home AFB, Idaho.

The fiscal year 1968 Military Construction Authorization Act passed on October 21, 1967, authorized 3,797 Air Force family

housing units of the 4,580 requested. After the appropriations bill passed, OSD approved funding for 2,510 units. For fiscal year 1969 the Air Force requested 6,776 units against its stated deficit of more than 100,000 units.

By the end of June 1968, 77 percent of the family housing projects approved for the fiscal year had been designed. Among these were 1,347 to be built at Craig AFB, Ala.; George AFB, Calif.; Dover AFB, Del.; Tyndall AFB, Fla.; Grissom AFB, Ind.; and Bergstrom, Laredo, and Laughlin AFB's, Tex. Efforts were well underway to obtain 1,350 units of rental guarantee housing that private sponsors would finance, construct, maintain, and operate for the exclusive use of USAFE forces in England.

Last year OSD initiated a research project to explore new technology and materials that promised to reduce the cost of residential construction significantly. In the first phase of this study, completed in November 1967, the Air Force received and evaluated 22 proposals from architects, builders, universities, and industries. Project design had not been completed at the end of the fiscal year, but OSD had selected a 200-unit housing project at George AFB, Calif., as a prototype for further research and cost studies.

During fiscal year 1968 the Air Force had 29 minor construction and improvement projects underway, valued at approximately \$4 million, and completed 20 valued at \$2.6 million. Two contracts were awarded for trailer court facilities—one for 50 spaces at Laredo AFB, Tex., and the other for 104 spaces at Scott AFB, Ill. The Laredo spaces were completed, finishing a fiscal year 1965 program of 139 spaces at three locations. The Scott project would complete the fiscal year 1966 program that had also included 220 spaces finished at Beale AFB, Calif.

In October 1967 Congress restricted domestic leasing of housing to locations where there had been a recent, substantial, and presumably temporary increase in personnel, where substantial reductions were planned in the near future, or where the number of personnel was so small as to make construction uneconomical. On this basis the Air Force reduced its domestic leases from 2,400 to 2,100.

Civilian Personnel

During fiscal year 1968 the average Air Force civilian grade rose from GS-7.14 to GS-7.32, continuing the slight upward trend that began last year. There was a decided drop in the number

of employees in the first three grades and a significant rise in GS-7 and above. Headquarters USAF instructed the major commands to exercise close control and, as feasible, redesign certain jobs to insure retention of some lower grade positions. A substantial change occurred in the turnover rate of civilian employees—the average monthly accession rate fell from 2.7 to 1.7 percent and the separation rate from 2.3 to 1.5 percent.

On March 1, 1968, the Air Force adopted a new method of handling employee appeals and grievances. Several full-time examiners were assigned to five field offices to investigate, analyze, hear, and furnish recommendations on complaints to installation commanders for decision. In addition to speeding up decisions on grievances, the new procedures saved the time of high-ranking administrators who previously dealt with the details of employee dissatisfaction.

To meet requirements of a Civil Service Commission regulation, on March 30, 1968, the Air Force adopted an executive staffing plan designed to assess immediate and long-range civilian executive needs and insure that positions were filled by the best available people. The plan was preliminary and will serve as a basis for a more definitive one to be developed later.

By the end of June 1968 the Air Force had completed 60 percent of the second phase of "Mix Fix," the substitution of civilian for military personnel. Phase II contemplated replacing 15,910 officers and airmen with 14,018 civilians. The Air Force had expected to complete this second phase during the first quarter of fiscal year 1969, but budgetary limitation on civilian hiring caused cancellation of the program.

Military Training

The Air Training Command (ATC) performs the majority of USAF training. ATC operated 16 bases and three tenant squadrons in the United States and about 150 field detachments throughout the world. With more than 130,000 personnel, including 16,000 instructors, ATC was the second largest command in the Air Force.

Technical training, the largest single instructional area, was conducted at five centers—Amarillo and Sheppard AFB's in Texas; Chanute AFB, Ill.; Keesler AFB, Miss.; and Lowry AFB, Colo. In addition, there were many detachments in the field, and on-the-job training was carried on at all bases.

Undergraduate pilot training was conducted at Laredo, Laughlin, Randolph, Reese, and Webb AFB's in Texas; Vance AFB,

Okla.; Williams AFB, Ariz.; Craig AFB, Ala.; and Moody AFB, Ga. Helicopter and German flying training was provided at Sheppard AFB, Tex., navigator training at Mather AFB, Calif., and basic military and officer training at Lackland AFB, Tex. All combat commands conducted crew and replacement flying training. ATC also instructed foreign pilots and technicians in the Military Assistance Program (MAP).

Air University provided professional education for officers through schools at Maxwell AFB—Squadron Officers School, Air Command and Staff College, and Air War College—and the Air Force Institute of Technology (AFIT) at Wright-Patterson AFB, Ohio. AFIT had four resident schools but sent the bulk of its students to civilian colleges, universities, or industrial firms. Air University also supervised the Air Force Reserve Officers' Training Corps (AFROTC) at 175 colleges and universities. The Air Force Academy, Colorado Springs, Colo., provided education for the several thousand Air Force cadets.

Flying Training

During fiscal year 1968 ATC trained 3,084 jet pilots for the Air Force, 157 for the Air National Guard (ANG), 15 for the Marine Corps, 65 for MAP, and 158 in the special German flying training program at Sheppard, as well as 8 helicopter pilots for the Air Force and 73 T-28 non-jet pilots for MAP.

The 3,084 jet pilots trained for the Air Force, an increase of 382 over the previous fiscal year, reflected the demands of the Vietnam war and the increased training rate approved in November 1966. The Air Force requested a further increase in the annual training rate; no decision had been made by the close of the fiscal year.

In the fall of 1967 ATC began testing a new method of controlling aircraft takeoffs for T-37 and T-38 undergraduate pilots to relieve runway and air traffic congestion. Training bases in Texas and Oklahoma used three parallel runways, and at one (Laughlin AFB, Tex.) aircraft took off 3 minutes apart. This new management technique expedited air traffic and enabled student pilots to fly more hours each day.

A total of 805 USAF, 58 ANG, and 35 MAP trainees were awarded the aeronautical rating of navigator after completing undergraduate training. The advanced navigator-bombardier and electronic warfare officer training courses produced 438 graduates, while 710 trainees completed the shorter navigator specialized training courses.

Air operations in Southeast Asia placed greater emphasis on electronic warfare and increased the need for specialized navigator training. There was also a demand for orientation and familiarization of operational staffs and system management personnel. Additional training quotas were scheduled for refresher training to meet the urgent requirements of several commands. But most courses were not suited to basic familiarization, being directed specifically toward qualifying an electronic warfare officer. Commands were, therefore, encouraged to provide such familiarization training locally, using an ATC instructional kit. ATC also increased the size of the classes for a 10-day course for all electronic warfare officers assigned to EB-66 units in Southeast Asia, developed a 2-week course for electronic officers assigned to EC-121 units in the combat zone, and expanded navigator-reconnaissance upgrade training for crews flying RF-4C's in the war area.

Needs of the war caused continued growth in aircrew attendance at both the basic and special courses of the Air Force Survival School, Fairchild AFB, Wash. Graduations at the school totaled 7,935, as compared to 7,522 the preceding year and 4,798 a year earlier. In July 1967 the general survival course was reduced 5 days by eliminating field training for those aircrews en route to Southeast Asia, who would attend the PACAF Jungle Survival School at Clark AB, P.I. In April 1968 2 additional days were deleted by eliminating 12 hours of judo training. The PACAF Jungle Survival School also expanded during the year, graduating 11,000 as compared to 6,000 the previous year. In addition to U.S. servicemen, military personnel from the Republics of China, Korea, and Vietnam attended the jungle survival course.

Technical Training

Approximately 142,490 students graduated from technical school courses, about 25,000 less than last year. Of the 1968 graduates, 107,919 were Air Force airmen; the remainder were Air Force officers (12,334), Reserve Forces personnel, Army, Navy, and MAP students.

At the end of June 1968 approximately 150,000 airmen were engaged in on-the-job training (OJT). Of these, 92 percent were participating in the Extension Course Institute's 231 career development courses which covered 392 Air Force skill specialties. The 150,000 airmen engaged in OJT represented a drop of nearly 30,000 from the high average level of the early months of fiscal year 1968 and almost 60,000 below the average of the previous

year. The massive training effort necessitated by the war in Southeast Asia was leveling off and OJT was expected to stabilize at about 140,000.

Technical training continued to be influenced by demands peculiar to the Vietnam war. Although total course completions fell to the lowest point since 1965, demand increased in several specialties to meet specific combat needs. Requirements for weapon mechanics rose, and the course at Lowry AFB had to be placed on a 6-day week and three shifts to accommodate about 4,000 students—more than double the number being trained before January 1968. Field training detachments, the most important means of providing replacements for weapon system technicians in Southeast Asia, were located with TAC units, and in Japan, Okinawa, and the Philippines. The detachments instructed about 19,100 technicians.

In many instances, only men without previous service in a critical specialty or men who had been retrained to a three-level skill were available as replacements for returnees from Southeast Asia. As a result, technical supervisory positions in the combat theater were often filled by NCO's who held only three-level skills learned in a basic technical course where they had recently been retrained from some other specialty. ATC, TAC, and PACAF cooperated to provide intensive practical instruction for these airmen between the date of course completion and deployment to Southeast Asia. Such training programs were in operation or planned for technicians in intelligence, photo interpretation, helicopter maintenance, and munition handling.

Results with airmen enlisted under the criteria of Project 100,000 proved generally favorable. ATC established 26 technical training courses for these men during fiscal year 1967 and added 32 more in fiscal 1968. As of June 1968, 3,902 airmen had entered these 58 courses, 2,658 had graduated, 802 were still in class, and 442 had been eliminated. Another 3,230 were sent to OJT in 38 career specialties. Of those taking formal courses, only 11 percent failed between October 1966–September 1967, and the rate improved to 9 percent for the October 1967–June 1968 period. Of those who failed, a few were discharged and the remainder assigned to other courses or OJT. Airmen inducted under the new standards required more than usual individual instruction and many required special classes to improve their reading ability.

Project TRANSITION, a special effort to counsel, train, and help place enlisted personnel about to leave military service,

was proposed by the President in April 1967 and formally established by the Department of Defense in March 1968. The Air Force initially gave special training to 182 NCO's and assigned them as TRANSITION counselors and instructors, and it planned to add more than 500 military and civilian personnel to this work in the coming year.

Of the nearly 100,000 airmen eligible for discharge, about 49 percent indicated that they would leave the service. Approximately 22,000 then noted a desire for TRANSITION assistance. By June 30, the Air Force had entered 3,500 in courses on 178 installations, counseling them on the preparation of experience dossiers, and providing employment information. For the most part the project was conducted during off-duty hours.

Professional Education

The Air Force operated its professional military schools on a reduced schedule during the 1967-68 school year. The Air War College enrolled only 146 (66 USAF) students instead of the usual 280 (220 USAF); Air Command and Staff College had 278 (147 USAF) against the usual 600 (500 USAF); and the Squadron Officer School had 1,110 (1,009 USAF) compared with normal 2,400 (2,250 USAF). No change was scheduled for fiscal year 1969, except that students at the Air War College would be colonels or lieutenant colonels selected for promotion to colonel. There was no reduction in the number of Air Force officers attending joint, other Service, or allied schools. To avert a deterioration in future Air Force management and leadership capacity, Air University planned to expand professional education to pre-Southeast Asia combat levels as soon as circumstances permitted.

The Air Force provided ROTC training at 175 colleges and universities. Enrollment for the 1967-68 school year was as follows:

Freshman	28,128
Sophomores	17,925
Juniors	4,968
Seniors	5,835
Total	56,856

The Air Force obtained 5,708 officers from ROTC, 8 above the quota and 188 less than the previous year. In February 1968 the Air Force placed 18 institutions on probation because their AFROTC units had not trained enough officers to make them worth the expense. Failing improvement by December 1968, the units would be eliminated.

During 1967-68 Junior AFROTC functioned in 65 high schools. The Air Force planned to increase the number to 120 in fiscal year 1969, 200 in fiscal year 1970, and 275 in fiscal year 1971 and thereafter.

The Air Force obtained 6,541 officers from Officer Training School (OTS), 842 less than a year earlier. Of the total, 217 were WAF's. During this period the enlisted commitment of an individual voluntarily withdrawing from OTS before receiving his commission was raised from 2 to 4 years. The Air Force also put a "bootstrap" commissioning program into effect which enabled an airman to obtain a commission through OTS if he had over 4 years of service and a bachelor's degree or was within 1 year of obtaining the degree. If he had the degree, he entered OTS directly; if not, he first attended college for up to 1 year. During the year 141 airmen received commissions through this program, and it was expected to produce 200 officers annually in the future.

On June 5, 1968, the Air Force Academy awarded degrees to 604 cadets (1 an Allied student). Their first assignments were as follows: 360 to pilot training, 32 to navigator training, 58 to technical training, 19 to graduate work on scholarships, 12 to medical school, 5 to law school, 62 to AFIT, 54 to duty, and 1 to the Marine Corps.

Between September 1967 and March 1968 the House Armed Services Special Subcommittee on Service Academies examined their operation. The chairman, Rep. F. Edward Hébert (La.), after discussion with top officials at the Air Force Academy, seemed satisfied that it had turned away from what he viewed as an overemphasis on academic subjects.

The Air Force Institute of Technology (AFIT) offered a broad program of education and training, with courses varying in length from 1 to 13 weeks to those pointed toward bachelor, master, and doctoral degrees. In June 1968, 1,699 officers were enrolled in civilian institutions working toward degrees, including 710 in engineering, 597 in management, and 249 in science. At the School of Engineering, 86 Air Force officers were studying for the bachelor, 306 for the master, and 42 for the doctoral degree. Enrollment in the graduate logistics Master of Science program included 78 Air Force officers and 27 other military and civilian personnel. A total of 74 officers was studying on scholarships or fellowships—60 at the master and 14 at the Ph.D. level. In the airman education and commissioning program, at the end of June 1968, 406 of an enrollment of 802 were studying in

various fields of engineering. For fiscal year 1969 AFIT established a degree-oriented quota of 1,731—1,154 in civilian institutions, 153 with industry, 324 in the School of Engineering, and 100 in the School of Systems and Logistics.

During the past 3 years there has been a growing need for graduates of the School of Systems and Logistics. However, because of a shortage of funds, facilities, and qualified students, the school could expand little. The graduate logistics class, started in August 1967, could fill only 81 spaces out of a quota of 100, largely because of the war in Southeast Asia.

The Civil Engineering Center (redesignated the Civil Engineering School in April 1968) established a new course in evaluation of sonic boom damage because of the increasing number of claims against the Air Force. The Judge Advocate General, responsible for adjudicating these claims, needed engineers to inspect and evaluate the damage. The 80-hour course, which will qualify base engineers to render necessary assistance, was scheduled for 75 officers and 225 civilians.

Because of a shortage of funds, the Secretary of the Air Force ordered a change in a program established in 1967 which enabled Air Force personnel overseas to receive instruction in the language of their host countries. He now directed that it be limited to personnel stationed in Southeast Asian nations only. With the cooperation of the Defense Language Institute, the Air Force proposed to start language training in South Vietnam and Thailand. The plan had not yet been approved by June 30, 1968. The older foreign language proficiency program continued to expand, with 30 courses in 11 commands. It appeared, however, that a lack of funds would soon compel a serious curtailment of all Air Force foreign language training.

Health in the Air Force

The Air Force Medical Service maintained the general health of the Air Force at a high level, provided exceptional service to combat personnel, and continued to push research on the frontiers of military medicine. The general state of health of Air Force personnel is reflected in the following table:

	<i>Fiscal year 1967</i>	<i>Fiscal year 1968</i>
Average USAF strength	895,623	895,368
Admissions per year per 1,000 average strength:		
All causes	176	178

	<i>Fiscal year 1967</i>	<i>Fiscal year 1968</i>
Disease	(156)	(159)
Nonbattle injury	(20)	(19)
Battle injury	(.15)	(.33)
Noneffective ratio (per 100 strength)	.72	.70
Hospitalized ratio (per 100 strength)	.54	.51
Average number of AF personnel occupying beds in medical facilities	4,484	4,469
Average number of patients occupying beds in AF facilities	8,556	8,563
Air Force	(4,015)	(3,862)
Other military	(469)	(607)
Nonmilitary	(4,072)	(4,094)
Number of births in AF facilities	49,366	49,873
Outpatient visits in AF facilities	17,535,969	18,168,759
Flight physical examinations in AF facilities ..	200,457	215,118
Other complete physical examinations	661,794	587,487
Immunizations at AF facilities	9,970,058	9,557,406

Medical Personnel

The Medical Service was adequately staffed in terms of numbers of physicians but continued to have difficulty in staffing some specialties with fully qualified people. During fiscal year 1968 the Air Force obtained 1,020 physicians who had completed their residency or intern service under the Armed Forces Physicians' Appointment and Residency Consideration Program. Of the 657 career officers who received graduate training under Air Force sponsorship, 117 completed residency training and 110 completed internship. The Office of the Surgeon General sought to predict what Air Force medical requirements would be 3 to 5 years in the future, so that it could direct the training of students to fit the demand.

The Air Force failed to retain enough highly qualified medical specialists; only about 1.2 percent remained for a career. Among the less highly trained physicians, about 12 percent stayed on, and the Air Force sent many of these to complete residency training at civilian or military institutions. For each year they attended school, they assumed a service commitment appropriate to the training received.

The retention rate was satisfactory among the more than 4,300 nurses serving the Air Force. Since their remuneration and other advantages compared favorably with civilian offerings, they remained in service much longer than the physicians.

The number of medical personnel in service for the last 2 years was:

	June 30, 1967	June 30, 1968
Officers (Corps):		
Medical	4,169	4,092
Dental	1,847	2,016
Veterinary	369	398
Nurse	4,189	4,311
Medical Service	1,387	1,699
Biomedical Sciences	884	1,068
Total	12,845	13,584
Airmen:		
Medical	23,943	24,017
Dental	3,181	3,471
Total	27,124	27,488

Medical Facilities

The Air Force operated the following fixed medical facilities as of June 30, 1968:

United States (*excludes Alaska and Hawaii*)

	Facilities	Beds
Hospitals	82	7,850
Class A dispensaries	16	108
Class B dispensaries	19	---
Total	117	7,958

Overseas (*includes Alaska and Hawaii*)

	Facilities	Beds
Hospitals	23	2,525
Class A dispensaries	41	411
Class B dispensaries	13	---
Total	77	2,936
Grand Total	194	10,894

Dental Facilities and Mobile Clinics

Continental United States	265
Overseas	137
Mobile vans	9
Total	411
Total dental treatment rooms	2,455

The principal medical facilities handling patients from the combat zone were at Tachikawa AB, Japan; Clark AB, P.I.; and Cam Ranh Bay AB, South Vietnam. In 1965 the Air Force

realized that it needed to hasten construction of medical facilities—dispensaries, casualty staging units, and hospitals—in Southeast Asia. Because current construction methods were too slow, it designed and constructed prefabricated buildings and shipped them to the combat theater for assembly. The first units were completed in 1966, and by June 1968 19 were in use. Experience demonstrated their success as a means of providing adequate medical facilities quickly in an undeveloped area.

Aeromedical Evacuation

The Air Force aeromedical evacuation system continued to function with exceptional success. Rapid movement to definitive treatment centers, advanced techniques and medication, and highly trained specialists gave the wounded in Vietnam better than twice the chance of survival of those wounded in any earlier war. Patient movements within Southeast Asia and from there to outside hospitals increased from 3,719 in December 1965 to 15,435 in June 1968. The number of patients moved from the Pacific theater to the continental United States increased during the same period from 1,085 to 5,134.

Medical Services

The Air Force Medical Service worked in such broad fields as environmental and preventive medicine, flight and space medicine, physiological training, dental and veterinary services, and medical research. Since there are more than 1,000 water supply systems in the Air Force, the Medical Service had to conduct about 100,000 bacteriological examinations to insure their safety. In addition, it performed over 125,300 water analyses to determine the chemical quality, 86,000 to learn the chlorine residue, and 20,000 to determine fluoride concentrations. It analyzed waste water from sewage treatment plants and industrial waste treatment facilities and air samples to assist in the national effort to reduce air and water pollution.

The Air Force Regional Environmental Health Laboratory, Kelly AFB, Tex., made significant advances in the treatment of industrial waste and determined some of the effects the treated effluent had on fish. Studies to date are expected to save the Air Force about \$2 million in its waste treatment techniques. A similar laboratory at McClellan AFB, Calif., developed and tested equipment that can determine the source of air pollution. Hundreds of thousands of tests and examinations were also conducted to determine the effects on the individual of exposure to po-

tentially hazardous noise and ionizing radiation. The Air Force continued to study safety standards for using laser and microwave equipment, participated in a study of the dangers of excessive noise, and helped prepare the interdepartmental report, "Noise—Sound Without Value."

The Air Force made a special effort to reduce the incidence of venereal diseases among personnel in Southeast Asia by providing individuals with information about these diseases and their prevention. This has resulted in a steadily declining rate during the past 12 months.

The Veterinary Service inspected food for the Defense Supply Agency, worked in the civic action program, provided medical care and guidance in the handling of military dogs, and cooperated with numerous civilian and governmental agencies in promoting general health improvement measures. During fiscal year 1968 the Air Force had the largest veterinary staff in its history, and about 80 percent of its career officers held, or were acquiring, degrees in radiobiology, toxicology, physiology, microbiology, and public health. Maj. George L. Anstadt, Doctor of Veterinary Medicine with the Air Force School of Aerospace Medicine, won a research award for developing a mechanical ventricular assistance pump for the heart.

Veterinary civic action included helping the Azores control the Mediterranean fruit fly, conducting research on animal diseases in Africa where their reduction was of primary importance to national economies, and assisting South American countries in the control of foot-and-mouth disease so that they could export their beef without restriction. Veterinarians in Thailand assisted in combating animal diseases and improving agriculture techniques.

As the military sentry dog program expanded, veterinarians prepared a new, less bulky diet for dogs working under stress, established a veterinary facility to advise the Military Dog Training Center, Lackland AFB, and set up a clinic at Cam Ranh Bay to improve the medical care of military dogs in Vietnam. The Air Force scheduled 300 military dogs for service in Thailand; by June, 55 had been sent.

The Dental Science Division of the School of Aerospace Medicine made considerable progress in developing a mobile dental facility for use in combat theaters and underdeveloped regions. It constructed and tested one lightweight dental chair, pushed work on a second, and continued development of a mobile dental cabinet and a portable darkroom. The Air Force-developed inter-

mediate restorative material, after undergoing more than a year of successful testing at the School of Aerospace Medicine, became available commercially from the General Services Administration. The Dental Corps of the three Services began coordinating plans for using the material under field or combat conditions, and NASA started studies in packaging it for space flight.

In August 1967 the Services initiated a preventive dentistry program for children. This program should benefit about 700,000 children each year through preventive treatment and oral hygiene instruction.

In civic action, Air Force dental officers worked in several Latin American countries. In South Vietnam and Thailand, they distributed dental supplies and equipment, gave professional advice, and helped in several aspects of dental education. They assisted Thailand in establishing a new training facility and a school for dental hygienists. Approximately 60,000 Thai school children were expected to receive instruction in oral hygiene. In June 1968 the Air Force opened its first class in the independent duty dental technicians course from which it planned to graduate 30 technicians a year. This intensive course in emergency dental skills is designed to prepare airmen experienced in oral surgery and preventive dentistry for independent work on assistance teams in foreign countries.

AFRes Medical Service squadrons and flights, with 925 professional personnel, provided some 36,000 man-days of assistance to the Air Force. Physicians working in every medical speciality provided 16,000 of these days. AFRes medical units performed approximately 30,000 dental examinations, 8,300 flying physicals, 13,800 nonflying physicals, 237,000 immunizations, 133,000 laboratory procedures, 33,000 X-rays, and 16,000 electrocardiograms.

Chaplains

The Air Force had 1,153 chaplains on active duty on June 30, 1968, 5 less than a year earlier and 27 less than the number authorized.

In the course of the year, the Chief of Chaplains held professional development seminars for USAF chaplains in most regions of the world. Catholic chaplains met between August and September 1967 at four locations in the United States; from October to November in Alaska, the Philippines, and Japan; and during the same period in England, Germany, and Turkey. Seminars for Protestant chaplains were held at three locations in

the United States between November 1967 and February 1968; during January and February, in England, Germany, and Turkey; and during the same period, in Alaska, Japan, and the Philippines. The Jewish chaplains' seminar was held in New Jersey in January 1968.

From September 1967 through March 1968 the Air Force Institute of Technology offered short courses in clinical pastoral training for Protestant chaplains. These were held at medical centers and hospitals in Texas and North Carolina. A special short course in this field was conducted in Washington, D.C., during October and November 1967 for 25 Catholic chaplains. During October 17-19, 1967, the annual Air Force Chaplain Conference convened in Washington, D.C., where three annual chaplain awards were presented for the first time.

The Air Force had 359 chapels and 289 chapel support facilities, a total of 424 buildings at bases in the United States and 224 overseas, 10 less than last year. Congress authorized and appropriated money for eight new facilities and six additions. Except for chapels at Mildenhall, England, and Tan Son Nhut, Vietnam, and an addition to the existing one at Ramey AFB, Puerto Rico, the new facilities were to be built in the United States.

Catholic chaplains held religious missions for Air Force personnel and their families at installations in Europe, Turkey, Libya, Labrador, and Greenland. Catholic civilian clergymen conducted Cana conferences in Europe, Turkey, Guam, Japan, Taiwan, the Philippines, Okinawa, Hawaii, and Bermuda. Religious education conferences for Protestants were conducted by 16 civilian specialists during the same period and in the same general areas. Torah convocations for Jewish personnel and their families were held during November-December 1967 in England, Germany, Spain, and Turkey.

Attendance at chaplain-led services was as follows:

	Protestant		Catholic	
	Number	Attendance	Number	Attendance
Sunday and Sabbath -----	36,736	4,004,720	45,357	8,101,929
Weekday -----	4,915	159,654	78,677	1,172,131

	Jewish		Total	
	Number	Attendance	Number	Attendance
Sunday and Sabbath -----	2,093	55,726	84,186	12,162,375
Weekday -----	796	13,895	84,388	1,345,680

Chaplains in the combat theater fulfilled their primary duties of conducting religious services and counseling military personnel and directed humanitarian work among Vietnamese civilians. In the vicinity of the 10 major air bases in Vietnam, chaplains supplied or procured labor, technicians, and materials for building and improving local orphanages, churches, schools, and hospitals. They also distributed clothing, food, medical and dental supplies, books and school supplies, and toys, donated by American religious and charitable organizations.

Air Force personnel donated substantial sums of money at religious services to build new facilities or to carry on rehabilitation work among Vietnamese refugees. For example, during the months of May and June 1967, Protestants and Catholics at Tuy Hoa AB contributed about \$2,600 for Vietnamese relief projects and, in addition, distributed boxes of clothing, soap, medical supplies, and toys, plus 20 tons of lumber to rebuild the Loc Thien orphanage.

The Tet offensive of early 1968 and the accompanying curfews temporarily halted much of this philanthropic work, but when relative calm returned in March and April a special Tet aggression relief project helped victims who had been left homeless, destitute, or injured. Off-duty Air Force personnel continued many English-teaching projects in local schools and churches.

Judge Advocate General

The Judge Advocate General's (JAG) department obtained 140 officers and lost 182 during the year, leaving its strength on June 30, 1968, at 1,223. Because of the draft, JAG had no difficulty obtaining its legal officer requirements for the year, but it was still unable to hold many beyond completion of their obligated tours. As a result, JAG had a shortage of 124 field grade officers, about double last year's deficit.

Military justice activity for the year is summarized as follows:

Decisions rendered by Board of Review (includes punitive discharges)	381
Records examined for legal sufficiency (not including punitive discharges)	128
Cases forwarded to U.S. Court of Military Appeals	115
Petitions granted by U.S. Court of Military Appeals	15
Petitions denied by U.S. Court of Military Appeals	97
Petitions withdrawn by request of accused	3
Board of Review decisions affirmed by U.S. Court of Military Appeals	6

Board of Review decisions reversed by U.S. Court of

Military Appeals	13
Cases pending in U.S. Court of Military Appeals as of June 30, 1968 ..	7

The court-martial rate continued to decline.

The JAG department received or reopened 1,819 claims valued at \$13,232,035.98, about \$2 million more than last year. A summary of claims activity is shown below:

	Number	Amount (In millions)
Claims on hand, July 1, 1967	1,212	\$12.9
Received or reopened	1,869	\$13.2
Total	3,081	\$26.1
Closed during period	2,168	\$17.3
On hand, June 30, 1968	913	\$ 8.8

In litigation cases during the year, JAG received 255, closed 361, and had 608 (106 less than last year) on hand at the end of June.

The Judge Advocate General area representatives (JAGAR's) program had 280 AFRes members located in 44 states. During fiscal year 1968, JAGAR officers provided 8,760 hours of legal assistance to the Air Force. Their services ranged from assisting individual servicemen with wills and estates to researching special legal projects for the major commands. The estimated savings to the Air Force was approximately \$175,000.

IX. Research and Development

The Air Force has tried to maintain technological and operational superiority over any enemy of the United States. As a result, it was able to respond rapidly to requirements in Southeast Asia and apply the newest techniques to systems already in operation or under development.

Southeast Asia Requirements

Scientists and engineers in Air Force laboratories or under contract applied the results of every phase of research and development to cope with the problems of the war in Southeast Asia. The laboratories of the Air Force Systems Command and Office of Aerospace Research developed conventional munitions, intrusion detection equipment, methods for rapid repair of runways, and a mobile low approach and landing system. Cooperatively, they developed an electronic countermeasure pod to degrade North Vietnamese missile-guidance radars. Contract scientists sought ways to detect and locate vehicles and troops concealed by foliage or tunnels and were instrumental in the design and operational deployment of an airspace control center in South Vietnam.

Southeast Asia Operational Requirements, requested by the combat forces in that area, accelerated the development of new equipment and the correction of deficiencies. For rapid response to requirements, in January 1965 the Air Force provided more than \$4 million under Project 1559 for 32 tasks. Since the inception of the project, additional tasks were identified and 79 completed, including 47 which resulted in the introduction of new items of hardware. Under separate funding, the Air Force also provided "quick fixes" in the field of electronic countermeasures.

Under Project Shed Light, the Air Force continued to increase the effectiveness of its aircraft against enemy targets at night and in bad weather. Development and modification programs were started to introduce AC-130 and AC-119 gunships and an interim force of multisensored B-57's for detecting and striking either fixed or moving targets.

In December 1967 the test and evaluation of the side-firing AC-130 in Southeast Asia was completed with highly successful

results. Its fire control and sensor systems were interrelated, with the sensor system establishing a line of fire to the ground target. The sensor system was obtained by modifying existing equipment.

A flight program to improve forward-looking sensors was completed. It included gun flash, air-to-air interception, and air-to-surface targeting tests. A downward-looking system underwent tests and evaluation in Vietnam and surpassed all similar operational systems in locating targets, providing all-weather detection of fixed and moving targets. Development of a new television system progressed from installation in B-57 test aircraft to safety-of-flight evaluation. A new technique in circuit design permitted a better signal under adverse light conditions. Lasers have also been built and tested and techniques and tactics developed for their military application.

In Southeast Asia, it was necessary to cut the time between discovery of a target by a hunter aircraft and the reporting of data to a strike aircraft. On December 22, 1967, the Air Force contracted for procurement of long leadtime items for this project. An aircraft modified for this purpose was scheduled for delivery early in fiscal year 1969.

As a quick solution to the problem of identifying hostile aircraft, the Air Force developed an electro-optical device and, in May 1968, successfully demonstrated its feasibility in an F-101. An operational test in an F-4 was also under consideration. The Air Force planned to install this equipment in selected aircraft to gain an initial operational capability as quickly as possible.

Systems Command Laboratories were developing a series of high-power transmitter tubes for airborne jamming equipment to provide greater electronic countermeasure efficiency. Parallel with this project, they were working on transmitters and integrated ECM systems to utilize the more powerful tubes.

Models of the tactical approach and landing radar (TALAR-4), a 35-pound microwave ground guidance device, were delivered to TAC for flight validation and development of operational procedures. TAC completed the flight tests with the C-123 and C-7A; they were in progress with the C-130 at the end of the period. The radar performed as expected, providing flying guidance for pilots to altitudes of less than 200 feet.

A cement that could harden within 30 minutes was developed to satisfy the requirement for quickly repairing damaged runways. Several bases were testing its ability to hold up under operational conditions. Also under development was a polyurethane foam to cushion and package delicate equipment. Since this

foam could be made at remote locations, the Air Force expected it to be highly useful in Southeast Asia.

Tests of the redesigned retracting mechanism of the BAK-13 aircraft arresting system were completed in May 1968. By June 30, the 14 BAK-13's for Southeast Asia had been delivered to the Air Force and were to be initially operational in October. The Air Force also planned to have another system by July 1971 that would safely stop tailhook-equipped aircraft weighing as much as 150,000 pounds and moving at speeds up to 220 knots.

Improvement of munitions and associated equipment, such as fuzes, flares, and launchers, continued. In May 1968 the Air Force introduced the FMU-26A/B multipurpose fuze for use with the CBU-24/29 and CBU-49 cluster munitions to delay cluster opening for a short period after release. Development also began on the LUU-2/B illuminating flare which is physically interchangeable with the operational MK-24 flare but has a higher light output and longer burning time.

Analysis, test, and combat operations proved electro-optical guidance to be a promising technique for delivering weapons against point targets. The Air Force demonstrated this technique with the relatively small HORNET research missile and, in August 1967, began operations in Southeast Asia with the WALL-EYE TV-guided glide bomb, developed by the Navy. Use of this technique was planned for both large HE bombs and the MAVERICK—a small rocket-powered TV-guided missile under development.

A transonic wind tunnel was built at the Arnold Engineering Development Center to test munitions being used in Vietnam. Employing two independent model mounts, the tunnel can determine the aerodynamic forces on armaments stored externally and the path that the armaments follow after leaving the aircraft. The first test in the tunnel took place on January 16, 1968.

Space

The Air Force and the National Aeronautics and Space Administration have worked together closely in the 10 years since NASA was established. During fiscal year 1968, this cooperation extended across all aspects of the program—manpower, facilities, experience, and money. Most of the funds went for range operations, supporting research and technology, contract administration, base support, and launching. The amounts were less than in previous years because no manned space flights took place and Air Force

procurement of boosters for NASA had been practically completed.

Manned Orbiting Laboratory

The manned orbiting laboratory (MOL), the largest military space program, received \$431 million during the year. All major MOL components were under development. With MOL, the Air Force planned to determine the tasks that military personnel could accomplish in space in conformance with existing treaties and international agreements.

The launching vehicle for MOL, the TITAN IIIM (a modified TITAN IIIC with attached boosters increased from five to seven segments), had satisfactory static test firings of the first-stage engine and its nozzle. Mock-up and structural test assemblies of the laboratory and experimental modules were completed and fabrication of the test components began. Construction of the launching complex at Vandenberg AFB, Calif., was expected to be completed in 1968. The first launch of the MOL system, an unmanned flight to qualify the TITAN IIIM booster, was scheduled for late 1970 and the placing of a two-man crew in near-earth orbit for 30 days for mid-1971. Fourteen pilots were in training for the program.

Spacecraft Technology

As part of the spacecraft technology and advanced reentry test program, the Air Force completed flights of the SV-5 small maneuverable lifting body in August 1966, demonstrating the feasibility of spacecraft maneuvers at hypersonic speeds. As the next step, the Air Force contracted for the X-24A, a piloted, flatiron-shaped, wingless vehicle powered by a rocket engine, to investigate the characteristics of a maneuverable manned lifting body at lower speeds and lower altitudes. In July 1967 the X-24A was delivered to Edwards AFB, Calif., where extensive instrumentation, calibration, and wind tunnel tests were conducted. The first of 10 gliding flights was planned for December 1968, to be followed by 20 flights using rocket motors that would boost the X-24A to altitudes of 100,000 feet and speeds of Mach 2.

Communication Satellites

A TITAN IIIC placed three Initial Defense Communications Satellite Program (IDCSP) satellites in orbit on July 1, 1967, increasing the number to 18, of which 17 were working satisfactorily. By mid-July the entire system was declared operational.

On June 13, 1968, a TITAN IIIC successfully launched another 8 satellites into orbit, bringing to 25 the number of operational satellites. There were no additional launchings planned for this phase of the program.

The Lincoln Laboratory Experimental Satellite Number 5 (LES-5), boosted into near-synchronous orbit on July 1, 1967, received and transmitted in the ultrahigh-frequency band. It has been used by the Services and certain nations in the North Atlantic Treaty Organization to demonstrate communication between aircraft, ships, submarines, and ground terminals. In August, USAF engineers using LES-5 sent teletype messages between a KC-135 and a B-52 10,000 miles apart.

Another experimental satellite under development for tri-Service tactical communications—TACSATCOM I—will operate on the standard military ultrahigh-frequency band and the super-high-frequency portion of the X-band set aside for military satellite communications. The satellite's antennas will radiate signals capable of being picked up by terminals installed on aircraft, submarines, ships, and on small tactical vehicles having antennas as small as 1 foot in diameter.

The TITAN IIIC launching on July 1, 1967, also included a despun antenna test satellite (DATS) to investigate the feasibility of using electronically despun antennas in communication satellites. DATS was still providing valuable experimental data a year later.

As a result of the joint agreement in 1966 on United Kingdom participation in the Defense Satellite Communications Program, the United States had under construction two synchronous Skynet satellites and a ground telemetry and command station for that country. In March 1968, NATO also decided to purchase two Skynet satellites for its needs. Ground terminals being developed in Europe are able to operate with American, British, or NATO satellites. NASA expected to launch the first British Skynet in mid-1969 and the first NATO Skynet late in 1969, in both instances using long-tank THOR-DELTA's.

Other Space Launchings

The Air Force participated in a number of launchings in support of NASA or for its own needs. The OVI-12 and OVI-86 satellites launched from Vandenberg AFB, Calif., on July 27, 1967, carried experiments for measuring cosmic ray particles, atmospheric oxygen, and atmospheric attenuation. NASA's orbiting geophysical laboratory (OGO), launched on July 28, carried

the Air Force ultraviolet radiation sensor. On March 4, 1968, the launch of the fifth and last OGO marked the first use of the SLV-3A stretched ATLAS booster.

A NIKE-CAJUN rocket, launched by the Air Force from Wallops Island, Va., on October 2, 1967, clearly demonstrated for the first time that solar illumination accelerated the voltage breakdown of antenna, a major problem for rocket and missile antenna. On December 13, 1967, a thrust-augmented THOR-DELTA booster placed PIONEER VIII, an interplanetary weather robot, in a solar orbit. The OV 3-6 atmospheric composition satellite (ATCOS-II), built at the USAF Cambridge Research Laboratories, went into orbit on December 4 from Vandenberg after being boosted by a four-stage solid-propellant SCOUT rocket. Instruments on board measured atmospheric composition, density, and temperature irregularities.

On April 6, 1968, an ATLAS F missile, launched from Vandenberg, placed two research satellites (OV1-13 and OV1-14) into orbit. The satellites, fitted into a specially designed heat shield fairing, contained 17 experiments. Although the OV1-14 achieved orbit, it was unsuccessful because of battery failure.

The final launch in the lunar orbiter program took place on August 1, 1967, at the Eastern Test Range as an ATLAS-AGENA successfully orbited a satellite for surveying and photographing potential lunar landing sites. On September 8 an ATLAS-CENTAUR launched NASA's SURVEYOR 5 to a soft landing on the surface of the moon. The operation was repeated on November 7 with SURVEYOR 6. The final launch in this program, SURVEYOR 7, also landed on the moon on January 7, 1968.

Engineering Development

The Air Force continued to study technology and tactics under the advanced ballistic missile reentry system (ABRES) program for penetrating enemy defenses. Surplus ATLAS boosters launched 11 full-scale experimental reentry vehicles and devices from Vandenberg AFB, Calif., while the ATHENA booster launched 22 experimental subscale flights from the Green River, Utah, complex to the White Sands Missile Range, N. Mex.

The ATLAS was used for seven launches in support of the Army NIKE-X program. A sequential payload delivery system, a maneuvering stage that carried the reentry vehicle and two smaller payloads, provided additional thrust and attitude control so that each payload could reenter at a different time along a

constant range line in the target area. Surplus MINUTEMAN boosters were scheduled for use in launching targets from Vandenberg to Kwajalein to help evaluate the antiballistic missile system.

The Air Force and NASA continued the joint XB-70 research program that supported development of a supersonic transport. This investigation of stability, control and handling qualities, and dynamic loads was expected to be completed by 1969 and the XB-70 retired.

Missile and Aircraft Technology

Strategic Weapons

An advanced ICBM would be needed to help maintain U.S. strategic superiority if the Soviet Union chose to deploy an extensive ballistic missile defense system as well as improve its offensive missiles. An advanced ICBM would provide greater throw-weight than the MINUTEMAN III and use advances in reentry technology permitting more multiple independent reentry vehicles (MIRV's) and more penetration aids. Development of the critical long leadtime elements of the advanced ICBM continued.

To enhance the survivability of future ICBM's the Secretary of Defense directed the Air Force in November 1967 to proceed with development of dual-capable facilities—superhard silos and control centers that would be able to house and control both the MINUTEMAN III initially and subsequently an advanced ICBM. In May and June the Air Force presented alternative development proposals concerning budget, initial operational capability, and prototypes. OSD approved a prototype engineering development program. During 1968 high explosive simulation of nuclear blasts (Hest Tests) was used to determine the pressure that hardened silos could resist.

The Air Force was convinced that an advanced manned strategic aircraft (AMSA) was needed for the mid-1970's, one that could fly at higher speeds, carry much larger payloads, have a longer range, and be even harder to detect by radar than the FB-111. It continued design work on the bomber airframe and pursued development of special avionic and propulsion components. Two contractors built demonstration engines that indicated significant improvements in performance and specific fuel consumption while progress in structural materials promised reduced weight. Work on the engine reduced its development time

to a point where it would be nearly comparable to airframe development schedules. At the close of the fiscal year, three AMSA alternatives were under consideration: Continued advanced development and study, contract definition, and competitive design leading to full-scale or prototype development.

The supersonic AGM-69A SRAM short-range attack missile was designed to allow stand-off bombing with the FB-111A and late-model B-52's. In December 1967 a B-52 rotary launcher dropped a dummy missile, and in January 1968 flight-flutter tests were conducted and dummies dropped from B-52 external pylons. In April C-130 test aircraft flew the missile guidance system, the master navigation system, and the computer. Sled tests of the missile guidance system were also in progress at Holloman AFB, N. Mex.

Air Defense Weapons

On November 23, 1967, the Secretary of Defense decided to discontinue F-12 development. A modified F-106 was selected as the future interceptor to complement the airborne warning and control system (AWACS) and over-the-horizon (OTH) radar in the Aerospace Defense Command. The fire control and missile system portions of the F-12 program were then placed under separate contract, F-12 program data retained, and other assets disposed of. A preliminary development program was prepared for an F-106X aircraft which would have a look-down radar and a shoot-down missile. This aircraft would be operational in the mid-1970's. At the end of fiscal year 1968 Congress had not yet acted on this program.

The airborne warning and control system, which would be applicable to tactical situations as well as continental air defense, required airborne radar, a large computer, and associated communication subsystems carried aboard a large jet transport-type aircraft. Several advances in radar technology seemed to assure the feasibility of AWACS. By October 1967 two contractors had flight-tested surveillance radars that could detect targets in the presence of ground clutter. Two airframe contractors were studying integration of the AWACS equipment, and a high-bypass fan engine was under consideration either for the original AWACS aircraft or for later retrofitting. At the end of the year the Air Force was anticipating approval to proceed with contract definition of the system.

In November 1967 two contracts for a design of an over-the-horizon back-scatter (OTHB) radar were awarded. Final re-

ports were submitted to the Air Force Systems Command, which compiled the data into a development plan. In March 1968 a contract was awarded for the collection of data on the performance of an OTHB radar operating in the polar region to determine the desirability of deploying an OTHB radar in that area.

Tactical Weapons

The F-X tactical fighter, scheduled to replace the F-4 during the mid-1970's, would take advantage of new technology in aerodynamics, avionics, and propulsion. Design studies of the F-X, completed in June 1968, furnished sufficient technical data to enable the Air Force to begin development of a fighter with great maneuverability for air-to-air combat.

On December 18, 1967, the Air Force and the Navy proposed a common propulsion program to meet the needs of both the F-X and the Navy's VFAX. On April 6, 1968, they established a joint propulsion office with the Air Force as the executive Service. Two proposals for initial engine development were received on June 10, and an 18-month effort was expected to begin early in the summer of 1968.

The AX specialized close air support aircraft, designed for cooperation with Army forces, was to emphasize range, payload, loitering time, weapons flexibility, and short takeoff and landing characteristics. The Air Force completed initial concept formulation in June 1968 and planned an initial operational capability in the early 1970's. The AX would be largely an off-the-shelf airplane equipped with twin turboprop engines. It would have high survivability, excellent low-speed maneuverability, and a fairly high subsonic top speed for quick response and evasion from the enemy fire as well as better rough field capability than either the A-7 or the A-37.

On April 16, 1968, the Air Force awarded three study contracts for a tactical long-range standoff missile, the AGM-X-3, compatible with current and projected attack aircraft. The Air Force considered air-augmented as well as solid rocket motors for propulsion, modular warheads, and interchangeable guidance units. It would be operational in the early or mid-1970's.

The Air Force planned to equip F-105's, F-4's, and F-111's with the Navy-developed AGM-78A and B standard antiradiation missile (ARM), which homes on and destroys enemy radars. OSD released the AGM-78B for production in March 1968. Initial operational capability (IOC) was scheduled for 1 year later. Also under competitive development for use with the F-4 were

two flak-suppression missiles—the XAGM-79A and XAGM-80A self-guided standoff weapons—containing bomblets and an altimeter fuze to permit an airburst and bomblet dispersion.

The tactical air-to-air weapon program began the design of a missile which would be matched specifically to the FX tactical fighter but could be employed on other fighters as well. This new missile was to be effective against maneuvering fighters at short ranges and superior to current heat-seeking missiles, particularly at higher altitudes.

Mission Support Aircraft

The Air Force requested a light turboprop transport to replace its old, uneconomical, piston-driven mission support aircraft. In August 1967 two contractors proposed military versions of their twin turboprop 12-passenger light transports. On December 22 the Air Force announced selection of the C-10, a version of the Jetstream civil aircraft. Delivery of the first aircraft was expected for January 1969, after suitable modifications were made to the engine to meet weight specifications.

Light Intratheater Transport

To replace or augment the fleet of C-7's, C-123's, and C-130's, the Air Force needed a light intratheater transport (LIT) that would satisfy Army requirements and insure the availability of adequate tactical airlift after the current force was reduced. Aeromedical evacuation and special air operations were other important missions slated for the aircraft. In February 1968 the Air Force Systems Command evaluated the findings of six aircraft companies and decided that each of their lift concepts was feasible. Three contractors were also conducting STOL studies for payloads varying from 8.5 to about 25 tons.

Advanced Rescue System

The Air Force stated a requirement for an improved rescue and recovery aircraft. Since it would be used for rescue in peace as well as war, it was redesignated the Advanced Rescue System rather than the combat aircrew recovery aircraft. AFSC continued a long-range effort to develop the system, and schedules called for an initial operational capability in 1976.

Research Aircraft

Following NASA's decision in January 1968 to withdraw from the joint X-15 program, the Air Force decided to use one of

its two remaining X-15's to complete three experiments and to ground the other aircraft. The third X-15 was wrecked in an accident in November 1967. The Air Force expected to complete the three experiments—supporting air defense and reconnaissance development—by January 1969.

In the tri-Service V/STOL program, the Air Force managed the X-19 and XC-142 aircraft and the Navy the X-22. The X-19 effort ended in 1966, and the Air Force concluded the XC-142A program in December 1967 after all test objectives had been met. Tests of one of the two XC-142A's at Eglin AFB, Fla., in August 1967 revealed the aircraft to be suitable for personnel pickups but only at higher hover altitudes than a helicopter. The other XC-142A, which collected vibration data, suffered extensive damage in a landing accident at Edwards AFB, Calif., in October. The remaining aircraft was offered to NASA for terminal testing, with delivery expected in August 1968.

In January 1968 the Air Force participated in a preliminary evaluation of the X-22. The analysis revealed numerous deficiencies, but if these could be corrected, the aircraft was judged useful for flight research. The Navy agreed to proceed with installation and checkout of a variable stability system for use in flight research.

Under the cooperative V/STOL tactical fighter research and development program, the United States and Germany in March 1967 jointly awarded a contract to a combined U.S.-German joint venture firm for system definition. Both governments agreed not to acquire a prototype unless an operational requirement existed for the aircraft. Late in January 1968 representatives of the two nations decided to carry out a coordinated development technology program, with both countries providing equal funds. The United States concentrated on V/STOL landing criteria, thrust vectoring, and modulation projections; Germany stressed V/STOL flight dynamics, avionic integration, and wind tunnel work.

In June 1968 the Air Force rolled out the XV-4B Hummingbird II research vehicle—a significant step toward an operational vertical takeoff and landing (VTOL) aircraft. This direct-lift version of the Army two-engined, jet-ejector XV-4A is powered by six J-85 engines—four mounted vertically within the center fuselage for direct lift and two horizontally in external nacelles for lift and cruise. It was scheduled to make its first flight on August 30, 1968.

Propulsion

The development of the TF-39 bypass turbofan engine for the C-5A continued. Since no test stand in the United States was large enough to handle such a large airbreathing engine, the Arnold Air Development Center modified a test cell and completed this 18-month project in December 1967. The TF-39 engine was tested, its design verified in April 1968, and the final tests scheduled for the fall of the year.

The success of this engine proved that components could be developed individually and then tested in the advanced turbine engine gas generator (ATEGG) program. These basic gas generators serve as building blocks upon which various types of complete engines could be built more quickly and inexpensively by adding necessary forward turbine stages, afterburners, nozzles, and controls. ATEGG technology was not only applied to the TF-39 but also to the engine demonstrators for the FX and the AMSA.

The United States and the United Kingdom are jointly developing a complete engine demonstrator, a direct-lift turbojet that is compact and lightweight but produces large amounts of thrust. Originally intended for the United States-German V/STOL fighter, the two countries continued the lift-engine program after the fighter was canceled. Complete engine testing was expected to be finished in June 1969.

The first flight of the modified AGM-37A SANDPIPER target missile occurred on December 12, 1967, proving the feasibility of a hybrid rocket engine using both solid and liquid fuel. Test results indicated that a comparatively inexpensive propulsion unit could provide the various thrusts and burning times needed for different types of missions. The Air Force conducted eight tests in an altitude facility and three flight tests. During the third flight, the missile, launched by an F-4 at 49,000 feet, climbed to 77,000 feet, attained a speed of more than Mach 2.5, then continued on a controlled ballistic glide maneuver. Ultimately, the SANDPIPER missile should fly at Mach 4 and 90,000 feet and be used for weapon system evaluation and combat crew training.

Avionics

A number of components of the Mark II avionic system, scheduled for the F-111D, were flight-tested earlier than planned. The inertial navigator component had its first flight test in March 1968 and the radar component in May 1968.

The Air Force and the Army agreed on the need for an adverse weather aerial delivery system (AWADS) that could operate without ground navigational aids and drop men and supplies at night and in bad weather as accurately as in daylight and clear weather. Tests indicated that an improved radar and computer could give the C-130E the necessary accuracy, and development began in June 1968, with initial operational capability scheduled for May 1970. The Air Force hoped to use the system in the C-141 also.

Development continued on Loran D, a radio navigation system that would be useful for navigation, rendezvous, air-ground close support, and correlating reconnaissance positions. Loran D was to be air transportable, capable of being set up in 10 hours, and operable at points up to 250 miles from the transmitters. Experimental models of the transistorized transmitters were delivered in November 1967. The avionics equipment was placed in production.

Materials

Tests of a boron filament horizontal tail section indicated that an F-111 tail assembly would be 300 pounds lighter if made from this material. The Air Force flight-tested other boron filament F-111 parts and planned to incorporate a boron filament wing slat segment into several C-5A's for service testing.

A new fireproof material has been developed which promises to replace rubber in hoses, seals, and containers for rocket motor oxidizers. This material will remain intact for 1½ years under conditions that cause rubber to deteriorate in an hour.

Air Force scientists completed development and tested prototypes of the filament-wound aircraft tire, which remained 15 degrees cooler when in use and cooled faster than the conventional tire. Lighter weight wheels could also be used, since tire inflation loads are not carried into the wheel. Fused slurry silicide coatings for columbium and tantalum alloys were also developed. This was a major advance in the evolution of multimission reusable reentry vehicles.

Basic Research

After 2 years of research, Air Force scientists developed a highly accurate, lightweight long-life ion sensor for use in attitude control for manned and unmanned space flights. This new sensor, which uses the properties of positive ions to measure spacecraft pitch and yaw, may prove a key component of the

automatic navigation systems of spaceships and supersonic aircraft operating in the upper atmosphere. The basic system was successfully tested on the GEMINI 10 and 12 missions and was under consideration for APOLLO and MOL flights. It was used as a backup on GEMINI 12 when the fuel cell failed to work properly and the inertial system had to be cut off.

Superconductivity, or the complete disappearance of electric resistance, has been discovered at 20° Kelvin, the highest temperature yet found for a superconductor. Air Force-sponsored research discovered a solid solution at this temperature, which may permit cooling by liquid hydrogen, creating the possibility of decreasing losses in powerlines and of manufacturing smaller electric motors, applications which may have considerable effect on the entire economy.

At the request of NASA, the Air Force Cambridge Research Laboratories (AFCRL) of the Office of Aerospace Research, the leading developer and user of balloons in the United States, designed and launched the world's largest balloon in support of the Voyager program. The balloon was used to lift a planetary entry parachute test package to 130,000 feet. At that altitude, a 1,600-pound body was propelled to velocities simulating entry into the atmosphere of Mars and was arrested by the test parachute. All four flights were successful, providing data which advanced knowledge of parachute performance at supersonic speeds and low atmosphere densities.

On December 19, 1967, for the first time, AFCRL scientists bounced a laser beam from a satellite during the day. This achievement was far more difficult than performing the same feat at night, for it required more precise timing and aiming. The signal was reflected from the Explorer B at a slant range 1,100 miles away. The laser energy was 120 joules.

In April 1968, Air Force and commercial aircrews joined in an extensive research program to determine the percentage of time that a pilot can see the ground from various altitudes, attitudes, and angles. AFCRL distributed 375 clinometers to the pilots which gave them a precise reading of the angle of vision, and about 10,000 observational forms.

Ranges and Equipment

The Air Force Systems Command conducted 28 launchings during the year under its reentry flight test program. Of these, 23 were successful. Additionally, AFSC supervised a total of 46

space launches—43 successful—from the Air Force's Eastern and Western Test Ranges and from Wallops Island, Va.

The Eastern Test Range accepted the last of eight EC-135N APOLLO/range instrumentation aircraft. These aircraft monitored all APOLLO flight tests and supported several Defense programs, including the Navy POSEIDON and the USAF MINUTEMAN. As replacements for C-130 instrumented aircraft deployed to Southeast Asia, the Air Force modified four C-135B's to furnish VHF telemetry coverage for space and missile test flights.

The Western Test Range assumed full operational control of the APOLLO/range instrumentation ship program. Four of the five vessels to be assigned—*Vanguard*, *Redstone*, *Watertown*, and *Mercury*—were in place and actively supporting the APOLLO mission.

Final approval was received for construction of the Advanced Satellite Test Center at Sunnyvale, Calif., and an adjacent powerplant. This addition to the existing Sunnyvale facility will house the Advanced Data System (ADS) and the Expanded Communications and Electronic Subsystem (EXCELS). It will also provide 14 new mission control complexes and a system control complex able to support all current and projected satellite programs through 1974.

Human Resources Laboratory

As a result of a recommendation of the Scientific Advisory Board and by order of the Secretary of the Air Force, effective June 20, 1968, the Air Force Human Resources Laboratory was constituted and activated as a major AFSC Laboratory. This was the first step in greatly augmenting the research and development work done in support of the manpower/personnel area. Begun with a merger of the Training Research Division of the Behavioral Sciences Laboratory at Wright-Patterson AFB, Ohio, and the Personnel Research Laboratory at Lackland AFB, Tex., plans called for an expansion from some 291 people to over 800 by 1974.

X. Management

1968 Budget

The proposed Air Force budget for fiscal year 1968, as approved by the President, called for \$24,846 million in new obligating authority, or \$3,904 million more than the amount approved the previous year. This included \$631 million for military construction and \$5,582 million to purchase more than 1,250 aircraft, including planes for the air forces of Vietnam, Thailand, and Laos. The Defense appropriation bill passed by Congress in October 1967 gave the Air Force \$23,922 million in new obligating authority, and a separate bill enacted in November 1967 added \$414 million for military construction—for a total of \$24,336 million. Subsequently, Congress appropriated \$101 million in supplemental funds—\$65 million for military and \$36 million for civilian pay increases. Miscellaneous transfers totaled \$53.9 million, and \$796.7 million was obtained from the Southeast Asia Emergency Fund. Thus, Air Force new obligating authority for fiscal year 1968 rose by \$951.7 million, and appropriations exceeded those of the previous year by \$1,054.9 million.

Including transfers and supplemental funds, the major cost categories for fiscal year 1968 were as follows: Military personnel (including AFRes and ANG), \$5,840.3 million; operations and maintenance (including ANG), \$6,159.9 million; aircraft procurement, \$5,510.5 million; missile procurement, \$1,399.2 million; other procurement, \$2,446 million; research, development, test, and evaluation, \$3,393.2 million; and military construction (including AFRes and ANG but excluding military family housing), \$502 million.

The following table summarizes the total funds available for obligation in fiscal year 1968:

AMOUNTS AVAILABLE FOR OBLIGATION BY THE
AIR FORCE DURING FY 1968—AS OF JUNE 30, 1968

[In millions of dollars] ¹

Department of Defense Appropriation Act 1968	23,922.0
Military Construction Appropriation Act 1968	414.1
Supplemental Defense Appropriation Act FY 1968	101.0
Total new obligation authority enacted	24,437.1

Unobligated balance of prior year programs	3,614.2
Other new authorizations	
Transfer from Emergency Fund, Defense, SEA, to:	
O&M, AF	484.8
Aircraft Procurement, AF	17.1
Missile Procurement, AF	59.2
Other Procurement, AF	16.2
RDT&E, AF	153.2
Military Construction, AF	66.2
Transfer from Reserve Personnel, AF, to:	
Navy	-7
Transfer from Air National Guard Personnel, AF, to:	
Navy	-3.2
Transfer from Operation and Maintenance, AF, to:	
GSA	-3
Operation and Maintenance, Defense	-2
Transfer from MAP to:	
O&M, AF	9.9
Aircraft Procurement, AF	21.9
Missile Procurement, AF	.1
Other Procurement, AF	4.7
Transfer from Operation and Maintenance, ANG, to:	
O&M, AF	² 6.6
Transfer from Military Construction, Defense, to:	
MCP, AF	21.7
Reimbursements	1,106.5
Total available for obligation, fiscal year 1968	30,008.3

¹ Represents nearest rounded figure.² Nonadd—Internal Air Force adjustment.

Actual obligations and expenditures for fiscal year 1968 are summarized in the table below. The total of \$26,508.4 million for obligations compares with \$26,531 million for 1967 and \$23,009 million for 1966. Expenditures totaled \$25,792.1 million, as against \$22,945 million for 1967 and \$20,131 million for 1966.

AIR FORCE ACTUAL OBLIGATIONS AND NET
EXPENDITURES FOR FY 1968—AS OF JUNE 30, 1968

[In millions of dollars] ¹

	Obligations	Net expenditures
Military Personnel, AF	5,710.7	5,655.5
Reserve Personnel	63.7	62.5
National Guard Personnel	84.2	88.1
Operation and Maintenance, AF	6,321.6	5,943.8
Operation and Maintenance, ANG	270.3	266.8
Discontinued Procurement Appropriations		.6
Aircraft Procurement	5,968.4	5,078.5
Missile Procurement	1,327.5	1,387.8
Other Procurement	2,616.0	2,941.3

Research, Development, Test, and Evaluation ..	3,699.6	3,800.4
Military Construction, AF	433.3	476.7
Military Construction, AFRes	1.9	4.3
Military Construction, ANG	11.4	11.0
Miscellaneous	-----	74.6
Total	26,508.4	25,792.1

¹ Represents nearest rounded figure. Amounts will not necessarily add to total.

HOW THE AIR FORCE DOLLAR WAS SPENT

[Expenditures]	Percent
Military Personnel ¹	22
Civilian Personnel ²	10
Operation and Maintenance	16
Aircraft, Missiles, and Other Procurement	37
Aircraft	(20)
Missiles	(6)
Other	(11)
Research, Development, Test, and Evaluation	13
Military Construction	2

¹ Includes AFRes and ANG costs.

² Includes direct hire and contract personnel.

1969 Budget

For fiscal year 1969 the President requested \$26,038 million in new obligating authority for the Air Force, including \$278.6 million for military construction. This was \$750 million more than the amount of new obligating authority that Congress provided for fiscal year 1968 and represented primarily the added costs of operation rather than substantive program increases. For instance, inflationary price increases would consume \$500 million and military and civilian pay increases some \$86 million additional. The presidential budget request for aircraft procurement, \$4,612 million, was for the purchase of 919 new aircraft, including C-5's, A-7's, F-111's, and FB-111's. At the end of June 1968, action on the 1969 budget was pending in both the House of Representatives and the Senate.

Cost Reduction

Under continuing financial restrictions, compounded by the expensive operations in Southeast Asia, the Air Force vigorously searched for ways of reducing costs and financing urgent projects. Additionally, in accordance with a Secretary of Defense directive of September 22, 1967, the Air Force established a management improvement program that would measure perform-

ance in certain areas that could not be evaluated in terms of dollars saved. In early 1968, the Office of the Secretary of Defense designated 11 areas for improvement of management and operating practices.

The Secretary of Defense approved an Air Force cost reduction goal of \$447 million for fiscal year 1968 and of \$738 million to be realized by the end of fiscal year 1970 from actions taken during the current year. This represented a significant increase from the fiscal year 1967 goals of \$332 million and \$583 million, respectively. Actual Air Force cost reductions for fiscal year 1967 were \$464 million or 140 percent of the \$332 million goal, while the 3-year savings already totaled \$923 million—158 percent of the goal. In the fall of 1966 the program was completely overhauled and new criteria established. For the first full year under the new criteria, fiscal year 1968, Air Force accomplishments were \$536 million, or 120 percent of the current year goal, and \$1,253 million, or 170 percent of the 1968-70 objective.

In White House ceremonies on July 27, 1967, President Johnson presented certificates of merit to four members of the Air Force for their cost reduction efforts. In similar ceremonies at the Air Force Academy on October 17, 1967, the Assistant Secretary of the Air Force for Financial Management and the Vice Chief of Staff presented 30 awards for significant contributions in exceeding the fiscal year 1967 goal. Fourteen were for outstanding cost reduction actions, ranging from manufacture of a \$1.03 tool saving the Air Force \$5,200 to a reduction in MINUTEMAN battery storage space saving \$4.4 million.

In January 1968, in response to a presidential statement expressing concern, the Air Force placed renewed emphasis on the international balance of payments (IBP) management improvement program. Air Force efforts to control, manage, and reduce IBP expenditures proved successful. For the first time since fiscal year 1965, expenditures did not increase over the previous year.

Data Automation

On October 26, 1967, the Air Force Data Systems Design Center (AFDSDC) was established as a separate operating agency, reporting directly to the Chief of Staff. AFDSDC is responsible for design, development, implementation, and maintenance of all standard (common to more than one command) automated data processing systems assigned to it by USAF Headquarters. The center has assumed responsibility for central-

ized data system development and computer programing for standard systems to be instituted at major commands and Air Force bases around the world. Its control room works round-the-clock, dealing directly with 200 bases on computer problems as they arise in systems for which AFDSDC is responsible.

The Air Force continued base supply automation activities, completing the installation of Univac 1050 II computers at 146 bases. This program established better control over high value items and at a lower cost, reduced the number of supply management personnel by more than 4,000, and permitted smaller worldwide inventories. At the same time the program increased weapon readiness. Installation of Burroughs 263 computers for general purpose reporting was also completed, with the last computer going to Phu Cat AB, Vietnam, in January 1968.

In January 1968, the Air Force began a \$68 million acquisition program to replace the Burroughs 263 computers at Air Force bases with Burroughs 3500 systems. These new systems would support base level data processing requirements, other than supply, at a net cost avoidance of some \$16 million over the planned operating life of the program. Between April and June 1968, the Air Force accepted two of these computers at Sheppard AFB, Tex., for training, and another two—at Randolph AFB, Tex., and Bolling AFB, D.C.—for program testing. Initial operational testing was expected to start at Langley AFB, Va., in October 1968. If the evaluation were successful, the system would be installed throughout the Air Force between January 1969 and August 1970.

The twin Spectra 70-45 RCA computers at the Department of Commerce-Air Force joint facility in Asheville, N.C., dedicated in May 1968, gathered and processed weather and other environmental data from worldwide sources for civilian and military use. This facility replaced separate installations, reduced overhead, and was expected to save \$94,800 annually. Early in the fiscal year, the Air Force Global Weather Central (AFGWC) at Offutt AFB, Nebr., began to install a four-computer Univac 1108 system. When completed in 1969, the AFGWC will be the largest such facility in the world, fully able to support all command and control systems with their weather data requirements.

The Air Force inventory of leased and Government-owned automatic data processing equipment for fiscal years 1965 through 1968 was as follows:

	<i>Fiscal year 1965</i>	<i>Fiscal year 1966</i>	<i>Fiscal year 1967</i>	<i>Fiscal year 1968</i>
Leased	560	632	584	631
Government-owned	209	308	392	381
Total	769	940	976	1,012

The Air Force authorized 18 new document storage and retrieval systems during the year, in line with the increasing capability of converting information from magnetic tape directly to microfilm. The Air Force authorized PACAF to acquire equipment for this purpose and approved an AFLC test of the technique for certain of its computer listings. A project was also established to investigate the potential advantages of using microfilm instead of paper on computers. Whereas conventional computer high-speed printers produce 600 to 1,500 lines per minute on paper, tape-microfilm recording equipment can produce 6,000 to 18,000 lines per minute. Besides speed, other potential benefits would be savings in material, storage space, and equipment costs.

Procurement and Production Management

Industrial Planning

To meet the demands of the Southeast Asia conflict and to develop and retain the industrial base required for mobilization production readiness, the Air Force maintained its long-time interest in industrial planning. It participated with OSD in formulating policy and guidance documents for the Services and the Defense Supply Agency.

The Air Force worked closely with the National Tool, Die, and Precision Machining Association, attempting to alleviate the critical production problems of the tool and die industry in the United States. As a result, the Association inaugurated a new system for making better use of production capacity. The 1,260 member firms call daily and list their open-time machining capability and their open capacities to build special tools. This information is computerized weekly and made available to all manufacturers and defense contractors.

Shortages in hard metal machining capacity will affect Air Force programs through fiscal year 1971. One measure to improve the situation was the joint Air Force-industry program of modifying obsolete profile milling machines. The conversion of tracer control machines to numerical control increased their production capacity by as much as 50 percent, improved the quality of the work, and resulted in substantial savings. First-

year savings per machine approximated \$28,000 in operating costs compared to modification costs of \$70,000 per machine.

Industrial Resources

The industrial facility budget totaled \$47 million, of which \$24 million went to repair and maintain industrial plants and equipment and to repair equipment for shipment to the Defense Industrial Plant Equipment Center and other priority users. The Air Force spent approximately \$19 million to replace and modernize Government-owned production equipment. Expenditure of about \$4 million was approved for expansion of plants manufacturing critical items such as landing gears and jet engines needed in Southeast Asia.

The Air Force continued to reduce its inventory of industrial plants and support facilities. These dropped from 50 to 48, of which 10 were in the process of disposal. Four of these were scheduled to be removed from the inventory during fiscal year 1969.

Procurement

The Air Force obligated \$8.3 billion of current fiscal year funds in fiscal year 1968, an increase of \$727 million over last year. Aircraft and spares obligations amounted to \$3.6 billion as compared to \$3.1 billion in 1967. Procurement of missiles and spares decreased from \$460 million in fiscal year 1967 to \$325 million. Contracts for modification, facilities, components, and other support activities increased from \$4 billion to \$4.2 billion. Obligations for communication and electronic equipment totaled \$188 million as compared to \$199 million in the previous year.

Aircraft deliveries totaled 984 to the Air Force and 215 to military assistance programs and foreign military sales customers. These deliveries reflected a continued high level of military production in the aircraft industry. Although military and commercial orders kept the aircraft industry producing at a maximum rate, leadtimes on airframes, engines, and other key components were stabilized.

To improve the effectiveness of fixed-price and fixed-price-incentive contracts, the Air Force developed new techniques for evaluating multiple incentive contracts and for using computers to portray visually the interrelationships between cost, schedule, and performance. Consequently, OSD appointed the Air Force as the executive agent for all DoD activities in this field. On April 1, 1968, the Air Force established a program office and

by June 30, 1968, had provided assistance on 41 multiple incentive contracts with a total value of \$9 billion.

Members of the Air Staff, assisted by major command personnel, conducted a detailed analysis of small purchase practices and procedures, using information from six central and seven base procurement activities. The study group analyzed intensively more than 100 procurement activities, identified deficiencies, and recommended corrective action. Changes in procurement practices during this period ranged from better identification of initial items purchased to the evaluation of value received for the dollar spent. Supply procurement units were visited in February and March 1968 to insure that the changes were being implemented.

Small business procurement decreased in dollar value during fiscal year 1968. Small concerns received \$1.1 billion in prime contracts, as compared to \$1.3 billion for the previous year, or 10.4 percent of the \$10.8 billion awarded to business concerns in the United States. Small concerns also received approximately \$924 million, or 31 percent of all subcontracts let by Air Force prime contractors.

Military Assistance Program

During the 19 years that the Air Force has participated in the military assistance program (MAP), U.S. grant aid and allied purchases have enabled friendly nations to maintain a high degree of operational readiness and to modernize their air forces. As of June 30, 1968, over 270 foreign air force squadrons—including more than 150 jet units—have been either equipped or supported under the grant aid program. Through June 30, 1968, the Air Force has expended \$10.2 billion, of which aircraft expenditures accounted for \$6.1 billion. By the end of fiscal year 1968 the Air Force had delivered 16,293 planes, including 11,030 jets.

In fiscal year 1968 Air Force grant aid for supplies and services amounted to \$179.2 million, distributed among 41 MAP countries. Deliveries included 126 F-5's, four other tactical aircraft, 13 cargo planes, 97 trainers, and 44 utility aircraft and helicopters. In addition, the military assistance Service-funded fiscal year 1968 program for Vietnam and Korea furnished support totaling \$123.4 million. Deliveries included four F-5's, 25 cargo planes, and 49 utility planes and helicopters as well as ammunition and other support materiel.

As the economic strength of the allied nations increased,

their requirements for grant aid assistance declined. With each passing year these countries have been phasing out more and more of their MAP-provided or supported squadrons. As this has taken place, these nations have participated in the Air Force military assistance sales program, thereby augmenting their military strength and easing the international balance of payments problem. Such participation has ranged from the outright purchase of aircraft to coproduction, production under license, and associated arrangements. Military assistance sales during fiscal year 1968 totaled more than \$377.7 million. Allied nations purchased 109 new production aircraft—F-4's, F-5's, RF-5's, and C-130's.

During the past 19 years, 74,702 foreign nationals have received training in Air Force schools and facilities under grant aid while 9,620 have completed training under foreign military sales. In fiscal year 1968, 4,063 foreign nationals received training under grant aid and military sales.

Logistics Management

The Air Force spent approximately 10 percent of its budget, or more than \$2.5 billion in fiscal year 1968, on logistics support—supply, maintenance, transportation, and base operations. Increased activity in Southeast Asia, recall of AFRes units, and activation of additional units to improve the defense of Korea affected the program during this period.

On October 1, 1967, the Air Force Logistics Command established the Advanced Logistics System Center at Wright-Patterson AFB, Ohio. In March 1968, the center published an advanced master plan which defined the objectives, concepts, and computer and communication requirements and characteristics of a closed-loop integrated logistic management system to be operational in the early 1970's. The system would use "third generation" computers and advanced communications to provide worldwide control of the entire range of logistics support. This one system would eventually replace most of the 376 logistic and related data systems now in use.

In December 1967, five combat logistic support squadrons—one at each of the air materiel areas (AMA's)—were established to provide assistance as required to operational commands throughout the world. The squadrons consist of specialized teams that include maintenance, supply, and transportation personnel ready to be deployed at a moment's notice. The value of such teams was demonstrated by the success of the AFLC's rapid

area maintenance (RAM) teams, civilian employee volunteer groups in Southeast Asia who have returned to operation more than 500 aircraft that had suffered extensive crash or battle damage. Similar teams had solved supply and transportation problems for the combat units.

For the last several years the AMA's at Mobile, Ala., and Middletown, Pa., have been phasing down operations preparatory to closure. The Middletown AMA officially closed on June 30, 1968, 1 year ahead of schedule. The Mobile depot was expected to close before June 30, 1969, which would complete the program begun in fiscal year 1964 to consolidate the functions of nine AMA's into five.

Supply

The Air Force logistics system effectively supported sustained combat operations in Southeast Asia. During the past 2½ years, the number of aircraft in the theater tripled and the number of main bases to be supplied rose to 17, as compared to two at the beginning of the buildup period. The number of items supported by the supply system increased from 25,000 to more than 1.2 million.

The Air Force has significantly reduced the inventory of spare parts over the years. In 1958, \$9 billion in spares supported \$25.6 billion in weapon and supporting systems. A decade later \$8.2 billion in spares supported \$39.3 billion in weapon and supporting systems, a reduction in the ratio of spares to equipment in use of 42 percent. Of the \$923 million appropriated for replenishing the aircraft spares inventory during the fiscal year, \$922.4 million was committed by June 30, 1968.

Greater inter-Service cooperation resulted in improved supply efficiency. In July 1967, the Air Force established an automated screening system for the redistribution of excess materiel among the three Services in Europe. In March 1968, the Air Force became single manager for nonstandard communication materiel needed for equipment of foreign manufacture used by the U.S. military in Europe. Previously the Army and Air Force had procured and maintained substantial inventories of this equipment separately. The consolidated operation will support 140 Air Force and 20 Army units at an estimated annual savings of \$100,000.

The worldwide inventory of Air Force air munitions on June 30, 1968, exceeded the total on hand prior to the Southeast Asia conflict by approximately 100,000 tons. This expansion has

allowed the Air Force to build a small reserve of stocks for Southeast Asia, begin an orderly modernization and buildup of war readiness materiel, and commit some stocks to the military assistance program.

In October 1966, the Air Force initiated the COMBAT BEEF program to provide certain ANG and AFRes units with the equipment necessary to carry out their missions in the event of mobilization. The task was accomplished despite shortages created by previous withdrawals to support the Southeast Asia buildup, low priorities, and insufficient funding. The Air Force established a monthly status report, adjusted procurement programs, and closely monitored redistribution actions. When the COMBAT BEEF units were mobilized in January 1968, no major equipment shortages existed which degraded their mission capability.

There was a net increase of 5,699 in the number of cataloged line items in the Air Force inventory for fiscal year 1968, as 213,091 items were added and 207,392 eliminated. As of June 30, 1968, the quantity of line items totaled 1,717,228.

Maintenance

Increased battle damage, caused by mounting aerial operations and enemy raids against air bases in Vietnam, posed a continuing maintenance problem. Additional personnel were sent to supplement the RAM team program which was instituted in Vietnam several years earlier. Through the combined efforts of these teams the number of aircraft operationally ready was kept at a high level despite the increasing number of airplanes requiring repair. During fiscal year 1968 the RAM teams repaired on the spot, prepared for shipment or one-time flight to a major overhaul depot, or salvaged 349 aircraft.

Depot maintenance involved repair and overhaul of all Air Force equipment beyond the capability of operational units. The cost of such maintenance during fiscal year 1968 totaled \$855 million, an increase of approximately \$64 million over the previous year. Aside from the substantial depot maintenance workload created by poor landing strips, battle damage, and high aircraft utilization, the climate in Southeast Asia caused corrosion problems on all types of airborne and ground equipment. Southeast Asia requirements for depot maintenance cost approximately \$445 million, 52 percent of the total expenditure.

On July 1, 1968, the Air Force established an industrial fund to support depot maintenance activities and a stock fund for

items formerly funded in the procurement appropriation. In fiscal year 1969 the operations and maintenance appropriation was expected to purchase depot maintenance service from the industrial fund in the amount of \$1,388 million. The balance (\$21 million) of the depot maintenance budget request of \$1,409 million would finance activities not industrially funded, such as storage of aircraft, missiles, and vehicles and calibration operations.

The structural integrity of aging aircraft demanded continual inspection, and those portions affected by fatigue needed to be repaired or replaced. Similarly, the age and complexity of the jet engine inventory required advanced techniques for inspection and maintenance. Two maintenance programs—nondestructive inspections (NDI) and spectrometric oil analysis—were used to help analyze the effects of time and wear. By June 30, 1968, 62 Air Force bases possessed equipment for nondestructive inspection, some bases with limited capabilities. Using optics, eddy currents, ultrasonics, infrared, or other devices, technicians examined aircraft and missile components without taking them apart, thus allowing more time for actual repairs. The Air Force planned to provide 124 bases with NDI equipment by the end of fiscal year 1970 at a cost of \$12.3 million. Spectrometric oil analysis is a technique for measuring the concentration of metal particles in the oil of aircraft engines, with excessive amounts indicating potential engine failure. During fiscal year 1968, 1,019,002 oil samples were tested and 978 defective engines identified. The Air Force planned to expand use of this procedure to include hydraulic systems, ground support equipment, and motor vehicles.

To protect aircraft during overseas shipments the Air Force began slipping a plastic envelope around each aircraft and zipping it up. Previously, all aircraft seams and openings were taped, the tape painted with preservative, and the entire aircraft sprayed with six coats of protective liquid. The process took 1 week while the new method took two men about 2 hours and the envelopes could be reused.

Transportation

The Air Force transportation budget for fiscal year 1968 was approximately \$500.6 million, a \$6 million decrease compared to the previous year. Approximately \$351.6 million of this money was used to support combat operations in Southeast Asia.

Ground handling of cargo is an essential complement to air-

lift in getting vital supplies to the forces in the field. Along with the airlift capacity gained from the acquisition of the C-141, the Air Force improved the techniques, equipment, and facilities supporting terminal operations. The 463L mechanized materials handling system speeded up movement of air cargo during the buildup in Southeast Asia and, more recently, in Korea. Mechanized loading and unloading equipment on the ground and in the aircraft cut turnaround time and greatly increased flying hour utilization.

When the C-5A becomes operational the 463L system will be severely overtaxed. The Air Force worked toward identifying and acquiring the manpower, facilities, and equipment needed to use the C-5A's airlift capability effectively. Aerial ports might become congested by the large amounts of cargo carried by the C-5A. The Air Force investigated the use of large helicopters for future aerial port clearance, looking at the Military Sea Transportation Service (MSTS) concept of using large helicopters to deliver containerized cargo from ships to inland destinations in areas without adequate ports or overland transportation. The feasibility of bus train vehicles to transport large numbers of personnel from terminal to aircraft was also explored, since the advent of aircraft carrying 300 to 500 passengers would make the small buses now used inadequate. In June 1967 the Air Force awarded a contract for five bus trains with delivery of the first scheduled for November 1968. Two were scheduled for test at Rhein-Main AB, Germany, and the others at Travis AFB, Calif., Eglin AFB, Fla., and Clark AB, P.I.

Air Force directives in the past stipulated that scheduled military and commercial contract flights to and from overseas would be given preferential handling over domestic flights at Air Force air terminals. Accordingly, Logair—the commercial contract airlift system within the continental United States—did not receive priority handling. In December 1967 the Air Force determined that Logair flights required priority equal to international flights in order to reduce pipeline time and make the flow of cargo more regular. Effective June 27, 1968, Logair aircraft were given equal ground-handling precedence.

Two additional Air Force bases were connected to commercial aviation pipelines during the year. Since one base was closed, the Air Force installations receiving this service totaled 46. Pipeline connections to two more bases were approved, with completion of facilities scheduled during fiscal year 1969. Five other bases were also being studied for pipeline service in the near

future. Based on transportation costs by other modes in effect when the pipelines became operational, the Air Force estimated that pipeline service had saved \$6 million annually and approximately \$65 million cumulatively since 1954. The pipeline companies provided nearly four million barrels of fuel storage capacity for these bases at no cost to the Air Force.

Base Maintenance

In fiscal year 1966 the Air Force instituted Project PRIME BEEF (Base Engineer Emergency Forces) to provide base recovery teams for emergencies at Air Force installations and engineering teams that could deploy throughout the world for tactical support and contingencies. Seventy teams, each with 60 men, were formed. During the Korean buildup in January 1968 the availability of these trained units proved the validity of the program. Thirty-six hours after the President approved deployment, eight teams were working at Korean air bases, erecting facilities, rehabilitating utilities and providing water, and preparing the bases generally for incoming tactical forces.

Anticipating an extensive rehabilitation and construction program in Korea, the Air Force deployed a force of 56 officers and airmen to augment the U.S. 5th Air Force civil engineering staff. Ten stayed in Japan while the other 46 comprised the 5th Air Force advanced headquarters civil engineering staff in Korea. Shortly thereafter, a 400-man base civil engineering augmentation unit was deployed to Korea for 179 days to undertake projects beyond the capabilities of the base civil engineer units and the PRIME BEEF teams.

The Air Force worked closely with the Federal Aviation Administration and civil aircraft interests to encourage the development of suitable civil facilities. During fiscal year 1968 the Air Force continued the lease agreement for McCoy AFB, Fla.; permitted scheduled airline service to Palmdale, Calif., by allowing the use of the landing field at Palmdale AF Plant No. 42; and authorized the civilian use of Dow AFB, Maine, pending base closure.

Air Force fire losses in buildings and contents were \$5.04 million, up from \$4.19 million in fiscal year 1967, but well below the 10-year average of \$9.9 million. Air Force bases reported a total of 849 fires—the lowest in the history of the Air Force. Two fires caused 53 percent of the loss: In the first, an aircraft crashed into a ground control complex, resulting in \$770,000 damage and three deaths; in the other, fire at a radar bomb-

scoring facility destroyed 12 vans and damaged 3 others for a monetary loss of \$1.9 million. There were 147 aircraft accidents requiring fire suppression, 46 less than in the previous year, and damage amounted to \$2.87 million as compared with \$10.2 million. Total fire losses were \$7.91 million (excluding losses in Southeast Asia) compared to \$14.4 million for the preceding year. Fifty-four people lost their lives, 45 in fires associated with aircraft accidents.

Since the beginning of the DoD base consolidation and closure program in November 1964, the Air Force has disposed of 17 installations and 46 missile silos. More than 50,000 acres, with real estate and improvements valued at \$737.35 million, were returned to the economy. As of June 30, 1968, six installations (15,686 acres with capital assets of \$186.5 million) and 107 missile silos (23,291 acres and \$387.44 million) were in the process of disposal. Additionally, 35,243 acres with capital assets of \$517.54 million at 14 installations were in the process of being declared excess to the Air Force.

During the year eight major Air Force installations, including Orlando AFB, Fla.; Dow AFB, Maine; Glasgow AFB, Mont.; Turner AFB, Ga.; Olmsted AFB, Pa.; Portland International Airport, Ore.; Truax Field, Wis.; and Waco 12th Air Force Headquarters Office, Tex., were reclassified and dropped from the major active installations list. On June 30, 1968, Air Force major installations were classified as follows:

Type	United States		Overseas		Total	
	1967	1968	1967	1968	1967	1968
Operational	70	66	43	43	113	109
Operational support:						
Flying	6	6	4	4	10	10
Nonflying	12	10	4	4	16	14
Training	31	30			31	30
Research and test	9	9			9	9
Logistic	9	8			9	8
Southeast Asia bases (Non-U.S. property)			18	18	18	18
Total	137	129	69	69	206	198

Inspections

The Inspector General (TIG) continued to inspect, survey, and investigate the state of readiness, safety, and security of Air Force personnel and installations. Inspection teams focused special attention on existing and potential problems to assure

prompt and effective correction of deficiencies which could have an adverse impact on the Air Force's combat potential and economical management of resources.

During fiscal year 1968 TIG conducted 37 inspections, including a comprehensive evaluation of Headquarters Command, AFLC, ADC, and the Air Force Academy. Other inspections involved specific system and functional areas—MINUTEMAN II, ABRES, nonnuclear munition acquisition, Loran D, and the worldwide airborne command post system. In the resource management area, the inspectors investigated the use of automatic data processing equipment by Air Force contractors.

The Inspector General investigated the procedures used in mobilizing the reserve forces in January 1968 and found the response to the no-notice callup commendable and the logistical support generally excellent. The inspection disclosed that guidance on the use of the units was lacking, billeting plans were inadequate, and the organization and manning of the recalled units required realignment. Action was immediately taken to correct these deficiencies.

Safety

The Air Force flying safety record continued to improve. From July to December 1967 the accident rate declined from 4.8 major aircraft accidents per 100,000 flying hours to 4.6. By June 30, 1968, the rate had dropped to 3.6. The rate for the entire fiscal year was 4.1 as compared to 4.5 for the previous 12-month period. Fewer aircraft were destroyed, although there were seven more minor accidents and four more pilot fatalities.

The Inspector General conducted the first Aerospace Safety Symposium in September 1967 at which directors and chiefs of safety from major commands exchanged ideas, information, experience, and professional knowledge. In April 1968, TIG representatives attended the Seventh Joint Services Safety Conference where mutual safety problems were discussed and closer cooperation developed among the Services.

The Inspector General continued to emphasize care during missile modification. TIG teams gave 92 briefings to Air Force management and specialized groups—73 on the TITAN II accident in August 1965 and 19 on the APOLLO disaster of January 1967. The Inspector General also participated in system, preliminary, and critical design reviews of the MINUTEMAN III, SRAM, and the manned orbiting laboratory and recommended corrective actions to eliminate safety deficiencies prior to final design

and fabrication. Additionally, TIG safety experts visited all units having missiles and other aerospace systems, assisting commanders in the specialized area of missile safety and providing guidance on the conduct of missile accident investigating boards.

As in previous years, no accidents resulted in nuclear explosions. On January 21, 1968, a B-52 crashed on the ice of North Star Bay, Greenland, with four nuclear weapons aboard (see ch. II). The Inspector General sent a team to assist in the recovery of weapon components and the removal of contaminated debris. Throughout the year, TIG received and analyzed 1,609 reports of nuclear safety problems. Approximately 1,000 of these received detailed technical evaluation and the Air Force subsequently corrected the difficulties. TIG conducted nuclear safety inspections at nine Air Force organizations and rated one organization unsatisfactory until the completion of corrective action.

The ground accident rate (number of accidents per million man-days of exposure) showed substantial improvement. A total of 9,512 accidents was reported, a 23.7 rate, as compared to 10,507 accidents and a 26.0 rate for the previous year. Nondisabling injuries to military personnel remained the same as the year before, but disabling injuries were reduced. Military/civilian disabling injuries were reduced 13 percent and nondisabling injuries 2 percent. For the seventeenth time, the Air Force received the National Safety Council Award of Honor—the highest recognition for accident prevention. Additionally, the council presented the Award of Honor to 28 units and the Award of Merit to 42 units.

Although the use of nonnuclear munitions continued to rise as a result of combat operations, there was a slight decrease in the number of explosive accidents and incidents—698 in fiscal year 1967 and 662 in 1968. An advanced explosive safety training course was established to improve safety management further and increase accident prevention activity at all levels of command.

Security

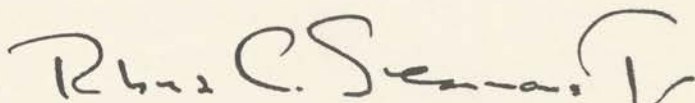
The Inspector General completed 363,087 investigations in the fiscal year: 314,941 personnel, 25,012 criminal and procurement fraud, and 23,134 counterintelligence. The property recovered as a result of criminal investigations was valued at \$942,275 and the money recovered from procurement fraud amounted to more than \$85,237—a total in excess of \$1 million.

The Inspector General provided assistance in preparing pre-

liminary designs for base defense in Southeast Asia. During October and December 1967, 11 security surveys were completed—seven in Vietnam, three in Thailand, and one in Korea. On December 6, 1967, the Chief of Staff approved the Safeside concept which called for Air Force personnel to protect bases they occupied in hostile areas—specifically those in Southeast Asia. Previous studies and experience indicated that a well organized, trained, and equipped force was essential to the defense of USAF units which are vulnerable to enemy ground attack. TAC became the single executive manager on March 1, 1968, activated a combat security police wing, and began training personnel. In April the first squadron deployed to Vietnam and a second squadron began training the following month.

Management Evaluation

During the fiscal year the Auditor General issued more than 8,500 reports of audit to Air Force managers. These were concentrated in the area of supply management, management of maintenance and repairs, management of real and installed property, and procurement and contract administration. A significant number of audit hours was devoted to new systems under Project PRIME 69. The Air Force Auditor General helped operating personnel to prepare and convert accounting systems from the appropriation base to cost base. Auditor training programs were accelerated and expanded as part of the over-all effort to provide constructive evaluation of the effectiveness and efficiency of Air Force management.



ROBERT C. SEAMANS
Secretary of the Air Force.

APPENDIX

1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11
12	12	12
13	13	13
14	14	14
15	15	15
16	16	16
17	17	17
18	18	18
19	19	19
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21	21	21
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85	85	85
86	86	86
87	87	87
88	88	88
89	89	89
90	90	90
91	91	91
92	92	92
93	93	93
94	94	94
95	95	95
96	96	96
97	97	97
98	98	98
99	99	99
100	100	100

Appendix

STATISTICAL INFORMATION

TABLE		Page
1.	MAJOR FORCES BY DEPARTMENT	498
2.	MAJOR FORCES BY MISSION	499
	<i>Vietnam</i>	
3.	U.S. MILITARY PERSONNEL IN SOUTH VIETNAM	500
4.	REPUBLIC OF VIETNAM FORCES	501
5.	OTHER FREE WORLD FORCES IN VIETNAM	501
6.	U.S. FORCES DEPLOYED IN SOUTHEAST ASIA	502
7.	U. S. MILITARY PERSONNEL CASUALTIES IN VIETNAM CONFLICT	503
8.	U.S. AIRCRAFT LOSSES IN SOUTHEAST ASIA	504
	<i>Budget and Finance</i>	
9.	FINANCIAL SUMMARY	505
10.	CHRONOLOGY OF FISCAL YEAR 1968 BUDGET ESTIMATES	506
11.	NEW OBLIGATIONAL AVAILABILITY FOR MILITARY FUNCTIONS AND MILITARY ASSISTANCE	507
12.	OBLIGATIONS FOR MILITARY FUNCTIONS AND MILITARY ASSISTANCE	508
13.	EXPENDITURES FOR MILITARY FUNCTIONS AND MILITARY ASSISTANCE	510
14.	DEFENSE BUDGET	512
15.	U.S. DEFENSE EXPENDITURES AND RECEIPTS ENTERING THE INTERNATIONAL BALANCE OF PAYMENTS	513
	<i>Research and Development</i>	
16.	RESEARCH, DEVELOPMENT, TEST, AND EVALUATION PROGRAMS, DIRECT OBLIGATIONS	514
	<i>Personnel</i>	
17.	ACTIVE DUTY MILITARY PERSONNEL	515
18.	DEPLOYMENT OF MILITARY PERSONNEL	516
19.	MILITARY PERSONNEL BY GRADE	517
20.	ENLISTED PERSONNEL PROCUREMENT	518
21.	DEPENDENTS OF MILITARY PERSONNEL	519
22.	REENLISTMENT RATES	520
23.	WOMEN MILITARY PERSONNEL	522

TABLE		Page
24.	CIVILIAN PERSONNEL	523
25.	OSD-JCS PERSONNEL	524
26.	OTHER DEFENSE ACTIVITIES PERSONNEL	525
27.	RESERVE PERSONNEL	526
28.	RESERVE PERSONNEL NOT ON ACTIVE DUTY	527
29.	RESERVE PERSONNEL IN PAID STATUS	528
30.	RESERVE ACTIVE DUTY BASIC TRAINING PROGRAMS	529
31.	MEDICAL CARE IN DEFENSE FACILITIES	530
32.	CIVILIAN HEALTH AND MEDICAL PROGRAM FOR THE UNIFORMED SERVICES	531
	<i>Logistics</i>	
33.	CONTRACT AWARDS BY PROGRAM	532
34.	CONTRACT AWARDS BY TYPE OF CONTRACTOR	533
35.	CONTRACT AWARDS BY PRICING PROVISIONS	534
36.	CONTRACT AWARDS BY COMPETITIVE STATUS	535
37.	CONTRACT AWARDS BY REGION AND STATE	536
38.	DEFENSE-WIDE SUPPLY	538
39.	EXCESS MATERIEL	539
40.	FEDERAL CATALOG SYSTEM	540
41.	COST REDUCTION PROGRAM	541
42.	MAJOR STORAGE FACILITIES	542
43.	PROPERTY HOLDINGS	543
44.	REAL PROPERTY HOLDINGS	544
45.	FAMILY HOUSING	545
46.	DEFENSE-WIDE TRANSPORTATION SERVICES	546
	<i>Military Assistance</i>	
47.	MILITARY ASSISTANCE, 1950-68	547
48.	MILITARY ASSISTANCE DELIVERIES	548
49.	MILITARY ASSISTANCE OBLIGATIONS AND EXPENDITURES	550

NOTE.—Subtotals in these tables may not add to totals due to rounding.

Table 1

MAJOR FORCES BY DEPARTMENT

	June 30, 1961	June 30, 1966	June 30, 1967	June 30, 1968
DEPARTMENT OF DEFENSE				
Active duty personnel	2,483,771	3,094,058	3,376,880	3,547,902
Active aircraft inventory	31,262	30,554	32,809	34,283
DEPARTMENT OF THE ARMY				
Divisions	14	17	17	18
Regiments/RCT's	6	4	5	5
Armored combat commands	1			
Brigades	2	9	11	11
Battle Groups	8			
Special Forces Groups	3	7	7	7
Army missile commands	4	1	1	1
Active duty personnel	858,622	1,199,784	1,442,498	1,570,343
Active aircraft inventory	5,564	8,098	9,375	10,465
DEPARTMENT OF THE NAVY				
Commissioned ships in fleet	819	909	931	932
Warships	(375)	(410)	(419)	(423)
Other	(444)	(499)	(512)	(509)
Carrier air groups	17	17	17	17
Carrier antisubmarine air groups	11	10	10	10
Patrol and warning squadrons	38	32	32	32
Marine divisions	3	4	4	4
Marine air wings	3	3	3	3
Active duty personnel	803,998	1,006,921	1,036,888	1,072,709
Navy	(627,089)	(745,205)	(751,619)	(765,457)
Marine Corps	(176,909)	(261,716)	(285,269)	(307,252)
Active aircraft inventory	8,793	8,260	8,417	8,491
DEPARTMENT OF THE AIR FORCE				
USAF combat squadrons	307	276	263	275
Strategic squadrons	(136)	(73)	(71)	(69)
Air defense squadrons	(61)	(40)	(35)	(30)
Tactical squadrons (including airlift)	(110)	(163)	(157)	(176)
USAF combat support flying squadrons	121	126	123	132
Active duty personnel	821,151	887,353	897,494	904,850
Active aircraft inventory	16,905	14,196	15,047	15,327

Table 2

MAJOR FORCES BY MISSION

	June 30, 1961	June 30, 1966	June 30, 1967	June 30, 1968
STRATEGIC RETALIATORY FORCES				
Intercontinental ballistic missiles:				
MINUTEMAN squadrons		17	20	20
TITAN squadrons		6	6	6
ATLAS squadrons	5			
POLARIS submarines	5	37	41	41
Strategic bombers:				
B-52 squadrons	39	40	37	34
B-58 squadrons	6	6	6	6
B-47 squadrons	80			
CONTINENTAL AIR AND MISSILE DEFENSES				
Manned fighter interceptor squadrons	42	33	28	24
Interceptor missile (BOMARC) squadrons	7	6	6	6
Army air defense missile battalions	49½	18	18	20¼
GENERAL PURPOSE FORCES				
Army divisions	14	17	17	18
Army maneuver battalions	124	191	201	218
Army aviation units	67	160	187	212
Army Special Forces Groups	3	7	7	7
Warships:				
Attack carriers	15	15	15	15
Antisubmarine warfare carriers	9	8	8	8
Nuclear attack submarines	13	22	28	33
Other	328	328	327	328
Amphibious assault ships	110	159	161	157
Carrier air groups (attack and antisub warfare)	28	27	27	23
Marine Corps divisions/air wings	3/3	4/3	4/3	4/3
USAF tactical forces aircraft squadrons	93	130	123	144
AIRLIFT AND SEALIFT FORCES				
Airlift aircraft squadrons:				
C-130 through C-141	16	42	45	44
C-118 through C-124	35	16	16	17
Troop and cargo ships and tankers	101	121	130	130

Table 3

U.S. MILITARY PERSONNEL IN SOUTH VIETNAM ¹

(In thousands)

	Army	Navy ²	Marine Corps	Air Force	Total
June 30, 1964 -----	9.9	1.0	0.6	5.0	16.5
FISCAL YEAR 1965					
Sept. 30, 1964 -----	11.9	1.1	0.7	5.8	19.5
Dec. 31, 1964 -----	14.7	1.1	0.9	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					
Sept. 30, 1965 -----	76.2	6.1	36.4	13.6	132.3
Dec. 31, 1965 -----	116.8	8.7	38.2	20.6	184.3
Mar. 31, 1966 -----	137.4	12.8	48.7	32.3	231.2
June 30, 1966 -----	160.0	17.4	53.7	36.4	267.5
FISCAL YEAR 1967					
Sept. 30, 1966 -----	189.2	21.9	56.5	45.5	313.1
Dec. 31, 1966 -----	239.4	23.8	69.2	52.9	385.3
Mar. 31, 1967 -----	264.6	25.1	75.4	55.8	420.9
June 30, 1967 -----	285.7	29.0	78.4	55.7	448.8
FISCAL YEAR 1968					
July 31, 1967 -----	293.4	29.5	79.9	55.8	458.6
Aug. 31, 1967 -----	302.7	29.7	78.6	55.2	466.3
Sept. 30, 1967 -----	296.1	30.3	76.5	56.8	459.7
Oct. 31, 1967 -----	306.5	31.4	73.6	55.9	467.4
Nov. 30, 1967 -----	306.1	30.8	76.1	56.7	469.7
Dec. 31, 1967 -----	319.5	32.2	78.0	55.9	485.6
Jan. 31, 1968 -----	325.5	32.9	78.2	56.4	493.0
Feb. 29, 1968 -----	330.6	34.8	82.9	57.5	505.8
Mar. 31, 1968 -----	337.3	35.8	83.8	58.3	515.2
Apr. 30, 1968 -----	342.9	35.1	83.0	58.7	519.8
May 31, 1968 -----	355.2	36.0	84.9	59.9	536.0
June 30, 1968 -----	354.3	36.1	83.6	60.7	534.7

¹ As reported by MACV.² Beginning in July 1965, includes 400 to 500 Coast Guard personnel.

Table 4

REPUBLIC OF VIETNAM FORCES

(In thousands)

	End of fiscal year				
	1964	1965	1966	1967	1968
Regular Forces	218.5	265.7	313.6	326.7	403.1
Regional Forces	87.3	107.7	141.4	141.3	197.9
Popular Forces	99.6	149.0	137.7	141.3	164.3
Other ¹	120.2	103.4	107.8	159.2	176.8
TOTAL	525.6	625.8	700.5	708.6	942.1

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	Fiscal year 1966	Fiscal year 1967	Fiscal year 1968	
	June 30, 1965	June 30, 1966	June 30, 1967	Dec. 31, 1967	June 30, 1968
Australia	1.1	4.4	5.9	6.8	7.5
Korea	2.1	25.2	45.6	47.8	50.1
New Zealand	(¹)	0.2	0.4	0.5	0.5
Philippines	0.1	0.1	2.1	2.0	1.8
Thailand	(¹)	(¹)	0.2	2.2	2.4
Other	(¹)	(¹)	(¹)	(¹)	(¹)
TOTAL	3.3	29.9	54.2	59.4	62.4

¹ Less than 50.

Table 6

U.S. FORCES DEPLOYED IN SOUTHEAST ASIA

	End of fiscal year			
	1965	1966	1967	1968
GROUND FORCES				
Maneuver battalions	9	51 2/3	85	112
Combat support battalions	4	38 1/3	64 2/3	81
Engineer battalions ¹	6 1/3	30 2/3	53	59
AIR FORCES				
Fighter-attack aircraft	593	841	948	1,121
Non-attack capable aircraft	405	838	1,128	1,519
Helicopters ²	505	1,687	2,419	3,268
NAVAL FORCES ³				
River control ships		64	202	331
Coastal patrol ships ⁴	35	91	132	130
Offshore ships	60	49	87	89

¹ Includes construction battalions.² Excludes Navy carrier-based helicopters in 1965 and 1966.³ Navy and Coast Guard ships and vessels normally engaged in South China Sea-Gulf of Thailand area west of 115° east.⁴ Includes DER's, MSO's, MSC's, WHEC's, and PG's.

Table 7

U.S. MILITARY PERSONNEL CASUALTIES IN VIETNAM CONFLICT

	Fiscal years 1961-4	Fiscal year 1965	Fiscal year 1966	Fiscal year 1967	Fiscal year 1968
From Actions by Hostile Forces					
DEATHS					
From aircraft acci- dents/incidents	130	109	319	413	749
From ground action	49	195	3,345	6,983	13,324
DEATHS					
Killed	123	191	3,099	6,134	11,680
Died of wounds	9	13	341	749	1,506
Died while missing or captured	47	100	224	513	887
TOTAL DEATHS	179	304	3,664	7,396	14,073
WOUNDS (nonfatal)					
Hospital care required	503	806	11,009	24,999	46,599
Hospital care not required	460	774	9,126	21,974	43,373
Not the Result of Actions by Hostile Forces					
DEATHS					
From aircraft acci- dents/incidents	27	62	193	424	563
Other than air	54	95	450	910	1,322
DEATHS					
Died of illness	22	24	94	210	331
Died while missing	7	39	131	240	506
Died from other causes	52	94	418	884	1,048
TOTAL DEATHS	81	157	643	1,334	1,885

Table 8

U.S. AIRCRAFT LOSSES IN SOUTHEAST ASIA

Aircraft type	Fiscal year 1965		Fiscal year 1966		Fiscal year 1967		Fiscal year 1968	
	Hostile	Operational	Hostile	Operational	Hostile	Operational	Hostile	Operational
Fighter and attack	86	44	302	83	393	85	384	111
Interceptor		1	4		2	4	1	
Reconnaissance	9	3	31	7	33	6	45	12
Bombers		2						3
Transports	1	7	14	14	5	18	21	19
Other fixed-wing	10	17	58	42	46	66	112	87
Total fixed-wing	106	74	409	146	479	179	563	232
Helicopters	30	53	124	130	190	290	505	437
TOTAL AIRCRAFT LOSSES	136	127	533	276	669	469	1,068	669

Table 9

FINANCIAL SUMMARY ¹

(In billions of dollars)

Total obligational authority (TOA)	Fiscal year 1967	Fiscal year 1968	Fiscal year 1969
TOA BY PROGRAM			
Strategic forces	6.9	7.9	9.6
General purpose forces	32.7	32.6	35.2
Intelligence and communications	5.3	5.7	6.3
Airlift and sealift forces	1.9	1.9	1.8
Reserve and guard forces	2.7	2.7	3.0
Research and development	4.8	4.6	5.1
Central supply and maintenance	7.1	7.1	7.3
Personnel support (training, medical, etc.)	8.5	9.4	9.8
Administration and associated activities	1.5	1.6	1.7
Military assistance	2.5	2.1	2.7
Less unfunded retirement pay	- 0.4	- 0.3	- 0.1
TOTAL OBLIGATIONAL AUTHORITY	73.4	75.2	82.4
Less financing adjustments	- 0.4	- 1.9	- 2.8
NEW OBLIGATIONAL AUTHORITY	73.0	73.4	79.6
TOTAL EXPENDITURES	68.3	74.2	77.1
TOA BY DEPARTMENT AND AGENCY			
Army	22.5	24.2	26.1
Navy	21.5	21.1	24.0
Air Force	24.7	25.1	27.0
Defense agencies	3.3	3.8	4.2
Defense family housing	0.4	0.5	0.5
Military assistance	0.9	0.5	0.6
TOTAL OBLIGATIONAL AUTHORITY	73.4	75.2	82.4

¹ As estimated in the President's Budget, January 29, 1968.

Table 10

CHRONOLOGY OF FISCAL YEAR 1968 BUDGET ESTIMATES

(In billions of dollars)

Item	Printed budget estimates, Jan. 24, 1967	Supplemental requests, Mar. 11, 1968, May 21, 1968, May 22, 1968	Total
NEW OBLIGATIONAL AUTHORITY (NOA) REQUESTED	75.2	4.7	80.0
ANALYSIS BY FUNCTIONAL TITLE			
Military personnel	22.0	0.5	22.6
Operation and maintenance	19.1	0.2	19.3
Procurement	22.9		22.9
RDT&E	7.3		7.3
Military construction	2.1		2.1
Family housing	0.8		0.8
Civil defense	0.1		0.1
Revolving and management funds	0.3		0.3
SEA emergency fund		3.9	3.9
Total, Military functions	74.6	4.6	79.3
Military assistance	0.6	0.1	0.7
TOTAL NOA REQUESTED	75.2	4.7	80.0
CONGRESSIONAL ACTION	- 2.7	- 0.4	- 3.2
TOTAL NOA ENACTED	72.5	4.3	76.8

Table 11

**NEW OBLIGATIONAL AVAILABILITY FOR MILITARY FUNCTIONS
AND MILITARY ASSISTANCE, FISCAL YEAR 1968**

(In millions of dollars)

	Army	Navy	Air Force	Defense- wide activities ¹	Depart- ment of Defense
MILITARY PERSONNEL:					
Active forces	7,825	5,591	5,684		19,100
Reserve forces	606	160	156		923
Retired pay				2,095	2,095
Total	8,432	5,751	5,840	2,095	22,118
OPERATION AND MAINTENANCE	8,373	5,407	6,160	1,010	20,950
PROCUREMENT:					
Aircraft	1,282	2,660	5,510		9,452
Missiles	493	601	1,399		2,493
Ships		1,300			1,300
Tracked combat vehicles	406	18			424
Ordnance, etc.	2,915	1,778	1,617	1	6,311
Electronics and communi- cations	587	499	339	8	1,432
Other procurement	717	752	490	35	1,994
Total	6,400	7,608	9,356	44	23,408
RDT&E:					
Military sciences	166	185	136	83	570
Aircraft	141	293	747	8	1,189
Missiles	673	676	950	105	2,404
Astronautics	7	16	1,018	3	1,043
Ships		314			314
Ordnance, etc.	178	145			322
Other equipment	356	142	271	255	1,025
Program-wide management	36	101	271	9	417
Total	1,558	1,872	3,393	463	7,285
CONSTRUCTION:					
Active forces	475	514	489	41	1,518
Reserve forces	6	5	13		24
Total	481	519	502	41	1,543
FAMILY HOUSING				691	691
CIVIL DEFENSE				86	86
REVOLVING AND MANAGE- MENT FUNDS	60			118	178
OTHER				67	67
MILITARY ASSISTANCE				500	500
TOTAL	25,303	21,157	25,251	5,116	76,827

¹ Includes the Office of the Secretary of Defense, Joint Chiefs of Staff, Defense agencies, Office of Civil Defense, Military Assistance, etc.

Table 12

OBLIGATIONS FOR MILITARY FUNCTIONS AND MILITARY ASSISTANCE,
FISCAL YEARS 1967-68

(In millions of dollars)

	Unobligated balance brought forward	New obligations available	Reimbursements, etc.	Total obligations available	Obligations	Unobligated balance carried forward
DEPARTMENT OF DEFENSE						
Fiscal Year 1967	13,865	72,136	6,169	92,169	78,208	13,737
Fiscal Year 1968	13,737	76,649	6,239	96,625	83,050	13,499
BY FUNCTIONAL TITLE						
<i>Military personnel:</i>						
Fiscal Year 1967		20,216	262	20,478	20,329	
Fiscal Year 1968		22,118	193	22,311	22,248	
<i>Operation and maintenance:</i>						
Fiscal Year 1967	71	19,434	2,091	21,596	21,463	61
Fiscal Year 1968	61	20,950	2,023	23,033	22,990	34
<i>Procurement:</i>						
Fiscal Year 1967	10,345	22,871	2,665	35,881	24,705	11,176
Fiscal Year 1968	11,176	23,408	2,998	37,581	26,881	10,701
<i>RDT&E:</i>						
Fiscal Year 1967	1,414	7,172	583	9,170	8,167	1,003
Fiscal Year 1968	1,003	7,285	571	8,859	8,000	859
<i>Construction:</i>						
Fiscal Year 1967	1,768	1,098	559	3,425	2,144	1,281
Fiscal Year 1968	1,281	1,543	553	3,377	1,784	1,593
<i>Family housing:</i>						
Fiscal Year 1967	217	507	5	729	550	178
Fiscal Year 1968	178	691	5	874	645	228
<i>Civil defense:</i>						
Fiscal Year 1967	39	101	1	141	118	22
Fiscal Year 1968	22	86		109	100	8
<i>Other:</i>						
Fiscal Year 1967		7		7	2	5
Fiscal Year 1968	5	67		72	1	72
<i>Military assistance:</i>						
Fiscal Year 1967	11	728	2	741	729	12
Fiscal Year 1968	12	500	-106	406	401	5

Table 12—Continued

OBLIGATIONS FOR MILITARY FUNCTIONS AND MILITARY ASSISTANCE,
FISCAL YEARS 1967-68—Continued

(In millions of dollars)

	Unobligated balance brought forward	New obligational availability	Reimbursements, etc.	Total obligational availability	Obligations	Unobligated balance carried forward
BY AGENCY						
<i>Army:</i>						
Fiscal Year 1967 --	2,156	22,588	3,285	28,028	24,947	2,965
Fiscal Year 1968 --	2,965	25,243	3,395	31,604	28,180	3,381
<i>Navy:</i>						
Fiscal Year 1967 --	6,666	20,633	1,484	28,783	21,961	6,762
Fiscal Year 1968 --	6,762	21,157	1,751	29,670	23,504	6,154
<i>Air Force:</i>						
Fiscal Year 1967 --	4,421	24,223	1,518	30,161	26,531	3,614
Fiscal Year 1968 --	3,614	25,251	1,143	30,008	26,508	3,484
<i>OSD and Defense agencies:</i>						
Fiscal Year 1967 --	573	3,863	-121	4,315	3,922	362
Fiscal Year 1968 --	362	4,411	56	4,829	4,356	467
<i>Office of Civil Defense:</i>						
Fiscal Year 1967 --	39	101	1	141	118	22
Fiscal Year 1968 --	22	86	-----	109	100	8
<i>Military Assistance:</i>						
Fiscal Year 1967 --	11	728	2	741	729	12
Fiscal Year 1968 --	12	500	-106	406	401	5

Table 13

EXPENDITURES ¹ FOR MILITARY FUNCTIONS AND MILITARY ASSISTANCE, FISCAL YEARS 1967-68

(In millions of dollars)

	Unexpended balance brought forward ²	New expendi- ture availa- bility, etc.	Total available for expenditure	Expendi- tures	Unexpended balance carried forward
DEPARTMENT OF DE- FENSE:					
Fiscal Year 1967 -----	43,041	72,732	115,773	68,537	46,970
Fiscal Year 1968 -----	48,910	76,530	125,440	78,138	47,058
BY FUNCTIONAL TITLE					
<i>Military personnel:</i>					
Fiscal Year 1967 -----	717	20,179	20,896	19,787	935
Fiscal Year 1968 -----	935	22,091	23,026	21,954	867
<i>Operation and mainte- nance:</i>					
Fiscal Year 1967 -----	2,300	19,479	21,779	19,000	2,700
Fiscal Year 1968 -----	2,737	20,966	23,703	20,578	3,163
<i>Procurement:</i>					
Fiscal Year 1967 -----	27,678	22,871	50,549	19,012	31,536
Fiscal Year 1968 -----	31,499	23,495	54,933	23,283	31,711
<i>RDT&E:</i>					
Fiscal Year 1967 -----	4,746	7,172	11,918	7,160	4,759
Fiscal Year 1968 -----	4,759	7,285	12,044	7,747	4,297
<i>Construction:</i>					
Fiscal Year 1967 -----	2,636	1,038	3,734	1,536	2,199
Fiscal Year 1968 -----	2,199	1,706	3,905	1,281	2,623
<i>Family housing:</i>					
Fiscal Year 1967 -----	346	507	853	558	291
Fiscal Year 1968 -----	291	691	983	495	401
<i>Civil defense:</i>					
Fiscal Year 1967 -----	117	102	219	100	114
Fiscal Year 1968 -----	114	86	200	108	89
<i>Other:</i>					
Fiscal Year 1967 -----		7	7		7
Fiscal Year 1968 -----	7	67	75	2	73
<i>Revolving and management funds:</i>					
Fiscal Year 1967 -----	2,670	534	3,204	512	2,689
Fiscal Year 1968 -----	4,629	-94	4,535	2,090	2,459
<i>Military assistance:</i>					
Fiscal Year 1967 -----	1,831	782	2,613	873	1,740
Fiscal Year 1968 -----	1,740	237	1,977	601	1,376

Table 13—Continued

EXPENDITURES ¹ FOR MILITARY FUNCTIONS AND MILITARY ASSISTANCE, FISCAL YEARS 1967–68—Continued

(In millions of dollars)

	Unexpended balance brought forward ²	New expendi- ture availa- bility, etc.	Total available for expenditure	Expendi- tures	Unexpended balance carried forward
BY AGENCY					
<i>Army:</i>					
Fiscal Year 1967 -----	8,941	23,026	31,968	21,010	10,824
Fiscal Year 1968 -----	11,184	25,696	36,881	25,294	11,529
<i>Navy:</i>					
Fiscal Year 1967 -----	18,074	20,792	38,866	19,291	19,505
Fiscal Year 1968 -----	19,851	21,100	40,952	22,106	18,872
<i>Air Force:</i>					
Fiscal Year 1967 -----	12,316	24,255	36,571	22,945	13,607
Fiscal Year 1968 -----	13,620	25,423	39,044	25,792	13,137
<i>OSD and Defense agencies:</i>					
Fiscal Year 1967 -----	1,760	3,776	5,536	4,317	1,180
Fiscal Year 1968 -----	2,400	3,987	6,387	4,237	2,056
<i>Office of Civil Defense:</i>					
Fiscal Year 1967 -----	119	101	220	100	115
Fiscal Year 1968 -----	115	86	201	108	89
<i>Military Assistance:</i>					
Fiscal Year 1967 -----	1,831	782	2,613	873	1,740
Fiscal Year 1968 -----	1,740	237	1,977	601	1,376

¹ Reconciliation of expenditures to outlays (as used in budget documents):

	Fiscal year 1967	Fiscal year 1968
Expenditures (shown above) -----	68,537	78,138
Budget concept adjustments:		
Trust fund expenditures -----	1,090	1,015
Intragovernmental transactions -----	-7	-7
Applicable receipts -----	-1,213	-1,119
Authorization to spend agency debt receipts family housing, Defense) -----	-77	-----
Outlays -----	68,331	78,027

² Fiscal year 1968 unexpended balance brought forward may not agree with fiscal year 1967 unexpended balance carried forward (1) because of reclassification of Aircraft and Related Procurement, Navy (see "Operations and Maintenance" and "Procurement"), and (2) because of inclusion of Unfinanced Contract Authorization in accordance with 10 U.S.C. 2210(b), amounting to \$1,940 million (see "Revolving and Management Funds" and totals for Department of Defense and Defense agencies).

Table 14

DEFENSE BUDGET, FISCAL YEARS 1968-69

(New obligational authority in millions of dollars)

	Fiscal year 1968			Fiscal year 1969
	Amounts requested	Amounts appropriated	Actual new obligational authority	Amounts requested ¹
BY FUNCTIONAL TITLE				
Military personnel	22,557	22,094	22,118	23,037
Operation and maintenance	19,307	19,009	20,950	22,839
Procurement	22,917	22,001	23,408	23,254
RDT&E	7,273	7,109	7,285	8,006
Military construction	2,123	1,402	1,543	1,430
Family housing	814	691	691	602
Civil defense	111	86	86	77
Other	² 3,916	² 3,762	67	13
Revolving and management funds	241	178	178	-----
Total	79,259	76,332	76,327	79,257
Military assistance	696	500	500	540
TOTAL	79,955	76,832	76,827	79,797
BY AGENCY				
Army	23,840	23,110	25,303	25,215
Navy	21,344	20,317	21,157	23,023
Air Force	25,090	24,437	25,251	26,038
OSD-Defense agencies	8,873	8,381	4,530	4,830
Civil Defense	111	86	86	77
Military Assistance	696	500	500	540
Proposed legislation ³	-----	-----	-----	75

¹ Amounts included in budget estimates of Jan. 29, 1968.² Includes amounts for "Emergency Fund, Southeast Asia" for transfer to other appropriation accounts.³ Not distributed by agency.

Table 15

**U.S. DEFENSE EXPENDITURES AND RECEIPTS ENTERING THE
INTERNATIONAL BALANCE OF PAYMENTS**

(In millions of dollars)

	Fiscal year 1961	Fiscal year 1966	Fiscal year 1967	Fiscal year 1968
DEPARTMENT OF DEFENSE EXPENDITURES				
<i>Support of U.S. Forces</i> -----	2,463.1	3,178.3	4,016.9	4,440.4
Expenditures by U.S. mil- itary civilians and de- pendents ¹ -----	802.5	1,157.2	1,339.2	1,520.2
Hire of foreign nationals -----	376.8	440.0	525.1	572.4
Procurement:				
Major equipment -----	61.6	86.8	143.9	221.1
Construction -----	157.5	261.6	409.0	350.1
Petroleum products ² -----	257.2	326.2	378.9	481.5
Other materials and supplies ³ -----	304.5	203.9	273.6	278.2
Services -----	503.0	493.7	687.4	921.3
Other payments ⁴ -----		208.9	259.8	95.7
Military assistance -----	314.9	159.8	124.9	63.3
Offshore procurement -----	155.2	52.5	30.6	21.2
NATO infrastructure ⁵ -----	105.2	50.7	49.0	-----
Other -----	54.5	56.6	45.3	42.1
Net change in dollar-pur- chased foreign currency -----	-2.0	12.0	25.8	-2.0
OTHER AGENCIES' EXPENDI- TURES ⁶ -----	348.5	50.2	28.3	9.2
TOTAL EXPENDITURES -----	3,124.5	3,400.3	4,195.9	4,510.9
RECEIPTS				
Cash ⁷ -----	-328.3	-1,064.6	-1,571.0	-1,014.4
Barter -----	-----	-139.5	-203.7	-224.9
TOTAL RECEIPTS -----	-328.3	-1,204.1	-1,774.7	-1,239.3
NET ADVERSE BALANCE -----	2,796.2	2,196.2	2,421.2	3,271.6

¹ Includes expenditures for foreign goods and services by nonappropriated fund activities. Fiscal year 1968 contains approximately \$100 million of PCS and TDY travel payments to individuals included in prior years in Construction, Services, and Other Payments categories.

² Except for fiscal year 1961, includes expenditures for petroleum procured through Operation and Maintenance accounts as well as through Stock Fund accounts. Fiscal year 1968 also includes approximately \$10 million of Industrial Fund petroleum payments which were included in the Other Payments category in prior years.

³ Except for fiscal year 1961, includes primarily expenditures for Operation and Maintenance supplies and Stock Fund purchases.

⁴ In fiscal years 1966-67, data previously reported as contractual services was divided into two categories, i.e., "Operation and Maintenance (Other)," which included all O&M payments not included elsewhere, and "Other Payments," which included expenditures for retired pay, claims, research and development, industrial fund activities, etc.

⁵ In fiscal year 1968, NATO Infrastructure is included in the Construction category.

⁶ Expenditures entering balance of international payments by the Atomic Energy Commission and other agencies included in the NATO definition of defense expenditures.

⁷ Includes primarily: (a) Sales of military items through Department of Defense; (b) reimbursement to United States for logistical support of United Nations forces and defense forces of other nations; (c) sales of services and excess personal property. Includes receipts for military equipment procured through U.S. commercial sources where covered by government-to-government agreements and data are available. Data exclude receipts from sale of special U.S. Treasury securities and other financial type arrangements.

Table 16

**RESEARCH, DEVELOPMENT, TEST, AND EVALUATION PROGRAMS,
DIRECT OBLIGATIONS ¹**

(In millions of dollars)			
	Fiscal year 1967, actual	Fiscal year 1968, actual	Fiscal year 1969, estimated
TOTAL	7,607.5	7,459.9	7,650.5
BY ACTIVITY:			
Military sciences	606.2	540.8	575.8
Aircraft and related equipment	1,310.7	1,208.6	996.9
Missiles and related equipment	2,477.0	2,506.9	2,464.7
Military astronautics and related equip- ment	1,140.3	1,073.6	1,178.6
Ships, small craft, and related equip- ment	310.5	257.8	342.4
Ordnance, combat vehicles, and related equipment	356.0	322.4	324.4
Other equipment	986.8	1,129.1	1,232.1
Management and support	420.0	420.8	486.7
Emergency fund			49.0
BY AGENCY:			
Army	1,585.9	1,495.7	1,643.7
Navy	1,977.1	1,976.6	2,115.0
Air Force	3,570.5	3,495.0	3,400.7
Defense agencies	474.0	492.6	442.1
Emergency fund, Defense			49.0

¹ As presented in the President's budget, Jan. 15, 1969.

Table 17

ACTIVE DUTY MILITARY PERSONNEL

	Department of Defense	Army	Navy	Marine Corps	Air Force
OFFICERS:					
June 30, 1967 -----	384,496	143,517	81,902	23,592	135,485
June 30, 1968 -----	415,844	166,173	85,425	24,555	139,691
<i>Regulars:</i>					
June 30, 1967 -----	174,640	44,529	51,441	15,794	62,876
June 30, 1968 -----	178,360	45,751	52,349	15,665	64,595
<i>Reserves:</i> ¹					
June 30, 1967 -----	209,856	98,988	30,461	7,798	72,609
June 30, 1968 -----	237,484	120,422	33,076	8,890	75,096
ENLISTED:					
June 30, 1967 -----	2,980,666	1,296,603	663,831	261,584	758,648
June 30, 1968 -----	3,119,541	1,401,727	673,610	282,697	761,507
OFFICER CANDIDATES:					
June 30, 1967 -----	11,718	2,378	5,886	93	3,361
June 30, 1968 -----	12,517	2,443	6,422	-----	3,652
TOTAL:					
June 30, 1967 -----	3,376,880	1,442,498	751,619	285,269	897,494
June 30, 1968 -----	3,547,902	1,570,343	765,457	307,252	904,850

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:¹					
June 30, 1967 --	3,027,902 (89.7)	1,442,498 (100.0)	410,505 (54.6)	277,405 (97.2)	897,494 (100.0)
June 30, 1968 --	3,227,018 (91.0)	1,570,343 (100.0)	452,108 (59.1)	299,717 (97.5)	904,850 (100.0)
<i>Continental U.S.:</i>					
June 30, 1967 --	1,868,339 (55.3)	766,414 (53.1)	317,689 (42.6)	170,144 (59.6)	614,092 (68.4)
June 30, 1968 --	2,029,079 (57.2)	890,546 (56.7)	345,562 (45.2)	193,622 (63.0)	599,349 (66.2)
<i>Outside conti- nental U.S.:</i>					
June 30, 1967 --	1,159,563 (34.4)	676,084 (46.9)	92,816 (12.3)	107,261 (37.6)	283,402 (31.6)
June 30, 1968 --	1,197,939 (33.8)	679,797 (43.3)	106,546 (13.9)	106,095 (34.5)	305,501 (33.8)
AFLOAT AND MOBILE ACTIVITIES:					
June 30, 1967 --	348,978 (10.3)	-----	341,114 (45.4)	7,864 (2.8)	-----
June 30, 1968 --	320,884 (9.0)	-----	313,349 (40.9)	7,535 (2.4)	-----
TOTAL:					
June 30, 1967 --	3,376,880 (100.0)	1,442,498 (100.0)	751,619 (100.0)	285,269 (100.0)	897,494 (100.0)
June 30, 1968 --	3,547,902 (100.0)	1,570,343 (100.0)	765,457 (100.0)	307,252 (100.0)	904,850 (100.0)

¹ Includes Navy activities temporarily based ashore.

Table 19

MILITARY PERSONNEL BY GRADE

JUNE 30, 1968

(Percentages listed in parentheses)

	Dept. of Defense	Army	Navy	Marine Corps	Air Force
OFFICERS	415,844	166,173	85,425	24,555	139,691
Percent of total	(11.7)	(10.6)	(11.2)	(8.0)	(15.4)
Gen. of the Army—Fleet Admiral	2	2	-----	-----	-----
General —Admiral	38	15	9	1	13
Lt. General —Vice Admiral	133	44	38	8	43
Maj. General	1,179	204	265	28	163
Brig. General —Rear Admiral	256	-----	-----	39	224
Colonel —Captain	17,969	6,204	4,360	750	6,655
Lt. Colonel —Commander	43,822	16,336	8,517	2,011	16,958
Major —Lt. Commander	72,130	22,903	15,478	3,823	29,926
Captain —Lieutenant	112,850	35,180	24,258	5,687	47,725
1st Lieutenant —Lieutenant (JG)	66,233	29,377	14,773	6,701	15,382
2d Lieutenant —Ensign	73,701	35,466	12,937	4,063	21,235
Chief Warrant Officer W-4	3,791	1,767	599	91	1,334
Chief Warrant Officer W-3	3,557	3,057	307	162	31
Chief Warrant Officer W-2	10,180	9,016	1,036	126	2
Warrant Officer W-1	10,259	6,346	2,848	1,065	-----
ENLISTED ¹	3,119,541	1,401,727	673,610	282,697	761,507
Percent of total	(87.9)	(89.2)	(88.0)	(92.0)	(84.2)
Pay Grade E-9	16,952	5,438	3,432	1,142	6,940
Pay Grade E-8	43,754	17,407	8,572	4,049	13,726
Pay Grade E-7	150,216	54,900	41,086	9,823	44,407
Pay Grade E-6	291,722	109,009	82,285	17,114	83,314
Pay Grade E-5	529,996	224,155	115,668	36,265	153,908
Pay Grade E-4	759,798	368,919	145,994	56,309	188,576
Pay Grade E-3	667,350	234,432	166,877	59,332	206,709
Pay Grade E-2	316,827	138,129	83,399	46,127	49,172
Pay Grade E-1	342,926	249,338	26,297	52,536	14,755
OFFICER CANDIDATES	12,517	2,443	6,422	-----	3,652
Percent of total	(.4)	(.2)	(.8)	(0)	(.4)
TOTAL	3,547,902	1,570,343	765,457	307,252	904,850

¹ Enlisted are shown by pay grade due to wide diversity of titles.

Table 20

ENLISTED PERSONNEL PROCUREMENT

	Department of Defense	Army	Navy	Marine Corps	Air Force
<i>Inductions:</i>					
Fiscal Year 1967 --	299,200	299,069	-----	131	-----
Fiscal Year 1968 --	339,596	334,222	-----	5,374	-----
<i>First enlistments:</i>					
Fiscal Year 1967 --	483,473	190,320	101,083	71,289	120,781
Fiscal Year 1968 --	513,088	198,860	122,793	93,013	98,422
<i>Immediate reenlistments:</i>					
Fiscal Year 1967 --	187,930	78,613	38,856	8,012	62,449
Fiscal Year 1968 --	188,523	79,080	33,773	8,605	67,065
<i>Other reenlistments:</i>					
Fiscal Year 1967 --	14,479	5,817	5,053	677	2,932
Fiscal Year 1968 --	14,163	5,739	5,689	795	1,940
<i>Reserves to active duty:</i> ¹					
Fiscal Year 1967 --	49,873	2,202	42,977	4,442	252
Fiscal Year 1968 --	69,069	18,865	33,149	2,860	14,195
TOTAL:					
Fiscal Year 1967 --	1,034,955	576,021	187,969	84,551	186,414
Fiscal Year 1968 --	1,124,439	636,766	195,404	110,647	181,622

¹ Includes National Guard.

Table 21

DEPENDENTS OF MILITARY PERSONNEL
MARCH 31, 1968

	Department of Defense	Army	Navy	Marine Corps	Air Force
TYPE OF DEPENDENT					
Wives	1,511,277	623,590	306,195	73,656	507,836
Children	2,490,025	884,730	484,797	114,877	1,005,621
Other ¹	215,954	167,371	6,160	874	41,549
LOCATION OF DEPENDENT					
Continental United States	3,689,398	1,480,389	720,115	177,763	1,311,131
Alaska	34,818	12,255	2,577	106	19,880
Hawaii	61,940	16,829	18,481	7,391	19,239
U.S. territories	45,880	19,480	9,451	577	16,372
Foreign countries	385,220	146,738	46,528	3,570	188,384
TOTAL	4,217,256	1,675,691	797,152	189,407	1,555,006
Number per military person	1.22	1.11	1.06	0.64	1.73

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 22

REENLISTMENT RATES

(Percentage of eligibles)

	Department of Defense	Army	Navy	Marine Corps	Air Force
REGULARS					
Fiscal Year 1967	42.2	44.1	37.9	22.0	50.1
Fiscal Year 1968	43.5	45.5	35.8	23.0	54.3
<i>First term:</i>					
Fiscal Year 1967	18.8	23.7	18.9	10.6	16.8
Fiscal Year 1968	19.6	28.0	16.8	11.9	18.1
<i>Career:</i>					
Fiscal Year 1967	81.1	74.2	80.9	77.9	88.0
Fiscal Year 1968	78.8	67.6	79.4	76.0	87.7
INDUCTEES (Army)					
Fiscal Year 1967		20.8			
Fiscal Year 1968		11.5			
FIRST TERM REGULARS, BY OCCUPATIONAL GROUP					
<i>Infantry, gun crews, and allied specialists</i>					
Fiscal Year 1967	23.3	33.3	19.1	9.2	43.2
Fiscal Year 1968	23.5	35.7	15.9	10.3	28.7
<i>Electronics equipment repairmen</i>					
Fiscal Year 1967	21.3	19.5	26.4	11.2	19.9
Fiscal Year 1968	23.9	23.1	25.3	17.9	23.8
<i>Communications and intelligence specialists</i>					
Fiscal Year 1967	18.1	23.6	18.6	7.4	17.5
Fiscal Year 1968	16.8	21.3	15.7	11.3	16.4
<i>Medical and dental specialists</i>					
Fiscal Year 1967	18.3	22.4	12.6	(¹)	20.7
Fiscal Year 1968	19.3	22.3	15.3	(¹)	20.1
<i>Other technical and allied specialists</i>					
Fiscal Year 1967	14.8	13.3	15.6	11.3	16.5
Fiscal Year 1968	14.3	12.3	13.1	11.3	18.2
<i>Administrative specialists and clerks</i>					
Fiscal Year 1967	18.4	19.8	19.9	13.1	17.7
Fiscal Year 1968	18.5	21.8	15.1	14.4	18.8

Table 22—Continued

REENLISTMENTS RATES—Continued

(Percentage of eligibles)

	Department of Defense	Army	Navy	Marine Corps	Air Force
<i>Electrical/mechanical equipment repairmen</i>					
Fiscal Year 1967 -----	19.3	21.1	20.0	11.7	18.6
Fiscal Year 1968 -----	18.8	28.0	16.4	13.8	17.0
<i>Craftsmen</i>					
Fiscal Year 1967 -----	15.5	17.3	16.9	10.8	13.8
Fiscal Year 1968 -----	15.5	35.1	10.3	10.7	19.4
<i>Service and supply handlers</i>					
Fiscal Year 1967 -----	19.6	28.2	31.3	12.6	12.1
Fiscal Year 1968 -----	18.9	29.9	23.2	10.2	14.0
<i>Miscellaneous</i>					
Fiscal Year 1967 -----	9.8	15.8	8.3	(¹)	12.1
Fiscal Year 1968 -----	30.0	56.1	12.8	(¹)	12.0

¹ Less than 100 eligible.

Table 23

WOMEN MILITARY PERSONNEL

	Department of Defense	Army	Navy	Marine Corps	Air Force
OFFICERS:					
June 30, 1967 -----	12,619	4,742	3,018	189	4,670
June 30, 1968 -----	13,344	5,096	3,032	225	4,991
<i>Regulars:</i>					
June 30, 1967 -----	3,219	1,080	1,100	119	920
June 30, 1968 -----	3,202	1,034	1,108	127	933
<i>Reserves:</i>					
June 30, 1967 -----	9,400	3,662	1,918	70	3,750
June 30, 1968 -----	10,142	4,062	1,924	98	4,058
ENLISTED:					
June 30, 1967 -----	22,300	9,741	5,249	2,122	5,183
June 30, 1968 -----	24,759	10,711	5,370	2,555	6,123
OFFICER CANDIDATES:					
June 30, 1967 -----	254	-----	254	-----	-----
June 30, 1968 -----	294	-----	294	-----	-----
TOTAL:					
June 30, 1967 -----	35,173	14,483	8,521	2,311	9,858
June 30, 1968 -----	38,397	15,807	8,696	2,780	11,114

Table 24

CIVILIAN PERSONNEL

	Department of Defense	Defense- wide activities	Army	Navy	Air Force
DIRECT HIRE:					
June 30, 1967 -----	1,302,605	79,134	484,818	409,942	328,711
June 30, 1968 -----	1,316,977	77,252	486,859	430,205	322,661
<i>Salaried:</i>					
June 30, 1967 -----	654,278	63,092	254,878	175,242	161,066
June 30, 1968 -----	674,611	64,039	260,898	190,888	158,786
<i>Wage Board:</i>					
June 30, 1967 -----	648,327	16,042	229,940	234,700	167,645
June 30, 1968 -----	642,366	13,213	225,961	239,317	163,875
INDIRECT HIRE:					
June 30, 1967 -----	120,340	14	80,282	13,625	26,419
June 30, 1968 -----	119,062	12	79,558	13,814	25,678
TOTAL:					
June 30, 1967 -----	1,422,945	79,148	565,100	423,567	355,130
June 30, 1968 -----	1,436,039	77,264	566,417	444,019	348,339

Table 25

OSD-JCS PERSONNEL

	June 30, 1967			June 30, 1968		
	Total	Civilian	Military	Total	Civilian	Military
OFFICE OF SECRETARY OF DEFENSE						
Secretary and Deputy Secretary	13	9	4	15	10	5
Defense Research and Engineering	558	390	168	559	383	176
Administration	402	246	156	430	286	144
Comptroller	337	326	11	363	345	18
Installations and Logistics	369	314	55	355	298	57
International Security Affairs	290	211	79	310	221	89
Systems Analysis	190	133	57	193	140	53
Manpower	338	257	81	215	125	90
Public Affairs	198	97	101	213	98	115
General Counsel	53	52	1	53	50	3
Special staff assistants	148	92	56	161	96	65
Total	2,896	2,127	769	2,867	2,052	815
JOINT CHIEFS OF STAFF ORGANIZATION						
Office of the Chairman ..	36	15	21	37	14	23
Joint Staff	666	221	445	669	216	453
Other Joint Chiefs of Staff activities	1,106	234	872	1,207	245	962
Total	1,808	470	1,338	1,913	475	1,438
TOTAL FULL-TIME PERSONNEL	4,704	2,597	2,107	4,780	2,527	2,253
Consultants and part-time clerical	77	77	-----	92	92	-----
Summer employees	116	116	-----	112	112	-----
TOTAL	4,897	2,790	2,107	4,984	2,731	2,253

Table 26

OTHER DEFENSE ACTIVITIES PERSONNEL

	June 30, 1967			June 30, 1968		
	Total	Civilian	Military	Total	Civilian	Military
Defense Atomic Support Agency ¹ -----	6,923	2,386	4,537	6,475	2,427	4,048
Defense Communications Agency -----	3,208	1,519	1,689	3,391	1,639	1,752
Defense Contract Audit Agency -----	4,108	4,108	-----	4,099	4,099	-----
Defense Intelligence Agency -----	6,086	3,357	2,729	6,347	3,695	2,652
Defense Supply Agency -----	65,573	64,448	1,125	63,345	62,185	1,160
U.S. Court of Military Appeals -----	36	36	-----	40	40	-----
Armed Forces Information and Education -----	481	430	51	493	436	57
International Military Activities ² -----	135	60	75	-----	-----	-----
TOTAL -----	86,550	76,344	10,206	84,190	74,521	9,669

¹ Includes Joint Task Force Two.² Transferred to Army on July 1, 1967.

Table 27

RESERVE PERSONNEL, JUNE 30, 1968

	Officers	Enlisted ¹	Total
DEPARTMENT OF DEFENSE -----	879,107	2,315,624	3,194,731
<i>Department of the Army</i> -----	406,901	1,459,420	1,866,321
Army National Guard -----	34,578	369,000	403,578
Army Reserve -----	372,323	1,090,420	1,462,743
<i>Department of the Navy</i> -----	228,474	518,644	747,118
Navy Reserve -----	198,207	368,577	566,784
Marine Corps Reserve -----	30,267	150,067	180,334
<i>Department of the Air Force</i> -----	243,732	337,560	581,292
Air National Guard -----	10,684	74,913	85,597
Air Force Reserve -----	233,048	262,647	495,695
ON ACTIVE DUTY ² -----	236,828	113,169	349,997
<i>Department of the Army</i> -----	119,951	20,342	140,293
Army National Guard -----	1,976	10,804	12,780
Army Reserve -----	117,975	9,538	127,513
<i>Department of the Navy</i> -----	41,966	78,993	120,959
Naval Reserve -----	33,076	75,459	108,535
Marine Corps Reserve -----	8,890	3,534	12,424
<i>Department of the Air Force</i> -----	74,911	13,834	88,745
Air National Guard -----	1,392	8,944	10,336
Air Force Reserve -----	73,519	4,890	78,409
NOT ON ACTIVE DUTY -----	642,279	2,202,455	2,844,734
<i>Department of the Army</i> -----	286,950	1,439,078	1,726,028
Army National Guard -----	32,602	358,196	390,798
Army Reserve -----	254,348	1,080,882	1,335,230
<i>Department of the Navy</i> -----	186,508	439,651	626,159
Naval Reserve -----	165,131	293,118	458,249
Marine Corps Reserve -----	21,377	146,533	167,910
<i>Department of the Air Force</i> -----	168,821	323,726	492,547
Air National Guard -----	9,292	65,969	75,261
Air Force Reserve -----	159,529	257,757	417,286
COAST GUARD RESERVE -----	7,211	25,984	33,195
On active duty -----	1,208	325	1,533
Not on active duty -----	6,003	25,659	31,662

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, 1967 -----	1,862,896	535,491	359,227	2,757,614
June 30, 1968 -----	1,990,604	395,154	458,976	2,844,734
DEPARTMENT OF THE ARMY				
June 30, 1967 -----	1,126,726	312,503	199,320	1,638,549
June 30, 1968 -----	1,264,274	230,875	230,879	1,726,028
<i>Army National Guard</i>				
June 30, 1967 -----	420,565			420,565
June 30, 1968 -----	390,798			390,798
<i>Army Reserve</i>				
June 30, 1967 -----	706,161	312,503	199,320	1,217,984
June 30, 1968 -----	873,476	230,875	230,879	1,335,230
DEPARTMENT OF THE NAVY				
June 30, 1967 -----	448,392	78,981	96,128	623,501
June 30, 1968 -----	459,902	63,065	103,192	626,159
<i>Naval Reserve</i>				
June 30, 1967 -----	344,851	48,109	86,253	479,213
June 30, 1968 -----	328,167	37,071	93,011	458,249
<i>Marine Corps Reserve</i>				
June 30, 1967 -----	103,541	30,872	9,875	144,288
June 30, 1968 -----	131,735	25,994	10,181	167,910
DEPARTMENT OF THE AIR FORCE				
June 30, 1967 -----	287,778	144,007	63,779	495,564
June 30, 1968 -----	266,428	101,214	124,905	492,547
<i>Air National Guard</i>				
June 30, 1967 -----	83,758			83,758
June 30, 1968 -----	75,261			75,261
<i>Air Force Reserve</i>				
June 30, 1967 -----	204,020	144,007	63,779	411,806
June 30, 1968 -----	191,167	101,214	124,905	417,286
COAST GUARD RESERVE				
June 30, 1967 -----	29,178	2,293	835	32,306
June 30, 1968 -----	28,434	2,329	899	31,662

Table 29

RESERVE PERSONNEL IN PAID STATUS

	Paid drill training			Paid active duty training only	Total in paid status
	Drill pay status	Active duty basic training	Total		
DEPARTMENT OF DEFENSE					
June 30, 1967 -----	887,877	94,793	982,670	82,894	1,065,564
June 30, 1968 -----	909,261	13,057	922,318	78,623	1,000,941
DEPARTMENT OF THE ARMY					
June 30, 1967 -----	595,653	84,378	680,031	69,642	749,673
June 30, 1968 -----	626,475	6,946	633,421	67,296	700,717
<i>Army National Guard:</i>					
June 30, 1967 -----	364,888	53,186	418,074	-----	418,074
June 30, 1968 -----	384,968	4,214	389,182	-----	389,182
<i>Army Reserve:</i>					
June 30, 1967 -----	230,765	31,192	261,957	69,642	331,599
June 30, 1968 -----	241,507	2,732	244,239	67,296	311,535
DEPARTMENT OF THE NAVY					
June 30, 1967 -----	168,129	4,487	172,616	9,859	182,475
June 30, 1968 -----	168,636	1,953	170,589	8,636	179,225
<i>Naval Reserve:</i>					
June 30, 1967 -----	123,756	1,302	125,058	7,629	132,687
June 30, 1968 -----	122,906	998	123,904	7,338	131,242
<i>Marine Corps Reserve:</i>					
June 30, 1967 -----	44,373	3,185	47,558	2,230	49,788
June 30, 1968 -----	45,730	955	46,685	1,298	47,983
DEPARTMENT OF THE AIR FORCE					
June 30, 1967 -----	124,095	5,928	130,023	3,393	133,416
June 30, 1968 -----	114,150	4,158	118,308	2,691	120,999
<i>Air National Guard:</i>					
June 30, 1967 -----	80,052	3,706	83,758	-----	83,758
June 30, 1968 -----	71,813	3,448	75,261	-----	75,261
<i>Air Force Reserve:</i>					
June 30, 1967 -----	44,043	2,222	46,265	3,393	49,658
June 30, 1968 -----	42,337	710	43,047	2,691	45,738
COAST GUARD RESERVE					
June 30, 1967 -----	16,580	1,528	18,108	1,054	19,162
June 30, 1968 -----	17,142	928	18,070	583	18,653

Table 30

RESERVE ACTIVE DUTY BASIC TRAINING PROGRAMS ¹

	Enlistments	Entered active duty	Completed active duty
DEPARTMENT OF DEFENSE			
Fiscal Year 1967 -----	96,292	204,858	146,809
Fiscal Year 1968 -----	61,850	54,403	130,319
DEPARTMENT OF THE ARMY			
Fiscal Year 1967 -----	73,513	179,924	121,503
Fiscal Year 1968 -----	41,410	32,510	105,992
<i>Army National Guard:</i>			
Fiscal Year 1967 -----	45,113	109,990	77,058
Fiscal Year 1968 -----	23,726	20,788	67,282
<i>Army Reserve:</i>			
Fiscal Year 1967 -----	28,400	69,934	44,445
Fiscal Year 1968 -----	17,684	11,722	38,710
DEPARTMENT OF THE NAVY			
Fiscal Year 1967 -----	9,254	10,519	10,892
Fiscal Year 1968 -----	7,989	8,025	9,896
<i>Naval Reserve:</i>			
Fiscal Year 1967 -----	1,825	1,756	1,495
Fiscal Year 1968 -----	1,783	1,731	1,720
<i>Marine Corps Reserve:</i>			
Fiscal Year 1967 -----	7,429	8,763	9,397
Fiscal Year 1968 -----	6,206	6,294	8,176
DEPARTMENT OF THE AIR FORCE			
Fiscal Year 1967 -----	13,525	14,415	14,414
Fiscal Year 1968 -----	12,451	13,868	14,431
<i>Air National Guard:</i>			
Fiscal Year 1967 -----	8,991	10,066	10,885
Fiscal Year 1968 -----	9,076	9,560	9,154
<i>Air Force Reserve:</i>			
Fiscal Year 1967 -----	4,534	4,349	3,529
Fiscal Year 1968 -----	3,375	4,308	5,277
COAST GUARD RESERVE			
Fiscal Year 1967 -----	2,950	3,436	3,486
Fiscal Year 1968 -----	1,150	1,250	2,008

¹ Four or more months active duty reserve training under provisions of Section 511(d), Title 10, U.S. Code. Table includes enlisted personnel only; in addition, 4 Army Reserve officers entered active duty training and 2 completed training during fiscal year 1967, while 4 Army Reserve officers entered active duty training and 6 completed training during fiscal year 1968.

Table 31

MEDICAL CARE IN DEFENSE FACILITIES

	Department of Defense	Army	Navy	Air Force
HOSPITAL ADMISSIONS				
<i>Active duty personnel:</i>				
Fiscal Year 1967	621,212	282,512	196,404	142,296
Fiscal Year 1968	663,913	291,924	223,989	148,000
<i>Dependents and others:</i>				
Fiscal Year 1967	650,725	266,023	148,804	235,898
Fiscal Year 1968	685,157	304,054	148,489	232,614
TOTAL				
Fiscal Year 1967	1,271,937	548,535	345,208	378,194
Fiscal Year 1968	1,349,070	595,978	372,478	380,614
OUTPATIENT VISITS				
<i>Active duty personnel:</i>				
Fiscal Year 1967	23,913,016	9,181,614	7,933,813	6,797,589
Fiscal Year 1968	25,603,047	8,961,135	8,227,328	8,414,584
<i>Dependents and others:</i>				
Fiscal Year 1967	28,367,923	10,671,617	6,957,926	10,738,380
Fiscal Year 1968	27,969,837	10,366,086	7,849,576	9,754,175
TOTAL				
Fiscal Year 1967	52,280,939	19,853,231	14,891,739	17,535,969
Fiscal Year 1968	53,572,884	19,327,221	16,076,904	18,168,759

Table 32

**CIVILIAN HEALTH AND MEDICAL PROGRAM OF THE
UNIFORMED SERVICES**

**EXPENDITURES BY THE GOVERNMENT FOR HEALTH CARE FROM
CIVILIAN SOURCES**

(In dollars)

	Department of Defense	Army	Navy	Air Force
HEALTH CARE BENEFICIARIES				
<i>Dependents of active duty members¹</i>				
Fiscal Year 1967	82,899,889	28,718,874	33,866,961	20,314,054
Fiscal Year 1968	116,815,924	44,075,699	44,199,154	28,541,071
<i>Retired members and their depend- ents and surviv- ors of deceased members</i>				
Fiscal Year 1967	5,281,153	2,038,947	1,787,343	1,454,863
Fiscal Year 1968	31,437,277	10,618,668	11,797,561	9,021,048
<i>Handicapped or retarded dependents of active duty members</i>				
Fiscal Year 1967	204,980	63,130	38,909	102,941
Fiscal Year 1968	2,887,212	879,357	779,956	1,227,899
ADMINISTRATIVE AND OTHER COSTS				
Fiscal Year 1967	3,655,000	1,695,000	1,343,000	617,000
Fiscal Year 1968	6,262,000	3,513,000	1,467,000	1,282,000
TOTAL COSTS				
Fiscal Year 1967	92,041,022	32,515,951	37,036,213	22,488,858
Fiscal Year 1968	157,402,413	59,086,724	58,243,671	40,072,018

¹ Excluding expenditures under the Handicapped and Retarded Program.

Table 33

CONTRACT AWARDS BY PROGRAM

(Net in millions of dollars)

	Fiscal year 1967		Fiscal year 1968	
	Amount	Percent	Amount	Percent
MAJOR HARD GOODS				
Aircraft	10,199	22.8	9,785	22.3
Missile and space systems	4,631	10.4	4,983	11.4
Ships	2,259	5.1	2,084	4.8
Tank-automotive	1,476	3.3	1,493	3.4
Weapons	624	1.4	684	1.6
Ammunition	3,632	8.1	4,603	10.5
Electronics-communications equipment	4,578	10.3	4,215	9.6
Total	27,399	61.4	27,847	63.6
SERVICES	3,893	8.7	4,335	9.9
ALL OTHER				
Subsistence	1,182	2.6	1,131	2.6
Textiles and clothing	1,184	2.7	749	1.7
Fuels and lubricants	1,540	3.5	1,697	3.9
Miscellaneous hard goods	2,815	6.3	2,351	5.4
Construction	2,131	4.7	1,695	3.9
Actions of less than \$10,000	4,489	10.1	3,951	9.0
Total	13,341	29.9	11,574	26.5
TOTAL	44,633	100.0	43,756	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 1967	1,252	227	667	316	41
Fiscal Year 1968	982	249	417	239	77
WORK OUTSIDE U.S.					
Fiscal Year 1967	2,816	1,019	905	411	481
Fiscal Year 1968	2,514	1,173	450	365	526
EDUCATIONAL AND NON- PROFIT INSTITUTIONS					
Fiscal Year 1967	756	189	216	350	1
Fiscal Year 1968	772	154	218	399	2
BUSINESS FIRMS FOR WORK IN THE U.S.¹					
Fiscal Year 1967	39,809	10,955	12,210	10,989	5,655
Fiscal Year 1968	39,487	11,821	12,068	10,845	4,753
<i>Small business firms</i>					
Fiscal Year 1967	8,073	2,072	2,096	1,312	2,593
Fiscal Year 1968	7,268	1,946	2,057	1,126	2,139
<i>Small business percentage</i>					
Fiscal Year 1967	20.3	18.9	17.2	11.9	45.8
Fiscal Year 1968	18.4	16.5	17.0	10.4	45.0
TOTAL					
Fiscal Year 1967	44,633	12,390	13,999	12,066	6,178
Fiscal Year 1968	43,756	13,397	13,153	11,848	5,358

¹ For military functions only. Data for military and civil functions combined is as follows:

	Fiscal year 1967	Fiscal year 1968
Awards to business firms for work in U.S.	\$40,609	\$40,304
Small business firms	8,361	7,584
Small business percentage	20.6%	18.8%

Table 35

CONTRACT AWARDS BY PRICING PROVISIONS

(Net in millions of dollars)

	Fiscal year 1967		Fiscal year 1968	
	Amount	Percent	Amount	Percent
FIXED PRICE:				
Firm	22,092	56.3	20,596	52.7
Redeterminable	688	1.8	561	1.5
Incentive	7,001	17.8	7,323	18.7
Escalation	1,193	3.0	1,832	4.7
Total	30,974	78.9	30,312	77.6
COST REIMBURSEMENT				
No fee	752	1.9	788	2.0
Fixed fee	4,068	10.4	4,234	10.8
Incentive fee	3,277	8.3	3,507	9.0
Time and materials	178	0.5	230	0.6
Total	8,275	21.1	8,759	22.4
TOTAL ACTIONS OF \$10,000 OR MORE				
.....	39,249	100.0	39,071	100.0
Actions less than \$10,000 ¹	4,132		3,703	
Intragovernmental orders ²	1,252		982	
TOTAL	44,633		43,756	

¹ Data on pricing provisions are not obtained for actions of less than \$10,000.² Pricing provisions not applicable.

Table 36

CONTRACT AWARDS BY COMPETITIVE STATUS

(Net in millions of dollars)

	Fiscal year 1967		Fiscal year 1968	
	Amount	Percent	Amount	Percent
COMPETITIVE:				
Formally advertised	5,792	13.4	4,902	11.5
Restricted to small business and labor surplus areas	1,936	4.5	1,853	4.3
Open market purchases of \$2,500 or less within U.S. ¹	1,841	4.2	926	2.1
Other price competition ²	9,047	20.8	8,457	19.8
Design or technical competition	1,998	4.6	1,896	4.4
Total	20,614	47.5	18,034	42.1
NONCOMPETITIVE:				
Follow-on contracts after price or design competition	7,844	18.1	7,702	18.0
Other one-source solicitation	14,923	34.4	17,037	39.9
Total	22,767	52.5	24,739	57.9
TOTAL, EXCEPT INTRAGOVERN- MENTAL ORDERS	43,381	100.0	42,773	100.0
Intragovernmental orders ³	1,252	-----	982	-----
TOTAL	44,633	-----	43,756	-----

¹ Price competition required on actions of \$250 or more and assumed for actions below \$250.² Contracts awarded through negotiation after requesting proposals from 2 or more suppliers.³ Competitive status not applicable.

Table 37

CONTRACT AWARDS BY REGION AND STATE ¹

	Fiscal year 1967		Fiscal year 1968	
	Millions of dollars	Percent of United States	Millions of dollars	Percent of United States
NEW ENGLAND:				
Maine	57	0.2	75	0.2
New Hampshire	162	0.4	156	0.4
Vermont	100	0.3	105	0.3
Massachusetts	1,422	3.8	1,619	4.3
Rhode Island	198	0.5	126	0.3
Connecticut	1,936	5.2	2,355	6.3
TOTAL	3,875	10.4	4,436	11.8
MIDDLE ATLANTIC:				
New York	3,262	8.7	3,484	9.4
New Jersey	1,235	3.3	1,109	3.0
Pennsylvania	1,649	4.4	1,727	4.6
TOTAL	6,146	16.4	6,320	17.0
SOUTH ATLANTIC:				
Delaware	52	0.1	42	0.1
Maryland	868	2.3	704	1.9
District of Columbia	358	1.0	350	0.9
Virginia	665	1.8	693	1.9
West Virginia	142	0.4	132	0.4
North Carolina	448	1.2	487	1.3
South Carolina	181	0.5	133	0.4
Georgia	1,148	3.1	964	2.6
Florida	799	2.1	976	2.6
TOTAL	4,661	12.5	4,481	12.1
SOUTH CENTRAL:				
Kentucky	124	0.3	60	0.2
Tennessee	538	1.5	542	1.5
Alabama	297	0.8	409	1.1
Mississippi	115	0.3	369	1.0
Arkansas	127	0.3	121	0.3
Louisiana	656	1.8	461	1.2
Oklahoma	158	0.4	165	0.4
Texas	3,547	9.5	4,087	11.0
TOTAL	5,562	14.9	6,214	16.7

See footnote at end of table.

Table 37—Continued

CONTRACT AWARDS BY REGION AND STATE ¹—Continued

	Fiscal year 1967		Fiscal year 1968	
	Millions of dollars	Percent of United States	Millions of dollars	Percent of United States
EAST NORTH CENTRAL:				
Ohio	1,602	4.3	1,641	4.4
Indiana	898	2.4	1,108	3.0
Illinois	1,064	2.8	932	2.5
Michigan	1,034	2.8	796	2.1
Wisconsin	384	1.0	406	1.1
TOTAL	4,982	13.3	4,883	13.1
WEST NORTH CENTRAL:				
Minnesota	650	1.7	620	1.7
Iowa	279	0.8	261	0.7
Missouri	2,278	6.1	1,357	3.6
North Dakota	17	(²)	68	0.2
South Dakota	9	(²)	34	0.1
Nebraska	104	0.3	121	0.3
Kansas	399	1.1	292	0.8
TOTAL	3,736	10.0	2,753	7.4
MOUNTAIN:				
Montana	78	0.2	20	0.1
Idaho	15	(²)	17	(²)
Wyoming	33	0.1	15	(²)
Colorado	210	0.6	263	0.7
New Mexico	81	0.2	87	0.2
Arizona	250	0.7	287	0.8
Utah	179	0.5	131	0.4
Nevada	29	(²)	18	(²)
TOTAL	875	2.3	838	2.2
PACIFIC:				
Washington	606	1.6	530	1.4
Oregon	99	0.3	119	0.3
California	6,689	17.9	6,472	17.4
TOTAL	7,394	19.8	7,121	19.1
ALASKA AND HAWAII:				
Alaska	86	0.2	107	0.3
Hawaii	65	0.2	95	0.3
TOTAL	151	0.4	202	0.6

¹ Includes supply, RDT&E, services, construction, and facility prime contract awards of \$10,000 or more within the United States, totaling \$37,382 million during fiscal year 1967 and \$37,248 million during fiscal year 1968.

² Less than 0.05 percent.

Table 38

DEFENSE-WIDE SUPPLY

	Line items centrally procured	Inventory investment (\$ millions)	Annual sales (\$ millions)	Annual obligations (\$ millions)
<i>Clothing and textiles:</i>				
June 30, 1967 -----	23,400	978.2	961.2	1,108.9
June 30, 1968 -----	22,625	1,041.8	818.2	676.5
<i>Construction supplies:</i>				
June 30, 1967 -----	384,600	405.5	518.2	506.7
June 30, 1968 -----	460,943	485.9	457.7	391.6
<i>Electronic supplies:</i>				
June 30, 1967 -----	605,500	486.2	239.2	260.0
June 30, 1968 -----	647,597	520.2	230.5	175.0
<i>Fuel:</i>				
June 30, 1967 -----				(1,504.3) ¹
June 30, 1968 -----				(1,660.0)
<i>General supplies:</i>				
June 30, 1967 -----	104,000	268.6	522.2	618.1
June 30, 1968 -----	124,899 ²	277.2	492.2	419.8
<i>Industrial supplies:</i>				
June 30, 1967 -----	497,064	312.7	255.2	294.6
June 30, 1968 -----	409,400	365.6	261.9	232.8
<i>Medical supplies:</i>				
June 30, 1967 -----	10,800	226.2	213.8	222.8
June 30, 1968 -----	11,112	188.7	238.1	217.0
<i>Subsistence:</i>				
June 30, 1967 -----	800	218.9	1,266.5	1,298.7
June 30, 1968 -----	891	161.2	1,275.5	1,203.1
<i>Base operating supplies:</i> ³				
June 30, 1968 -----		0.7	4.6	3.3
DSA SUPPLY CENTERS				
TOTAL				
June 30, 1967 -----	1,538,500	2,896.3	3,976.3	4,309.8
June 30, 1968 -----	1,765,131	3,041.3	3,778.7	3,319.0

¹ The Defense Fuel Supply Center procures coal and bulk petroleum, utilizing the stock funds of the military Services. It does not own stocks or manage inventories. Fuel figures represent open procurements rather than obligations; they are not included in DSC totals.

² Although some 13,700 items of General Supplies were scheduled for transfer to GSA on July 1, 1968, the actual transfer took place late in fiscal year 1968 and is reflected on this table.

³ New reporting category; not centrally managed or reported in previous years.

Table 39

EXCESS MATERIEL

(In millions of dollars)

	Fiscal year 1967	Fiscal year 1968
UTILIZATION WITHIN DEPARTMENT OF DEFENSE		
Wholesale inter-Service supply support	434	242
Intra-Service ¹	726	541
Inter-Service	380	319
Total	1,540	1,102
OTHER UTILIZATION AND DISPOSAL		
Military Assistance Program	319	214
Utilization by other Federal agencies	309	266
Donations	231	191
Sold as usable property ²	917	847
Designated for sale as scrap	2,146	2,093
Other dispositions	244	61
Destroyed or abandoned	39	53
Total	4,205	3,725
TOTAL GROSS UTILIZATION AND DISPOSAL	5,745	4,827
CASH PROCEEDS REALIZED	101	90

¹ Excludes intra-Service transfers of property by property officers.² Includes sales of missile property.

Table 40

FEDERAL CATALOG SYSTEM

	Fiscal year 1967		Fiscal year 1968	
FEDERAL CATALOG				
Number of items at beginning of year -----	4,182,916		4,293,066	
Number of items added -----	396,471		372,724	
Number of items deleted -----	286,321		368,246	
Net change -----	+110,150		+4,478	
Number of items at end of year ----	4,293,066		4,297,544	
Department of Defense items ----	3,963,692		3,969,209	
Other agency items -----	329,374		328,335	
	June 30, 1967		June 30, 1968	
	Number	Percent	Number	Percent
INTER-SERVICE USE				
Army:				
Items in use -----	1,173,404		1,208,469	
Items also used by other Services -----	415,437	35.4	445,779	36.9
Navy:				
Items in use -----	1,520,680		1,572,350	
Items also used by other Services -----	407,414	26.8	449,645	28.6
Marine Corps:				
Items in use -----	278,270		291,328	
Items also used by other Services -----	189,123	68.0	200,693	68.9
Air Force:				
Items in use -----	1,711,529		1,717,228	
Items also used by other Services -----	449,032	26.2	487,919	28.4

Table 41

COST REDUCTION PROGRAM

(In millions of dollars)

	Savings	
	Fiscal year 1968, actual	Fiscal years 1968-70, estimated
BUYING ONLY WHAT WE NEED		
<i>Refining requirements—calculations</i>		
Major items	108	265
Initial provisioning	25	56
Secondary items	162	207
Manuals, data, and reports	10	19
Production base facilities		
<i>Use of long supply, excess, and surplus</i>	88	102
<i>Eliminating "Goldplating"</i>	290	579
Total, buying only what we need	683	1,228
BUYING AT LOWEST SOUND PRICE		
<i>Shift to competitive procurement</i>	66	118
<i>Direct purchase breakout</i>	11	20
<i>Multi-year procurement</i>	20	57
Total, buying at lowest sound price	97	195
REDUCING OPERATING COSTS		
<i>Terminating unnecessary operations</i> ¹	3	85
<i>Reducing operating expenses</i>		
General management improvements	149	438
Operations management and use of ADP	13	50
<i>Increasing efficiency of operations</i>		
Telecommunications management	14	43
Transportation and traffic management	112	231
Equipment maintenance management	97	249
Military housing management	5	10
Real property management	21	48
Preservation, packaging, and packing	15	40
Total, reducing operating costs	429	1,194
MILITARY ASSISTANCE PROGRAM	10	17
TOTAL PROGRAM	1,219	2,634

¹ Savings realized as result of base closing decisions made during fiscal year 1968.

Table 42

MAJOR STORAGE FACILITIES

(In millions of square feet)

	Fiscal year 1967	Fiscal year 1968
COVERED SPACE: ¹		
Beginning of fiscal year	296.6	273.8
Net change	-22.8	+7
End of fiscal year	273.8	274.5
OCCUPIED OPEN SPACE: ²		
Beginning of fiscal year	83.8	107.8
Net reduction	+24.0	+14.4
End of fiscal year	107.8	122.2
CROSS-SERVICING OF COVERED SPACE: ¹	24.6	22.5
Among Defense agencies	19.7	18.3
National stockpile	4.2	3.6
Other Government agencies	0.7	0.6
CROSS-SERVICING OF OCCUPIED OPEN SPACE: ²	20.1	17.8
Among Defense agencies	6.0	5.3
National stockpile	13.8	12.3
Other Government agencies	0.3	0.2

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>Materiel in use:</i>					
June 30, 1967	95.5	11.1	45.2	39.2	-----
June 30, 1968	100.0	13.1	47.1	39.8	-----
<i>In supply system:</i>					
June 30, 1967	41.4	13.2	13.5	11.7	3.0
June 30, 1968	43.8	14.2	14.5	12.0	3.1
<i>Plant equipment:</i>					
June 30, 1967	11.2	4.6	3.6	2.4	0.6
June 30, 1968	11.8	4.7	4.1	2.3	0.7
<i>Government-provided material:</i>					
June 30, 1967	4.7	1.0	2.5	1.2	(¹)
June 30, 1968	4.0	1.7	1.1	1.2	(¹)
<i>Industrial funds:</i>					
June 30, 1967	0.4	(¹)	0.3	(¹)	(¹)
June 30, 1968	0.5	(¹)	0.4	(¹)	(¹)
<i>Excess and surplus:</i>					
June 30, 1967	2.2	0.3	0.7	1.1	0.1
June 30, 1968	2.0	0.4	0.7	0.8	0.1
Total:					
June 30, 1967	155.5	30.2	65.8	55.6	3.7
June 30, 1968	162.1	34.1	67.9	56.1	3.9
REAL PROPERTY:					
June 30, 1967	38.5	11.2	10.8	16.5	-----
June 30, 1968	38.7	11.5	10.9	16.3	-----
CONSTRUCTION IN PROGRESS:					
June 30, 1967	1.7	0.4	0.8	0.5	-----
June 30, 1968	1.8	0.4	1.0	0.4	-----
TOTAL PROPERTY HOLDINGS—ALL TYPES:					
June 30, 1967	195.5	41.8	77.5	72.6	3.7
June 30, 1968	202.5	45.9	79.8	72.8	3.9

¹ 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, 1967	32,671	9,823	9,045	13,803
June 30, 1968	32,603	9,997	9,137	13,469
<i>U.S. possessions</i>				
June 30, 1967	1,364	277	699	388
June 30, 1968	1,436	302	725	409
<i>Foreign countries</i>				
June 30, 1967	4,460	1,142	1,014	2,304
June 30, 1968	4,612	1,160	1,048	2,404
TOTAL:				
June 30, 1967	38,495	11,242	10,758	16,495
June 30, 1968	38,651	11,458	10,910	16,282
ACREAGE (IN MILLIONS OF ACRES)				
By location				
<i>United States</i>				
June 30, 1967	26.8	13.0	4.2	9.6
June 30, 1968	26.3	12.6	4.2	9.6
<i>U.S. possessions</i>				
June 30, 1967	0.3	0.1	0.1	0.1
June 30, 1968	0.3	0.1	0.1	0.1
<i>Foreign countries</i>				
June 30, 1967	2.4	0.9	0.3	1.2
June 30, 1968	2.4	0.9	0.2	1.2
TOTAL:				
June 30, 1967	29.5	14.0	4.6	10.9
June 30, 1968	29.0	13.7	4.5	10.9
By type of control				
<i>Owned outright</i>				
June 30, 1967	7.1	4.1	1.4	1.7
June 30, 1968	7.1	4.1	1.4	1.6
<i>Public domain and public lands</i>				
June 30, 1967	16.6	7.3	2.3	7.0
June 30, 1969	16.6	7.3	2.3	7.0
<i>Leased, easements, etc.</i>				
June 30, 1967	3.4	1.7	0.6	1.1
June 30, 1968	3.0	1.4	0.6	1.1
<i>Foreign rights</i>				
June 30, 1967	2.3	0.9	0.3	1.1
June 30, 1968	2.3	0.9	0.3	1.1

Table 45

FAMILY HOUSING

	June 30, 1967	June 30, 1968
TOTAL UNITS—MILITARY OWNED AND CONTROLLED	382,043	380,175
<i>Adequate</i>	360,736	360,101
Capehart	113,869	114,106
Wherry (acquired)	73,416	72,647
Leased	9,063	8,939
Surplus commodity	7,430	7,464
Other public quarters	149,312	150,512
Wherry (privately owned)	3,970	3,969
Rental guaranty	1,100	
810 housing	2,576	2,464
<i>Inadequate</i>	21,307	20,074
UNITS UNDER CONSTRUCTION	2,642	6,488

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 1967 ---	9,820,000	2,417,000	243,000	7,160,000
Fiscal Year 1968 ---	9,782,000	3,076,000	181,000	6,525,000
CARGO MOVED (in short tons)				
<i>Dry cargo tonnage</i>				
Fiscal Year 1967 ---	30,902,000	599,000	14,277,000	² 16,026,000
Fiscal Year 1968 ---	33,728,000	679,000	15,125,000	17,924,000
<i>Petroleum tonnage</i>				
Fiscal Year 1967 ---	41,848,000	-----	27,399,000	14,449,000
Fiscal Year 1968 ---	46,656,000	-----	31,474,000	15,152,000
TOTAL				
Fiscal Year 1967 ---	72,750,000	599,000	41,676,000	30,475,000
Fiscal Year 1968 ---	80,384,000	679,000	46,599,000	33,126,000
COSTS (\$ millions)				
<i>Payments for com- mercial services</i>				
Fiscal Year 1967 ---	2,804	685	981	² 1,138
Fiscal Year 1968 ---	2,989	691	1,100	² 1,198
<i>Other costs</i>				
Fiscal Year 1967 ---	608	318	170	120
Fiscal Year 1968 ---	694	384	162	148
TOTAL				
Fiscal Year 1967 ---	3,412	1,003	1,151	1,258
Fiscal Year 1968 ---	3,683	1,075	1,262	1,346

¹ Operations of this agency are limited to the continental United States, except for the through-billed movement of household goods.

² Excludes tonnage and costs for through-billed household goods moved between the United States and oversea locations—189,000 tons and \$116 million for fiscal year 1967 and 192,000 tons and \$132 million for fiscal year 1968.

Table 47

MILITARY ASSISTANCE, 1950-68¹

(In millions of dollars)

Fiscal year	Appropriations	Transfers, reimbursements, and recissions	Available for obligation	Obligations and reservations	Expenditures
1950	1,314.0	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	1,192.7	-418.1	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	² 1,130.0	62.5	1,192.5	1,174.7	1,272.6
1966	² 1,470.0	³ -498.8	971.2	977.3	1,114.3
1967	792.0	569.2	1,361.2	1,351.3	1,055.1
1968	500.0	³ -55.6	444.4	465.5	754.8
Total ⁴	37,734.8	-1,117.2	36,617.6	36,612.6	34,789.6

¹ Includes Foreign Military Credit Sales Programs financed under the Foreign Assistance Act of 1961, as amended, and predecessor legislation.

² Includes \$75 million Section 510 "Special Authority" in fiscal year 1965 and \$300 million in fiscal year 1966.

³ Reflects transfer of financing responsibility for support of military assistance to free world countries in Southeast Asia from the military assistance program to the military departments and transfer of the infrastructure program to the Department of the Army.

⁴ Includes "Common Use Item" appropriation administered by the Agency for International Development.

Table 48

MILITARY ASSISTANCE DELIVERIES

(In millions of dollars)

	Fiscal year 1967	Fiscal year 1968	Fiscal years 1950-68
EUROPE			
Belgium	0.1	1.9	1,237.6
Denmark	7.5	(¹)	617.9
France			4,153.2
Germany			900.8
Italy	4.2		2,288.9
Luxembourg			8.2
Netherlands	2.8		1,217.0
Norway	32.6	24.2	877.1
Portugal	2.2	3.2	313.8
Spain	8.0	11.8	552.4
United Kingdom			1,034.5
Yugoslavia			693.9
Europe area ²	0.9	1.2	306.2
TOTAL	58.4	42.5	14,201.7
NEAR EAST			
Afghanistan	0.1	0.3	3.5
Ceylon		(¹)	(¹)
Greece	44.0	45.0	1,399.8
Iran	41.2	38.7	754.2
Iraq	0.1	¹	46.7
Jordan	11.9	2.1	50.2
Lebanon	0.1	0.1	8.9
Saudi Arabia	0.8	1.0	34.0
Syria	¹	¹	0.1
Turkey	118.5	130.9	2,563.9
Yemen			(¹)
Near East area ²	2.8	0.9	784.1
TOTAL	219.4	219.1	5,645.5
AFRICA			
Cameroon			0.3
Congo	5.1	3.8	19.9
Dahomey			0.1
Ethiopia	9.0	17.4	118.0
Ghana		¹	0.1
Guinea	0.2		0.9
Ivory Coast			0.1
Liberia	1.3	1.1	6.0
Libya	2.6	1.6	13.9
Mali	0.7		2.7
Morocco	5.2	6.6	33.3
Niger			0.1
Nigeria	0.2	0.2	1.2
Senegal	0.1	0.2	2.7
Sudan	0.3	(¹)	0.7
Tunisia	0.7	1.7	18.0

See footnotes at end of table.

Table 48—Continued
MILITARY ASSISTANCE DELIVERIES—Continued

(In millions of dollars)

	Fiscal year 1967	Fiscal year 1968	Fiscal years 1950-68
Upper Volta			.1
Africa area ²		(¹)	(¹)
TOTAL	25.2	32.6	218.0
EAST ASIA			
Cambodia			87.1
China, Republic of	70.4	115.0	2,435.0
Indo China			709.6
Indonesia	0.6	3.1	66.9
Japan	29.1	3.6	854.3
Korea	149.8	197.4	2,503.9
Malaysia, Federation of	0.2	0.2	0.6
Philippines	21.0	29.1	373.4
Thailand	44.9		589.7
Vietnam			1,476.4
East Asia area ²	84.7	3.1	650.3
TOTAL	400.8	351.5	9,747.3
LATIN AMERICA			
Argentina	6.8	10.9	34.4
Bolivia	2.9	3.5	19.3
Brazil	13.4	12.6	206.7
Chile	4.7	7.5	86.7
Colombia	7.9	12.2	79.7
Costa Rica	0.1	0.1	1.8
Cuba			10.6
Dominican Republic	3.4	2.3	18.3
Ecuador	3.1	2.8	37.0
El Salvador	0.6	0.6	5.3
Guatemala	1.4	2.3	13.1
Haiti			3.2
Honduras	1.0	1.0	6.4
Jamaica	0.3	0.3	1.1
Mexico	0.2	0.1	1.7
Nicaragua	1.0	1.3	10.2
Panama	0.5	0.3	2.6
Paraguay	1.1	1.8	7.0
Peru	6.6	8.7	81.9
Uruguay	1.6	2.0	37.8
Venezuela	1.0	1.3	7.6
Latin America area	1.3	1.0	14.5
TOTAL	59.1	72.8	687.0
NONREGIONAL	50.6	0.3	2,761.2
TOTAL, DELIVERIES UNDER GRANT AID	813.5	718.7	33,260.7

¹ Less than \$50,000.

² Includes totals for classified countries.

Table 49

MILITARY ASSISTANCE OBLIGATIONS AND EXPENDITURES ¹

(In millions of dollars)

Budget activity	Obligations/Reservations		Expenditures	
	Fiscal year 1968	Fiscal years 1950-68	Fiscal year 1968	Fiscal years 1950-68
GRANT AID PROGRAM:				
<i>Equipment and supplies:</i>				
Aircraft	104.9	6,874.8	87.7	6,658.0
Ships	20.0	1,828.2	44.5	1,741.1
Vehicles and weapons	71.4	7,619.2	177.3	7,488.7
Ammunition	42.9	4,354.5	62.6	4,275.2
Missiles	-8.9	1,329.1	-2.4	1,313.4
Communications equipment	33.8	2,074.1	47.9	1,963.9
Other equipment and supplies	92.7	2,700.6	40.3	2,495.2
<i>Services:</i>				
Construction	1.5	495.1	3.2	488.4
Repair and rehabilitation	6.4	689.0	19.8	673.0
Supply operations	65.3	2,298.6	64.8	2,286.2
Training	33.8	1,198.6	40.3	1,178.8
<i>Other services:</i>				
Administrative expenses	18.7	418.2	21.1	413.7
Infrastructure		992.8		992.8
Int. military hq.	22.3	196.0	26.5	169.6
Mutual wpns. dev. program	-1.4	270.5	-1.0	270.5
Other spec. projects and serv.	10.2	764.2	-7.4	720.9
Total grant aid program	513.7	34,103.5	625.0	33,129.2
SALES PROGRAM	212.9	1,598.8	129.2	750.6
ECONOMIC PROGRAM	-0.1	910.3	0.6	909.7
Oblig./res. transferred ²	-261.0	NA	NA	NA
TOTAL	465.5	36,612.6	754.8	34,789.6
BY AGENCY:				
Army	333.2	17,816.3	405.3	17,166.9
Navy	28.5	4,414.0	117.4	4,079.8
Air Force	186.9	11,281.3	200.4	10,887.9
OSD	-87.2	1,918.7	25.5	1,472.8
Other agencies	4.0	1,182.3	6.3	1,182.2
TOTAL	465.5	36,612.6	754.8	34,789.6

NOTE: Negative amounts result from adjustments among budget activity categories.

¹ Includes foreign military credit sales programs financed under the Foreign Assistance Act of 1961, as amended, and predecessor legislation.² Represents fiscal year 1968 transfer of prior year obligations/reservations for Infrastructure and Laos-Thailand from MAP to Military Functions.³ Includes "Common Use Items" appropriation administered by the Agency for International Development.

