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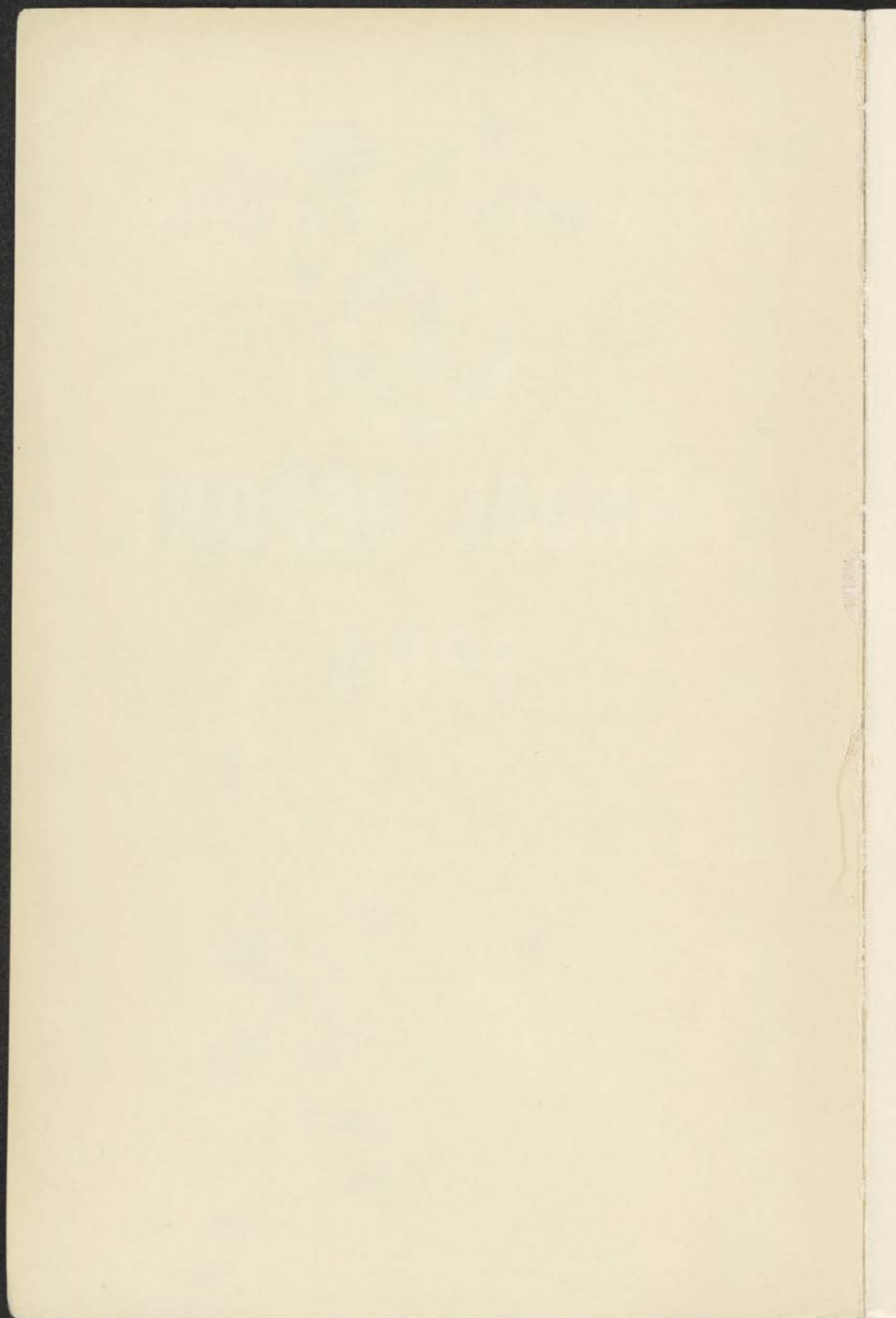
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SECRETARY OF THE AIR FORCE

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Letter of Transmittal

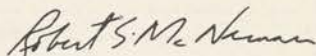
THE SECRETARY OF DEFENSE

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 1964, together with the reports of the Secretaries of the Army, Navy, and Air Force for the same period.

Yours sincerely,



ROBERT S. McNAMARA

THE PRESIDENT
THE WHITE HOUSE

Letter of Transmittal

Transmittal of Report

Washington

Dear Sir:

In compliance with Section 1001 of the National Security Act of 1947, as amended, I submit the report of the Secretary of the Army for the year 1947, together with the report of the Secretary of the Navy, 1947, and the Departmental report.

Sincerely,
[Signature]

James H. Doolittle

Very Respectfully,
The Secretary

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In Defense of Freedom

Annual Report of the SECRETARY OF DEFENSE

July 1, 1963 to June 30, 1964

ANNUAL REPORT OF THE SECRETARY OF THE AIR FORCE

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I. In Defense of Freedom

For 2 years and 10 months our armed forces under the guidance of President Kennedy developed a striking power, flexibility, and readiness unmatched in the peacetime history of our country. The tragic events of November 22, 1963, marked no interruption in established policies and programs. The basic directive to the Department of Defense—that military requirements should be considered without regard to arbitrary budget ceilings but that the forces found essential should be operated at the lowest possible cost—was reaffirmed by President Johnson. At a Joint Session of the Congress on November 27, 1963, President Johnson stated:

“In this age when there can be no losers in peace and no victors in war, we must recognize the obligation to match national strength with national restraint. We must be prepared at one and the same time for both the confrontation of power and the limitation of power. We must be ready to defend the national interest and to negotiate the common interest. This is the path that we shall continue to pursue.”

In support of this policy, our armed forces continued during fiscal year 1964 to increase their capabilities to counter readily any type of aggression in any part of the world. First priority since 1961 has been given to providing a general readiness that would enable the President in case of emergency to choose with confidence whatever degree of military pressure might be required to protect the Nation's security and that of our free world allies. As a result, substantial qualitative and quantitative improvements have been registered throughout the armed forces. Compared to 1961, we had achieved on June 30, 1964:

- A 150-percent increase in the number of nuclear warheads available in the Strategic Alert Forces.
- A 50-percent increase in the number of strategic bombers on alert.
- A 45-percent increase in the number of combat-ready divisions.
- A 75-percent increase in airlift capability.
- A 44-percent increase in the number of tactical fighter squadrons.
- An 800-percent increase in Special Forces trained to deal with counterinsurgency.

This continuous effort received the full cooperation of the Congress. The plans and programs of the Department were outlined annually in extensive detail to committees of both Houses and the additional funds required to fill the gaps in our defenses and provide for the maximum readiness of the armed forces were made available. Department of Defense expenditures for military functions (excluding military assistance) rose from \$43.2 billion in fiscal year 1961 to \$46.8 billion in 1962, \$48.3 billion in 1963, and \$49.8 billion in 1964. Expenditures would have been even higher if it had not been for the systematic effort to reduce costs throughout the Department by better management. This cost reduction program yielded audited savings of \$1.4 billion for fiscal years 1962 and 1963 and \$2.8 billion for 1964.

National security requirements are not static. They are subject to constant change caused by new developments in foreign relations as well as in science and technology. Against this changing background, our military posture is being constantly reassessed and adjusted promptly whenever indicated. The new planning-programing-budgeting system, together with the reviews and analyses that support it, provides an effective tool for evaluating the need and urgency for such adjustments. The cost reduction program, besides promoting greater efficiency throughout the Department, encourages the timely disposal of property no longer needed as the result of changing requirements. Continued improvement in this dual approach to the Nation's defense needs will provide the best assurance of adequate strength at minimum cost.

Assistance to Vietnam

Military assistance to the beleaguered Republic of Vietnam remained one of the most vital missions of our armed forces during fiscal year 1964. Subjected to intensified subversion, controlled and supported by the Government of North Vietnam, the Republic of Vietnam—its people and its armed forces—continued to counter Communist aggression despite the very heavy sacrifices that this conflict entailed. The United States, in accordance with pledges dating back to 1954 and reaffirmed on many occasions since, supported the Vietnamese with increased economic and military assistance in their struggle for the maintenance of their independence.

The expansion of U.S. support during the fiscal year was required as the Communist-directed Viet Cong took maximum advantage of governmental instability in Saigon. Countering Buddhist grievances with drastic suppression, the Diem government aroused popular opposition during the summer of 1963 and lost the support of many civilian and military leaders. President Diem was ousted on Novem-

ber 1, 1963, and replaced by a group of military officers. The subsequent period of governmental instability was accompanied by the replacement of many military and provincial officials, and the weakened government structure opened the way for substantial Communist gains. With a steady flow of arms and personnel from the north, the Viet Cong increased their attacks against the vulnerable, overextended strategic hamlet system and expanded their tactics of ambush, kidnapping, murder, and terror of every form. The Republic of Vietnam survived this period of intensified pressure, and its armed forces in their counterattacks inflicted heavy casualties on the aggressor.

The Vietnam situation was kept under continuous review by the U.S. Government. Four trips to Vietnam during fiscal year 1964 provided the Secretary of Defense with firsthand information. The need for further increases in U.S. assistance was determined in March 1964 and again in May and led President Johnson on May 18, 1964, to request an additional \$125 million in foreign aid funds for Vietnam, including \$55 million for military assistance. On the military side, new programs were established for expanding the Vietnamese regular and paramilitary forces and for improving their equipment, effectiveness, and conditions of service.

U.S. military personnel in Vietnam, which had totaled 14,000 at the beginning of the fiscal year, had risen to about 16,000 by June 30, 1964. Working under the direction of the Military Assistance Command, Vietnam (MACV)—a unified command reporting to the Commander-in-Chief, Pacific—these men trained Vietnamese forces in the use and maintenance of U.S. weapons and equipment and acted as advisers to field units. In carrying out their assignments on training missions and in the field, they shared with their Vietnamese colleagues all the hazards and dangers of antiguerrilla warfare. The dedication and bravery shown by our armed forces have been in the best tradition of the Army, Navy, Marine Corps, and Air Force. During fiscal year 1964, 108 U.S. military men died in Vietnam as the result of hostile action and 747 were wounded; an additional 16 men were listed as missing at the close of the fiscal year.

American assistance is being given in answer to the call of the South Vietnamese for help and in recognition of the vital interest that the United States has in preserving their independence. The Communists have proclaimed again and again their determination to overthrow non-Communist governments by every type of subversion if not by open war. They have made Vietnam a test case and challenged the free world to stop them. We cannot fail to meet this challenge. The Vietnamese in resisting aggression are fighting for the free world community as well as their own independence. Our Nation's security demands that we extend to them our fullest possible support.

II. Operational Forces

The armed forces of the United States remained the main obstacle to Communist plans for military aggression during fiscal year 1964. As such they constituted a major force for peace and freedom throughout the world. Their readiness and striking power, substantially enlarged as the result of programs initiated in 1961, were a constant reminder to aggressors of the heavy penalties that adventurous policies might entail.

Active duty military personnel totaled 2,687,000 on June 30, 1964—a decrease of 12,000 compared to June 30, 1963. Army, Navy, and Marine Corps strength remained about the same throughout the year, but Air Force strength was reduced by some 13,000 men as new programs absorbed only part of the personnel made available by the phase-out of B-47 wings and KC-97 squadrons stationed overseas and by changes in the Air Defense Command.

While maintaining whatever forces are required for our national security, the United States has searched for and welcomes any realistic opportunity that would permit reducing the heavy defense burden. Such an opportunity arose in July 1963, when the Soviet Union agreed to join the United States and the United Kingdom in prohibiting the detonation of nuclear devices in outer space, the atmosphere, and under water. The treaty entered into force on October 10, 1963.

This agreement will not adversely affect the nuclear superiority of the United States. It imposes the same test limitations on the other signatories as on us. Moreover, to protect the country against surprise abrogation or violation of the test ban treaty, four specific safeguards were established:

1. The conduct of comprehensive aggressive and continuing underground nuclear test programs designed to add to our knowledge and improve our weapons in all areas of significance to our military posture for the future.
2. The maintenance of modern nuclear laboratory facilities and programs in theoretical and exploratory nuclear technology which will attract, retain, and insure the continued application of our human scientific resources to these programs on which continued progress in nuclear technology depends.

3. The maintenance of the facilities and resources necessary to institute promptly nuclear tests in the atmosphere should they be deemed essential to our national security or should the treaty or any of its terms be abrogated by the Soviet Union.

4. The improvement of our capability, within feasible and practical limits, to monitor the terms of the treaty, to detect violations, and to maintain our knowledge of Sino-Soviet nuclear activity, capabilities, and achievements.

Responsibility for carrying out these protective measures is shared by the Atomic Energy Commission and the Department of Defense.

In support of the first safeguard, an expanded underground test program was initiated at the Nevada Test Site. New tunnels and cavities were constructed to accommodate an increased test schedule as well as to make possible the gathering of additional data. During the second half of fiscal year 1964, 10 underground detonations, not related to the Plowshare program for the peaceful use of atomic blasts, were announced. In this test program, the Atomic Energy Commission is responsible for weapons developments to meet military needs for new and improved weapons, while the Department of Defense is charged with collecting additional data on weapons effects.

A similar arrangement of responsibilities is in effect in the nuclear research field. With the signing of the test ban treaty, special emphasis was placed on the search for new ways and means of acquiring information formerly obtained through testing in the environments prohibited by the new treaty. These laboratory programs, carried out by an outstandingly capable group of scientists and technologists, have added significantly to our nuclear weapons knowledge.

Standby capabilities for the resumption of nuclear testing are being developed on Johnston Island in the Pacific. The land area of this atoll has been substantially enlarged by dredging and filling, and new facilities are under construction. A joint task force is being maintained ready to resume testing whenever required. The objective is to achieve a capability for operational systems tests within 2 or 3 months after notice of violation or abrogation is received and for weapons effects tests within 6 months.

Substantial improvement in our detection capabilities, the fourth safeguard, is being achieved under accelerated programs. The Atomic Energy Detection System (AEDS) is not only being modernized but also greatly expanded. Considerable progress was recorded in the VELA research and development projects for the detection of underground detonations, for ground-based detection of detonations at high altitude and in space, and for the use of satellites in the detection of detonations in space.

The underground project, VELA UNIFORM, is centered primarily on seismological research, including research in earth physics, the provision of standardized seismic equipment to a worldwide network of cooperating stations, the monitoring of underground nuclear and chemical explosions, and the development and testing of on-site inspection techniques. A seismic information analysis center has been established at the University of Michigan. A pair of nuclear-detection satellites was launched in October 1963 and a second pair in July 1964. Although designed for research and development purposes, these satellites are already providing an interim capability for detecting nuclear explosions in space as well as sending back information on the natural radiation environment in which such sensors must function.

Retaliatory Forces

During fiscal year 1964, the retaliatory forces of the United States continued to grow in numbers, reliability, and effectiveness. The number of operational ICBMs and POLARIS missiles, which almost tripled during fiscal year 1963, more than doubled again during fiscal year 1964. The strategic bomber force remained in a high state of readiness, tested again and again in sudden alert exercises. Intensive research on penetration aids further improved the effectiveness of both missiles and bombers. The programs approved and the studies initiated assure that the overwhelming striking power of these deterrent forces will be maintained in the years ahead.

In the strategic missile field, the 1964 developments reflected to a large extent the 1961 decision to place major reliance in the future on solid-fueled, rather than liquid-fueled, missiles. All the experience gained since that time indicates that this decision was the proper one.

As a result, the liquid-fueled ATLAS and TITAN missiles, which had provided a major deterrent in the early sixties, started to be phased out toward the end of fiscal year 1964 as solid-fueled MINUTEMAN and POLARIS missiles became available in substantial numbers. A total of 13 ATLAS squadrons with 126 missiles had become operational during fiscal year 1963, and 12 TITAN squadrons with 108 missiles were fully deployed by December 30, 1963. The phaseout started with the older, relatively vulnerable ATLAS missiles and will be extended to later ATLAS models and TITAN I missiles. The TITAN II will not be affected by current plans.

The solid-fueled MINUTEMAN force, on the other hand, experienced a phenomenal growth during fiscal year 1964. On June 30, 1963, a total of 160 MINUTEMAN missiles were in place and operational. At the close of the fiscal year, the total was 600—all of them in widely dispersed, underground silos, protected against a surprise

attack and ready to retaliate instantly when directed by the Commander-in-Chief. Almost equally significant has been the successful development of the MINUTEMAN II—a missile many times more effective than the MINUTEMAN I as the result of its greatly increased range or payload, its extremely high accuracy, and the flexibility with which it can be used. The marked superiority of the MINUTEMAN II over the MINUTEMAN I, comparable to that of the long-range B-52 over the medium-range B-47, led to a modification of the 5-year MINUTEMAN program, placing greater emphasis on the early retrofit of a substantial number of MINUTEMAN I silos for use by MINUTEMAN II rather than on the rapid numerical expansion of the MINUTEMAN force. Consequently, while fewer MINUTEMAN missiles than originally planned will become operational in the next few years, the capability of the total force to carry out its mission will be substantially increased.

The expansion of the POLARIS force during fiscal year 1964 was as remarkable as that of the MINUTEMAN. On June 30, 1963, the POLARIS force consisted of 9 submarines with the fleet, carrying 144 missiles, and 3 more submarines in commissioned status. On June 30, 1964, the total had risen to 15 submarines—240 missiles—with the fleet and an additional 6 submarines commissioned but not yet deployed. Approved plans call for 29 submarines with 464 missiles delivered to the fleet by the end of fiscal year 1965 and for a total program of 41 submarines with 656 missiles by September 1967. The rapid increase of almost 100 POLARIS missiles in fiscal year 1964 and of over 200 in fiscal year 1965 is attributable to the construction acceleration ordered in early 1961, when the delivery rate for calendar year 1964 was raised from 1 submarine every 2 months to about 1 submarine each month. The establishment of more rigid inspection procedures, as a result of the tragic loss of the U.S.S. *Thresher* on April 30, 1963, slightly delayed the original schedule, but this slippage is expected to be made up during fiscal year 1965. Simultaneously with the quantitative growth of the POLARIS force, substantial qualitative improvement is being achieved. Research and development for the POLARIS A-3 missile, also accelerated in 1961, progressed with such speed that the U.S.S. *Daniel Webster*, the first submarine to be equipped with this more advanced weapon—having a range of 2,500 nautical miles, improved accuracy, and greater effectiveness—could be commissioned on April 9, 1964, with deployment scheduled for late September. Current plans call for a POLARIS fleet of 13 submarines with the 1,500-nautical mile A-2 missile and 28 submarines with the longer range A-3 version.

The dependability of the MINUTEMAN and POLARIS systems to carry out their missions was also submitted to thorough tests and

analyses. Dependability is judged on the basis of readiness, survivability, reliability, and the capability to penetrate enemy defenses, and these weapon systems achieved high scores in all categories. The readiness rate of MINUTEMAN and POLARIS, as determined from operational logs and by surprise inspections, was found to be substantially better than that of any other major weapon system. A high degree of survivability is provided by deployment in dispersed and hardened silos or in submerged submarines cruising in vast ocean areas. To assure maximum reliability, a greatly expanded test program was initiated in 1961, and the results of the test justify the fullest confidence in the launch, flight, and warhead reliability of these missiles. The extensive effort of recent years to develop effective penetration aids has further increased their capability to strike any designated target no matter how well protected.

The retention of this high rate of dependability is assured by a broad program of research and development. Studies for the Advanced ICBM are focused on new operational concepts and techniques for ballistic missiles. Substantial progress is being made in the research for an improved version of POLARIS beyond the A-3. Although the funds for the system development of the Mobile Medium-Range Ballistic Missile (MMRBM) failed to be authorized by the Congress in March 1964, the reduced appropriation will be used for the development of stellar inertial guidance systems and of certain command and control elements of possible use in more advanced missiles. Intensive research on penetration aids has already produced numerous effective techniques and devices to confuse enemy defenses and even better ones are under development; some \$350 million were budgeted for this program in fiscal year 1964 and a similar amount is being set aside for 1965.

As for our strategic bombing force, increased reliance was being placed during the fiscal year on the 14 wings of B-52 heavy bombers (630 aircraft) and the 2 wings of B-58 supersonic medium bombers (80 aircraft) as the gradual phaseout of the B-47's continued with a reduction from 13 to 10 wings. More than 500 bombers were on 15-minute ground alert throughout the year, and spare parts were available to keep, if necessary, one-eighth of the B-52's on airborne alert. In accordance with current plans for maintaining a mixed missile-bomber retaliatory force into the seventies, the B-52's are being structurally strengthened and equipped with new electronic devices to make them more effective in their primary mission of followup attacks against hard missile sites and weapon storage facilities. Through fiscal year 1964, a total of \$1.6 billion has been invested in this modification program, and another \$300 million has been budgeted for fiscal year 1965. The bomber force continued to be supported by a large

number of KC-135 jet tankers and its attack and penetration capabilities enhanced by HOUND DOG air-to-surface missiles and QUAIL decoy missiles.

Various options are open for replacing the B-52's in the seventies, if a replacement requirement exists at that time. In case supersonic speed and high altitude are needed for the future strategic bomber, the experience gained from three different Mach 3 planes, currently in the research and development stage, will be available—the XB-70, the A-11, and the SR-71. The first XB-70, a heavy supersonic aircraft, was rolled out on May 11, 1964, and scheduled for flight tests after the close of the fiscal year. As technical difficulties caused additional delays and increased costs, the XB-70 program was reduced from three to two prototype aircraft. The successful development of the A-11 or YF-12A, an aircraft capable of flying more than 2,000 miles an hour and at altitudes in excess of 70,000 feet, was revealed by the President on February 29, 1964. Less than 5 months later, on July 24, 1964, the President also announced the existence of the SR-71, a long-range strategic reconnaissance plane with speed and altitude characteristics similar to those of the A-11. In case low-level penetration capabilities turn out to be the key to future bomber effectiveness, the lessons being learned from the F-111, for example, will be applicable. Moreover, the fiscal year 1965 budget includes funds for a special study on an Advanced Manned Strategic Aircraft (AMSA), a long-range, low altitude penetrator to serve as an airborne missile platform.

Continental Defense

The overwhelming and indestructible retaliatory power of the United States constitutes the major deterrent to a direct attack on the North American continent. The rapid increase in the size and effectiveness of our retaliatory forces during fiscal year 1964 should have removed any doubt concerning the dire consequences of such an attack. In addition, the defensive capabilities of the North American Air Defense Command (NORAD) presented formidable hurdles for any potential aggressor to overcome. This combination of retaliatory and defensive strength provided effective protection to our country in fiscal year 1964 as in previous years.

The continental defense system, operated as a combined United States-Canadian effort, continued to be adjusted to the changing nature of the threat. Antibomber defenses were given increased protection against missile attacks by the wider dispersal of manned interceptors and of radar warning and control facilities. Antimissile defenses acquired improved detection capabilities, and substantial progress was

made in all development phases of the new NIKE-X missile defense system. In addition, an interim antisatellite capability was developed. Further improvements in many segments of these defenses are scheduled, but major changes will depend on the fundamental decisions yet to be made concerning the eventual deployment of NIKE-X and the expansion of the current civil defense program.

Adjustments in our antibomber defenses are focused on improving survival capabilities in case a bomber strike is preceded by a missile attack. The vulnerability of the Semi-Automatic Ground Environment (SAGE) system to a missile strike presented a key problem in this area. Hardening of the system proved to be impractical and the location of SAGE facilities near potential prime target areas, such as bomber bases and large cities, created additional hazards. To provide a more viable warning and control system, widely dispersed, semiautomatic Back-Up Interceptor Control (BUIC) stations, protected against radioactive fallout, are being constructed. This new approach permitted the closing of six SAGE direction centers and one SAGE combat center, and additional direction centers will be eliminated as the BUIC system becomes fully operational.

Increased protection for our manned interceptor force against missile attack is being provided by maintaining one-third of these aircraft on 15-minute alert and by making additional alternate airfields available for emergency deployment. This substantial force of F-101's, F-102's, F-104's, and F-106's is supplemented by Canadian squadrons as well as by about 500 Air National Guard aircraft. Each of the Air National Guard squadrons is keeping a few of its planes on runway alert.

A wide network of surface-to-air missiles supplements the manned interceptor defense. Solid-fueled BOMARC-B missiles, capable of striking targets 400 miles away, operate from bases in the United States and Canada; the shorter range, liquid-fueled BOMARC-A missiles will, as announced on January 21, 1964, be phased out during fiscal year 1965. Closer to their targets, attacking bombers will encounter a vast array of NIKE-HERCULES batteries, manned by regular Army and Army National Guard units; the last NIKE-AJAX missiles, assigned to the Army National Guard, were phased out during fiscal year 1964. Regular Army HAWK batteries provide additional defenses.

The adequacy of these forces to counter the Soviet bomber threat is being kept under constant review. Against current Soviet capabilities in this area, the existing defenses appear to be sufficient, although additional improvement in protection against missile attacks is indicated. In line with this requirement, current programs call for further modernization and dispersal of surveillance, warning, and control

facilities. A special effort to modernize the interceptor force does not seem justified, unless the Soviet Union deploys a radically new long-range bomber. In this case, numerous options for meeting this contingency are available as an outgrowth of an extensive research and development program for advanced aircraft. Among the possible choices are the F-4, already in our inventory; the F-111, scheduled for initial procurement in fiscal year 1965; and the A-11 or YF-12A, a new high altitude, 2,000 miles per hour experimental plane. Research is also being carried forward on various subsystems for even more advanced aircraft.

In the antimissile defense field, progress continued to be made in broadening the early warning coverage and in the development of NIKE-X, probably the most advanced antimissile system yet conceived by any nation.

The construction of the Ballistic Missile Early Warning System (BMEWS) was completed during fiscal year 1964, when the Fylingdales station in the United Kingdom became operational and joined those at Thule, Greenland, and Clear, Alaska, in providing about 15 minutes' warning of a missile attack. Projects for the continuing improvement of the effectiveness of these stations have been initiated. In addition, a breakthrough in over-the-horizon radar techniques—involving the detection of missiles within seconds after launch at a distance of several thousand miles by bouncing signals off the ionosphere—will make it possible to double the warning time in the years ahead. The new radars will supplement, rather than replace, the more versatile BMEWS radars and also provide new detection capabilities for the antibomber defenses.

The NIKE-X program, which was announced in January 1963, constitutes a major effort for the development of a more effective anti ballistic missile defense system than that offered by the NIKE-ZEUS. The speed of its high acceleration SPRINT missile provides additional time for its radars to discriminate between warheads and decoys, and its advanced Multifunction Array Radar (MAR) can not only acquire and track a large number of objects simultaneously but can also operate from hardened sites, providing increased survivability. Successful tests of SPRINT components during the past year kept the development of this new missile on schedule. The first test version of MAR, which combines the previously separate acquisition, tracking, and discrimination radars into a single system, started operating at the White Sands Missile Range on July 1, 1964. Valuable information for the development of the new system was obtained from NIKE-ZEUS tests at Kwajalein Island, where new intercept techniques were tried against intercontinental ballistic mis-

siles. A NIKE-ZEUS tracking radar installed on Ascension Island, the southern terminus of the Atlantic Missile Range, provided additional data for tracking oncoming missiles. Project DEFENDER, directed by the Advanced Research Projects Agency, continued to be closely associated with these tests and also supported a broad research program for new defense and penetration concepts.

The eventual deployment of NIKE-X remains an option for future decision. Assuming the successful completion of the development phase, a complex variety of technical, strategic, and economic factors will have to be considered. The relative effectiveness of the new system against small, moderate, and major missile attacks will have to be balanced against the capability of potential enemies to develop new penetration techniques at relatively low cost. In these circumstances, the high deployment cost of NIKE-X, measured against its eventual effectiveness, becomes an important factor. The deployment of NIKE-X around some 20-odd cities, containing about 30 percent of our population, is estimated to cost between \$15 and \$17 billion, and the operational costs thereafter will amount to about \$1 to \$2 billion a year. In addition, the effectiveness of a ballistic missile defense system in saving lives will depend in large part upon the existence of an adequate civil defense system protecting the American people against fallout. Thus, even after all the technical problems relating to NIKE-X are resolved, a most careful review by the Congress and the Executive Branch of competing advantages and disadvantages is indicated.

An effective defense against submarine-launched ballistic missiles raises equally complex problems. A key element in this defense remains the extensive Anti-Submarine Warfare (ASW) program for the detection and destruction of enemy submarines before they have an opportunity to launch their missiles. This effort continued to show good progress during fiscal year 1964. A modification of coastal radars to improve the detection of submarine-launched missiles has also been initiated. For an active defense, NIKE-X appears to offer the greatest promise.

To counter the possible threat of armed enemy satellites, two anti-satellite systems have been developed, as announced by the President shortly after the close of the fiscal year. Both systems, one developed by the Army and the other by the Air Force, utilize data from our global space detection and tracking networks. The Army system, a derivative of NIKE-ZEUS, was initiated in May 1962 and had a successful intercept a year later. The Air Force system, based on a modified THOR missile, was started in the spring of 1963 and completed a successful operational test in May 1964. The two systems have been effectively tested and the interception of U.S. satellites by

dummy warheads occurred well within the destructive radius of the weapons.

Responsibility for the civil defense program, which had been assigned to the Secretary of Defense by Executive Order 10952 of July 20, 1961, was delegated to the Secretary of the Army on March 31, 1964. This transfer was in line with the organizational principle of the Department of having essentially operational functions carried out by military departments or Defense agencies. The Office of Civil Defense operates now as a separate civilian organization directly responsible to the Secretary of the Army.

By the close of fiscal year 1964, fallout shelter space for approximately 121 million persons had been located; shelter space to protect about 64 million had been marked; supplies for nearly 24 million had been delivered to shelters; and procurement commitments to serve an additional 39 million had been made. The program for marking and stocking space suitable for fallout shelters in existing facilities will be continued. The Congress, however, while granting authority for providing shelter space in new Federal construction projects, did not approve funds for assisting State and local governments and nonprofit institutions in providing shelter space through the modification of existing facilities or new construction.

Further progress was made in the development of an adequate nationwide organization for handling an emergency. Federal matching funds assisted State and local groups in improving their organization. An extensive educational program provided trained personnel in increased numbers and made available detailed information on the action to be taken in case of nuclear attack. Research was carried on to develop more effective and efficient means for coping with the numerous emergency problems likely to arise, and improvements were made in such supporting systems as those for emergency warning, radiological monitoring, and damage assessment. Civil defense activities are discussed in greater detail in the report of the Secretary of the Army.

General Purpose Forces

The general purpose forces are the forces designed to counter the broad spectrum of aggression short of general nuclear war—ranging from massive conventional attack or tactical nuclear war to guerrilla warfare. They include most of the Army and Navy, all Marine Corps units, and the tactical units of the Air Force.

The ability of these forces to carry out their mission was further improved during fiscal year 1964. Combat readiness was higher than ever before in peacetime as special emphasis continued to be placed on the orderly elimination of existing shortages, particularly those in

non-nuclear striking power, airlift capabilities, and counterinsurgency training. As currently composed, these forces constitute an effective instrument for carrying out a policy of flexible and controlled response to any type of aggression.

Army

The need for major improvements in the U.S. Army was recognized in 1961, when extensive programs were established to increase its size and, even more importantly, its combat effectiveness. These basic programs continued to control Army developments during fiscal year 1964.

More than 100,000 men have been added to the Army during the past 3 years. Active duty strength, which was 859,000 at the end of fiscal year 1961, totaled 973,000 on June 30, 1964. The additional manpower permitted the Army to organize 2 new divisions and to bring 3 training divisions to combat-ready status—thus increasing the number of combat-ready divisions from 11 to 16. In addition, the Army at the end of fiscal year 1964 could put seven independent brigades in the field, whereas the troop structure 3 years earlier had included only two brigades and some eight battle groups that have since been consolidated. The new combat units made it possible to increase the strategic reserve in the United States from three to eight combat-ready divisions plus supporting forces.

Conversion of divisional and major nondivisional units to the new ROAD (Reorganization Objective Army Divisions) tables of organization and equipment was completed during fiscal year 1964, giving the field forces greater firepower, mobility, and flexibility. The number of aircraft assigned to divisions was increased by 100 percent. The new divisional and brigade structure will facilitate the grouping of infantry, armor, and artillery in task forces of varying composition to meet specific combat and terrain requirements. Logistical support elements of divisions were also restructured and strengthened to enhance capabilities for sustained combat.

To equip the new and existing divisions with modern weapons and materiel, Army procurement programs were greatly expanded since 1961, rising from \$1.5 billion to \$2.5 billion in fiscal years 1962 and 1963 and to \$2.9 billion in 1964. An interim objective was established for providing the full complement of modern weapons and equipment for a force of 22 divisions—16 of the regular establishment and 6 from the reserve components. In addition, replacement equipment, spare parts, ammunition, and other items for the 16 active divisions are being procured in the quantities required for sustained combat during the time needed for production to catch up with wartime consumption

rates. The procurement of comparable wartime supplies for the six reserve divisions is scheduled to start in fiscal year 1966.

Among the new aircraft received by the Army in 1964 were UH-1B/D Iroquois utility helicopters, CH-47A Chinook transport helicopters, OV-1B/C Mohawk combat surveillance fixed-wing aircraft, and CV-2B Caribou transports. These new aircraft replaced some older models but also increased the Army's active aircraft inventory to 6,338, as compared to 5,564 at the close of fiscal year 1961. Missile deliveries included more solid-fueled SERGEANTS and PER-SHINGs, permitting the phaseout of the liquid-fueled CORPORAL and REDSTONE, respectively, for the medium- and long-range support of Army troops. Long-range artillery support will be provided by the new 175-mm. gun, which was deployed to Europe and the Pacific during the year. Additional LITTLE JOHN and improved HON-EST JOHN artillery rockets and launchers and SS-11 and ENTAC antitank guided missiles also strengthened the firepower of Army divisions. The increased availability of new self-propelled 155-mm. howitzers and of armored personnel carriers assisted in completing the mechanization of four infantry divisions. Many other new weapons were in the late stages of development, including the REDEYE bazooka-type air defense missile, for which the first production contract was awarded in April 1964, and the LANCE surface-to-surface and the SHILLELAGH antitank guided missiles. Shortly after the close of the fiscal year, contracts were awarded jointly by the United States and the Federal Republic of Germany for the development of a new main battle tank.

The Army's Special Forces were reorganized during fiscal year 1964 and further strengthened to improve their capabilities for assisting allies in countering subversion and insurgency. At the close of the fiscal year, over 10,000 soldiers were assigned to seven Special Forces groups, which represented an increase of one group during the year. New tables of organization and equipment significantly augmented the logistical support, including aerial delivery, as well as the communications elements of the Special Forces. Detachments were actively engaged in Vietnam during the year, helping to train local defense units, and special mobile training teams assisted allied countries requesting their services in other parts of the world. Army regulations issued in 1964 provide that all combat and combat-support units receive some training in counterinsurgency and unconventional warfare operations.

Army training exercises during the year demonstrated the feasibility of decreasing reaction time by prepositioning heavy equipment in forward areas. Exercise BIG LIFT in October 1963 proved that an entire armored division—some 15,000 men—could be flown to Europe,

draw vehicles and equipment from depots there, and be ready to participate in NATO maneuvers within 5 days—2 days ahead of planning schedules. A 1,500-man, 116-aircraft, U.S.-based composite tactical air strike force moved concurrently with the division and was available to provide close air support during the exercise. Exercise QUICK RELEASE in January 1964 was staged in the Pacific to evaluate the forward floating depot concept. Heavy equipment and combat supplies had previously been stored on three converted merchant ships. These ships sailed from the Philippines to rendezvous at Okinawa with an augmented infantry brigade airlifted from Hawaii. The ships were unloaded rapidly, the equipment prepared for use, and the troops participated in simulated counterinsurgency operations. Afterwards the vehicles and equipment were cleaned, damaged items repaired or replaced, and the ships reloaded. While these two exercises were both very successful, lessons were learned that will contribute to further improvement in the technique of pre-positioning equipment for immediate use in an emergency.

Major progress was also made in testing new concepts for increasing the air mobility of ground forces. A special provisional force was formed for this purpose in February 1963, consisting of the 11th Air Assault Division, the 10th Air Transport Brigade, and supporting elements. Starting in October 1963, equipment and operational techniques were tested in a series of tactical problems, and a full-scale divisional exercise was scheduled for the fall of 1964. Areas of investigation during fiscal year 1964 included the evaluation of the OV-1 Mohawk aircraft for surveillance missions, methods of rearming and refueling helicopters, maintenance techniques, and control of air traffic. Concurrently, other concepts for improving the effectiveness of tactical air-ground cooperation were being tested by Air Force and Army units under the unified Strike Command. The concepts employed in these exercises will be evaluated in 1965 and troop structures and tactical doctrine adjusted to take advantage of proven developments.

Navy and Marine Corps

On June 30, 1964, the major units of the U.S. Fleet included, in addition to the 21 POLARIS submarines mentioned earlier, 15 attack carriers, 9 antisubmarine warfare (ASW) carriers, 19 nuclear attack submarines, 324 other warships, and 133 amphibious assault ships. The Navy's personnel strength totaled 668,000 or 3,000 more than at the beginning of the fiscal year—representing a total increase of 40,000 since 1961. With the additional personnel, the Navy was manning 859 ships or 40 more than on June 30, 1961.

The recent expansion of the Navy was initiated in 1961 with a new ship construction and modernization program that led to the authorization of 159 new vessels in the fiscal years 1962-65 budgets—nearly twice the number of ships authorized during the preceding 4 years. As a result of this program, 23 new warships were commissioned during fiscal year 1964—11 surface vessels, 9 POLARIS submarines, and 3 nuclear attack submarines. With the addition of these modern ships, older units were deactivated, limiting the net gain during the year to two commissioned ships.

The 11 surface vessels newly commissioned will strengthen particularly the anti-air warfare capability of the fleet. They include the heavy guided-missile cruiser U.S.S. *Chicago*, equipped with both TALOS and TARTAR missiles, six TERRIER missile frigates, and four TARTAR missile destroyers. In addition, the readiness, reliability, and effectiveness of all three "T" missiles are being substantially enhanced through a comprehensive program to bring these weapon systems to their full potential. TARTAR guided-missile ships already with the fleet are being modified on a regular schedule to fire an improved, long-range version of the missile. The TYPHON weapon system, which was intended to provide a more advanced air defense for the fleet, turned out to be far too large, complex, and costly for deployment, and the termination of the project was announced on January 7, 1964. Work is continuing on the development of a new standardized missile to replace TARTAR and TERRIER in the near future, and for long-range improvement a completely new surface-to-air fleet missile system is under development. The air-to-air defensive capabilities of the fleet continued to improve with additional deliveries of F-4 Phantom II supersonic, all-weather fighters, armed with SPARROW and SIDEWINDER missiles. The F-111B, equipped with the PHOENIX air-to-air guided missile, is scheduled to replace the F-4 in the late sixties.

The offensive capabilities of the attack carrier forces were increased as more improved A-4E Skyhawk single-jet and A-6A Intruder twin-jet aircraft were delivered. To replace the Skyhawk, a contract was let in February 1964 for the development of the A-7A (VAL) light attack aircraft that will have twice the range of the Skyhawk and allow substantially greater payloads at any range.

The 15-ship carrier force included in 1964 the nuclear-powered U.S.S. *Enterprise*, 6 *Forrestal*-class carriers, 3 of the *Midway* class, and 5 converted *Essex*-class ships. A seventh *Forrestal*-class carrier, the U.S.S. *America*, was scheduled for commissioning in fiscal year 1965, and the contract for the construction of the eighth carrier of this class, the U.S.S. *John F. Kennedy*, was announced on April 30, 1964. The continuing high cost differential between conventional- and

nuclear-powered ships argued against installing nuclear propulsion in the new carrier, but the current work on the development of very high-powered, long-life reactors could make the cost/effectiveness ratio more favorable for future surface ships.

Major emphasis continued to be placed during the year on Anti-Submarine Warfare (ASW). Since the discovery of a radically new technique for the surveillance and detection of submarines appears unlikely in the near future, a solution is being sought by the evolutionary, step-by-step integration of hundreds of technological and operational advances into the various ASW systems. The size of the ASW effort is indicated by an RDT&E budget of \$350 million for fiscal year 1964 and by the nearly \$2.0 billion allocated for ASW ship construction and conversion and the procurement of ASW weapons and equipment. To provide centralized coordination for ASW planning and programing, a new Office of Antisubmarine Warfare Programs was established in May 1964, directly under the Chief of Naval Operations, and a single office for the management of ASW projects was created in the Office of Naval Material.

ASW research is being supported by a broad program in oceanography, and the recent establishment of the Atlantic Underseas Test and Evaluation Center (AUTEC) should provide valuable additional data. A new long-range sonar, SQS-26, capable of bouncing signals off the ocean floor, underwent technical evaluation during the year and was approved for installation in new ships. Also in the late stages of development were the Mark 46 lightweight, self-guided torpedo and SUBROC, a submarine-to-air-to-underwater long-range rocket. Current ASW capabilities were increased with additional deliveries of the ASROC surface-to-subsurface rocket, installed on over 100 ships, and of the DASH drone antisubmarine helicopter, deployed on about 30 destroyers. More P-3A Orions improved the search rates, range, and destruction capabilities of land-based naval patrol aircraft squadrons. The antisubmarine carrier force of nine *Essex*-class ships received additional modern S-2E Tracker fixed-wing and SH-3A Sea King helicopter aircraft.

The Marine Corps, which maintained a personnel strength of about 190,000 throughout the year—about 13,000 more than on June 30, 1961—continued to provide three combat-ready divisions and air wings plus supporting elements and the nucleus of a fourth division/wing team to be manned in an emergency by reservists. One Marine division/wing team was deployed in Hawaii and the Far East, and the other two were located in the United States, one on the east coast and one on the west coast. In addition, Marine forces were embarked with the Second Fleet in the Caribbean, the Sixth Fleet in the Mediterranean, and the Seventh Fleet in the western Pacific. The combat

capabilities of ground units were increased with the delivery of improved artillery and air defense weapons, while Marine air wings received their first CH-46A Sea Knight medium assault helicopters and additional UH-1 Iroquois utility helicopters, F-4 Phantom II all-weather interceptors, and A-6A Intruder medium attack aircraft. The amphibious fleet included 133 warfare ships on June 30, 1964—an increase of 23 since 1961. Vertical assault capabilities were increased with the commissioning of the U.S.S. *Guadalcanal*, an LPH carrying 2,000 combat troops and 24 large helicopters, and of the U.S.S. *La Salle*, an LPD designed for 900 troops and 6 helicopters.

Tactical Air Force

The general purpose forces of the Air Force are composed of tactical fighter and reconnaissance wings, B-57 tactical bomber squadrons, MACE surface-to-surface tactical missile units, oversea air defense forces, and special air warfare units for dealing with insurgency. Expansion of the force structure, modernization of aircraft, and procurement of substantial additional stocks of missiles, rockets, and other ordnance during recent years have greatly strengthened these forces to carry out their mission of gaining air superiority and providing close air support to ground forces during sustained combat. Further gains will be realized with the completion of current programs.

The number of tactical fighter squadrons has been increased by 44 percent since 1961, permitting the activation of 5 new wings for a total of 21 on June 30, 1964. Three more wings will be added as modern aircraft come off the production lines under the expanded procurement schedules. The F-105F, an advanced Thunderchief model, began to enter the active aircraft inventory during the year, and the Air Force received its first deliveries of the F-4C, a modified version of the supersonic Phantom II, deployed by the Navy and Marine Corps. Further increases in fighter strength and capabilities will be achieved as improved F-4D and F-4E models, now in production, are delivered. Subsequently, the new supersonic F-111, scheduled for flight testing in fiscal year 1965, will become available. The F-111 will have intercontinental range without refueling, carry a heavy load of ordnance on combat sorties, and be able to operate from relatively short forward air bases, thus giving it great operational flexibility. Intelligence-gathering capabilities of the tactical air force will continue to improve as squadrons begin to receive the reconnaissance version of the Phantom II during the coming year.

A serious constraint on the readiness of the tactical air force for sustained combat has been the low level of reserve stockpiles of non-nuclear ammunition, missiles, and other ordnance. These shortages have now been largely overcome. Annual procurement programs

have more than doubled since 1961. During fiscal year 1964, for example, large quantities of BULLPUP air-to-surface missiles and cluster bombs were added to the weapons inventory. Expanded development efforts are making available new ordnance such as the SHRIKE antiradar missile and the Snakeye bomb, both of which will go into production during the coming year, and the Walleye TV controlled glide bomb.

Tactical air force effectiveness in joint operations with the Army has benefited from the greater frequency of training exercises conducted by the unified Strike Command since its establishment. During May 1964, for example, over 100,000 soldiers and airmen from 4 Army divisions and 15 Air Force squadrons participated in Exercise DESERT STRIKE. Earlier, in Exercise BIG FEET, the Tactical Air Command demonstrated its capability of moving three fighter squadrons and a composite reconnaissance force to Europe and having the aircraft ready to operate with ground force units within a very short time after arrival. Further improvements in air-ground cooperation will be sought in a series of tests to be conducted during fiscal year 1965 by the Strike Command and by the Tactical Air Warfare Center, which was established in December 1963 to evaluate close air support concepts under field conditions.

Air Force resources for combating insurgency have steadily expanded since April 1961 when a combat crew training squadron was activated at Eglin AFB, Fla. This squadron provided the nucleus for what is now the Special Air Warfare Center, composed of an air commando wing and a combat applications group. Detachments equipped with B-26, T-28, and A-1E aircraft have been training Vietnamese Air Force personnel, and mobile training teams have been provided to various friendly countries upon request. Increased attention is being given to the development and procurement of special weapons and equipment for counterinsurgency operations.

Airlift and Sealift

As a result of the programs initiated in 1961 to augment and modernize our airlift forces, the mobility of our limited war forces continued to improve during fiscal year 1964. At the close of the fiscal year, airlift capabilities had been increased 75 percent over 1961 and approved plans called for a 410 percent increase by 1968.

The current augmentation is focused on the rapid introduction of C-130E's and C-141's, which have a strategic deployment as well as assault capability and thus can be assigned to either the Military Air Transport Service (MATS) or the Air Force's Tactical Air Command (TAC). The C-130E, which started to be delivered in March 1962, is a turboprop aircraft with an average cruise speed of

about 280 knots and can deliver a 25,000-pound payload more than 4,000 miles. The C-141, which had its first flight test in December 1963, is a turbofan jet with an average cruise speed of about 440 knots and can deliver a 70,000-pound payload more than 4,000 miles. Both can land and take off on airstrips no longer than 5,300 feet. As these new aircraft enter the inventory, the C-135's, used as interim augmentation in 1961, will be phased out of the airlift forces and reassigned to other Air Force missions.

Intensive study is being given to the requirement for a cargo aircraft for carrying outsize equipment currently being airlifted by piston-engine C-124's and turboprop C-133's, the last of which were delivered in 1955 and 1961, respectively. It has been determined that even the relatively large C-141 will be unable to carry over one-third of the equipment of a modern infantry division and an even larger proportion of the equipment of an armored division. Current analyses indicate that the most efficient solution to the problem created by the outsize equipment and the aging C-124's and C-133's would be the procurement of a large transport aircraft incorporating the latest development in jet engine design.

In case of emergency, our regular airlift forces can be considerably increased by aircraft from the Air National Guard, the Air Force Reserve, and the Civil Reserve Air Fleet (CRAF). Air National Guard and Air Force Reserve units keep large numbers of C-97's, C-119's, C-121's, C-123's, and C-124's in ready condition for deployment within 24 hours. Plans have been developed for phasing out the older and less efficient models of these propeller aircraft as our over-all airlift capabilities increase. Through contracts with commercial carriers, nearly 349 additional aircraft—145 of them modern jets—can become available within 48 hours. To encourage the further modernization of CRAF equipment, the Department announced on March 6, 1964, that future commercial airlift contracts would be concluded, whenever feasible, with carriers flying turbine-powered aircraft and deriving a substantial percentage of their transportation revenue from commercial sources.

Our sealift forces include troop ships, cargo ships, and tankers operated by the Military Sea Transportation Service and the "Forward Mobile Depot" ships. These active forces are backed by a substantial reserve fleet and the ships of the merchant marine. Tests conducted during the year clearly indicated that the forward deployment of heavy equipment in depot ships can greatly shorten the reaction time of our forces in case of emergency, and an expansion of this capability beyond the three converted Victory-class ships is planned.

The current mix of airlift and sealift resources enables the United States to deploy large forces rapidly to distant areas. Approved programs will maintain this capability in the years ahead.

Reserve Forces

The readiness of the reserve units earmarked for early mobilization in an emergency showed further improvement during fiscal year 1964. Troop structures were realigned and manpower levels adjusted to assure the availability of the types of forces called for in the most recent contingency plans. Additional personnel were recruited and training programs intensified, and newer weapons and equipment were provided to reserve units. Despite the gains of 1964, however, further assignment of manpower and materiel to high priority units, particularly to those of the Army reserve components, is required to provide on short notice a properly balanced reserve for the augmentation of our general purpose forces.

The need to restructure and modernize the reserve components had been recognized at least as early as 1961. In May of that year the late President Kennedy announced that plans were being developed to make possible the much more rapid deployment of reserve forces. The recall of reservists during the Berlin crisis of 1961 reemphasized the requirement for a more realistic and flexible reserve structure and at the same time disrupted the schedule for achieving it. Thus it was not until fiscal year 1963 that new plans were being placed into effect, resulting in the readiness improvements that became evident during 1964. This progress provides the foundation for the further advances being planned.

The realignment of the Army National Guard and Army Reserve force structure involved the activation of approximately 1,000 new units and the deactivation of some 1,700 older ones no longer required. Manning and equipment levels of combat and supporting forces with a high mobilization priority were raised. Reserve units were converted to the new ROAD tables of organization and equipment that had been introduced in the active Army during 1962. The 29 combat divisions and 11 brigades of the National Guard and the Reserve operated under the ROAD concept throughout fiscal year 1964, while smaller nondivisional combat units completed their transition to the new and more flexible organizational structure by June 1, 1964. Further progress was also made during the year in converting the 76 NIKE-AJAX batteries in the continental United States manned on site by the National Guard to 48 more powerful NIKE-HERCULES batteries. By June 30, 1964, 36 of these 48 batteries were operational, while the remaining 12 were undergoing

conversion. Six additional NIKE-HERCULES batteries were manned by National Guardsmen in Hawaii.

Changes in the reserve force structures of the other military Services were less extensive, although some adjustments were made to conform with the latest mobilization requirements. In the Air National Guard, aeromedical transport squadrons were converted during fiscal year 1964 to the broader mission of air transport, and one tactical fighter and one air defense wing were replaced by air transport wings. As a result, on June 30, 1964, the Air National Guard long-range airlift force totaled 7 wings and 25 squadrons—an increase of 2 wings and 9 squadrons. Changes to increase operational flexibility included the redesignation of four Air National Guard troop carrier squadrons as air commando groups, which were equipped with additional utility aircraft for their enlarged mission. Moreover, some larger size support units of the Air Force Reserve, such as aerial port squadrons and hospital units, were reorganized into smaller detachments to facilitate a quick response to a wider range of contingencies. In the Navy, the principal structural change during the year was the reorganization of Naval Air Reserve squadrons and units to bring them into closer alignment with mobilization requirements of the fleet. While the number of units was reduced, assigned personnel strength rose. The Marine Corps Reserve, following its reorganization during the preceding fiscal year, continued in 1964 to train reservists in units that would provide most of the elements for the activation of a fourth division/wing team during an emergency.

The number of Ready Reservists and the number of reservists in paid status increased during fiscal year 1964, reversing the downward trend that had followed the dislocations associated with the callup and release of units and individuals during the Berlin crisis. (See tables 22 and 23.) These increases in strength reflected more intensive and more flexible recruitment procedures and were achieved despite the adoption of higher standards for enlistment, assignment to units, and retention. These more selective standards contributed, however, to the failure of fully achieving the drill-pay personnel goals of 400,000 for the Army National Guard and 300,000 for the Army Reserve, although both these components showed gains during the year. On June 30, 1964, the National Guard was 4.5 percent below programed strength for drill-pay training and the Army Reserve, 10 percent.

Particularly helpful in the effort to recruit additional personnel was the revised legislation enacted in September 1963 for direct enlistment in reserve components—an optional form of military service that had been made available in 1955. The term of obligated service was reduced from 8 to 6 years and the length of the initial tour of active duty for training was made more flexible, ranging from a minimum of

4 months, with the duration dependent upon the training requirements for the particular military skill involved. This authority to offer longer periods of training has assisted reserve units in filling their needs for more highly skilled specialists. Enlistments under this program totaled 175,000 during fiscal year 1964—an increase of nearly 62,000—and 146,000 enlisted reservists began their active duty for training during the year, as compared to only 107,000 in 1963. (See table 24.)

More intensive and more realistic training also improved reserve readiness during the year. The Army National Guard and the Army Reserve experimented with the use of multiple drills during weekends and found that unit proficiency increased. Selected Army and Air Force reserve units played an active role in Exercise DESERT STRIKE, the largest armored field maneuvers of the active forces since World War II. Air National Guard and Air Force Reserve transport squadrons airlifted Army National Guard and Army Reserve units to field training sites, to the mutual advantage of all participants. The training of Naval and Marine Corps Reserve units with elements of the regular establishment was particularly helpful in enhancing the readiness of reservists to take their place alongside the active forces in an emergency.

Weapons and equipment of the reserve components continued to be modernized during the year. High priority Army National Guard units received new self-propelled artillery and armored personnel carriers. Army Reserve units achieved a higher capacity for mobilization partly through the acquisition of additional equipment and partly through the improvement of their maintenance capabilities. The assignment of F-8 and A-4 aircraft to Naval and Marine Corps Air Reserve units permitted the phaseout of older models and a reduction in the different types of aircraft with which these units are equipped. The procurement of additional 3-inch/50-caliber rapid-fire gun mounts and Mark 63 gun-fire-control systems enabled Naval Reserve training units to instruct personnel more effectively in the use of materiel deployed with the active fleet. The Air National Guard increased its aircraft inventory by 16 percent, from 1,556 to 1,810. While Air Force Reserve units had 12 fewer aircraft at the close of the year than at the beginning, stocks of other weapons and equipment were augmented significantly during the year.

The funds programed for the reserve components have been increased by about \$0.3 billion since 1961, reaching a total of \$2.0 billion during fiscal year 1964. This increase in the funding level as well as the other actions taken reflect the steadily rising importance of the reserve forces to the Nation's security plans and programs.

Defense Space Program

Expenditures for military space activities rose to \$1.6 billion during fiscal year 1964—an increase of 120 percent since 1961. These activities form an integral part of the much larger National Space Program. The Department of Defense effort is focused on space programs of particular use to national security, and it supplements the work of the National Aeronautics and Space Administration (NASA) and of other Federal agencies in fields of science and technology in which the military Services have developed special technical competence. These agencies, in turn, assist the Department in achieving its space objectives by making the results of their research readily available.

Unmanned military satellite projects to meet current Defense requirements include systems for navigation, geodesy, detection of nuclear explosions, and communications. The navigational satellite system, which was in the final phase of development and evaluation during the fiscal year, became operational on July 15, 1964. This space system—the first to be employed on a regular basis by the fleet—enables naval surface ships and submarines to determine their position anywhere at sea in any kind of weather. Work is continuing to increase the operating lifetime and reliability of these satellites, while NASA and other Federal agencies are investigating the need for a nonmilitary system of this type.

Further progress was also made in the geodetic satellite program which is under the over-all management of NASA. In January 1964, a Sequential Collation of Range (SECOR) satellite, developed by the Army Corps of Engineers, was launched, and subsequent tests demonstrated the high accuracy of this experimental system for determining the relative location of continents, islands, and other landmarks separated by large bodies of water. Recent developments in the techniques for detecting nuclear detonations at high altitudes and in space have been mentioned earlier.

In the field of communications, the Department explored during fiscal year 1964 the feasibility of participating in the development and use of the commercial network being developed by the Communications Satellite Corporation. Although the technical problems of joint military-civilian usage did not appear insuperable, military requirements for secure and flexible communications channels precluded the conclusion of an agreement. Shortly after the close of the fiscal year, on July 15, 1964, the Secretary of Defense announced that the Department was reluctantly foregoing the economies inherent in joint operations and was proceeding independently with its own interim satellite

communications program. This network is scheduled for use in early 1966 and will be followed later by a more advanced and longer lived system. The Department also continued during the year to build and test experimental ground support equipment and facilities, including transportable terminals, to operate with communication satellites.

The manned space flight program of the Department of Defense was reoriented in December 1963 when the Air Force was authorized to proceed with investigations to determine the military usefulness of a near-earth Manned Orbiting Laboratory (MOL). At the same time, development work on Project Dyna-Soar, a one-man spacecraft system designed primarily for the exploration of hypersonic flight and maneuverable reentry and recovery techniques, was terminated. The MOL, a pressurized cylinder with a volume of more than 1,000 cubic feet, is planned to have equipment and instrumentation for military experiments in orbit. It will be launched by a TITAN IIIC rocket. A specially modified two-man GEMINI capsule, mounted on the MOL, will be used for transporting the astronauts. Preprogram definition studies of the MOL concept were initiated. The Department also continued to cooperate with NASA in the development of the GEMINI spacecraft and the lunar exploration system, Project APOLLO, both of which will contribute substantial data useful to military space objectives. In addition, new reentry and recovery techniques and technology for space vehicles were being explored through two related programs—ASSET (Aerothermodynamic/Elastic Structural Systems Experimental Test) and START (Space Technology and Reentry Test).

Development of the TITAN IIIC standardized launch vehicle for the MOL and for a wide range of other manned and unmanned missions proceeded on schedule during the year. The TITAN IIIC consists of a TITAN II ballistic missile as the basic building block plus a new restartable upper stage, a control module, and two "strap-on" 120-inch diameter solid-propellant rocket motors. It is designed to place payloads ranging in weight from 5,000 to 25,000 pounds into a variety of orbits. Various components of the system were tested during the year, while facilities for launching the complete space booster were constructed at Cape Kennedy, Fla. Designed to support both military and NASA space missions, TITAN IIIC represents a major Defense contribution to the National Launching Vehicle Program. Other Defense development work under this program included a 156-inch diameter solid-propellant motor with a thrust of 3 million pounds; a 1-million-pound version of this motor was successfully fired for the first time at full power in a stationary position during May 1964. Agreement was reached during the year for shifting responsibility

for the larger 260-inch diameter motor from the Air Force to NASA, since the 156-inch model appears adequate to meet potential military requirements.

All military space activities have been closely coordinated with the civilian space effort to produce a truly integrated national space program. Over-all responsibility for assisting the President in this field rests with the National Aeronautics and Space Council, presided over by the Vice President. In addition, NASA and the Department of Defense established an Aeronautics and Astronautics Coordinating Board (AACB) in 1960, co-chaired by the Associate Administrator of NASA and the Director of Defense Research and Engineering. The AACB and its subordinate panels and planning groups constitute a vital forum for seeking solutions to problems of mutual concern. By the end of the fiscal year, over 75 major agreements had been concluded by NASA and the Department defining objectives, delineating responsibilities, and providing for joint utilization of resources and mutual support by these two agencies. Fiscal year 1964 agreements covered such subjects as exploratory studies for advanced manned earth-orbital space station, the management of geodetic satellites and of lunar mapping and survey programs, the funding of support costs at the Atlantic Missile Range, and the operation of instrumentation ships. NASA-DoD cooperation also covers a broad spectrum of management activities including the administration of procurement contracts, construction and operation of facilities, and the transportation of large launch vehicles. In addition, close contacts have been established between the staffs of the two agencies and some 200 active duty military personnel have been assigned to positions in NASA.

III. Defense Management

The buildup of our armed forces to meet the changing requirements of national security continued to be accompanied in fiscal year 1964 by a major effort to improve the logistics support of combat forces while at the same time eliminating unessential expenditures wherever possible. The current intensive search for more efficient ways of managing the Defense establishment was initiated in 1961. Since then this effort has gained increasing momentum. The cost reduction program alone permitted the Department to reduce its appropriations request for fiscal year 1965 by over \$2 billion, and further dividends will accrue as the actions already taken become fully effective. Improvements in the planning-programing-budgeting process assure not only that current requirements are being adequately met but also that future ones are being planned, developed, and integrated in an orderly and efficient manner. Established procedures provide for the thorough examination of alternative courses before major decisions are reached. All these and numerous other actions were taken in keeping with Presidential instructions to maintain whatever forces are needed for our security and to operate these forces at the lowest possible cost.

While the high cost of defense operations—about \$50 billion annually since 1961—makes efficient management imperative, the size and scope of these operations create many difficult and complicated problems to resolve. Part of the difficulty arises from the sheer numbers of people involved. The Department employs some 3.9 million people—2.7 million in uniform and 1.2 million as civilians—and stations them throughout the world. An additional 2.6 million are enrolled in the reserve forces, while millions of others—such as the employees of defense contractors and the dependents of military personnel—are vitally affected by what the Department does. Another factor contributing to the complexity of the management task is the volume and variety of the material resources that must be utilized to maximum advantage. Real and personal property controlled by the Department represents an investment of over \$170 billion. Nearly 12 million contracting actions with a value of about \$28.8 billion were required to procure some 4 million different supply items and necessary supporting services. Further complications are caused by the wide range of Defense activities. The Department operates an airline, a shipping

fleet, a far-flung global communications system, extensive maintenance establishments, and each of these enterprises involves special management techniques. The more than 600 major bases and installations of the military Services are themselves small cities, each with its own host of municipal problems. To merge all these men, materials, and facilities into an integrated effective instrument in support of our national security objectives constitutes a major management challenge.

Organization

No major changes were made during fiscal year 1964 in the Defense organizational structure, developed since 1961 in accordance with the provisions of the Defense Reorganization Act of 1958. Subject to some minor adjustments, the existing organization provided an adequate framework for the continuous improvement of management activities. The experience gained over the last 3 years has familiarized Defense personnel with the objectives and requirements of the newly established procedures. As a result, the Department has been operating with increased efficiency.

The President, as head of the Executive Branch as well as Commander-in-Chief, and the Secretary of Defense, his deputy for defense matters, exercise their control of the Department through two chains of command—one for the operational command of our combat forces and the other for the direction of support activities. The first command line runs through the Joint Chiefs of Staff to the eight unified and specified commanders to whom the bulk of our operational forces is assigned. The second extends to the Secretaries of the military departments who are responsible for organizing, training, and equipping the forces required for prompt and sustained combat operations. Within the operational command line and responsible to the Joint Chiefs of Staff, three inter-Service agencies have been assigned Department-wide tasks for atomic weapons, communications, and intelligence—the Defense Atomic Support Agency, the Defense Communications Agency, and the Defense Intelligence Agency. In the logistics support area, the Defense Supply Agency is directly responsible to the Secretary of Defense for the management of supplies and logistical services used in common by the military forces.

The management principle of centralized direction and decentralized operations prevails within the Department. Top-level management concentrates on the solution of policy problems and provides the guidance essential for the implementation of approved policies and programs. The operational components carry full responsibility for the efficient execution of assigned tasks. In keeping with this objective, the military departments clarified their logistical support

channels by internal reorganization—the Air Force in 1961, the Army in 1962, and the Navy in 1963—and the newly established inter-Service agencies mentioned above were given clear management authority for Defense-wide operations in their respective areas.

As new opportunities for more efficient management arose during fiscal year 1964, they were carried out within the existing organizational structure. A new charter for the Defense Atomic Support Agency was issued on July 22, 1964, after a thorough review of its activities, particularly those related to laboratory research on the effects of nuclear weapons, underground tests of nuclear devices, and U.S. readiness to resume atmospheric testing in the event of a breach of the test ban treaty. The Defense Supply Agency continued the consolidation of previously assigned functions and took on additional Defense-wide responsibility for the movement and storage of household goods (September 16, 1963), for scientific and technological information (November 1, 1963), and for integrated contract administration (June 5, 1964). Simultaneously, additional assignments to one military Service of single manager responsibility for inter-Service activities were made. The Army was charged with conducting the training for all information specialists of the armed forces (February 21, 1964), the Navy with operating the Defense Computer Institute (February 27, 1964), and the Air Force with managing intercontinental missile and satellite ranges (November 16, 1964). The feasibility of further consolidations, including printing services, automatic data processing, and military traffic terminals, was still under study at the close of the fiscal year.

On March 31, 1964, civil defense functions were transferred from the Office of the Secretary of Defense to the Office of the Secretary of the Army. The Office of Civil Defense (OCD), although primarily an operating agency, had been placed in the immediate office of the Secretary of Defense in July 1961 to facilitate close personal supervision, as directed by the President, while the civil defense program was being integrated with other Defense operations. With this integration accomplished, administration of OCD functions by one of the military departments was called for by the management principle of the Department.

The position of Assistant Secretary of Defense, vacated by the OCD transfer, was utilized to provide a focal point for the improvement of administrative management. The new Assistant Secretary for Administration is the principal staff assistant to the Secretary of Defense for administration, management, and organization. He was assigned the existing staffs for organizational and management planning and for the administrative support of the Office of Secretary of Defense. In addition, he will provide inspection services for the Secretary of

Defense and the Joint Chiefs of Staff, conducting when necessary criminal or counterintelligence investigations and studies of operational or administrative effectiveness. He also serves as principal adviser to the Secretary in the latter's capacity as Executive Agent for the National Communications System, established by the President in August 1963 for the integration of the communications systems of the Federal Government.

Planning-Programing-Budgeting

The rational allocation of available resources to produce the maximum increase of our military capabilities has been the key Defense management problem since World War II. The development since 1961 of the appropriate management tools for this purpose—the planning-programing-budgeting system and the extensive use of systems analysis or “cost/effectiveness” studies—has made possible major advances toward a solution of this problem.

The difficulties to be overcome were many, including above all the lack of correlation between military missions and the budget structure based on broad functional purposes and organizational components, the lack of compatibility between long-range military plans and short-range annual budgets, and the lack of teamwork between the military planners and the civilian budget officers. As a result of these handicaps, long-range military plans lacked fiscal realism, and budget decisions frequently had to be made without adequate information on the dollar impact in the years ahead. The solution was found in the establishment of a new programing system—known as the “Five Year Force Structure and Financial Program”—which bridged the gap between planning and budgeting and made both of them more meaningful.

The Five Year Program projects not only the military forces required for our long-range military plans but also the personnel, equipment, supplies, and installations needed to support them. In addition, it projects the full cost of these resources and thus provides a sound basis for the development of the annual budget requests to the Congress. It is organized around forces and weapon systems grouped by mission. In fiscal year 1964 it included 10 major military programs—Strategic Retaliatory Forces, Continental Air and Missile Defense Forces, General Purpose Forces, Airlift and Sealift Forces, Reserve and National Guard Forces, Research and Development, General Support, Retired Pay, Civil Defense, and Military Assistance. These major programs are made up of subgroups, which in turn are composed of program elements. The latter are considered the basic building blocks and constitute the decision-making level in the programing

process. There are about 1,000 such program elements, each representing an integrated force or activity such as the B-52 bomber force, the POLARIS submarine force, attack carriers, and infantry divisions.

Systems analysis or cost/effectiveness studies have been particularly helpful in the determination of military requirements. These military-economic studies do not produce final answers. However, by comparing alternative ways of accomplishing national security objectives and by highlighting the one that appears to contribute the most for a given cost or to achieve a given objective at the least cost, such studies provide invaluable assistance to the decision-makers. In defense, as in any other field, benefits must be weighed against cost. The fact that our national resources are limited makes such judgments inevitable. The open, explicit, verifiable, self-correcting process used in systems analysis provides a method for making these judgments more logical and objective than heretofore. This technique, although still in its early development stage, constitutes an essential tool for assuring that available resources are employed to produce a maximum national defense position.

During fiscal year 1964, the advantages inherent in the Five Year Program and in systems analysis became more widely understood and accepted throughout the Department. At the same time further progress was made in ironing out the problems encountered in updating and reviewing the Five Year Program. Programing was tied even more closely to military planning by using the Joint Strategic Objectives Plan prepared by the Joint Chiefs of Staff as the vehicle for reaching intermediate decisions on programed force levels.

Following the procedures in effect during 1963, the military Services submitted more than 300 program change proposals, involving a shift of about \$45 billion over the full Five Year Program period. About half of this amount—\$23 billion—was approved, and these changes added a net of \$3.7 billion to the program projection that provided the basis for the development of the fiscal year 1965 budget.

The Service estimates for this budget, forwarded to the Secretary of Defense in the fall of 1963, totaled \$60.7 billion. After review by budget officials of the Department and the Bureau of the Budget, some 650 specific issues were submitted to the Secretary for his decision. Departmental agencies asked for further consideration of 246 of these decisions, and their appeal was sustained in 90 cases. As in previous years, the principal civilian as well as military advisers directly participated in this review process. The Joint Chiefs of Staff, for example, considered the 1965 budget and related matters 104 times during the year. After a final review by the President, the budget was sub-

mitted to the Congress in January 1964. It totaled \$50.880 billion in new obligational authority, or about \$10 billion less than the original Service proposals. A budget amendment of \$55 million was forwarded in May 1964 to provide additional funds for military assistance in Vietnam.

The 1965 budget request of \$50.935 billion was \$2.7 billion less than the amount requested for 1964. This decrease was achieved despite the considerable increase in military, civilian, and retired payrolls which, as the result of pay raises, have added \$2.7 billion to the budget since 1961. A major contribution to the absorption of these higher costs has been made by the Department's cost reduction program to lower military operating expenses. In addition, the substantial progress achieved since 1961 in the buildup of our strategic retaliatory forces permitted a reduction in the funds required for this program in 1965. This reduction, however, was partially offset by a continuing increase in the funds needed for our general purpose forces.

The 1965 budget request considered by the Congress totaled \$50.763 billion, since \$172 million of the original request could not be acted upon until the Congress had approved the Department's recommendations of a further military pay increase. After thorough review by the Military Affairs and Appropriations Committees of the Senate and the House, a total of \$49.483 billion was appropriated during the summer of 1964—a reduction of about 2.5 percent in the Administration's request. These actions, together with the authorized transfer of \$240 million from revolving funds, gave the Department \$49.723 billion in new obligational availability for fiscal year 1965. Additional funds will be required to meet part of the authorized military and civilian pay increases and the additional expenditures incurred in countering Communist aggression in Vietnam.

The scheduled transfer for 1965 of \$240 million from revolving funds to other accounts has been made possible by supply management improvements that have reduced the inventories capitalized by these funds, thus generating excess capital. This program has been in effect for some time and has yielded substantial results. Transfers from revolving funds to other accounts since 1953 totaled \$3.5 billion at the close of fiscal year 1964, and an additional \$3.4 billion reverted to the Treasury during the 11-year period. (See table 8.) Regulations to govern stock fund accounting and reporting were revised during 1964 to introduce greater uniformity in the procedures of the military departments and the Defense agencies.

This revision represents but one phase of the continuing program of the Department for improving all its financial operating procedures in support of the planning-programing-budgeting system.

During fiscal year 1964 major emphasis was placed on improving three primary areas—military personnel disbursing and accounting, research and development programing, and military family housing cost accounting. Greater use of automatic data processing equipment in the handling of military personnel payrolls not only produced savings in man-hours but also provided more accurate and more timely information for the effective control and management of an annual appropriation totaling more than \$12 billion. Realignment and adjustments in the programing and budget structures of research and development accounts introduced greater flexibility in the administration of basic research activities. Consolidated management and financial controls on a Department-wide basis for the construction and operation of military family housing contributed to more effective utilization of available assets and to lower costs.

Research and Development

The current United States superiority in military strength is due in large part to the tremendous contributions of American science and technology in recent years. To maintain this superiority, the Department supports a broad, well-balanced, and vigorous research and development program, focused on the most important and most promising areas of investigation. The effective management of this program is made difficult by the very nature of research, which deals primarily with unknowns, sometimes with possibilities or probabilities, and very seldom with certainties. New programing and management techniques have been established since 1961 to overcome these difficulties to the greatest possible extent and have yielded substantial results. These procedures encourage research wherever there appears to be a promise of further penetrating the frontiers of knowledge, but they also submit the expensive end-products to the severe tests of military needs, technical feasibility, combat effectiveness, and acceptable cost.

Funds obligated for research, development, test, and evaluation (RDT&E) in fiscal year 1964 amounted to \$7.3 billion—about the same as during the preceding year. Current prospects are that RDT&E requirements will gradually decline in the immediate years ahead. With the United States having acquired a substantial stock of reliable and survivable strategic missiles on land and sea, further research in this area can probably be carried on at a more modest level. The President's budget for fiscal year 1965 requested an RDT&E appropriation of \$6.7 billion—\$0.6 billion less than the \$7.3 billion requested for 1964 and \$0.2 billion less than the \$6.9 billion appropriated. The Congress, however, approved only \$6.4 billion

for 1965, thus necessitating extensive reprogramming in an already austere budget. The original requests of the military Services had totaled \$7.9 billion.

For management purposes the research and development effort of the Department has been grouped into some 300 program elements, including approximately 1,300 projects which in turn comprise some 10,000 research tasks or subprojects. All these efforts are also classified according to five broad categories, corresponding generally to the successive development stages through which military weapons and equipment must pass before they become available to the armed forces—research, exploratory development, advanced development, engineering development, and operational systems development. A sixth category represents expenditures for general management and support. Different review and control procedures have been established for each category. For research, the determination of the proper level of effort to be expended might constitute the most appropriate control, while major projects moving into the engineering and operational development stage require thorough cost/effectiveness analysis and the establishment of goals, milestones, and time schedules before approval.

The review procedures for projects proposed for full-scale development were formalized in February 1964 with the issuance of instructions for conducting a Project Definition Phase (PDP). PDP represents a time period specifically set aside to provide management officials with realistic and dependable cost and schedule estimates on which to base their decision. The final plan defines for Government and contractors alike what is wanted, how it is to be designed and built, how it will be used, what it will cost, and how the development and production program will be managed. At the same time, high risk areas are identified, technical approaches validated, and achievable performance specifications establish. The objective of PDP is to remove deficiencies that had plagued research and development programs in past years and resulted in the cancellation of numerous projects after substantial sums had been spent or in considerably higher costs and greatly extended time schedules than originally estimated. Although PDP had been previously used in isolated cases, such as the TITAN III space booster and the LANCE missile, the February 1964 directive made PDP applicable whenever development costs are expected to exceed \$25 million or production costs more than \$100 million.

The improved management techniques have assisted in eliminating projects of only marginal utility and permitted the concentration of available resources on the most essential military tasks. Since 1961 projects such as SKYBOLT, mobile MINUTEMAN, the TYPHON

missile system, and the aircraft nuclear propulsion program were terminated after thorough analyses developed overwhelming evidence in support of cancellation. On the other hand, numerous weapon systems in early development at the time were brought to completion and many new ones initiated whenever careful review indicated a significant contribution to military capabilities. The latter included, in addition to the TITAN III booster and the LANCE missile mentioned above, the MINUTEMAN II—as different from the MINUTEMAN I as the B-52 is from the B-47—the F-111A and A7A aircraft, the WALLEYE air-to-surface missile, a new Main Battle Tank, the EX-10 torpedo, and many others. At the same time, research and development were carried forward on many even more advanced weapons whose full-scale development was not yet justifiable on technological or military grounds.

The timely and continuous flow of new ideas is being encouraged by the Defense Documentation Center (DDC), which in November 1963 was transferred from the administrative control of the Air Force to the Defense Supply Agency. Operating under the over-all direction of the Office of the Director of Defense Research and Engineering, the center receives, stores, abstracts, retrieves, and distributes scientific and technical reports. Some 3,700 military organizations, 300 other Federal agencies, and 2,000 industrial concerns are registered for DDC services. During fiscal year 1964, over 40,000 new documents were acquired, bringing the total collection to nearly 750,000, and more than 1 million requests for documents were serviced. In March 1964, arrangements were completed to have the Office of Technical Services of the Department of Commerce handle all unclassified Defense reports that can be distributed without restrictions. This assignment not only will enable DDC to speed up the processing of classified technical documents but also represents a major step toward a unified Federal document distribution system. As an additional measure to increase the availability of the latest scientific information, the Department of Defense was preparing at the close of the fiscal year to establish a number of specialized information analysis centers to which qualified researchers could turn for answers to specific technical questions. This action is being taken in response to a 1963 recommendation of the President's Science Advisory Committee.

Another important improvement in the administration of RDT&E support activities was initiated in November 1963 with the announcement of a realignment in responsibilities for the management of ballistic missile and space booster test ranges. In keeping with the over-all assignment of Service roles in space and missile programs, the Air Force will control and operate both the Atlantic and the Pacific Missile Ranges through a centralized, single manager office.

During the next 2 years it will assume responsibility from the Navy for most of the facilities associated with the Pacific Range, including impact areas and space tracking stations, with the exception of the antimissile test support facilities on Kwajalein Atoll, which will pass from the Navy to the Army. Defense responsibilities for on-orbit control of satellites were also clarified and assigned to the Air Force. At the same time, the Navy was made responsible for converting and operating range instrumentation ships, taking over control of the ships previously operated by the Air Force in support of the Atlantic Missile Range. In this connection, the Department of Defense and the National Aeronautics and Space Agency agreed in February 1964 that the Navy would operate a pool of about 20 ships to provide tracking and telemetry data for both NASA and Defense programs. These new assignments and transfers will eliminate unnecessary duplication of effort and reduce overhead costs.

Manpower

In the final analysis, the effectiveness of our armed forces depends on the ability and dedication of our military personnel. We shall never be able to compensate them adequately for the hazards and hardships of their profession, including the risk of death and injury in combat, the long and frequent family separations, the 24-hours-a-day availability, and many others. These have no price tag. We can, however, take steps to insure that our servicemen and their families fully share with other sectors of our society the rising American standard of living. This obligation has been of major concern to the Congress, the President, and the Department of Defense and has been met in large part by the joint actions taken in recent years.

A 1962 study of the military compensation system concluded that a thorough revision of the pay structure was overdue and that, in order to minimize a future lag between military and civilian compensation, the military pay structure should be adjusted annually as necessary and be subjected to a comprehensive review every 4 years.

As a first step toward greater equity, a 20-percent increase in basic quarters allowances was enacted, effective as of January 1, 1963, at an annual cost of \$285 million.

The Uniformed Services Pay Act of 1963, proposed by the President in January 1963 and approved on October 2, provided the first change in rates of basic pay since 1958. It gave our military personnel an average increase of 14.4 percent, with higher percentages concentrated at crucial career points to improve the retention of junior officers, senior noncommissioned officers, and enlisted personnel completing their first tour of duty. The new law also corrected inequities and anomalies

in various allowances and special pay categories and increased the pay of retired personnel. It raised annual military compensation costs by \$1.2 billion and added \$4 billion for past service costs of the military retirement system. A detailed account of this legislation was included in the report for fiscal year 1963.

In signing the 1963 pay act, President Kennedy pledged a continuous effort "to assure that in the future military compensation will keep pace with increases in salary and wages in the civilian economy." President Johnson reaffirmed this pledge in his budget message for fiscal year 1965, and in February 1964 the Department transmitted legislation proposing an increase of 3 percent for all officers and 2.4 percent for enlisted personnel with more than 2 years of service. The new law, as approved by the Congress shortly after the close of the fiscal year, gave a 2.5 percent increase to all military personnel with over 2 years of service and an 8.5 percent increase to junior officers and warrant officers with less than 2 years of service. These officers had received no pay increase since 1952. The first full year's cost of the new pay scales, which became effective on September 1, 1964, will be about \$200 million.

One of the most pressing manpower problems of the armed forces in recent years has been the recruitment and retention of junior officers. While the military pay bills, as noted, were designed in part to reduce the existing shortage, various additional steps were taken during the year to help in a solution of this problem. The military Services expanded their officer candidate schools and their enlisted education and commissioning program. The enlargement of the student bodies at the Air Force and Military Academies from 2,259 to 4,417—the size of that at the Naval Academy—was authorized, and the first increment of the funds required for the construction of the necessary additional facilities was made available. The most important action in this area, however, was the legislation designed to enhance the attractiveness of the Reserve Officers' Training Corps (ROTC) program offered at 339 colleges and universities. To secure a greater number of career-motivated officers from this source, the ROTC Vitalization Act of 1964 authorized 2-year courses as well as the standard 4-year program, increased retainer and summer camp pay for students, and established ROTC scholarships for the Army and Air Force similar to those that have been available to Naval ROTC members since 1947 under the so-called Holloway plan. In addition, the Congress directed an expansion of the junior ROTC program to a maximum of 1,200 units, including the 253 currently established units. While the Department of Defense recognized the benefits that would accrue to the Nation as a whole from this program, it could find no direct military requirement. With the passage of the legislation, the

Department initiated studies to develop new methods for making the junior ROTC program more responsive to military needs.

In the enlisted personnel field, the problem corresponding to the loss of young officers has been the difficulty of retaining men in critical occupational categories after they complete their initial enlistment. The loss of these men just when they are becoming professionally competent in specialties requiring costly and extended training not only reduces the effectiveness of the armed forces but also imposes a substantial retraining burden. In recent years, only about one out of four enlistees has chosen to reenlist after satisfactorily completing an initial tour of service. The Uniformed Services Pay Act of 1963, which provided higher pay increases at crucial career points, may help in improving reenlistment rates. To increase the retention rates for the most capable personnel in critical occupations, the proficiency pay program was revised during the year. The military Services were authorized for the first time to award the P-3 rating with extra compensation of \$100 per month and to increase the compensation of the P-2 and P-1 ratings from \$60 to \$75 and from \$30 to \$50 respectively. P-1 payments of \$30 monthly were continued as an award for superior performance. Qualifying standards for the ratings were raised at the same time, thereby reducing the number of enlisted personnel receiving proficiency pay from 274,000 to 198,000 during the year. The Army, Navy, and Marine Corps utilized the new system immediately, while the Air Force postponed the implementation subject to further study.

Personnel surveys have repeatedly indicated that one of the significant reasons for leaving military service is the desire for formal academic education. To meet this challenge the Services continued to provide assistance to officers and enlisted men wanting further instructions. Financial aid, including payment of part of the tuition costs by the Government for off-duty courses offered by local colleges, was made available, as was authorization for temporary duty to attend colleges and universities for up to 12 months to complete degree requirements. In fiscal year 1964 more than 290,000 enrollments in off-duty education classes were reported and more than 6,700 individuals were awarded degrees for full-time attendance.

Measures to upgrade the living conditions of military personnel and their families continued to be of major concern to the Department in view of the close relationship between morale and adequate housing and for reasons of simple equity. In connection with the 1964 budget, the Department proposed a family housing program for building 62,100 units over a 5-year period. As a first increment, the Department recommended the construction of 12,100 units, but the Military Construction Appropriations Act for 1964, signed on December 21,

1963, provided funds for only 7,500. Most of these were either started or placed under contract during the remaining 6 months of the fiscal year. The Department's request for 12,500 units for fiscal year 1965 fared little better, as only 8,250 were finally approved. Thus, while progress is being made in eliminating the military family housing deficit, the time required apparently will be longer than originally planned.

Funds were also made available during both fiscal years for the construction on military bases of parking facilities for privately owned trailers of Service personnel and for leasing up to 5,000 housing units per year from private sources in areas where temporary occupancy of bases or other conditions make Government construction of permanent housing uneconomical. The development of new standardized plans for family housing will contribute to more rapid and more economical construction, and the improved maintenance and management procedures will assure better utilization of the available resources. To help servicemen, whose duty assignments preclude their families from residing with them, the Uniformed Services Pay Act of 1963 authorized a new family separation allowance of \$30 per month. This extra compensation assisted an estimated 10,000 officers and 100,000 enlisted men not occupying Government quarters in meeting the additional expenses that arise when a military man must be away from home for extended periods of time.

Children of military personnel should benefit from the establishment in January 1964 of a single Department of Defense oversea dependents school system replacing the three separate and largely uncoordinated programs of the military departments. Over-all policy direction for the new system, which includes 291 schools in 28 countries with an enrollment of about 155,000, was assigned to the Assistant Secretary of Defense (Manpower). His office will establish general educational goals, prepare standardized curricula, oversee the personnel administration of teachers, and develop operational and administrative guidance. An intermediate level of academic supervision will be furnished by a single military Service on an areawide basis—the Army in Europe, the Navy in the Atlantic area, and the Air Force in the Pacific area. Formerly each Service supervised its own schools on a worldwide basis. About 30 fewer supervisors will be required as a result of the reorganization. The military Services and the local base commanders will continue to be responsible for general logistical support of the schools on their installations and are expected to relieve academic personnel for housekeeping chores to enable them to concentrate on educational matters. In a related action, clearer guidance was promulgated during the year to govern the allocation of costs between purely educational and logistical support accounts in order to

facilitate the administration of the statutory ceiling of \$285 per pupil per year.

To maintain their authorized enlisted strength during fiscal year 1964, the military Services required personnel gains of some 750,000 men. About 250,000 of these were obtained through personnel reenlistments and reservists entering on extended active duty, while the remaining 500,000 came from civil life. Not only did the Department, as pointed out above, devote major attention to increasing reenlistment rates in critical categories, but it also initiated in April 1964, at the direction of the President, a comprehensive study for a better flow of personnel from civil life. Of the 500,000 in this category, about 150,000 entered the armed forces through the Selective Service System, while the remaining 350,000 enlisted voluntarily. Although only the Army placed draft calls for enlisted personnel, it is estimated that about two-fifths of those who volunteered for duty in all four Services—officers as well as enlisted men—were influenced to do so by the existence of the obligation to serve. The draft, therefore, has been clearly essential in meeting military strength requirements. The sharp growth in the population of draft-age men stemming from the post-World War II "baby boom" has resulted, however, in a declining proportion of young men who were in fact required to enter service before completing their period of draft liability. Thus, the task of meeting the Nation's security needs is not being shared equally. The Department's new study will consider all possible means for achieving future requirements with greater equity.

The Selective Service System also had to be used by the Department for meeting the shortage of medical officers. Since medical school graduates volunteered in insufficient numbers following internship, a call for 1,050 physicians had to be placed in January 1964 and one for 100 veterinarians in March 1964.

As for civilian employees of the Department, they, like the military personnel, benefited from the Administration's program to establish salaries comparable to those paid in private industry. This principle was written into the Federal Employees Salary Act of 1962, which also provided a civil service pay increase averaging 5.5 percent effective in October 1962 and a second increase averaging 4.1 percent effective in January 1964. Since Federal salaries, despite the new schedules, continued to lag behind those in industry, first President Kennedy and then President Johnson recommended further salary adjustments. After extended study, the Congress in August 1964 approved the Government Employees Salary Reform Act of 1964. Under its provisions, the pay in the lower and intermediate civil service grades was increased by 3 percent effective on July 1, 1964, while

considerably larger raises were given to the higher grades, ranging up to 22.5 percent for the top civil service grade of GS-18.

The new salary rates should improve the Department's ability to recruit and retain capable and qualified personnel. They were applicable to about 536,000 of the 1,030,000 direct-hire employees in the Department on June 30, 1964. The remaining 494,000 were wage board employees whose compensation is regulated by local wage rates. In addition, the Department employed abroad 140,000 "contract" personnel—foreign nationals hired by contract with foreign governments.

While strongly supporting more equitable salaries for civilian employees, the Department also continued its drive to make better use of available manpower resources. More efficient operations and better organizational arrangements permitted a reduction of 20,000 direct-hire employees during the fiscal year, making the total of 1,030,000 the lowest since January 1951. Simultaneously, the number of "contract" foreign nationals was reduced by 23,000.

Additional opportunities for recruiting capable personnel became available with the passage of the Dual Compensation Act in August 1964. This legislation, proposed by the Civil Service Commission with the support of the Department of Defense, removed obsolete restrictions on total remuneration that had barred retired regular officers from civil employment—restrictions that had not been applicable to retired enlisted personnel or reservists. At the same time, career civilian employees were protected from any unfair advantage that might accrue to retired military personnel solely by virtue of their service either at the time of initial appointment or in the event of a reduction in force. In fiscal year 1964, about 2 percent of the civilian employees of the Department were former members of the armed forces entitled to retired pay—reservists, former enlisted men, and officers retired for disability. During the next few years, over 4,000 regular officers will be retiring annually, including many with skills and experience that can be utilized to good advantage in the Department of Defense and other Federal agencies. Formerly these officers would receive no salary if employed in any civil service job paying more than \$2,500 annually—an amount now less than the salary of the lowest civil service grade. The Dual Compensation Act permits them to receive full civil service pay, the first \$2,000 of their retired pay, and one-half of the remaining retired pay.

Enforcement of the principle of equality of treatment and opportunity for all personnel regardless of race, creed, color, and national origin was given special attention during fiscal year 1964. In accordance with the report of the President's Committee on Equal Opportunity in the Armed Forces, issued in June 1963, areas of active concern were broadened to include problems arising from discrimination in

civilian communities outside of military bases. In July 1963, military commanders were instructed to foster greater equality of opportunity for military personnel in these communities. In August, official participation of military personnel and units in segregated meetings and ceremonies was prohibited. Instructions issued in March and April 1964 called attention to the need for assisting personnel in securing adequate off-base housing and schooling. Studies were undertaken to discover effective means for enlisting community support, and military commanders were able in many instances to report improvements achieved in cooperation with civic leaders. The Civil Rights Act of 1964, signed by the President on July 2, 1964, should make possible more rapid relief from discriminatory practices. Within the Department, equal opportunity directives controlled the employment and promotion of civilian and military personnel, and particular progress was made in opening regular avenues of advancement to qualified members of minority groups. In addition, the cooperation of industry and labor has been enlisted by the Department in promoting equality of working conditions at industrial plants producing materiel for the armed forces.

To insure compliance with Federal court orders regarding school integration, units of the Alabama National Guard were federalized during the summer of 1963. At the beginning of the fiscal year, about 400 National Guardsmen were in Federal service to be available in case of disorders arising from the admission of Negro students to the University of Alabama. On September 10, 1963, approximately 15,300 additional men were federalized at the direction of the President, when it appeared that some civil authorities might obstruct execution of court orders directing the admission of Negroes to certain Alabama public schools. This danger did not materialize, and the bulk of the federalized Guard forces was returned to State control on September 12. The remaining Guardsmen were phased out over a 90-day period.

Logistics

The Defense logistics program has two key objectives. The first is to provide our armed forces with all the weapons, equipment, and support required to carry out their missions with maximum effectiveness. The second is to obtain these necessities as efficiently and economically as possible. To achieve the latter objective, the Department formally established in July 1962 a cost reduction program that has been developed since then into a major management undertaking, yielding each year substantially greater savings than anticipated.

The original goal established in 1962 projected annual savings of \$3.1 billion in operating expenses to be obtained by 1967. Progress made during the first year of the program made it possible to raise this goal to \$4.0 billion, and as a result of the experience gained during fiscal year 1964 a new \$4.8 billion goal was established to be reached by 1968. A similar rise occurred in actual "hard" savings, which in fiscal year 1964 amounted to \$2.8 billion, including certain one-time, nonrecurring economies, or almost \$1.0 billion more than had been estimated at the beginning of the year. In anticipation of these savings, the Department's budget request for fiscal year 1965, as presented to the Congress in January 1964, was \$2.4 billion lower than would otherwise have been required.

The marked success of the cost reduction program is the direct result of contributions and suggestions by thousands of military personnel and civilian employees throughout the Department. The importance of such individual initiative and imagination was publicly recognized by President Johnson on July 20, 1964, when he participated in a special awards ceremony at the Pentagon honoring 19 particularly noteworthy contributors to cost reduction. In addition, defense contractors and their employees have joined with Government personnel in seeing that a dollar's worth of security is received for each dollar spent. Their help had been specifically enlisted by the President and the Secretary of Defense in December 1963, and subsequently formal cost reduction programs and reporting procedures were established by joint agreement between contractors and the Department of Defense. The Defense Industry Advisory Council, chaired by the Deputy Secretary of Defense, has provided valuable assistance in this field as well as in obtaining industry's support for many other management improvement programs in the logistics area.

Within the Department, the cost reduction program has been organized as an integral part of management at all administrative levels. Firm, clearly defined goals have been established for each level of management, and the objectives, methods, and procedures of the program have been thoroughly explained to all those responsible for achieving these goals. In addition, a uniform progress reporting system has been established, enabling managers to take prompt, appropriate action whenever needed. Finally, a special auditing unit has been organized to make certain that reported savings are valid and can be properly substantiated.

In fiscal year 1964, the cost reduction program encompassed 26 major areas of activity, grouped into three broad categories: (1) Buying only what we need, (2) buying at the lowest sound price, and (3) reducing operating costs.

Buying Only What We Need

Efforts in this area were concentrated on preventing excess purchases by more careful planning and analysis of requirements, by increased use of available stocks, by eliminating "goldplating" in specifications, and by reducing the number of items in our inventory. These efforts produced savings of more than \$1.5 billion in fiscal year 1964.

The greatest part of the savings was achieved through the refinement of requirements calculations. For example, Navy and Air Force requirements for air-to-air and air-to-ground missiles and other non-nuclear ordnance were reduced by over \$152 million after a careful analysis of the threat to be countered in relation to weapon effectiveness. The Navy found that it could cancel the procurement of supplementary navigation instruments costing \$44 million for POLARIS submarines by improving the performance of an existing gyroscope. The Army determined that the combat-tested M-2 machinegun could be substituted for the more costly M-85 on most combat vehicles with a saving of \$21 million. Reductions in procurement time and the use of more recent reliability and durability data permitted the lowering of inventory requirements. Air Force studies demonstrated that the storage life of the solid-propellant MINUTEMAN motor could be safely extended from 3 to 4 years, saving \$25 million in fiscal year 1964 and an estimated \$100 million in fiscal year 1965. More realistic stock levels for fuel controls used on Navy jet engines reduced new purchases by \$3.2 million, and recomputation of the Army's mobilization requirement for insect repellent saved \$1.2 million. At the same time, better logistics management, assuring the availability of spare parts, has made it possible to establish exceptionally high levels of operational readiness for our major weapon systems while annual purchases of spares were substantially reduced.

The increased use of excess inventories also played an important role in limiting new purchases. Through the centralized, automated screening program administered by the Defense Supply Agency (DSA), new orders are being checked against existing assets in long supply before initiating procurement, which is frequently found unnecessary. Great ingenuity was displayed by inventory managers in adapting excess materiel to new uses. The Army rebled the powder charges of three excess types of projectiles to provide the propellant for a fourth type at a net saving of \$5.1 million. The Navy found a way to recover silver from dental clinics, old batteries, and X-ray film for reuse in making torpedo batteries, thereby saving \$6.1 million in fiscal year 1964. Through such actions and many others, the value of Defense stocks reutilized during the year totaled \$1.3 billion, as

compared to \$1.0 billion in 1961. Total disposals amounted to \$6.9 billion during 1964—an increase of \$1.8 billion over 1963. (See table 38.)

Value engineering has been used as another means to reduce procurement costs. Its aim is to eliminate any unnecessary refinement, or "goldplating," that increases prices without increasing military utility. By simplifying the designs of weapons and equipment, value engineering contributes directly to greater military effectiveness. The search for more simple, economical designs has been aggressively pursued in cooperation with industry. Value engineering symposia, sponsored jointly by the Department of Defense and the National Security Industrial Association, were held in various parts of the country to inform defense contractors of the program and enlist their help. Substantial contract incentives were established to enable contractors to share in the savings from value engineering. Cost reductions of \$252 million were achieved during fiscal year 1964. The substitution of a modified version of a commercially available transmission for a specially designed military one for use in the M-113 personnel carrier saved nearly \$4 million. The replacement of high-cost magnesium wheels by lightweight steel wheels on the M-151 jeep yielded \$1 million. The use of standard commercial diodes instead of specifically designed voltage rectifiers on the MINUTEMAN missiles saved over \$2 million. These actions illustrate the substantial savings that can be achieved through the constant challenge of design specifications. Even such a minor change as the use of corrosion-resistant steel in place of a metal alloy in the manufacture of "dog tags" reduced costs by nearly \$100,000.

Closely related to value engineering are the continuing programs for the elimination of unnecessary varieties, types, and sizes of defense items in the Federal Supply Catalog administered by the Department. During fiscal year 1964, some 487,000 items were earmarked for deletion when current stocks become exhausted. The standardization actions taken included, for example, a reduction in the types of fire extinguishers from 141 to 6 and the elimination of 145 models of diesel engines, 13 types of electron tubes, and 16 sizes of clothing lockers. To prevent the entry of new duplicating items into the military supply systems, the Defense Supply Agency was directed in October 1963 to establish an Item Entry Control Office. In March 1964, the Secretary established a Council on Technical Data and Standardization Policy with the specific mission to promote standardization in the early stages of weapon development and design. All these efforts, particularly if they receive the full support of industry, promise substantial savings in the years ahead. The fact that the number of defense items in the Federal Catalog was held at a fairly stable level during the year

despite the constant introduction of new weapons and equipment indicates that progress is being made. (See table 36.)

Buying at the Lowest Sound Price

In pursuit of this objective, the Department revised many of its own procedures and initiated a major drive to shift procurement from noncompetitive to competitive contracts and from cost-plus-fixed-fee to fixed-price and incentive-type contracts. Buying at the lowest sound price contributed savings of \$553 million during fiscal year 1964.

Improvements in all phases of the procurement cycle made these savings possible. More detailed planning was undertaken before contracts were awarded for the development of major weapon systems. Procedures were established for obtaining and disseminating more promptly the technical data, including drawings and specifications, required for competitive procurement. Components of complex systems were "broken out" for separate bidding. New contracting techniques were used, such as two-step advertising—for items that require evaluation of the technical proposals before formal award of contracts—and multiyear purchase—for items for which there will be recurring demand. Prime contractors were encouraged to award their subcontracts more competitively and to buy rather than manufacture component parts whenever savings would result. Greater uniformity in procurement practices was fostered by numerous joint training courses conducted by the military departments and the Defense Supply Agency and attended during the year by nearly 16,000 military and civilian personnel. Periodic reviews of major procurement offices and activities were instituted to improve procurement management, reduce administrative leadtimes, and standardize operations. The benefits of the Program, Evaluation, and Review Technique (PERT) were explained in 1-day conferences to some 4,000 Defense procurement officers and 2,000 industry representatives in cities throughout the country.

Shifts from noncompetitive to competitive procurement yielded the largest savings in this general drive to buy at the lowest sound prices. During fiscal year 1964, procurement worth \$1.8 billion was thus shifted and produced audited savings of \$448 million, or 25 cents for each procurement dollar. Frequently, the savings were much greater—30 cents on each dollar for a constant speed drive used on the F-4 aircraft, 50 cents for PERSHING missile containers, 64 cents for air test gauges for shipboard use, and 74 cents for a self-locking nut used on the TITAN missile. As a result of the Department's intensive effort to use competitive contracts whenever possible, the percentage

of such contracts in total Defense awards has risen from 32.9 percent in fiscal year 1961 to 39.1 percent in 1964.

Shifts from cost-plus-fixed-fee (CPFF) contracts to fixed-price and incentive-type contracts produced savings averaging at least 10 cents on the dollar. CPFF contracts are justified only when no meaningful performance measures can be established in advance, as in the case of exploratory research and study projects, or in grave national emergencies. By guaranteeing full reimbursement for allowable costs and, in addition, a fixed fee as a profit, such contracts place all risks on the Government and provide equal rewards for good and poor contractor performance. The continued increase in CPFF contracts during the fifties was halted in 1961 by imposing drastic restrictions on their use, thereby forcing engineering and procurement agencies to undertake more detailed precontract planning. With the help of industry, new incentive-type contracts were developed, offering the contractor increased profit for reducing original cost estimates and time schedules and exceeding reliability specifications. As a result of these efforts, the CPFF percentage of total awards fell from 38 percent during the first 9 months of fiscal year 1961 to 12 percent in 1964. During 1964, contracts worth \$6.2 billion were shifted from CPFF for an eventual saving of \$616 million. The CPFF conversion program contributed \$100 million to the 1964 cost reduction drive.

In accordance with Government-wide policies, the Department also continued to emphasize contract awards to small business and to firms in surplus labor areas. Small business firms were successful in bidding during fiscal year 1964 for 18.0 percent of prime Defense contracts, valued at \$4.8 billion, as compared to 16.5 percent with a value of \$4.6 billion during the preceding year. Including the 1964 sub-contract commitments of \$3.6 billion to small firms by large prime contractors, the total share of small business amounted to \$8.4 billion for the year. Contractors in areas of substantial unemployment received \$173 million in contracts through special programs involving set-asides and tie-bid preferences, which, however, accounted for only a small percentage of the total 1964 awards of \$4.1 billion to firms in these areas. The Department also sponsored procurement workshops and clinics to inform small business of the opportunities and procedures for securing Defense contracts and subcontracts and to encourage large contractors to develop supply sources in labor surplus areas.

Reducing Operating Costs

The reduction of operating costs has been made the third major area for cost reduction and has been focused on terminating unnecessary operations, consolidating and standardizing common support

functions, and increasing operational efficiency. This effort produced savings of \$757 million during fiscal year 1964.

The termination of unnecessary operations was initiated as a special project in 1961 at the direction of President Kennedy and subsequently continued and expanded as part of the Department's cost reduction program. This effort involved a systematic evaluation of military installations to identify those that could be consolidated, reduced, or closed without detriment to military readiness. Among the problems considered were the current and future requirements for the airbases that had supported the phased out SNARK missiles and B-47 bombers, for supply depots no longer needed due to improvements in the distribution systems and inventory levels, for industrial plants, posts, and camps held in the mobilization reserve, and for redundancy in bombing ranges. As a result of these reviews and many related ones, 574 actions had been taken between 1961 and the close of fiscal year 1964 involving the eventual release of property having an acquisition cost of over \$3.0 billion—including 1,084,000 acres, 61 industrial plants, and the elimination of 33,000 civilian and 53,000 military positions. These actions reduced operating costs for fiscal year 1964 by \$334 million.

Substantial additional benefits are derived from the availability of this surplus property for other productive uses. Since 1961, transfers to other Federal agencies have saved the Government over \$68 million and sales have returned nearly \$85 million to the U.S. Treasury. Current studies, such as the one concerning shipyard requirements, indicate that the full potential of the program has not yet been reached.

To minimize the economic impact that the reduction or termination of military activities might have on local economies, the Department has established an Office of Economic Adjustment to assist in the Government-wide program to find productive civilian uses for former military properties and to aid displaced workers in obtaining other employment. With this assistance, many communities found themselves in a stronger economic position after the closing of military bases than before. As for civilian career employees displaced by this program, the Department has guaranteed new job opportunities for all of them. Travel expenses for relocation are being paid by the Government, and retraining opportunities have been made available on an expanded basis. For those who find the offers unacceptable because of unwillingness to move or other reasons, the Department continues its help in finding new positions. To improve the effectiveness of this service, a regional test program was started in April 1964 for the automatic screening of displaced employees against position vacancies to determine the feasibility of a nationwide system for this purpose.

The consolidation and standardization of common support functions produced savings of \$137 million during fiscal year 1964. About \$42 million of this total was contributed by the Defense Supply Agency (DSA), which operated with 5,700 fewer personnel than formerly required by the military Services. Responsible for the central management of 1,328,000 items of common supply—an increase of 299,000 during the year—DSA contracted for supplies worth \$2.7 billion, or 9.4 percent of total 1964 Defense purchases. Closer working relationships were also developed with the General Services Administration, which sold to the Department services and supplies valued at \$976 million—an increase of \$198 million over 1963. A detailed account of DSA activities is given in Annex B to this report.

Substantial future savings are expected from the consolidation of Defense contract administration offices, approved on June 4, 1964. DSA was assigned responsibility for establishing this common support service, which will be concerned with evaluating, before contracts are awarded, the capability of bidders to perform satisfactorily and, subsequently, with expediting production, checking quality, overseeing plant security, paying contractors, and taking charge of Government property. Some 150 field offices of the military departments and DSA, employing about 20,000 persons, have been involved in these activities. Alternative methods for achieving more uniform and more efficient contract administration were investigated in 1963, leading to the establishment of a pilot project in fiscal year 1964 involving the placement of field offices in five Eastern states under a single regional headquarters in Philadelphia, Pa. The success of this test led to the decision to consolidate all contract administration offices under DSA. Defense contractors should also benefit from this consolidation through the development of uniform Defense-wide policies and procedures and the establishment of a single point of contact.

Increased operational efficiency in support activities accounted for savings of \$286 million during fiscal year 1964.

Nearly half of these savings were realized through improved management of telecommunications. The progressive consolidation of the 20 million miles of long-haul lines and the 204 stations operated by the three military departments into a single system monitored by the Defense Communications Agency permitted the elimination of unnecessary redundancy in circuits and facilities, the negotiation of cheaper rates from commercial sources, and other administrative improvements. At the same time, all levels of command served by the Defense Communications System were provided with greater assurance of reliable and rapid communications channels.

In the field of transportation, cost reduction is primarily the responsibility of three common service agencies—the Defense Traffic

Management Service, the Military Air Transport Service, and the Military Sea Transportation Service. Established to promote the more efficient use of military and commercial transportation resources, these agencies contributed to the 1964 cost reduction program by more extended use of economy classes of travel by Defense personnel and by obtaining from common carriers more advantageous rates and conditions for the Government. In the latter category, substantial savings are being realized through moving household goods of military families more economically—these shipments represent 33 percent of the freight costs of the Defense Traffic Management Service while constituting only about 3 percent of the volume handled.

The program for the improved management of equipment maintenance contributed \$65 million to the 1964 savings, and greatly increased savings are expected in the years ahead. Illustrative of the actions taken were the elimination of unnecessary periodic inspections of aircraft and other weapons, the repair of parts formerly discarded and replaced by new ones, improved management of noncombat vehicles, extending the life of electron tubes, and closer control over the use of contract technicians. Additional maintenance improvements will result from the implementation of a directive, issued on June 19, 1964, providing that maintenance and other support requirements are considered systematically and currently with the development of new equipment.

In the field of real property management, including family housing, cost reductions were achieved through the consolidation of utility systems, the negotiation of lower electric rates, better scheduling and utilization of maintenance personnel, and greater use of on-call service in lieu of preventive maintenance.

Collective Security

United States interests as well as those of our allies are best served when the nations of the free world act in concert to check aggression. This fact has been demonstrated on many occasions since the end of World War II, and effective support of the concept of collective security is one of the Department's major responsibilities. This task involves participation in the development of over-all plans and programs for allied cooperation; coordination of our own military planning, programing, and deployment with these over-all plans; and administration of a program of military assistance to carry out joint projects and to support allies unable to finance adequately their contribution to free world defenses.

The framework for interallied cooperation is provided by a series of multilateral and bilateral mutual security treaties that link the United

States to more than 40 nations. This treaty system includes five regional defense alliances: The North Atlantic Treaty Organization (NATO), the Southeast Asia Treaty Organization (SEATO), the Organization of American States (OAS), the Australia-New Zealand-United States (ANZUS) Treaty, and the Central Treaty Organization (CENTO). The United States is a member of the first four of these alliances and participates in many CENTO activities. In addition, special bilateral defense treaties have been concluded with Japan and with the Republics of China, Korea, and the Philippines. Within this network of alliances, the United States continued to work during fiscal year 1964 to strengthen joint allied capabilities for dealing with the many possible contingencies of Communist aggression.

For NATO, the major problem during fiscal year 1964 remained the reexamination of the strategy, force structure, and support resources likely to be required in future years. While these issues were not resolved, the current NATO forces under the Supreme Commander, Europe (SACEUR), and the Supreme Commander, Atlantic (SACLANT), continued to provide an effective deterrent to military aggression. Numerous field and command post exercises tested the readiness of allied staffs and units, including that of SACEUR's strategic mobile reserve designed for quick deployment to any threatened sector. Representation on the military staff of the NATO Standing Group was broadened, effective July 1, 1964, by increasing the assignments of officers from NATO countries other than France, the United Kingdom, and the United States. The importance of a joint NATO nuclear policy was reflected in the appointment of a special assistant for nuclear affairs on SACEUR's staff and by the additional steps taken to obtain closer coordination between U.S. and NATO planners in the nuclear field. Alternative ways of providing a NATO nuclear force, including the U.S. proposal for a multilateral force (MLF) composed of surface ships armed with POLARIS missiles, were studied by an 8-nation working group. To explore the feasibility of multinational manning of such ships, the United States made available the guided missile destroyer, U.S.S. *Claude V. Ricketts*. Negotiations were also started on a new agreement to increase the types of atomic information that may be exchanged with NATO and its members.

In other parts of the free world, the United States assisted in the building of stronger regional defense systems by participating in the development of joint plans as well as in numerous joint maneuvers that strengthened interallied operations in the field. During the spring of 1964, Iranian units and some 6,800 U.S. Army, Navy, and Air Force personnel participated in the CENTO-sponsored Exercise DELAWAR in the Persian Gulf area. SEATO maneuvers included

Exercise AIR BOON CHOO—an air attack and air/ground defense problem conducted in Thailand during late April 1964 with 5,000 men from Thai, U.S., U.K., Australian, and New Zealand units—and Exercise LIGTAS—an airborne and amphibious landing and defense operation in the Philippines, involving 20,000 men, 75 ships, and 300 aircraft. The U.S. Navy also conducted its annual Operation UNITAS with naval and air units of South American countries to improve antisubmarine defenses and gain joint operating experience. Exercises such as these were held with almost every country with which the United States is allied and helped to establish a foundation for practical cooperation in wartime, should it ever be required.

Basic to collective security is the timely assistance that U.S. forces can extend to our allies. This capability continued to increase during fiscal year 1964. Strategic reserve forces in the United States improved not only their readiness but particularly their mobility with the acquisition of additional transport aircraft and the pre-positioning of heavy equipment. At the same time, a substantial portion of our armed forces continued to be deployed abroad or on the high seas in position to join our allies immediately in defense against aggression. At the close of fiscal year 1964, 40 percent of our military personnel—some 1,076,000 men—were assigned to oversea commands or to afloat and mobile naval activities. The Army accounted for 392,000 of the oversea total and the Air Force for 211,000—40 and 25 percent, respectively, of the strength of these two Services. Sailors and marines assigned to afloat or mobile activities numbered 386,000, while another 87,000 were stationed at oversea bases—representing 64 percent of Navy strength and 26 percent of that of the Marine Corps. (See table 12.)

In addition to deterring aggression by their presence overseas, U.S. forces assisted the United Nations Organization in its efforts to maintain peace, including the airlift of some 3,300 U.N. troops to the strife-torn island of Cyprus in the spring of 1964. Help was also extended on numerous occasions to countries in various parts of the world struck by natural disasters or confronted by other sudden emergencies. The tensions caused by the unfortunate flag incident in the Canal Zone in January 1964 were not permitted to expand by the parties involved. After 4 days of riots, that involved the death of four U.S. soldiers, the problem was brought to the discussion table for resolution. Restraint also marked the U.S. reaction to the suspension of water service to Guantanamo by the Cuban Government on February 6, 1964. In answer to this direct violation of existing contracts, the Guantanamo naval base was made more self-sufficient by the installation of a water desalinization plant and the substitution of U.S. personnel for Cuban workers in various support activities.

Perhaps the most important contribution to collective security, however, continued to be made by the U.S. military assistance program. Designed to help primarily those nations that are threatened with aggression or subversion but unable to meet the military requirement for maintaining their freedom, this program has effectively served the common cause of the free world for many years. In terms of funds required, it accounts for only about 2 percent of the Defense budget, but the return in number of combat forces locally available is far greater than could be obtained in any other way. Without these allied units, the United States would have to increase its own forces substantially or revise its national security policy.

Uncertainty about the funds available for military assistance contributed to the difficulties of administering this worldwide program effectively during fiscal year 1964. The President's budget for that year included a military assistance estimate of \$1.5 billion, but the Congress authorized only \$1.0 billion—a reduction of nearly 30 percent—and this amount did not become available until the first half of the fiscal year had elapsed. Consequently, substantial reprogramming adjustments had to be made late in the year, to the detriment of program execution.

The 1965 military assistance program, submitted to the Congress in early 1964, reflected the previous year's experience. The original request was limited to the maximum that the Congress appeared willing to support—\$1.0 billion. An additional request of \$55 million for military assistance to Vietnam had to be made in May 1964. After thorough review, the Congress approved the exact amount requested by the President, \$1.055 billion.

To improve the management as well as understanding of the military assistance program, the Department, with the help of automatic data processing, developed a new format for the 1965 budget request. The traditional presentations had emphasized regional allocations, shopping lists of end-items, and cost categories, such as investments in new capabilities and support of existing capabilities. To these were added two new breakdowns—a “programs” category, which aligned the military assistance budget with the Defense programming system, and an “objectives” category, which highlighted the policy purposes for which the funds were requested.

The new “programs” category should contribute to more efficient management, since the military assistance program relies upon the military departments for the supply of materiel and services and for the execution of programs. By subdividing budget estimates into established Defense-wide programs—air and missile defense forces, general purpose forces, airlift and sealift forces, and general support

activities—the evaluation and execution of military assistance plans and projects will be greatly facilitated.

The new “objectives” category emphasizes the important role that military assistance plays in collective security. Nearly two-thirds of the 1965 funds—or 64 percent—will be devoted to forward defense, supporting 11 countries on the periphery of the Soviet Union and Communist China from Greece and Turkey in the Mediterranean to Korea in the Pacific. These 11 countries guard the frontiers of the free world. The 3,500,000 men in their armed forces represent defensive strength essential to our over-all military strategy, and U.S. assistance makes it possible to maintain this strength at the required level. Other country programs account for 14 percent of the 1965 estimates—6 percent to 15 Latin American nations in support of Western Hemisphere security, 2 percent to strengthen the forces of 4 countries where the United States enjoys military base rights, about 1 percent to support U.S. foreign policy in 7 newly independent or underdeveloped countries, and 5 percent to fulfill earlier commitments to Norway, Denmark, and Japan where no new projects are being initiated. The remaining 22 percent of the 1965 budget represents the U.S. share of joint programs with our allies and expenditures for the administration and overhead of the military assistance program. The joint program category includes the NATO infrastructure which provides airfields, communications networks, petroleum pipelines and storage tanks, and other military facilities for use by U.S. and other NATO forces. The administration and overhead account takes care of the costs for packing, handling, transporting, and delivering equipment and supplies and for related logistical services.

The current level of military assistance constitutes the bare minimum of what is required for a meaningful collective defense. Already many important projects had to be deferred, delaying the essential modernization of allied forces in the face of constantly improving technology of Communist countries. Further reductions in the size or scope of the program might fatally weaken not only the capability but also the will of free nations to resist and, thereby, threaten our own security. The current budget presentation clearly outlines the specific objectives for which the funds are intended and demonstrates the key role of military assistance in deterring aggression. This program deserves the full and continued support of the American people.

The extensive oversea activities of the armed forces and the persistent deficit in the U.S. balance of payments have led the Department of Defense to give continuing attention to the balance of payments problem during recent years.

Special programs have been developed not only to lower defense expenditures abroad but also to increase the sales of U.S. equipment

and services to our allies. This effort has paid substantial dividends. The net adverse balance in U.S. defense expenditures, which totaled \$2.8 billion in fiscal year 1961, was reduced to about \$1.6 billion in fiscal year 1964—a reduction of \$1.2 billion or 43 percent. (See table 9.)

A great variety of actions have been taken to reduce oversea expenditures by our armed forces and for their support. Measures that might affect necessary combat readiness abroad or create undue hardship for U.S. personnel and their dependents were avoided. Oversea construction projects not essential to military needs were eliminated or deferred. The employment of foreign nationals was reduced—by 28,000 during fiscal year 1964. The number of oversea headquarters personnel was reduced by 2,600 during the same period, and the reorganization or consolidation of oversea logistic support activities yielded additional personnel savings. Further reductions were made possible by the phase-out of obsolescent weapon systems, such as the LACROSSE, and by the assumption of more air defense responsibilities by national units in Japan and Spain at the end of the fiscal year. Procurement normally made abroad was returned to the United States under a directive generally permitting a 50 percent cost differential over the foreign price including transportation. These and many other actions made it possible to keep oversea expenditures by and for U.S. forces at about \$2.5 billion, despite recent price and wage increases in many allied countries at more than twice the U.S. rate.

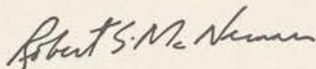
Military assistance expenditures abroad have seldom exceeded 20 percent of the funds expended for this purpose. Such oversea expenditures totaled \$0.2 billion in 1964, as compared with \$0.3 billion in 1961. Reductions have been achieved by restricting oversea procurement and by limiting offshore buying for joint projects with our allies essentially to that required for the fulfillment of prior commitments.

A further contribution of \$0.2 billion to lowering the payments deficit in defense operations was made by the Atomic Energy Commission and other agencies with defense-related expenditures overseas. Expenditures in this category were reduced from \$0.3 billion in 1961 to \$0.1 billion in 1964.

By far the greatest contribution to the balance of payments drive was made, however, by the increased purchases of U.S. weapons, equipment, and services by our allies. Cash receipts rose from \$0.3 billion in 1961 to nearly \$1.3 billion in 1964. The largest part of this increase was attributable to the agreement between the Federal Republic of Germany and the United States whereby U.S. military expenditures in Germany are offset by German purchases of U.S.

military materiel and services. Military purchases by other allies also increased substantially.

Despite the encouraging progress made in reducing the net adverse balance of payments in defense activities, the achievement of further reductions will present a formidable task. Much will depend on developments in the world situation. Still, the value of the Department's effort in this area has been clearly demonstrated, and the continuation of the program consistent with our responsibilities to our allies and to our national security is essential.



ROBERT S. McNAMARA,
Secretary of Defense.

ANNEX

ANNEX

ANNUAL REPORT

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ANNEX

Annex A
ANNUAL REPORT
of the
RESERVE FORCES POLICY BOARD

July 1, 1963, to June 30, 1964

To adhere to the traditional military policy of this country, it is essential that the strength and organization of our reserve components, as an integral part of the defenses of the United States, be maintained and assured at all times. To be able constantly to fulfill their role, the reserve components, in addition to being organized and at the required strength, must maintain a high degree of readiness possible only through carefully designed and skillfully managed programs.

The past fiscal year witnessed changes in the reserve programs directed toward improving their over-all efficiency, flexibility, and reliability, in turn pointing the way for continual improvements.

This report on the status of the reserve programs of the armed forces is intended to reflect the reserve components' mobilization potential and their value to our national security.

The Reserve Forces Policy Board (RFPB), operating in its statutory capacity as principal policy adviser to the Secretary of Defense on matters pertaining to the reserve components, maintained constant surveillance over their performance during fiscal year 1964, so that any needed action could be recommended promptly.

New members, either designated by law or appointed to the board by the Secretary of Defense during the reporting period, are: Honorable Paul Ignatius, Under Secretary of the Army; Maj. Gen. Charles A. Ott, ARNGUS; Maj. Gen. Ernest L. Massad, USAR; Rear Adm. Leslie L. Reid, USNR; Brig. Gen. Robert B. Bell, USMCR; Maj. Gen. Clarence A. Shoop, ANGUS; and Brig. Gen. Donald S. Dawson, USAFR.

In its three sessions during fiscal year 1964, the Reserve Forces Policy Board considered a number of matters of major policy affecting the reserve components. Principal among these were:

1. The need for any further amendment of the Reserve Officers Personnel Act of 1954;
2. Screening of the Ready Reserve;
3. Standby Reserve management;
4. Military support of civil defense; and
5. Deferment of reserves by Selective Service.

These matters were the subject of repeated presentations and discussions at RFPB meetings during the year. In addition, the board addressed itself to other subjects and directed particular attention to various items of proposed

legislation, both those originating within the Department of Defense and those referred to the Department for comment by a committee of the Congress. In these legislative cases, where appropriate, RFPB recommendations were transmitted to the Secretary of Defense to aid in the development of the Department's position.

Personnel

The strength of each reserve component in fiscal year 1964 is shown in tables 21 and 22 of the appendix.

The 6 months' active-duty-for-training program, now a variable term (4 months or more) program, is now in its ninth year of operation. Over this period of time it has produced nearly 900,000 basically trained enlisted men for the Ready Reserve.

The problem of training personnel in the "hard-core" skills, encountered in the past, was overcome by introducing flexibility into the program, varying the length of active duty service according to the military skill the individual is to be trained in as requested by the unit in which he enlisted. The more complex the skill, and the more time required to master it, the longer the active duty training requirement is. This change in the program, which qualifies men in their MOS specialties, will help increase the readiness of units as well as provide the capability of bringing mobilized units to full strength by the assignment of such trained personnel. The number of participants in the active duty for training program during fiscal year 1964 is shown in table 24.

The screening from the Ready Reserves as required by Section 271, Title 10, U.S.C., caused the armed forces to screen a total of 2,094,088 personnel records during fiscal year 1964. As a result, 560,771 men were released from a Ready Reserve status, 301,188 were transferred to the Standby Reserve or the Retired Reserve, and 259,683 were discharged. This continuous procedure was designed to insure that the Ready Reserve is composed of qualified personnel available for mobilization.

Reserve Officer Personnel Act (ROPA)

The Reserve Officer Personnel Act, as amended (codified in Titles 10 and 14, U.S.C.), has in most instances served the purpose for which it was drafted. The temporary authority granted by the "omnibus amendments" of 1960 to the Army and Air Force to exceed grade ceilings by allowing the promotion of officers to fill reserve unit vacancies terminates concurrently with the end of this reporting period. Unless this authority is renewed or some other relief devised, unit promotion will be adversely affected for a considerable period. One other method of obtaining relief from overages in grade is the elimination of the procedure whereby reserve officers on extended active duty, in addition to being counted against the regular forces, are also charged against their reserve component's authorization. There were, as of June 30, 1964, nearly 69,000 officers in the Army and 70,000 in the Air Force being counted against both the active force and the reserve ceilings. Since, in an emergency, the additional personnel war requirement must be filled by individuals other than those already on active duty, it is misleading to continue the practice of the double-count, since many Ready Reserves are already on active duty.

The impact of mandatory promotions presents a special problem to the Army and Air Force, especially the Army and Air National Guard. Experienced officers are being promoted out of units where no vacancies exist in the higher grades. This situation is aggravated by a lack of equally well qualified replacements. Viewed from another direction, the use of the authority to decline

promotions is retarding the promotion of junior officers and limiting their training and development in a logical progression of assignments. Also to be considered at the same time is the matter of age and physical ability of officers declining promotion to perform combat duties commensurate with their grade. The declination provision may make itself felt pronouncedly during fiscal year 1964 when the first authorized group of 8-year declinations expire, resulting in the loss of more experienced officers. Consideration of the future effects of ROPA's attritive provisions indicate that the crucial years are 1968 to 1971, inclusive. These losses, coupled with expiring declinations, indicate a continuing heavy loss of experienced officer personnel to be planned for.

ROPA, as it relates to Coast Guard Reserve officers, was adequate until the passage of Public Law 88-130, which changed the system of promotion for Regular officers from fully qualified to best qualified. As a result, and because of certain temporary provisions creating a considerable amount of attrition, a larger number of Regular Coast Guard officers have entered a zone of promotion earlier than otherwise would have occurred. By operation of the running mate system, a larger number of Coast Guard officers have entered the promotion zone thus enlarging the "hump" which has existed in the Reserve in grades of captain and commander. Some attrition was created in these grades in the fall of 1963 by the use of boards convened under the authority of 14 U.S.C. 787a. While these provisions will be used again during this fiscal year, only a small number of vacancies can be created, thereby allowing only a token number of promotions to these grades.

During this period the Board received Service reports on the operation of ROPA in their reserve components. Upon the completion of the study of these reports recommendations will be made by the Board as to the need for additional legislative or administrative action to change the effects of the act.

Army Reserve Components

The reorganization of the reserve components units, begun in the last fiscal year, proceeded on schedule, and all units are now reorganized for their mobilization mission. This provides a more realistic support and mobilization base for the active Army.

Particularly significant indicators of increased readiness were the GUARD LIFT I and the Army Reserve SKYTHRUST exercises during annual active duty training in 1964, which provided invaluable air mobility unit training and the opportunity to train in an unfamiliar environment.

Equally important was the unprecedented participation by reserve components in DESERT STRIKE, where elements and members of the reserve components practiced their mobilization missions and could have their performance measured against their active Army counterparts.

Another source of increased readiness is the Nine-State Test of consecutive multiple drills by the Army National Guard and a similar test by the U.S. Army Reserve. These multiple drills on successive days provide more time for training to improve unit readiness to perform assigned missions, and the chance for field-type training otherwise impossible except during annual active duty training.

Army National Guard (ARNGUS)

The number of federally recognized company- or detachment-size units in the Army National Guard as of June 30, 1964, was 4,003, 2 less than the fiscal year 1963 total. Included were 17 infantry divisions, 6 armored divisions, 5 command

headquarters (divisional), 4 infantry brigades (separate), 1 infantry brigade (M) (separate), 2 armored brigades (separate), 2 separate scout battalions, 21 infantry battalions, 7 armored cavalry regiments, 1 armored cavalry squadron, 16 tank battalions, 47 air defense missile and AWSP battalions, 73 field artillery battalions, 66 support battalions, 3 Special Forces detachments, 174 headquarters units, and 406 separate companies and detachments.

The Immediate Reserve consists of 2,251 units, of which 18 are to support other Services and 69 are in the mobilization base. The Reinforcing Reserve consists of 1,752 units. The Immediate Reserve contains 61 percent of the actual personnel strength of the Army National Guard, with 39 percent in the Reinforcing Reserve.

Army National Guard infantry and armored divisions were further reorganized under ROAD from draft tables of organization and equipment to the final E series TOE's during this period. The conversion of all nondivisional combat units under ROAD had been completed by June 1, 1964. The reorganization provided all separate brigades with assigned battalions. It also provided separate combat battalions for assignment as needed, to reinforce active or ARNGUS divisions and brigades, to replace active Army school troops, or to serve as unit replacements. The June 30, 1964, federally recognized strength of the Army National Guard was 381,546, of whom 33,909 were officers and 347,637 were enlisted men, including 45,868 who were on initial active duty for training. In the inactive Army National Guard were 7,521 Guardsmen attached to units for administration who would be available for duty as reinforcements upon mobilization. The total strength, active and inactive, as of June 30, 1964, was 389,067.

In May 1962, the Army National Guard began to reorganize the 76 NIKE-AJAX batteries in the continental United States (CONUS) to 48 HERCULES batteries. This program, to be completed in fiscal year 1965, has progressed smoothly. The phaseout and reorganization of the last NIKE-AJAX units in the Norfolk, Va., area on May 18, 1964, marked the end of the planned conversion to NIKE-HERCULES program. As of the end of fiscal year 1964, in addition to the 6 NIKE-HERCULES batteries in Hawaii, there were 36 batteries operational on-site and 12 batteries in conversion training and programed to become operational in fiscal year 1965 in CONUS.

Difficulty was experienced in maintaining air defense batteries at the operational standards of previous years. Funding limitations for the first three quarters of the year made it necessary for many air defense technicians to work overtime. The year-round training plan for ARNGUS on-site air defense units has provided the manpower to meet mission requirements. Under this plan approximately 80 percent of the authorized annual field training days were used, as unit commanders scheduled small groups for training through the year to meet actual mission requirements on an "as needed" basis.

The Army National Guard conducts training in accordance with criteria established by Headquarters, U.S. Continental Army Command (USCONARC), and U.S. Army Air Defense Command (ARADCOM). Individual training is planned to attain and maintain proficiency of all personnel in the fundamentals of combat operations and in their MOS and grade assignment.

During this reporting period annual field training of 15 days was conducted for all units, with approximately 300,000 Guardsmen attending. Live-fire squad platoon rifle attack courses, established last year, were continued. These courses give troops a basic concept of live-fire battle drill and the teamwork required under combat conditions.

Armory training was conducted with ARNGUS units participating in at least 48 paid inactive duty training assemblies (armory drills) except for a few units

affected by reorganizations, which performed their proportionate share of the required 48 assemblies. ARNGUS training assembly attendance averaged 92.1 percent of assigned strength, 0.1 percent more than in fiscal year 1963. In annual armory inspections by Army area commanders' representatives, approximately 99 percent of the ARNGUS units were rated satisfactory or above, and 78 percent were rated excellent or superior.

During fiscal year 1964, 5,576 ARNGUS personnel attended Army service schools, 1,726 fewer than fiscal year 1963 due to funding limitations. Short courses were eliminated from the school program. Attendance at Army area schools was limited to NCO academies conducted by each Army commander, which 620 Guardsmen attended.

During fiscal year 1964, the regular OCS at the U.S. Army Infantry School and the U.S. Army Artillery and Missile School enrolled 12 ARNGUS candidates; about 500 Guardsmen were enrolled in the special OCS conducted by CONARC. State Officer Candidate Schools are the sources of the greatest number of second lieutenants for the Army National Guard. During fiscal year 1964 approximately 3,500 candidates enrolled in these schools in the District of Columbia, Puerto Rico, and all States except Alaska. In order to expand the State OCS program to meet the increased loss in officer personnel predicted for 1967 and 1968, new policies have been adopted, including provision for equivalent training for the candidates. Studies are being made of further changes.

Except for a limited number, Army National Guard technicians are federally recognized members of units and are employed by the States in administrative, training, maintenance, or support roles. In March 1964, as a result of the decrease in the reserve component technician program, the ARNGUS lost 423 technician spaces from the 22,770 authorized at the beginning of the fiscal year. As of the end of this reporting period 22,222 technicians were employed, including 156 supported on a reimbursement basis as a condition of cross-Service agreements and 4,795 employed in air defense.

The 1,659 ARGUS aviators on flying status as of June 30, 1964, reflect an increase of 146 during fiscal year 1964. The total flying hours was 203,413, an increase of 26,348 over the fiscal year 1963 total. Approximately 549 officers and enlisted men with aviation MOS attended aviation courses.

The equipment situation in the Army National Guard has improved. ARNGUS assets are being redistributed to insure the best possible equipage of high priority units. Some new self-propelled artillery weapons, armored personnel carriers, scoop loaders, water purification sets, and generators have been received. Distribution plans received from the Office, Chief of Reserve Components, list the following items of equipment to be issued during fiscal year 1965: (1) Weapons carrier, self-propelled, full-tracked for the 107-mm mortar, (2) additional carriers, armored personnel, M-113, and (3) tank, medium gun M48A1. Designated ARNGUS units will also receive a limited number of new rifles, 5.56-mm., XM16E1, during 1965. The mobility of units has improved with the continued acceptance of "as is" wheeled vehicles. ARNGUS firepower has increased with the acceptance of 144 self-propelled and towed howitzers, 5 M31 training kits for use with the HONEST JOHN launchers, and a limited number of new rocket launchers. The lack of new area communication equipment continues to present a training problem. Equipment for support units has improved during the past fiscal year, providing the capability to spend more time in the field and to participate to a greater extent in field exercises with active Army units. DESERT STRIKE placed heavy emphasis on and tested the capabilities of the units to maintain equipment in an operational condition, which stressed the shortages of

repair parts. As an example of the results of these shortages, the California ARGVUS units participating in the exercise with 427 vehicles were forced to retrieve 150 of these vehicles from the maneuver area.

The Army National Guard utilizes 2,807 armory facilities to house, administer, and train units in all 50 States, Puerto Rico, and the District of Columbia.

During this reporting period 58 ARGVUS armory construction projects were contracted for, with a total Federal contribution of \$8,661,884. In addition, 17 nonarmory construction projects with \$4,052,984 in Federal funds were placed under contract. Additional obligations for minor construction and architectural engineering services totaled \$729,056. The over-all total obligations were \$13,443,924, funded under the National Defense Facilities Act of 1950, as amended. Under this act Federal contributions to the States may not exceed 75 percent of the cost of authorized armory construction. Nonarmory construction, expansion rehabilitation, or conversion of existing State-owned facilities made necessary by the reorganization of units are supported 100 percent by Federal funds.

Army Reserve (USAR)

The Army Reserve portion of the reserve component troop basis for 1964 authorizes 4,134 company-size units. Of these units, 3,211 are in the Immediate Reserve with 86 earmarked for support to other Services and 1,357 in the mobilization base. The Reinforcing Reserve consists of 923 units.

The Immediate Reserve contains 76.2 percent of the authorized strength and the Reinforcing Reserve has 23.8 percent.

The USAR was authorized 300,000 personnel in a paid-drill status in the following units: 6 infantry divisions, 13 training divisions, 4 command headquarters (divisional), 2 maneuver area commands, 4 brigades (3 infantry, 1 mechanized), 4 EW brigades (HHE), 1 corps artillery (HHB), 5 special forces groups (HHE) and 15 special forces companies, 18 commands, 10 centers, 7 depots, 82 groups, 120 battalions (sep), 122 battalions headquarters, 15 corps augmentations, and 1,488 separate company-size units. The actual paid-drill strength as of June 30, 1964, was 268,524, an increase of 31,539 over fiscal year 1963.

Realignment of the USAR continued through fiscal year 1964 to provide a force structure compatible with mobilization requirements. Reorganization of non-divisional units under ROAD configuration was accomplished during the year.

USAR units conducted 48 paid home-station assemblies during the year as required by regulations, at which attendance averaged 90.5 percent for officers and 83.5 percent for enlisted men. These averages are similar to fiscal year 1963 attendance experience.

Annual field training for 15 days was conducted for approximately 271,600 reservist unit and reinforcement personnel. Four USAR units executed Army Training Tests (ATTs) during fiscal year 1964 and will be expanded.

School training for USAR personnel is provided through attendance at active Army service schools, Army area schools, USAR schools, and Army extension courses. Reservists who enroll in any of these must have the same qualifications as required for active Army personnel. Most USAR participation is in the USAR school system and in Army extension courses. One hundred and eleven USAR schools are currently operating, with 50 different departments teaching 1,339 courses. As of June 30, 1964, there were 2,694 officers and 1,226 enlisted men assigned as staff and faculty of USAR schools, with 19,274 students undergoing training. Career officer courses and Command and General Staff College courses are offered for USAR officers. Approximately 9,320 Army Reservists

attended Army service schools during fiscal year 1964, and 6,530 received training at Army area schools.

As of the end of this reporting period approximately 900 aviators were assigned or attached to USAR TOE/TD units and participating in the USAR aviation program. The USAR aviation inventory was increased by 14 aircraft, but the contractual hire of civil aircraft still remains the largest single factor contributing to the readiness of the USAR aviators.

The flexible initial active duty for training program and the change from a single enlistment period of 3 years to optional ones of 1, 2, 3, or 6 years should contribute greatly toward the improvement of USAR recruitment and its retention of qualified enlisted personnel.

At the end of fiscal year 1964, USAR civilian technicians authorized for Immediate Reserve units numbered 3,684, with 1,157 authorized for units of the Reinforcing Reserve, or a total of 4,841. Actual strength as of the end of this period was 4,427. The authorized strength is 1,163 over that at the end of fiscal year 1963, and the actual strength is 1,128 over that at the end of fiscal year 1963. Increased technician strength during the year provided further upgrading of the mobilization posture of the USAR.

Concerted effort was exerted during fiscal year 1964 to improve the equipment posture of USAR units, particularly on equipping high priority units. Distribution plans received in the last quarter of fiscal year 1964 included equipment allocations, for issue in subsequent periods, for the armored full-tracked personnel carrier; self-propelled, full-tracked weapon carrier; 107-mm. mortar; M48A1 medium gun tank (from depot rebuild); both fixed- and rotary-wing aircraft; and the lighter amphibious 5-ton LARC V. Designated Army Reserve units will also receive a limited number of the new rifle, 5.56-mm. XM16E1, during fiscal year 1965. Inventories in the USAR also will be increased by issues of 18 SP 105-mm. full-tracked howitzers; 3,000 M60 7.62-mm. machineguns; and additional major items made available from active Army excesses and laterally transferred to USAR units by the USCONARC. Fiscal year 1964 reports reflect further significant gains in major item assets and appreciable increases to USAR stock funded inventories. However, the USAR is still short of the prescribed allowances of equipment required for training.

The readiness posture of USAR equipment has been materially improved by doubling USAR maintenance capabilities during the past year. By assigning full-time civilian organizational maintenance technicians to heretofore inadequate existing maintenance facilities, 145 area organizational maintenance shops and 5 aviation organizational maintenance shops were organized. This resulted in a marked decrease in the nonavailability rate for USAR equipment.

During fiscal year 1964, a Department of the Army policy was implemented to provide for utilization of USAR excess combat serviceable AG-44 uniforms, valued at some \$3 million, and to prevent further large stock accruals.

The U.S. Army Reserve occupies 1,207 reserve centers, of which 545 were constructed with Federal funds, 526 were leased, and 136 are donated. Under present DoD approved space criteria, the USAR presently requires 306 new centers and the expansion of 72 others. A recently completed study indicates the cost of the total foreseeable USAR facilities requirement is about \$419.2 million.

Fiscal year 1964 programing of U.S. Army Reserve centers required for adequate home-station training of Army Reserve units included 11 projects to provide facilities for 4,825 unit Reservists. The Congress authorized \$4.7 million for fiscal year 1964 projects and the acquisition of associated real estate. To accomplish the newly authorized program to construct one project authorized

in fiscal year 1963, to do necessary minor construction, and to perform advance planning, \$4.5 million was appropriated and the use of \$1.5 million of accumulated savings was authorized, creating a \$6-million program.

During fiscal year 1964, 13 Reserve centers, 2 additions, and 1 maintenance shop, costing \$5,170,923, were placed under contract. Eight of the Reserve centers were joint projects with other reserve components, attesting to progress in joint construction. A total of 34 projects (31 Reserve centers and 3 additions) were completed at a cost of \$9,200,000. Sixteen of these were joint construction projects.

There were 20 projects in the fiscal year 1964 execution program; 9 were on Government-owned land, 8 on sites made available by acquisition directives, and 3 on land under long-term nominal leases.

During fiscal year 1964, 37 lease-holds for facilities occupied by troop program units at the beginning of the year were canceled, reducing the number of leased facilities to 526. The reduction of the number of leases is a continuing objective.

Naval Reserve

The over-all readiness of the Naval Reserve is good. The Selected Reserve growth potential was demonstrated by having on board a total of 134,000 in May 1964, which was reduced to 123,000 in June 1964 to remain within the authorized strength limit. The authorized paid-drill strength for fiscal year 1964-69 is 126,000, substantially below the Navy's stated M-Day mobilization requirement of 170,000. An increase of approximately 3,700 personnel in drill-pay status resulted from increased impetus on improved recruiting and enlisted training, and implementation of the team training/team recruiting method.

The Navy continues to improve the readiness of its Reservists by requiring most of them without prior service to perform 2 years of active duty as a part of their statutory obligation. With this active duty a reservist, even though not in a drilling program, is unlikely to lose his acquired skills during the remainder of the 3 or 4 years he remains a reservist. His recall to service during that time would still provide the Navy with a man at least basically oriented in a particular Navy skill.

The Selected Reserve, established in 1958 within the Ready Reserve, drills and trains to be ready and available for immediate mobilization or when otherwise called to active duty. It consists of five components: Antisubmarine warfare, mine warfare, active fleet augmentation, fleet support activities, and shore establishment. Selected Reserve members have pre-cut orders which they carry to enable them to report immediately to their active duty billets. All officers and approximately 65 percent of the enlisted personnel in the Selected Reserve have had a minimum of 2 years active duty and are well qualified to move smoothly into their mobilization assignments.

The Selected Reserve includes 126,000 in authorized drill-pay status (category A) and 126,000 in nondrill-pay status (category B) who are pre-selected to man reactivated reserve fleet ships and to provide fleet and shore establishment support. In addition to the Selected Reserve, there are approximately 21,500 officers and 38,500 enlisted in a nondrill-pay status.

Several steps were taken during this reporting period to increase the readiness posture of the Naval Reserve.

In Operation RETURN, records of ex-Navy personnel are reviewed to determine suitability for reenlistment, and personnel with good potential are contacted and interviewed with the intent to enlist or reenlist them in the Naval Reserve.

A second step was consolidation of reserve records at one point, the Naval Reserve Manpower Center, Bainbridge, Md., rather than at the various naval district headquarters.

Another was increased utilization of accelerated recruit and class "A" school tours by Reserve personnel as a part of both their pre-active duty and active duty training.

The Naval Air Reserve completed plans during the fiscal year 1964 for implementation during fiscal year 1965 of several programs aimed at improving its mobilization effectiveness. These included:

(1) Reorganization/realignment of Naval Air Reserve squadrons into the following unit structure:

<i>Squadrons</i>		<i>Units</i>	
VS.....	40	AWS.....	18
VP.....	64	NARMU.....	24
VF.....	16	NARDIV.....	4
FA.....	19	WEPTU.....	51
VR.....	57	NAIRU.....	24
HS.....	30		
Total.....		Total.....	121
226			

This provides the maximum capability available to meet full mobilization requirements for squadrons/units with aircraft and personnel and augmentation of additional units with personnel only.

(2) Modification of the special 6-year enlistment program to provide 4 to 10 months of active duty for training rather than the 6 months previously required. This allows the trainee to complete the entire course at the "A" school he attends.

(3) Institution of the requirement for "2 x 6" enlistees to affiliate with units of the Naval Air Reserve after their 2 years' active duty when enlistees were given "A" school training.

(4) Reinstatement of the 85-day accelerated training program. The first class consisted of 500 trainees, and the second class had 1,000 trainees. This program provides pre-active duty class "A" school training in technical ratings. Each trainee signs a statement agreeing to mandatory participation in inactive duty training upon release from 2 years' active duty.

(5) The General Aviation Training Conference, 1964, recommended that the concept of carrier qualifications for certain VF/VA Navy Reserve squadrons be approved. Scheduling of this training will be coordinated by the Chief of Naval Air Training when the carrier deck becomes available and fleet and training command requirements have been fulfilled.

(6) During fiscal year 1964, the following numbers of type squadrons performed 2 weeks' active duty for training under fleet commanders or with fleet host squadrons at fleet bases: 21 VS, 33 VP, 12 HS, 12 VR, 13 VA, 10 VF, 9 NARMU.

Continuing efforts to provide more modern ordnance equipment in the reserve training program concentrated on 3"/50 caliber rapid-fire gun mounts and MK63 gunfire control systems. These are normally programmed for new construction training centers authorized to train gunners mates and fire control technicians. Nine 3"/50 gun mounts were included in the fiscal year 1964 budget with an additional 16 in the 5-year program. Seven gunfire control systems were included in the fiscal year 1964 budget with 18 more in the 5-year program. Full implementation of this plan was not feasible due to the lack of funds for the

installation of this equipment, although the equipment is available from stock on hand.

Shortages of electronic training equipment have been reduced from 1,186 items on April 1, 1960, to 890 items on January 1, 1964. Included are radio transmitters, receivers, teletype equipment, keyers and converters, radar repeaters, and radar target generators. Some of this equipment is available for installation at the training centers, but insufficient funds for installation precludes its use in the reserve training program.

The mobilization potential and operational readiness of the Naval Air Reserve has been improved as follows:

During fiscal year 1964 F-8 aircraft were introduced into the program which also completed a successful year of operations with the F-6. At the close of fiscal year 1964 the reserve inventory included two models of high performance afterburner-equipped jet fighter aircraft. Additional F-8's are being planned for during fiscal year 1965 to provide this one model aircraft to meet the jet fighter requirement.

The A-4 light attack jet inventory was increased and will be further increased in fiscal year 1965 to provide this one model for the jet attack requirement. The total number of attack squadrons remained at 19; however, the mix changed from 13 jet and 6 prop to 15 jet and 4 prop by the transition of 2 of the A-1 prop-type squadrons to the A-4.

Considerable improvement was made in the consolidation of models of FS, HS, and FP aircraft inventories. Three models of FS have been reduced to one; four models of FP have been reduced to two; and two models of HS have been reduced to one. The total inventory of these ASW aircraft remained the same as a result of this consolidation. All these ASW aircraft have electronic submarine detection equipment compatible with the active fleet equipment.

Initial introduction of C-118 transport aircraft to supplement the C-54's was made late in the fiscal year and an additional increase is to be made in fiscal year 1965.

In summary, the Naval Reserve is receiving training equipment available under existing budgetary ceilings, but this is insufficient to equip new construction training centers and to overcome "block obsolescence" in existing training centers.

The number of Naval Reserve training surface activities was maintained at a level of 453 during fiscal year 1964. On July 1, 1964, these were grouped as follows:

Naval Reserve Training Centers.....	167
Naval Reserve and Marine Corps Reserve Training Centers.....	**133
Naval Reserve Training Facilities.....	11
Naval Reserve Electronics Facilities.....	*141

*Redesignated Naval Reserve Training Facilities as of Aug. 1, 1964.

**Two carried as Armed Forces Training Centers by the Marine Corps.

These facilities vary in size from a 3,100-square-foot electronics facility to a five-division Naval Reserve training center of over 35,000 square feet. Use of old buildings not designed as training centers results in much space being wasted.

In the period 1951-64 inclusive, the number of Naval Reserve training activities has been reduced from 721 to 453. This 37 percent reduction occurred with only a 6 percent reduction in drill-pay strength during the same period.

Joint utilization with other reserve components has been achieved to a marked degree. One hundred and thirty-three are used jointly with the Marine Corps Reserve, 126 with the Coast Guard Reserve, 17 with the Air Force Reserve,

38 with the Army Reserve, and 8 with the Army National Guard. The concept of joint utilization wherever practicable is and will continue to be a primary consideration in any plans for replacement, change, or consolidation.

The following major improvement or replacement construction projects were completed during fiscal year 1964:

Replacement of Naval Reserve Training Centers.....	10
Replacement of Naval Reserve Electronics Facilities.....	3

The fiscal year 1965 Naval Reserve military construction program submitted to the Congress for approval and funding will provide for six replacement Naval Reserve training centers.

The aviation components of the Naval and Marine Reserve programs continue to occupy 12 naval air stations and 6 Naval Air Reserve training units. A Marine Air Reserve training detachment is currently being supported by each naval air station and by each Naval Air Reserve training unit except the NARTU at Lakehurst, N.J. The Naval Air Station at Grosse Ile, Ill., is scheduled to be relocated at Selfridge AFB in 1967, and to be designated a Naval Air Reserve facility.

There is a continuing requirement for approximately 975 Navy and Marine officers and 9,700 Navy and Marine enlisted men on active duty to support these NASs and NARTUs, and to supervise the training of approximately 9,000 officers and 24,700 enlisted men of the Naval and Marine Air Reserve.

The related operating aircraft allowance was 819 in 1964 and is programed at 805 for fiscal year 1965.

Many of the facilities of the naval air stations are over-age or otherwise inadequate due to size or type of construction. The current backlog of essential maintenance and repair in the amount of \$6.4 million and annual funds are insufficient to permit headway in reducing this backlog.

Marine Corps Reserve

The total strength of the inactive Marine Corps Reserve rose slightly during fiscal year 1964. As of June 30, 1964, Marine Corps Reserve strength, excluding those on active duty, was 136,001, a gain of 9,928 from the post-Korean war low of fiscal year 1964. As predicted, however, the Ready Reserve strength of the Marine Corps Reserve (not on active duty) declined 7,188 during fiscal year 1964 to 103,703. The authorized fiscal year 1964 and strength of the Organized Reserve was continued at 45,500.

Ready Reserve assets at the end of fiscal year 1964 continue to be inadequate for the desired rate of mobilization expansion. This situation would be alleviated by an increase in the authorized drill-pay strength of the Marine Corps Reserve.

During fiscal year 1964 the Selected Reserve consisted of the entire Organized Marine Corps Reserve and a portion of the Volunteer Reserve which includes many personnel who have recently served 3 or 4 years of active duty.

The Organized Marine Corps Reserve is constituted to include basic units of the 4th Division/Wing Team. These units are required to support a Marine Corps force structure of four Marine division/wing teams, and are designed to train individuals to augment both mobilized reserve units and units of the regular establishment. Most units are organized under T/Os and T/Es identical to or similar to those of the regular establishment, but are not authorized full T/O strength and have on hand only the equipment required to support training.

The present Marine Corps Reserve structure allows for flexibility and responsiveness to mobilization requirements of varying magnitudes, either for individuals, trained units, or both.

During fiscal year 1964 significant progress was made in the Organized Marine Corps Reserve to increase both individual and unit readiness. Major actions taken to achieve this progress were:

1. The deactivation of nine *non*-4th Division/Wing Team units and three detachments that represented marginal investments of authorized resources, and the reapportionment of their strength allocations among units of the 4th Division/Wing Team.
2. Redesignation of certain units corresponding to changes in the structure of the regular Marine Corps.
3. Assignment of an 80 percent manning level objective to designated division units.
4. Increasing the number of technically trained personnel in units, through the use of voluntary extended technical training program for 6-month trainees.
5. Additional individual active duty for training for personnel requiring training in technical skills.

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

Fiscal year 1964 saw the introduction of F-8A aircraft at one Reserve location. This program will expand through fiscal year 1965. Additional A-4B aircraft were assigned to replace the AF-1E. The AN/TPQ-10 radar course directing control is in operation and modernization of other air control equipment is to be accomplished during fiscal year 1965.

The only helicopter available for Marine Corps Reserve training is the Navy (antisubmarine equipped) SH-34G. This situation is not desirable because pilots can now only maintain actual control proficiency. These helicopters cannot be used to haul troops or heavy loads or for rough area work. As a result, tactical training of troops in helicopter operations is minimal.

During fiscal year 1964 the Marine Corps Reserve units were reequipped with the 7.62-mm. M14 rifle and the M60 machinegun. Delivery of modernized 90-mm. gun tanks (M48A3) and tracked landing vehicles (LVTP5-A1) to the Marine Corps Reserve was completed. One battery of each direct support artillery battalion of the 4th Marine Division was reequipped with the 107-mm. towed M98 (HHowtar) mortar.

Unit and individual equipment on hand is adequate to support the training mission. A plan for protection and withdrawal of Marine Corps-furnished assets for effecting outfitting of the 4th Marine Division/Wing Team upon mobilization was implemented.

At the end of fiscal year 1964 Marine Corps Reserve units occupied 210 facilities compared to 220 a year ago. The difference resulted from deactivation of units. The 210 facilities are:

- 131 Joint Naval and Marine Corps Reserve Training Centers
- 43 exclusively owned Marine Corps Reserve Training Centers
- 10 exclusively leased Marine Corps Reserve Training Centers
- 2 Joint Army and Marine Corps Reserve Training Centers
- 17 Naval Air Stations (1 occupied with the Air National Guard)

During fiscal year 1964, improvements to ground unit training centers, to make them more adequate for training, included the paving of drill field/vehicle parking areas; installation of security fences; installation of fire detection systems; and expansion of locker rooms.

The Marine Corps Reserve adheres closely to the policy of joint utilization of facilities as specified in the National Defense Act of 1950 and to the Department of Defense policy of eliminating the use of rental property.

Air Reserve Forces

Improvements in all aspects of the Air reserve forces are reflected in the operational readiness of Air National Guard (ANG) and Air Force Reserve (AFRes) units. Measured by active Air Force inspectors, using the same standards which apply to units of the active Air Force, the readiness of the reserve forces flying units has improved significantly during the past year.

Whereas 63 percent of the ANG flying squadrons were rated operationally ready on July 1, 1963, the total had reached 68 percent by June 30, 1964. The remainder of the units are hampered primarily by recent conversions and reorganizations and by nonavailability of aircraft currently undergoing modification.

The troop carrier units of the Air Force Reserve have likewise made progress in spite of increasingly stringent requirements. On June 30, 1964, 64 percent of the troop carrier groups were operationally ready as compared with only 51 percent on July 1, 1963. Changes in aircrew requirements and shortages of aircraft are the primary limiting factors on the remaining AFRes troop carrier units.

Both the Air National Guard and the Air Force Reserve have experienced difficulty in supporting the training requirements of their unit personnel. The resources available are not sufficient to provide the upgrade training required for the operation of new and more complex equipment.

The most critical deficiency in the training area is the need for additional pilot training. A recommendation by this board and by the Air Reserve Forces Policy Committee for the establishment of a program to train pilots for the Air Force Reserve and additional pilots for the Air National Guard was approved in principle by the Under Secretary of the Air Force. The Air Force is currently investigating alternative methods of supporting such a program.

Recognizing that there would be a very significant loss of reserve officers in 1970-72 through mandatory retirements under the Reserve Officer Personnel Act, AFRes was allocated a separate quota of up to 300 spaces per year in the Air Force Officer Training School (OTS) Program and ANG a quota of 120 spaces per year. Applicants will be enlisted against specific officer vacancies. Either prior service or nonprior-service college graduates may be recruited. Also, the Continental Air Command and the National Guard Bureau were authorized to reappoint former Reserve rated officers to fill aircrew vacancies. Reappointments will be limited to company grade officers who are either pilots or navigators to fill aircrew positions.

From 1956 to 1960, unit vacancy promotions to the grades of major and lieutenant colonel were frozen in the Air Reserve forces because of the mandatory promotion system established in ROPA and the World War II officer "hump" or grade imbalance. Temporary authority granted in 1960 to make unit vacancy promotions without regard to grade ceilings was due to expire June 30, 1964, unless extended by new law.

Participation in special exercises with active Army and Air Force units helps the Air Reserve forces to sharpen their skills and gain experience in the kind of joint actions which they would be likely to take in wartime. The SWIFT STRIKE III exercise, an airborne maneuver conducted early in fiscal year 1964, included both ANG and AFRes units and personnel and gave them experience in planning and conducting operations with the Army. AFRes troop carrier units flew some 170 sorties and almost 2,000 hours in support of Exercises SILVER FOX I and III, and Exercise KING CRAB V. Three provisional ANG fighter squadrons, composed of personnel from many different organizations, made a significant contribution to DESERT STRIKE; and the two ANG tactical control groups provided the major portion of the control and communications system that enabled the Air Force to function effectively during the exercise.

Air National Guard and Air Force Reserve air transport and heavy troop carrier groups are incorporated into the Military Air Transport Service (MATS) to provide completely realistic training for their aircrews. In addition to special missions flown in support of Presidential visits, State Department projects, etc., these units carry essential military cargo on routine MATS flights overseas.

During the year extensive studies and surveys were made to determine if cost reductions could be realized by relocating certain Air Reserve forces units to other Department of Defense properties. The studies were expected to be completed early in fiscal year 1965.

Air National Guard (ANG)

The Air National Guard strength (not on active duty) grew from 74,235 on July 1, 1963, to 75,137 on January 31, 1964. The intensive recruiting drive which built up the strength during the last half of fiscal year 1963 caused an imbalance between officer and airman strengths. Actions to correct this imbalance caused a decline in total (not-on-active-duty) strength to 73,217 on June 30, 1964.

Personnel accounting and reporting for ANG officers will be accomplished through electronic data processing effective July 1, 1964. Plans and procedures have also been developed for early implementation of an ANG airman data processing system. This will result in the complete mechanization of personnel accounting and reporting for the Air Reserve forces by the end of fiscal year 1965, providing more accurate and readily accessible statistics and producing compatibility with the active Air Force data system. Electronic personnel data processing will greatly enhance the mobilization responsiveness and flexibility of the Air Reserve forces.

Air National Guard fighter interceptor and aircraft control and warning units continued to participate in the full-time air defense of the United States under the operational control of North American Air Defense Command.

Air National Guard GEEIA squadrons again this year performed "live scheme" training by repairing and installing communications facilities at Air Force and Air National Guard bases and stations. The Air Force Logistics Command estimates that this practical application of the Air National Guard GEEIA squadrons training has saved the Air Force hundreds of thousands of dollars during the year, and has gained valuable time in the completion of essential communications projects.

During fiscal year 1964, ANG air transport groups provided airlift for 14,787 tons of cargo and 69,849 personnel in conjunction with aircrew training. Some 32.5 million ton-miles were flown in support of MATS on overseas flights.

To increase the mobility of its total combat force, the Air Force conducted three exercises involving ANG jets and refueling aircraft. In MINUTEMAN

ALPHA, 12 RF-84F's deployed to Alaska, performed photo missions for the Air Force, and returned to their bases in the southeastern United States, refueling in flight from ANG tankers. In ABBEY TOWERS, 8 RF-84F's and 12 F-100's deployed to Puerto Rico, exercised with the Puerto Rico Air National Guard fighter squadron, and returned home, also with refueling by ANG tankers. The third refueling mission involved a flight of 18 F-100's to Puerto Rico and return. Plans are being made for a practice nonstop deployment to Europe early in fiscal year 1965.

In reserve forces structure and organization as well as in training methods, the Air Force continued to emphasize greater responsiveness to active force requirements.

In the Air National Guard, the four troop carrier groups were redesignated air commando groups, and each received six U-10B aircraft in addition to the HU-16 and C-119 aircraft already assigned. All air transport units were converted to the "dual deputy" system, and the aeromedical transport units were converted to the broader mission of air transport. The tactical fighter wing at Niagara Falls, N.Y., was deactivated to allow the activation of a new air transport wing at Brooklyn, N.Y., and the air defense wing at Pittsburgh, Pa., was replaced by an air transport wing at the same location. These actions produced a total ANG long-range airlift force of nine air transport wings with 25 air transport squadrons.

The ANG aircraft inventory increased during the year from 1658 to 1810, primarily as a result of the return of F-84F aircraft retained by the Air Force after the Berlin mobilization of 1961. Increases in the F-100 and F-102 inventory were almost entirely offset by decreases in the number of F-86L and T-33 aircraft. A sizable deficiency in assigned UE aircraft still exists and hampers unit training. The mechanization of the ANG supply system was completed during the year, facilitating maintenance of a high degree of equipment readiness.

Installation of on-line secure message facilities for ANG flying bases, using commercial TWX and 131-2B encryption devices, is to begin in late August 1964 and is expected to be completed by December 31, 1964. This capability not only will provide a means of training communications and cryptographic personnel but also will improve the responsiveness of the ANG flying units in emergencies.

Four TRANSCOM systems (AN/TSC 28) at a total cost of approximately \$4 million, each system consisting of five vans, were programed for, to be delivered early in fiscal year 1965 to Air National Guard locations at Van Nuys, Calif.; Springfield, Ohio; Wellesley, Mass., and Portland, Ore.

The ANG military construction program for fiscal year 1964 totaled \$15.9 million. It provided for airfield pavements, aircraft maintenance facilities, warehousing, aviation gasoline and ammunition storage facilities, operations and training buildings, and other miscellaneous facilities. Although the program varied from that initially authorized by the Congress, the changes, caused by mission requirements, were accomplished without difficulty by means of the streamlined OSD/BoB/Congressional Committee approval authorized in the enabling legislation.

Air Force Reserve (AFRes)

Air Force Reserve recruiting efforts pushed the drill-pay strength from the July 1, 1963, figure of 58,607 of 60,835 on June 30, 1964. Practically all of the year's increase was in the troop carrier and air rescue units, which were 79 percent and 94 percent manned, respectively, on June 30, 1964.

The total Ready Reserve strength (not on active duty) also increased during the fiscal year from 168,382 on July 1, 1963, to 177,456 on June 30, 1964. Stand-by Reserve strength increased from 116,874 to 129,903.

During this reporting period individual Air Force Reservists as well as units made valuable contributions to the continuing effectiveness of the total Air Force. The Air Force Academy liaison officers, the members of information flights and research and development flights, and the Reserve lawyers who serve as the Judge Advocate General's area representatives (JAGARs) were particularly active. For example, during fiscal year 1964, the "JAGARs" handled some 1,600 cases for the Air Force and Air Force personnel concerning domestic relations, wills, real estate transactions, military affairs, and special projects.

Two AFRes air terminal squadrons performed their annual active duty training by assisting MATS in operating oversea terminals, one at Chateauroux, France, and one at Hickam AFB in Hawaii. This was the first time nonflying AFRes units had gone outside the continental United States for training.

During the year, AFRes troop carrier groups flew more than 12,536 airlift sorties, airlifting about 152,000 personnel and 9,480 tons of cargo. Part of this total provided more than 50 percent of the Air Force support for Army airborne training, including the airdrop of more than 115,000 paratroops and 754 tons of equipment, not counting those airdropped during special exercises and such as SWIFT STRIKE III.

AFRes air rescue squadrons flew 117 sorties, including precautionary escort of aircraft in distress, prepositioned orbits for fighter aircraft movements, and search and evacuation missions.

The 6 AFRes aerial port squadrons with 29 detachments were reconstituted into 45 aerial port flights, 1 in each troop carrier group. The new organizational structure provides greater flexibility in mobilization, permitting callup of the aerial port flights with their parent units or separately, as requirements dictate.

The AFRes medical program is being completely realigned. All but 1 of the 10 hospitals and all 10 of the casualty staging units are being replaced by some 140 medical service units. These are small, highly flexible units, training at and under the supervision of existing Air Force medical facilities, and can be used to augment or replace active force medical units and to perform a wide variety of medical missions.

Approval was obtained for the activation of two air postal groups and eight flights. This program provides a new Reserve mail-handling capability within the Air Force to support emergency requirements overseas.

The AFRes recovery program was reevaluated in conjunction with Air Force survival plans, and recovery squadrons were matched against the specific dispersal and recovery requirements of the Air Force operating commands. As a result it was decided to deactivate 40 AFRes recovery groups and 91 AFRes recovery squadrons for which the commands indicated they have no requirements. These deactivations will be phased over the first 2 months of fiscal year 1965. The remaining 43 groups and 112 squadrons have firm and specific missions in support of Air Force commands.

In the Air Force Reserve, the aircraft inventory decreased from 737 on July 1, 1963, to 712 on June 30, 1964. Only 41 of the authorized 48 C-123 aircraft are possessed by the three assault troop carrier groups, and no additional aircraft are programed for these units. The five C-124 groups, whose total UE authorization is 40 aircraft, have only 20 aircraft. Additional C-124's are programed to correct this situation by the end of fiscal year 1965.

During the year there was significant improvement in the percentage of mobilization equipment on hand in the Air Force Reserve flying units, a result in part of reevaluation of requirements. There was no improvement, however, in the equipment status of the AFRes mobile communications units.

The military construction program for the Air Force Reserve was \$4.6 million. Development of a single cantilevered aircraft maintenance dock which will provide a 90-foot aircraft depth for housing all aircraft wing configurations allowed more effective use of construction funds. This highly flexible and economical design can support increases or decreases in shops, maintenance control, and squadron operations areas without loss of square footage. Two of these docks are under construction at Richards-Gebaur AFB, Mo., with a programmed requirement for 18 more at other sites. A new double cantilevered hangar design is being developed for Hamilton AFB, Calif., and, if economically practicable, will be adapted for seven other locations.

Coast Guard Reserve

In general, Coast Guard Reserve readiness was slightly more satisfactory than at this time last year. Individual selection and training has been definitely improved, but the small numerical increase in Coast Guard Reservists was far short of that required to meet task assignments upon mobilization. While the Reserve is in excellent condition to fulfill its personnel requirements in the port security field, inadequate Organized Reserve unit strength in the areas of vessel manning, coastal force, and aviation, and a continuing shortage of adequate amounts of training equipment in most fields must be recognized.

During fiscal year 1964, a review of mobilization requirements indicated the need for a larger authorized ceiling for the Coast Guard Ready Reserve. At the request of the Secretary of the Treasury, the Secretary of Defense authorized, on March 11, 1964, a new ceiling of 45,200. Thus, although the Ready Reserve increased slightly in strength, the change in ceiling from the previously authorized 39,600 caused an apparent reduction in effective strength to 60 percent from the fiscal year 1963 level of 66 percent. Also, the requirement to be met by personnel in drilling units increased to 29,475. This is now 56 percent filled, which is a lesser percentage than in fiscal year 1963, again due to the larger requirement.

The total strength of the Coast Guard Ready Reserve, not on active duty, increased from 25,621 to 27,129 during this period. The number of personnel assigned in a drill-pay status increased from 16,277 to 16,620.

Specific improvements over the past fiscal year have occurred in the personnel field. Through the use of data processing equipment, it has been possible to tailor, more closely, personnel training objectives to varying mobilization requirements. Completion of the initial phase of the mobilization assignment system has matched, and provided pocket orders for, available Reservists and retired personnel to mobilization billets which carry early phase dates. In addition, the implementation of Public Law 88-110 has provided a much more effective rate training program for trainees on initial ACDUTRA, through the utilization of preselection in recruiting procedures.

To provide still more effective training, the Coast Guard Reserve has begun an active program to procure and utilize existing surplus operational equipment. This equipment is used to augment training aids, both at the units and at ACDUTRA sites.

Training in a drill-pay status is provided in 262 organized units, with 303 additional personnel training in various inter-Service training units. Volunteers

in a nonpay status are assigned among 21 Coast Guard volunteer training units, 10 Organized Reserve port security units, and various inter-Service training units.

As of June 30, 1964, 126 organized units were designated operational port security training units, with 992 officers and 9,199 enlisted personnel assigned. The concept of operational unit training as teams for specific functions upon mobilization was expanded by the organization of another 12 units into Organized Reserve port security units, which are charged with the effective coordination of all Coast Guard Reserve port security training efforts in any important port area. ORPSUs were increased from 21 to 28 units with 18 in a paid status.

Personnel training for vessel augmentation and activation number 454 officers, and 3,039 enlisted personnel in vessel augmentation Organized Reserve training units. Continued emphasis is being placed on this area, particularly through preselected recruits who are enlisted to train in the seagoing ratings.

Preselection is also being used for coastal force trainees. In addition to the two pilot coastal force units established in fiscal year 1963 on the west coast, a third has been established on the east coast. Personnel undergoing this type of training now number 15 officers and 124 enlisted personnel, with a steady expansion planned for the next few years. This expansion will include the training of personnel in light aircraft surveillance methods.

The training programs of other organized units continue to be reviewed to insure alignment with mobilization requirements by rating and specialty.

A general shortage of equipment for realistic operational training continues to exist. During fiscal year 1964, six sets of port security equipment were obtained for operational training at the Organized Reserve port security unit level. Additionally, the first of 10 MSF-type vessels needed for shipboard training was acquired for use in training of the seagoing ratings. A schedule for the orderly acquisition of adequate training equipment and vessels has been planned and will be implemented as funds become available.

In the event of mobilization, unit operating equipment will be obtained through normal supply channels. Unit training equipment and training vessels will also be available to Regular or activated Reserve units, as conditions indicate.

The Coast Guard Reserve continues to drill at training facilities of other armed forces, primarily those of the Navy, or at existing facilities of Coast Guard operating units. In a few instances, space is leased from other Government agencies of commercial interests.

The Coast Guard Reserve Training Center, Yorktown, Va., is used for year-round training for Reserves. During fiscal year 1964, 3,155 Reservists received training in 21 courses or specialized areas of instruction. During the summer, a large variety of 2-week courses is taught for ACDUTRA personnel. During the other 9 months of the year, the center trains and graduates Reserve officer candidates and conducts many specialized and technical courses for both officer and enlisted Reserve personnel. Most of the structures at this facility are of temporary World War II construction and are in need of replacement.

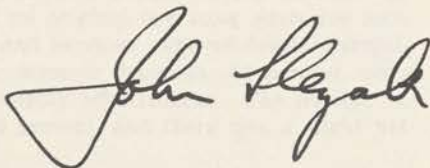
The total appropriation for fiscal year 1964 was \$18.8 million. These funds maintained the Organized Reserve at close to fiscal year 1963 level, and permitted a small increase in the over-all Ready Reserve strength. The acquisition of six sets of port security training equipment and an MSF-type vessel was also possible. No funds were available for major new construction.

Reserve Officers' Training Corps

The Advisory Panel on ROTC Affairs operating under the Reserve Forces Policy Board met during the year and considered such subjects as current versus anticipated production and requirements from the Army ROTC, present unit capabilities and program expansion possibilities, problems of substandard units, and student motivation.

They also examined the new AFROTC curriculum in the junior and senior years, which, after the Air Force has made use of it for one experimental year in 10 institutions, is to be made standard for all AFROTC units. The panel considered present plans for administering the scholarship program which the ROTC legislation pending in Congress would authorize.

The panel concluded that the urgency of the present situation and the future of the ROTC program dictate the need for all possible effort toward attaining passage of the pending ROTC legislation in this session of Congress.



JOHN SLEZAK,
Chairman, Reserve Forces Policy Board.

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Annex B
ANNUAL REPORT
of the
DEFENSE SUPPLY AGENCY

July 1, 1963, to June 30, 1964

This is the third annual report of the Defense Supply Agency (DSA). In fiscal year 1964, DSA achieved most of its original operating goals for integrated management of assigned supplies and services. The wholesale distribution system successfully met increased customer demands—62 percent more requisitions were filled without loss in supply effectiveness. The number of items centrally managed increased by 29 percent, and there was a slight net decrease in supply inventory value.

New management responsibilities were undertaken for documentation and retrieval of scientific research information. DSA was also assigned the missions of worldwide traffic management for transportation and storage of household goods, providing Defense-wide commercial warehouse service, and supporting the Army overseas with DSA decentralized and noncataloged items. At the end of the fiscal year, the agency received a major new assignment to provide national-level management of consolidated contract administration services. This added function will result in a 65 percent increase in DSA field personnel over the next 2 years and will require restructuring DSA headquarters.

The potential benefits of consolidated management were sought through continued introduction of management improvements and the conduct of systems studies. Major studies initiated during the year concern a reappraisal of item management coding criteria, an improved inter-Service system of materiel utilization, and a Federal Item Identification Guide improvement project, which is expected to enhance the utility of the Federal Catalog. A study of the desirability of DSA assuming responsibility for supplying all Federal civil agencies with food, fuel, clothing, and electronic and medical supplies, will be based, at least in part, on recent feasibility tests involving most of these commodities.

The first Director of DSA, Lt. Gen. Andrew T. McNamara, USA, retired on July 1, 1964. He was replaced by his Deputy, Vice Adm. Joseph M. Lyle, SC, USN.

Changes in Item Management Responsibility

DSA began fiscal 1964 with nine supply centers fully operational in the management of 229 Federal supply classes. In August 1963, the Secretary of Defense determined that merging certain functions of Army and DSA inventory control points handling automotive and construction supplies would generate personnel and overhead savings. As a result, the Defense Automotive Supply Center (DASC) in Detroit, Mich., was phased out by January 1, 1964. The Army

Tank-Automotive Center (ATAC) in that city became the DoD integrated supply manager for Army-designed combat and tactical vehicles and peculiar parts. Items which previously had been centrally managed by DASC and which were not assigned to ATAC were transferred to the Defense Construction Supply Center (DCSC) in Columbus, Ohio. Concurrently, the Army's Mobility Support Center in Columbus was phased out and DCSC assumed part of its item management responsibilities. This responsibility included inventory management, for the Army only, of some 67,000 items in 46 nonintegrated supply classes. The Secretary of Defense formally assigned 45 of these classes to DSA for integrated management for all the military Services in June 1964. Implementation of the new assignment is scheduled to be completed in fiscal year 1966.

At the end of the year the Defense General Supply Center (DGSC) was capitalizing four classes of electrical supplies and six classes of lighting fixtures. The Defense Industrial Supply Center (DISC) had added the single class of electrical wire and cable. The Defense Electronics Supply Center (DESC) gained 8 classes of electronics supplies during the year, and 14 classes of automotive supplies were transferred to DCSC. DSA ended fiscal 1964 with 8 operating supply centers managing 230 supply classes for all military Services and 46 classes for the Army only. Distribution and inventory value of the 1,328,000 centrally managed items involved are shown in table 34 in the appendix.

DSA Distribution System

After its first full fiscal year of operations, the DSA distribution system had fulfilled most of the expectations of its designers. Administrative control was enhanced by transfer to DSA management of Army depots at Memphis, Tenn., and Ogden, Utah. The geographical pattern of 18 Direct Supply Support Points (DSSPs) serving the Navy remained unchanged. Original plans for elimination of temporary storage locations, which DSA inherited along with the supplies transferred by the military Services, were modified. When the distribution system was implemented in January 1963, the best information available foresaw the elimination of all attrition sites by June 1964. However, because of continued capitalizations of materiel stored at such locations and a decision not to "bulk move" supplies for reason of over-all economy, this target was set back to June 1965. Moreover, projections of resources available for fiscal year 1965 and plans for additional materiel capitalizations by DSA made a firm goal unfeasible. The agency will continue to store materiel at attrition sites for an indefinite time. DSA-owned materiel totaled 268,000 tons at 58 attrition sites in June 1963 and 135,000 tons at 47 sites in June 1964.

Idle Industrial Plant Equipment (IPE) was stored at 11 sites which were under 4 different types of management—3 were contractor-operated, 3 cross-Service (Army) operated, 2 common-Service (Navy) operated, and 3 operated by DSA. Long-range planning for a uniform IPE storage system was complicated by the need to maintain equipment as well as to store it and the Services' desire to phase out some of these locations. DSA completed a distribution and facility survey and planned consolidations in its IPE storage and maintenance system.

A DSA-wide program for modernizing depot operations, initiated during the fiscal year, was expected to increase operating efficiency, provide more timely service, and reduce costs of receiving, storing, and shipping supplies. These improvements are to be obtained through mechanization and combination of various functions into a completely integrated system for each depot. During fiscal year 1965, DSA will monitor the progress made in modernizing depot op-

erations with the assistance of a task group comprised of industrial engineers from each depot involved. Defense Depot Ogden was selected for the pilot installation, and procurement of the system will be initiated in fiscal year 1965. Installation of equipment at Ogden was programed for fiscal year 1966.

Industrial Plant Equipment

The Defense Industrial Plant Equipment Center (DIPEC) began operations in September 1963 and became fully operational on June 30, 1964. Charged with primary responsibility for development and maintenance of central records of the DoD inventory of IPE and the management of idle equipment, DIPEC recorded descriptive data for approximately 434,000 items with an acquisition cost of \$3.55 billion. From the idle inventory, which exceeded 35,000 units of equipment, DIPEC screened an average of 3,700 requisitions per month. Reutilization of items valued at \$82.9 million resulted from this screening. Included in this sum were \$54.3 million which qualified as cost reduction savings of the military departments. DIPEC ended fiscal year 1964 with an idle equipment inventory valued at \$334.6 million. Among those using idle IPE were the military departments, friendly foreign governments, the Atomic Energy Commission, National Aeronautics and Space Administration, Department of the Treasury, and vocational training schools throughout the United States.

DIPEC inherited differing IPE inventory management systems when the functions of the separate equipment control offices of the military departments were transferred. These systems are to be standardized and adapted to modern data processing methods to provide better service and support to the military departments.

Defense Documentation Center

The Defense Documentation Center for Scientific and Technical Information (DDC) was transferred to DSA from the Air Force in November 1963. The Director of Defense Research and Engineering continued to furnish policy direction. DDC was made a primary level field activity under the direction and operational control of the Director, DSA. The center received, stored, announced, and accomplished secondary distribution of scientific and technical documents in consonance with the DoD Scientific and Technical Information Program. Technical report services were furnished to all DoD components, contractors and other Government agencies, their contractors and potential contractors and grantees, and foreign governments as authorized.

During fiscal year 1964, the center provided the DoD research and development (R&D) community with more than 1 million scientific and technical documents, 7,643 bibliographies, 1,669 data summaries concerning the DoD research projects, and 44,919 announcements describing R&D documents added to the DDC collection.

In December 1963, a large-scale computer replaced two medium-scale computers which DDC had outgrown. A working agreement by which the Office of Technical Services of the Department of Commerce would process the unclassified documents without restrictions on distribution was signed in March 1964. It is expected that interagency collaboration and the use of the new computer will materially reduce the processing time for publication of announcements and providing other services.

Contract Administration Services

In June 1964, as the culmination of a DoD study known as Project 60, the Secretary of Defense assigned the management of certain contract administration services (CAS) functions to DSA. This responsibility involved a national merger of existing geographic-type organizations, comprising some 20,000 people working in over 150 separate offices of the military departments. Buying functions and administration of contracts in certain plants associated primarily with major weapon systems contracts were excluded from the assignment.

A CAS National Planning Group was established under the Director, DSA, to develop a detailed implementation plan for submission to the Secretary of Defense by January 1, 1965. The plan will include the organization and resources required to implement nationwide consolidation of centrally managed CAS functions. Subject to Secretary of Defense approval, it is anticipated that field consolidation will begin about April 1, 1965. Field conversion will be patterned after the Philadelphia Pilot Test Region. Concurrent with consolidation of the field organization, the National Planning Group will be phased into a permanent headquarters organization which will provide over-all policy guidance and control. Maximum operational responsibility will be delegated to the field.

Central CAS management under uniform procedures will serve to eliminate duplication and overlap which existed among the military departments. Defense contractors should therefore be able to deal with the Department of Defense more effectively, and at less cost. Such contractor savings should be reflected in lower direct procurement costs to the Government. Direct savings through consolidation will be substantial and are expected to result ultimately in annual savings of approximately \$19 million.

Organization, Direction, and Control

To control DSA's extensive and geographically dispersed operations, the Director's basic management concept continued to be that of centralized policy control and decentralized operational control. DSA goals and objectives were established as a 3-year forward projection within and consonant with the DoD Five Year Force Structure and Financial Program. In March 1964, DSA field activities were directed to prepare and submit integrated 3-year program-budget-manpower (IPBM) documents of a new type. The initial responses received will permit the correlation of specified objectives with required workloads, management reporting and cost accounting data, and performance in a single integrated submission.

To appraise performance, the Director held two semiannual headquarters staff reviews and two field command reviews during the year. These reviews analyzed and emphasized problem areas and future operations. They enabled the Director to take corrective and preventive actions to assure accomplishment of programmed objectives.

Additional mission assignments and organizational changes to improve mission accomplishment modified the DSA structure during the fiscal year. They are listed in chronological order:

On July 1, 1963, the mission of the DSA Administrative Support Center (DSASC) was expanded to include responsibility for providing electronic computer and data services to DSA activities in the Washington, D.C., area. On August 15, 1963, DSASC was designated a primary level field activity. On April 17, 1964, DSASC was assigned responsibility for civilian payroll accounting and

installation level accounting and disbursing services for all DSA activities located in the Washington area.

On September 1, 1963, eight DSA Equal Employment Opportunity Offices were established to survey contractor compliance with the requirements of the President's Committee on Equal Employment Opportunity.

In September 1963 DSA was assigned responsibility for the DoD Household Goods Moving and Storage Program on a worldwide basis. Technical direction and operational responsibility were delegated to the Defense Traffic Management Service (DTMS), which assumed control of 18 DoD Household Goods Field Offices on January 1, 1964. Five of these offices were assigned additional responsibilities for operating general merchandise warehouses under the DoD commercial warehouse service plan. The administration of general merchandise warehouses was transferred from the Army to DSA in October 1963.

Reduction in the number of Defense Surplus Sales Offices from 34 to 18 was completed in November 1963. Annual savings in operating costs were estimated at \$1.7 million, and improved service is expected through application of automated data processes at the remaining locations.

The DSA Data Systems Automation Office (DSAO) was established in February 1964 on the site of the Defense Construction Supply Center at Columbus, Ohio, to perform centralized data systems flow charting and detailed computer programing of all automatic data processing applications included in the DSA uniform ADP systems program. Staffing of DSAO will be accomplished within current personnel resources, and significant personnel savings in field programmers will be effected through this consolidation.

On May 21, 1964, the Assistant Secretary of Defense (I&L) authorized the establishment of an Automatic Data Processing Equipment (ADPE) Reutilization Screening Office in DSA. This office will become the focal point in the DoD to assure maximum use of ADPE no longer required by the original user.

Progress has been made in the automation of the DSA management information system, which provides for the identification of basic management data elements and the operation of a centralized automated data bank. Selected recurring statistical and accounting reports containing 4,426 basic data elements were mechanized to provide input. Operation of the data bank released operating personnel from time-consuming manual compilation, thereby permitting timely in-depth analysis of data.

An integrated performance standards program was instituted at all major DSA field activities. This was designed to assess effectiveness, efficiency, and economy in the utilization of manpower and funds. The program established criteria for management to appraise the current relationship of workload to manpower, and to evaluate personnel productivity in the operating functions on a continuous basis. Performance standards established under this program will be employed in the development and execution of DSA operating budgets.

Budgeting and Funding

Generally DSA uses appropriated Operations and Maintenance (O&M) and Research, Development, Test, and Evaluation (RDT&E) funds to pay operating costs (except military personnel costs) and a Stock Fund to finance supply inventories. It funds certain surplus disposal activities out of the proceeds of sales.

DSA's share of the O&M Defense Agencies appropriation for fiscal year 1964 was \$256.7 million. Additional funds were received from the military departments as reimbursement; total DSA operating costs in fiscal year 1964 amounted

to \$278.6 million. DSA's O&M budget for fiscal year 1965 provides for \$263.5 million in direct obligational authority.

On November 1, 1963, the Defense Documentation Center (DDC) was transferred from the Department of the Air Force to DSA with \$5.9 million in appropriated RDT&E funds. An additional \$0.6 million was transferred to DSA during fiscal 1964 for DoD support of other governmental R&D activities. The 1965 RDT&E budget requested \$11.4 million in direct obligational authority for DDC and associated administrative support costs.

DSA used Military Construction funds totaling \$1.0 million during fiscal 1964 to provide for administrative and logistical facilities, including minor construction and planning. Procurement, Defense Agencies funds in the amount of \$0.9 million (including fiscal year 1963 carryover) were used principally for materials handling equipment and administrative vehicles. The fiscal year 1965 budget includes \$2.0 million and \$2.5 million appropriated for Military Construction and Procurement requirements, respectively.

Under the appropriation Family Housing, Defense, \$39,000 was obligated by DSA during fiscal year 1964 to operate 33 family housing units. For fiscal 1965, \$193,000 was requested to operate, maintain, and improve 118 units.

Data reflecting operations, by center, of the Defense Stock Fund in fiscal year 1964 are shown in table 34. Sales at the centers exceeded obligations by \$160.4 million. With proceeds from surplus sales and other income totaling \$800,000, the net investment change resulted in an inventory drawdown of \$161.2 million, exceeding the approved program by \$46.6 million. Projections for fiscal 1965 provide for \$1,808.0 million in net sales and \$1,697.4 million in obligations, and an inventory drawdown of \$110.6 million. These net reductions represent sales of items in long supply or excess without replacement and do not involve stocks required for support of current operations or mobilization reserves.

Personnel

Personnel strength increased from 25,970 to 31,141 during the year, due primarily to the transfer to DSA of the Army depots at Memphis and Ogden, the Defense Documentation Center, and the industrial plant equipment mission. Personnel savings attributable to the consolidation of missions and functions in DSA totaled approximately 5,700 as of June 30, 1964.

Summary statistics on the growth and distribution of DSA personnel strength are shown in figure 1. Further transfers of manpower spaces from the military departments expected during fiscal year 1965 will approximate 700. This excludes spaces identified with contract administration services, for which resources must be identified.

The personnel adjustments which characterized the previous fiscal year have continued. These involved the transfer of employees from the military departments, as well as some intra-agency movement associated with internal realignment of management responsibilities. Arrangements were made to minimize personal hardships and management disruptions in the interrelated actions of closing DASC and expanding functions at DCSC.

In the military personnel area some progress was made toward a more balanced staffing of DSA. As of June 30, 1964, Service distribution was: Army, 49 percent; Navy, 23 percent; Air Force, 25 percent; and Marine Corps, 3 percent. Authorized distribution was Army, 41 percent; Navy, 27 percent; Air Force, 28 percent; and Marine Corps, 4 percent. Goals were not met due to the transfer of the Army depots at Memphis and Ogden, which were over 96 percent Army staffed

STATUS OF DSA PERSONNEL

Activity	June 30, 1963			June 30, 1964		
	Total	Civilian	Military	Total	Civilian	Military
Automotive.....	692	670	22	(1)	(1)	(1)
Clothing and Textile...	4, 020	3, 934	86	3, 762	3, 696	66
Construction.....	3, 874	3, 790	84	4, 656	4, 587	69
Documentation.....				486	484	2
Electronic.....	4, 292	4, 176	116	3, 708	3, 653	55
Fuel.....	301	281	20	348	325	23
General.....	2, 691	2, 585	106	2, 474	2, 404	70
Industrial Plant Equipment.....				448	446	2
Industrial.....	2, 448	2, 403	45	2, 754	2, 706	48
Logistic Services.....	1, 203	1, 190	13	1, 131	1, 122	9
Medical.....	608	572	36	724	693	31
Subsistence.....	1, 646	1, 507	139	1, 870	1, 732	138
Traffic Management...	1, 026	935	91	1, 090	996	94
Data Systems Auto- mation Office.....				48	48	
Procurement Support Offices.....	549	540	9	597	588	9
Mechanicsburg Depot...	771	764	7	1, 391	1, 357	34
Memphis Depot.....				1, 796	1, 771	25
Ogden Depot.....				1, 691	1, 660	31
Tracy Depot.....	941	926	15	1, 128	1, 111	17
Administrative Support Center.....	188	138	50	296	254	42
Headquarters, DSA...	720	621	99	743	641	102
Totals.....	25, 970	25, 032	938	31, 141	30, 274	867

¹ Disestablished.

Figure 1

as the fiscal year ended. Staffing of these depots will be adjusted toward the authorized percentages as current tours of duty are terminated.

Procurement and Production Program

Procurement awards during the year totaled \$2.7 billion. Purchases by the subsistence, clothing and textile, and fuel centers constituted more than three-fourths of the total. DSA made 91.5 percent of all purchases on a competitive basis, including 37.8 percent procured through formal advertising. Small business firms received awards of \$1.01 billion, or 43 percent of all dollar awards to U.S. firms—5.5 percent over the annual goal. DSA's small business and labor surplus area programs provided procurement counseling to more than 3,600 firms, both small and large. Of the 3,000 firms added to the bidders lists, over 2,400 were obtained as a result of participating in 44 industrial assistance events. Awards made to these bidders accounted for a significant portion of the \$3.73

million in audited savings achieved through broadening of the competitive base.

Procurement leadtime averaged 39.7 days, substantially under the DoD objective of 45 days. To further reduce leadtime and costs of procurement administration, DSA developed and tested a uniform automated system for small purchases. The system, covering all assigned Federal supply classes, is expected to be fully operable by the end of fiscal year 1965.

Significant progress was made in standardizing and simplifying procurement procedures in such areas as solicitations, internal reviews, commodity buy lists, contract provisions, and fast buy procedures for small purchases. Continued improvements in procurement management will be stressed to assure that purchases are made at the lowest sound price.

Market analyses and evaluation of industry's production cycles were exploited to achieve the optimum interrelationship of requirements forecasting, procurement scheduling, and fund availability. Varying guidelines are needed for the individual centers, e.g., most food procurements are tied to crop harvests, the best time to buy clothing is when seasonal civilian demands are minimal, and centers which procure technical-type hardware cannot utilize truly cyclical forecasts. DSA will continue to expand its efforts to identify and exploit the "best time to buy" during fiscal year 1965.

Arrangements have been made with about 7,000 potential producers for emergency production of critical combat essential items procured by DSA. Substantial increases in industrial mobilization agreements are expected as the Services complete transfer of item cognizance. Increasing industrial base capacity, through industrial readiness planning, was established as an element of the Cost Reduction Program with a goal of \$3.03 million for fiscal year 1965. Savings will be obtained from the reduction in fund requirements for mobilization reserve stock resulting from the agreements.

DSA realized substantial savings by using materials declared excess to the national stockpile. Waterfowl feathers and down valued at nearly \$1.1 million were used in a procurement of sleeping bags, mercury valued at \$800,000 was used for medical equipment, and sizable quantities of quebracho were used for tanning leather for military footwear. Serious production difficulties were alleviated by the utilization of excess cadmium, antimony, and crude rubber from the stockpile. These materials were essential to production of fire-retardant shipboard items, tires, and aircraft parts. By keeping our supply centers advised of available materials, similar or greater savings are expected during fiscal year 1965.

DSA implemented and will continue to refine an integrated quality and reliability program, stressing the preventative role of quality discipline through liaison with developing, retailing, and using agencies. An example was the Quality Check Program consisting of discussions with actual users to determine attitudes toward the quality of the commodities we buy. Another example was the Intra-Governmental Procurement Advisory Council on Drugs (IPAD), a DSA-sponsored agency which will maintain a central pool of information on drug procurement methods and standards, the qualifications of drug manufacturers, and a common Government-wide system of reporting adverse reactions to drugs. The transfer of quality control functions to the contractors progressed during the year. In the field of subsistence alone, this procedure saved nearly \$400,000, and savings of over \$1 million are forecast for the coming year.

Commencing January 1, 1964, Defense supply centers assumed responsibility for direct support of DSA centralized items to Army oversea forces. In March

1964, DSA also began to supply Army oversea forces with decentralized and non-cataloged DSA items previously furnished by Army oversea supply agencies. With respect to the latter, the subsistence regional headquarters at Alameda and New York will procure the items during a 6 months' test. These procedures, and the feasibility of extending such support to the Navy and the Air Force, are to be evaluated by DoD during fiscal year 1965.

Automation of DSA Operations

A primary consideration in the establishment of DSA was that an agency directly under the Secretary of Defense could develop and install a single set of uniform supply procedures to replace the varied systems evolved by the separate military departments. This concept is being implemented progressively through DSA's Uniform Automated Data Processing System (UADPS) program. Results of completed segments of the program, such as the distribution system and the management information system, have been discussed above. A uniform system for the Mechanization Of Warehousing And Shipping Procedures (MOWASP), for installation at all DSA depots, progressed to the point that a request for proposals was forwarded to all interested manufacturers of automated data processing equipment. It is expected that selection and test of equipment and pilot installation at the Data Systems Automation Office, the testing installation, can be completed by September 1965.

A uniform system for material management at all DSA centers, including integrated systems in the functional areas of cataloging, distribution, requirements, financial control, and procurement, was still in the planning stage. Task groups in each area, in coordination with data systems personnel, were developing criteria for these systems.

During fiscal year 1964 DSA implemented the first system linking the automatic digital network of DoD data communications (AUTODIN) with a computer programed to perform logistical functions by activation of the AUTODIN computer interface terminal at the Defense Industrial Supply Center, Philadelphia, Pa., in June 1964. Similar terminals were also installed at Defense Depot Ogden and at the Defense Logistics Service Center, Battle Creek, Mich. Following operational evaluation of these prototypes, it is expected that this automated system will be installed in all major DSA activities.

Military Standard Logistics Data Systems

An entire family of military standard data systems has been produced jointly by DSA and the military Services to meet current logistics requirements. The development of these data systems eliminated many of the varied procedures, codes, data elements, and formats existing throughout DoD, and provided the base for expeditious processing of logistics information through greater reliance on high-speed data processing equipment, communication systems, common code languages, and machine-processable formats. These systems have affected all elements of DoD, and, in some instances, GSA and the Coast Guard. Because of an increasing trend toward supply support crossing military Service lines, it was essential that a single monitoring agency assure uniform systems application among users. DSA has been designated as the single focal point in DoD for system supervision after the design and implementation phases. The agency monitors DoD-wide application of the standard data systems described below and coordinates all changes and improvements recommended by users.

The Military Standard Requisitioning and Issue Procedures (MILSTRIP) have been used by all DoD elements since July 1962 in ordering and issuing supplies. Also supervised by DSA are the Military Standard Transportation and Movements Procedures (MILSTAMP) which were implemented DoD-wide in October 1963 to control shipments of materiel from supply source to user. Inasmuch as commercial contractors and vendors are also affected by these data systems, companion MILSTRIP and MILSTAMP procedures for contractors will be published.

A third data system—Military Supply and Transportation Evaluation Procedures (MILSTEP)—was under development for implementation with a target date of January 1966. This procedure will prescribe the means for measuring the time intervals from date of submission of a requisition until receipt of materiel by user. Thus the operational effectiveness of all links of the logistics chain, can be gauged for materiel movements under MILSTRIP and MILSTAMP.

Procedures, codes, and punched card formats for recording receipt, due in, inventory count, and adjustment supply transactions, and also for maintaining stock records, were fully automated. They were being provided to DoD storage depots, stock control activities, and inventory control points in the Military Standard Transaction Reporting and Accounting Procedures (MILSTRAP). This newly designed system will furnish the remaining standard transactions which complement the issue procedures of MILSTRIP. This system is to be effective throughout DoD on July 1, 1965.

It is anticipated that additional benefits in machine operations, shipment planning, and movement control will accrue from adoption of standard procedures for coding and publishing the address of installations and activities as contained in the Military Standard Activity Address Directory (MILSTAAD). Systems design is awaiting approval. Implementation is scheduled for July 1965.

Defense-Wide Services

During fiscal year 1964, DSA administered Defense-wide programs for cataloging, materiel utilization, surplus disposal, coordinated procurement, and traffic management. In several of these areas, the agency was also charged with special responsibilities for the commodities it managed. During most of the fiscal year, DSA administered the Defense-wide standardization program, which was transferred to a new DoD Office of Technical Data and Standardization Policy in June 1964. As standardization assignee for nearly half of the classes in the Federal Catalog, DSA has retained a major interest in this activity.

Continued efforts were made to improve the operation and utilization of the Federal Catalog System. An important aspect of the UADPS program, already mentioned, is a complete reorientation and automation of the cataloging process, scheduled for completion in calendar year 1965. Facilitated interchange of cataloging data with the Services and the General Services Administration (GSA) has resulted, and automation is expected to effect major improvements in processing and controlling catalog submissions. Increased use of descriptive-method item identifications was stressed to supplant reference-type identifications. This step was an essential prerequisite for improvements in item entry control, item reduction, and competitive procurement actions. A goal was established to increase descriptive-type item identifications to 60 percent of the Federal Catalog as compared with a level of 53 percent at the end of the fiscal year.

Reduction of the items assigned to DSA for management continued to be a high priority objective. One related program, established in July 1963, seeks to identify and eliminate inactive items. During the year a total of 55,861 items, which were managed by DSA for at least 24 months with no demands, were brought under review. By agreement with potential customers, 13,494 of these were designated for deletion. In the coming year, review of items will be accelerated by the use of simplified criteria and the decision to review items after 21 months with no demand. It is expected that 75,000 zero-demand items will be deleted. Through the use of this and other techniques for item reduction, DSA centers reached agreement with the military Services on eliminating 56,809 DSA-managed items and 23,844 related Service-managed items.

In spite of the number of items that were deleted from those assigned to DSA and the Services, however, it was believed that greater success would be achieved in reducing the number of items in the Federal Catalog if procedures were established to control the entry of new items into the system. Accordingly, two separate projects with this objective were begun during the fiscal year.

DSA has embarked on a 4-year development program which will eventually result in a "front screen". The dual purpose of purging the system of duplicate items and barring the entry of nonessential items will be served by use of the newly developed program. Federal supply classes with the greatest item population and growth will be the first to be reviewed. Development of automated techniques for classifying and indexing items in accordance with characteristics will be a primary objective.

The DoD Item Entry Control Office, established as an activity of DSA, developed a pilot test to determine the feasibility of performing a technical review prior to assignment of catalog numbers to proposed new items. The test will begin on July 1, 1964, at five activities, and a characteristic screening of new item proposals in seven Federal supply classes will be made. This office also engaged in studies to foster the use of existing standard items in the design development of new military equipment.

Full-scale provisioning screening capability was attained by DSA's Defense Logistics Services Center (DLSC) in February 1964. The military Services and many civil agencies have used this service to determine whether manufacturers' part numbers for new items match identical items already assigned Federal stock numbers. During fiscal year 1964 \$1.97 million was credited as cost avoidance savings in the DoD Cost Reduction Program. These savings were based on elimination of unnecessary cataloging through the screening process.

Continuous emphasis was placed on the Defense Utilization Program, particularly in view of its cost reduction significance. Procedures were implemented at DLSC for centralized, mechanized matching of military Service requirements against available assets, including acceptable substitutes, on a DoD-wide basis. As of June 30, 1964, requirements valued at \$8.4 billion and assets of \$3.8 billion were recorded in the DLSC computer file.

The obsolescence and replacement of major weapon systems, such as NIKE-AJAX and REDSTONE, resulted in many highly complex and expensive components being phased out of active inventory. Finding new uses for such equipment, which would otherwise be disposed of as surplus at a fraction of its cost, involved preparing illustrated brochures to describe these components and offer them to potential users. Seven brochures produced through fiscal year 1964 have resulted in utilization of materiel worth more than \$227 million, and during fiscal year 1964 alone the reutilization of weapons systems within DoD exceeded \$103 million.

The Defense Utilization Manual, which consolidates utilization procedures in a single reference, was completely rewritten. Integrated, cyclic screening of releasable assets against requirements and a uniform Defense-wide reporting system for the utilization program were provided for in the revision. Procedures for retail interservicing at post, camp, and station level were also prepared and are being staffed with the military Services. The value of materiel, including excess, utilized through the Defense Utilization Program in fiscal year 1964 totaled \$1,325 million, an increase of \$168 million over the preceding year.

DoD efforts to reduce supply inventory accelerated declarations of property as excess or surplus. The total acquisition value of DoD materiel utilizations and disposals in fiscal year 1964 was \$6,828 million. Proceeds from sale of usable property amounted to \$60.7 million, a return of 6.2 percent of acquisition costs. Further details regarding these programs are given in table 38 of the appendix.

Centralized management of certain aspects of the DoD surplus disposal program permitted reduced operating costs and increased productivity. At the end of the year all Defense disposal operations were governed by a single DoD manual which incorporated all related policies and procedures applicable to the DSA and to military Services worldwide. Mechanization of both the Defense surplus bidders list of potential buyers and of sales reporting operations provided a number of benefits. Examples of these are more selective sales coverage and distribution of sales catalogs, machine preparation of contracts and release documents, and continuous automatic purging from the list of nonparticipating bidders. There now exists a research and analysis capability which involves product analysis of selected surplus commodities and development of new merchandising techniques, geared to changing market conditions.

Managing the DoD-wide coordinated procurement program, whereby one military department or agency performs central purchasing of certain items for all, is also a DSA responsibility. In its entirety, this program currently accounts for annual expenditures of some \$9 billion. A revised DoD instruction setting forth policies and procedures for the commodity aspects of the program was issued late in the fiscal year, and a project was started to update implementing procedures covering each assignment. A concentrated effort was made to accelerate the purchase by DSA of Service-managed items which met the criteria for DSA procurement. During the fiscal year, DSA acted as buyer of about \$55 million's worth of such Service-managed items.

Defense Traffic Management

Two additional missions were added to the traffic management functions performed for DSA by the Defense Traffic Management Service (DTMS). In January 1964 DTMS was given responsibility for the traffic management aspects of the DoD household goods movement and storage program on a worldwide basis. Additionally, property accountability for the Defense Freight Railway Interchange Fleet was assigned to DSA effective July 1, 1964. From that date DTMS will exercise ownership and operational control over some 5,300 military-owned freight cars used to haul specialized items of defense materiel.

During fiscal year 1964, DTMS quoted 710,500 freight rates and 26,300 passenger rates on behalf of various Defense elements, issued 144,800 freight route orders, and arranged 18,300 group movements. Some 22.4 million short tons of freight, 0.8 million short tons of household goods, and 4.5 million passengers were moved under DTMS cognizance at a cost of \$308.8 million, \$237.7 million, and \$126.9 million respectively. DTMS estimated economies of \$19.7 million

under the DoD Cost Reduction Program, accruing to the military departments as a result of use of air transportation (passenger), through-bill movement of household goods, and use of Great Lakes ports.

Civil Defense Support

DSA continued support of the Civil Defense Fallout Shelter Supply Program through procurement, storage, and issue of shelter supplies, food, water containers, sanitation kits, and medical kits. Approximately 56 percent of shelter supplies procured for 63 million shelter spaces were stored at 67 locations occupying 4.2 million net square feet of storage space. Civil defense chemical, biological, radiological, and engineering program operations at four locations (three GSA and one Army) were consolidated at two DSA activities.

Relationships With Federal Civil Agencies

Recognizing the increasing role that could be played by the General Services Administration in supply support to military activities, the Assistant Secretary of Defense (I&L) in September 1963 assigned the Director, DSA, the duty of monitoring all DoD relationships with GSA in respect to procurements and supply services. This included maintaining a review of GSA performance under approved arrangements and, in collaboration with the military departments, taking steps to assure efficient use of GSA services.

GSA support to the Department of Defense during the fiscal year involved sales of \$976 million, an increase of \$198 million from the previous year. A large part of the increase in sales resulted from the transfer of management responsibility for hand tools and paint from DSA to GSA. Items in these categories worth \$58 million were transferred to GSA, and \$7 millions' worth were turned back to the military departments. Some 23,800 centrally managed items were involved, for which DSA retains cataloging and standardization responsibilities. The value of all transfers from DSA to GSA in fiscal 1964 was \$64 million.

The Administrator of the GSA and the Assistant Secretary of Defense (I&L) developed a tentative agreement which identified, clarified, and stabilized the respective supply management roles of DSA and GSA. If proved feasible in practical application, the agreement, including the criteria and other provisions embodied therein, will fulfill the DoD and GSA obligations to the Joint Economic Committee of the Congress for development of a plan for a Government-wide supply system. To test the practicality of the agreement, DSA began studies of the feasibility and desirability of DSA providing supply support, on a Government-wide basis, for subsistence, medical, clothing and textile, petroleum, and electronic supplies. These studies involve an analysis of civil agency requirements in terms of range and nature of support to be provided, systems compatibility, impact on DoD, and the economic considerations that would result from consolidations incident to such support. The commodity support test results and final evaluation reports will be available late in fiscal year 1965. The DoD-GSA agreement also involved criteria for determining DSA items susceptible for management by GSA for the DoD. These criteria were under test for their feasibility in application, with the results to be available during the fiscal year 1965.

In April 1964, DSA and the Federal Aviation Agency (FAA) signed an agreement whereby FAA would requisition materiel from the Defense Electronic Supply Center on a reimbursable basis. Support began in June. Initially,

FAA asked for support on about 500 items of electron tubes, but this number is expected to increase. On June 19, 1964, DSA and the Coast Guard signed an agreement whereby Coast Guard units may requisition DSA centrally managed items of supply directly from Defense supply centers. The Defense Medical Supply Center continued to provide medical materiel from DSA stocks and procurement services for nonstocked items for the Veterans Administration and the Public Health Service. Agreements with these two Federal civil agencies were made by the Military Medical Supply Agency prior to the establishment of DSA.

Supply Effectiveness

DSA has established a standard system to measure supply effectiveness in two ways. One measurement—stock availability—reflects the performance of centers as inventory managers in having stock on hand to satisfy customer requisitions at the time they are received and edited. The other—on-time shipments—reflects the over-all performance of the DSA supply system in processing requisitions and shipping materiel within the time period allowed under MILSTRIP procedures. Goals were established against which actual performance could be compared.

Measured in these terms, over-all stock availability was 89.2 percent, which was above the goal of 85 percent, and on-time fill 72.4 percent compared to a goal of 83 percent. Those percentages were achieved in spite of an increase of 62 percent in the number of DSA customer requisitions from the previous year.

The degree of effectiveness varied between centers from month to month, and while not all factors unfavorable to performance could be identified, changes in item management responsibility already described had a temporary disrupting effect. A considerable number of back orders were transferred to DSA along with inventory capitalizations. In some cases, too, there were delays in processing requisitions at DSA depots, particularly at temporary storage sites. This last factor has, of course, been aggravated by efforts to phase out such sites through attrition.

Improvements in supply effectiveness reporting were instituted which will make possible closer surveillance of field operations from the Headquarters. A major addition to the system was the report on depot supply performance. Plans for still more far-reaching improvements in effectiveness reporting are an essential part of the program for automating DSA operations, already described.

Cost Reduction Program

DSA participation in cost reduction bears a priority second only to that of effective support to the armed forces. DSA's contributions to cost reduction are both direct and indirect. All of DSA's operational elements participate directly in meeting DoD cost reduction goals. DSA activities search out additional sources of savings outside the formal DoD Cost Reduction Program. Indirect contributions result from DSA activity in administering Defense-wide programs and performing Defense-wide services, such as materiel interservicing, item reduction, and traffic management. These efforts are reflected in savings largely accruing to and reported by the military departments.

During fiscal year 1964 DSA accomplished direct cost reductions totaling \$99 million, 14 percent over its established goal of \$87 million. The largest single item, operating expense savings, accounted for \$42 million. Operating savings were derived in large part from a redesigned distribution system and a consolida-

tion of service functions formerly performed by the military departments. Refinement of secondary item requirements, including initial provisioning, was the second largest area and accounted for \$35 million. Value engineering contributed \$5 million; item withdrawals, \$9 million; and increased competitive procurement, \$3 million. An inventory drawdown of \$161.2 million, already mentioned in connection with stock funds, was credited as a one-time saving.

Cost reduction goals for fiscal years 1965 and 1966 were set at \$170 million and \$248 million, respectively. These expanded goals reflect anticipated management improvements in all areas, but especially in the reduction of secondary item requirements and in the promotion of value engineering. Potential savings to result from the consolidation of contract administration services are being explored. New goals, internal to DSA, were also added in the areas of broadening the competitive base and in reduction of mobilization reserve requirements by broadening their industrial production base.

Summary

After 3 years of operation, DSA was well down the road toward accomplishment of all its original objectives. Of the projected family of military standard logistics data systems, two were in operation, two others were being implemented, and the rest were entering the final phases of design. Insofar as the originally assigned functions of DSA were concerned, relationships with the military Services and the Federal civil agencies were clarified and stabilized. Cooperation was close and increasingly effective.

During the last year the agency undertook new areas of activity or responsibilities not anticipated in the original DSA charter. Custody of idle industrial plant equipment was in itself a responsibility of considerable size. Moreover, it carried the responsibility for working with the military Services to insure that industrial plant equipment no longer required for the purpose for which originally authorized was promptly reported for reuse. Assumption of responsibilities in the scientific and technical documentation field brought DSA into the new and rapidly expanding area of automated research information retrieval systems.

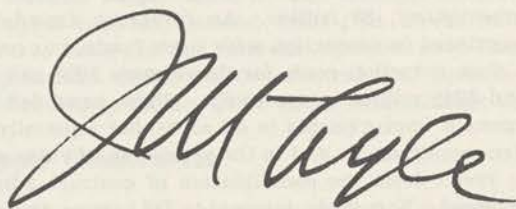
Supply of DSA decentralized noncataloged items to the Army overseas increased DSA's support activity for overseas military forces. Expansion of DSA support for Federal civil agencies likewise expanded its supply support mission.

DSA's newly assigned contract administration function was the largest new assignment since establishment of the agency. New assignments usually involve obstacles, and the contract administration services function was no exception. Considerable facilities alteration and construction will be required for consolidation of dispersed contract administration activities of the military departments. In most cases interim minimal facilities will have to be made available through urgent minor construction projects. This will be followed by planned military construction on a long-range basis for permanent facilities. The functional and geographical realignments of personnel accompanying these installation changes will also require long-range planning to minimize personal hardship and management disruptions.

The end of fiscal year 1964 found DSA close to the fulfillment of its original management assignment and embarking upon a second assignment of almost equal magnitude. Tentative plans were being made for still further assignments, some of them in previously unexplored functional areas. All these activities and accomplishments were in conformance with DSA's original and unchanged basic mission:

—First and foremost, to provide effective logistical support to the operating forces of all the military Services, in war or peace.

—Second, to provide that support at the lowest possible cost to the taxpayer.

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

J. M. LYLE,
Vice Admiral, SC, USN
Director, Defense Supply Agency

I. Introduction

Annual Report of the SECRETARY OF THE ARMY

July 1, 1963 to June 30, 1964

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1. Introduction

The past year has been a period of steady internal improvement for the Army. Under the stewardship of Mr. Cyrus R. Vance until he became Deputy Secretary of Defense on January 28, 1964, and under Mr. Stephen Ailes since that time, the Army has worked ceaselessly to increase its combat capabilities. For multiple national needs the Army offers the choice of multiple responses. It stands ready to meet the challenge of a general war or to help allies in turning back the threat of local insurgency. Around the world from Europe to Vietnam, Army forces form part of the Defense team dedicated to counter-ing aggression.

From the "cutting edge" overseas to the backup forces in the United States, the Army has made every effort to provide its fighting men with the best training and equipment available. Rather than attempting to match potential enemy forces man for man, the Army has striven for qualitative superiority in communications, firepower, mobility, and support in depth.

Fast, efficient means of communications have been developed to provide dependable information on a timely basis. In the field of firepower, the Army seeks improved ammunition with increased range and lethal effect and more mobility and protection for the weapons. It is placing the greatest emphasis upon the air transportability of weapons and equipment and upon the organic air mobility necessary to bolster combat effectiveness. The Army now has a highly versatile strategic force ready for employment in any environment against any foe. Behind the strategic force are units of the Immediate Reserve, which have been brought to an improved state of deployment readiness through an improved training program and the issue of selected items of new equipment and weapons. In addition, the Army has instituted a system of periodic readiness reporting that will eventually enable it to identify the combat status of all units and to remedy deficiencies rapidly.

The great strides forward in weapons and equipment would be meaningless without a corresponding improvement in the men that use them. The soldier is still the hub of the Army wheel, and today he must possess not only the courage to meet the enemy on the battle-

field but also the many special skills required to operate the complex equipment of a modern force.

To prepare the soldier for this dual role, the Army has improved its training program. Starting with the recruits, the Army has sought to enhance instruction and point up the rewarding features of an Army career. In the process the Army hopes to produce and retain men who can handle rifles or radios, cannon or computers, as the situation demands.

As part of this intensified training program, Special Warfare Forces have been organized, trained, and dispatched on counterinsurgency missions. Many Army personnel have taken special warfare training to prepare for diversified missions in unconventional warfare, counterinsurgency, and psychological warfare.

Training the men is but one part of the problem of combat readiness; retaining them is another. The more sophisticated weapons and equipment coming off the production lines demand a higher level of troop education and training. The skills that the soldiers thus acquire are at a premium in the civilian area and the Army has had to seek greater inducements to retain them. Better pay, broader opportunities for schooling and promotion, and improved troop and dependent housing are some of the incentives that the Army has strongly supported to attract and hold skilled personnel.

Well aware of the rising costs of personnel, goods, and services, the Army has conscientiously carried out its part in the Defense Cost Reduction Program to eliminate waste, duplication, and frills. It has stretched out its procurement goals to prevent block obsolescence of weapons and equipment. Measured modernization promotes an orderly flow of new items into the Army's inventory, maintains a stable production base, and eliminates uneconomical surge buying. The Army has tried to use its assets fully by aiming at a goal of peak efficiency at the lowest possible cost. Much still remains to be done, but continuing efforts to improve operations all along the line form the cornerstone of Army policy.

II. Preparedness

Whether they are stationed in potential trouble spots overseas or undergoing training in the United States, the objective of Army forces is essentially the same—to be ready for any emergency. The outbreak of insurgency in a friendly nation, a disastrous flood or earthquake and its aftermath, or a major threat from a powerful enemy—any of these challenges may have to be met at any moment. The Army is ready to respond as the situation demands with aid and assistance, medical help and disaster relief, or a full-scale effort to resist aggression. Deployed around the world, Army forces are equipped with the best materiel available and given thorough training for their tasks. They are prepared.

The Pacific-Far East

USARPAC

The U.S. Army in the Pacific (USARPAC) is deployed on a frontage of over 6,000 miles of political and military turbulence in five major areas: Hawaii, Japan, Korea, Okinawa, and Thailand-Vietnam. Active combatant forces include three infantry divisions, an airborne infantry brigade, and other combat elements such as a missile command, separate artillery battalions, air defense battalions, and aviation companies.

The bulk of USARPAC forces are deployed with the Eighth Army (EUSA) in Korea. These forces are maintained by EUSA logistical support units, including the Eighth Army Support Command. The U.S. Army, Japan, stationed at Camp Zama, operates a major logistical complex, but has no combat forces. In Okinawa the U.S. Army, Ryukyu Islands, is a multifaceted operation administering the IX U.S. Corps, an airborne brigade, a portion of the Asia Special Action Force, an air defense brigade, and a LITTLE JOHN rocket battalion. The situation in Southeast Asia has made necessary a major allocation of U.S. Army resources to the Republic of Vietnam and Thailand to bolster the defense and security needs of those countries.

The military assistance commands in Vietnam and Thailand control over 12,000 U.S. Army personnel including engineer, signal, aviation, medical, ordnance, quartermaster, military police, transportation, and

other specialized units. In Thailand, the support units are administered by the 9th Logistical Command; in the Republic of Vietnam, they are administered by the U.S. Army Support Command, Vietnam. Both commands are under the Commanding General, U.S. Army, Ryukyu Islands, less operational command. The U.S. Army has made significant contributions to the people of Vietnam and Thailand. Other U.S. Army personnel are represented in Military Assistance Advisory Groups (MAAGs) in Korea, Japan, Taiwan, and the Philippines, in the Military Training Assistance Group in Indonesia, and in the Military Equipment Delivery Team, Burma.

Headquarters, USARPAC, is in Hawaii. The U.S. Army, Hawaii, and the 25th Infantry Division are also located on Oahu.

During the year, elements of the 25th Infantry Division took part in Exercise QUICK RELEASE. In a striking exhibition of the possibilities of airlift used in conjunction with the forward floating depot concept, an augmented infantry brigade of the 25th Division enplaned in Hawaii and flew to Okinawa in January 1964. In the meantime the forward floating depot, consisting of three Victory ships loaded with prepositioned sets of equipment and outfitted with controlled humidity plants, had sailed from Subic Bay, Philippines. From Fort Eustis, Va., planes brought a transportation terminal service company to unload the vessels at Okinawa. The 25th Division units quickly "married-up" with the equipment and were ready for action. The exercise demonstrated how rapidly the United States could react to an emergency in that area.

The Conflict in Vietnam

In the early part of fiscal year 1964, there was reason for optimism as the total effort of Army advisers, units, and materiel furnished under the Military Assistance Program began to make an impact upon the situation in Vietnam. Despite sometimes strained political relationships with the Republic of Vietnam Government, headed by Ngo Dinh Diem, there were signs of progress. Operation BEEF UP of a year earlier had created a favorable American image in the Republic of Vietnam that was not lost upon the insurgents. The strategic hamlet program was reported by the Vietnamese to be within 2,000 units of reaching its objective of 11,000. In October 1963, the United States determined that the situation had been stabilized to the extent that a partial withdrawal of U.S. forces could be considered.

In the following 3 months, however, two significant political events—the November 1963 coup, which ousted the Diem government, and the bloodless January 1964 coup, which brought General Nguyen Khanh to power—tended to slow down and disrupt political and military progress. Later investigation showed that previous reports of prog-

ress were hardly realistic and that there remained much to be done. Following the January coup, considerable effort was made to reappraise the situation to determine a practical, workable course of action. In March 1964 General Khanh approved the "Chien Thang" plan. Although not a final and all-embracing plan or solution, it is a fairly well-conceived concept that provides a base for expansion of current efforts and direction for all elements of Vietnamese society toward a common objective—to halt insurgency and bring peace to the country.



Figure 1. SAF adviser briefing Montagnard strike force before moving out against nearby Viet Cong guerrillas.

In the meantime, there has been no letup in the U.S. Army effort in Vietnam. Plans approved in fiscal year 1963 have continued to be pursued and refined; goals adopted at the outset are unchanged and a more effective Vietnamese Army is beginning to emerge. The U.S. Army has streamlined its organization to achieve a better unity of effort. In May of 1964, MAAG, Vietnam, was inactivated and its functions were combined with the Military Assistance Command, Vietnam. By this action all functions of the military are directed through a single agency.

The total U.S. Army effort in Vietnam includes approximately 10,000 persons. Many work in the headquarters area in command, programing, planning, coordinating, and advisory functions at the highest levels of the government. Others work directly with the Vietnamese Army as advisors and trainers from corps down to company level. The largest U.S. Army group by far is the Army Support Command. Intelligence, communications, aviation, and logistical support functions comprise the major activities in which they are engaged, in most part in direct support of the Vietnamese Army.

The nature of this special kind of warfare in a country without modern communications, transportation, weapons, or intelligence agencies has challenged the best efforts of U.S. advisory personnel. The U.S. Army has provided its elements and the Vietnamese Army with the most modern communications and transport in its inventory. U.S. Army aviation support, which makes it possible to move large quick-reacting forces over rivers, jungles, swamps, and mountains in record time, has enhanced the Vietnam Army's mobility. In the area of weapons, all items adaptable to the situation have been provided. These include M-113 personnel carriers, 105-mm. and 155-mm. howitzers, the new M-79 grenade launchers, and Claymore mines. The presence in Vietnam of the Army Concept Team is evidence of continued U.S. interest in assisting the Vietnamese to improve techniques, materiel, and concepts. The Concept Team is evaluating on the ground those experiences and ideas that will insure the use of the most effective and appropriate materiel and tactics.

Laos

Across the Vietnam frontier in Laos the situation again became critical in the latter part of the fiscal year. The Communist refusal to give full support to the 1962 Geneva Accords weakened the position of Prince Souvanna Phouma and his coalition government. With the movement of the Communist Pathet Lao into the Plaine des Jarres during the spring, the Geneva Accords appeared to be in danger of complete collapse.

The United States has maintained no forces in Laos since the U.S. Military Assistance Command was discontinued and the personnel evacuated in October 1962 within the terms of the Geneva Accords.

Thailand

Although Thailand is not directly confronted by active insurgency within its borders, subversion and preparation for insurgency is going on, however, and this, coupled with the deteriorating situation in other parts of southeast Asia has created in Thailand a situation requiring immediate attention if insurgency is to be avoided. The U.S. Army has a vital role in the effort to head off insurgency and to shore up

Thai defenses against external security threats. Major undertakings developed in previous years are being continued in order to expand Thailand's economic, military, and logistical base and to assist in the preparation of its armed forces for possible future contingencies. Among these actions in Thailand have been construction of a new airfield west of Nakhom Phanom, delivery of rolling stock, construction (to be completed in 1966) of a bypass road around Bangkok, and establishment of materiel depots. In addition, there have been major contributions to the communications capability for the Thai military in areas once isolated and remote.

Besides improving the posture of the Thai Army through increased advisory and materiel assistance, many civic action projects, for the most part, carried out in connection with joint Thai-U.S. exercises, have been undertaken to raise Thai civilian standards of living and to reflect the consideration of the military for civilian welfare.

Korea

Far to the north of Thailand lies another bastion of the free world—the Republic of Korea (ROK). There, after 11 years of uneasy armistice, the forces of the ROK Army and the Eighth U.S. Army, under the operational control of the United Nations Command, face the Communist North Korean forces across a 150-mile-long demilitarized zone.

The major U.S. combat forces of the Eighth U.S. Army are the I Corps (Group) with its two American divisions, the 1st Cavalry and the 7th Infantry, the 4th Missile Command, and the 38th Artillery Brigade (Air Defense). Two members of the United Nations—Turkey and Thailand—still station combat troops in Korea and these units are attached to larger U.S. organizations. The I Corps (Group), whose mission it is to block the avenues of approach into the Republic of Korea on the west, has stationed the 1st Cavalry Division along a part of the demilitarized zone. The 7th Infantry Division is in reserve. The U.S. Army units regularly engage in simulated combat and participate in numerous exercises to maintain a high state of readiness.

Units added to Eighth Army within the last year include the 3d Battalion, 81st Artillery; 6th Battalion, 12th Artillery; and the Eighth Army Support Command. The two artillery battalions were deployed from the Continental United States (CONUS). The support command was organized, from resources made available within Eighth Army, to improve logistical support capabilities.

In addition to the combat and support units deployed in Korea, the Korea Military Advisory Group helps the ROK Army develop and maintain its force structure.

As an adjunct to the military support and assistance given by the Eighth Army and the Korea Military Advisory Group, the United States since 1953 has provided additional help to the Republic of Korea through the Armed Forces Assistance to Korea (AFAK). Initiated by Gen. Maxwell Taylor when he was commanding general of the Eighth Army, AFAK has proved to be one of the most successful programs of military-civilian cooperation ever employed in foreign areas by the U.S. forces. American assistance in building and reconstructing community facilities such as schools, public buildings, and bridges has helped enormously in overcoming the ravages of the Korean war.

Despite its success, the AFAK program has been dependent upon funds obtained from the Military Assistance Program rather than from a special appropriation and has had to compete with other activities of high priority. During the past year special efforts had to be made to secure \$376,000 from MAP funds to continue AFAK activities. Since the projects completed under the program have an estimated value three times the amount of the American contribution, it would appear that AFAK is a worthwhile investment and should be continued.

Administration of the Ryukyus

The United States administers the Ryukyu Islands under the terms of Article 3 of the Treaty of Peace with Japan. The Department of the Army, to whom the responsibility for supervising the administration of the Ryukyus has been delegated, has been entrusted with fulfilling a national obligation to insure that every appropriate effort is made to improve the welfare and economic well-being of the inhabitants of the islands. At the same time the Army supports the strategic requirement of maintaining the important U.S. military base complex on Okinawa, and the related military installations on the other islands, in a condition which permits them to perform their defense missions in support of U.S. and free world security. In these efforts the Army has sought the active cooperation and support of the Ryukyuan people in administering the local government, improving the local economy, advancing the Ryukyuan culture, and maintaining good relations with the U.S. forces. The High Commissioner of the Ryukyu Islands, an Army officer, heads the U.S. Civil Administration of the islands. The Civil Administrator is his principal advisor and assistant. The Government of the Ryukyu Islands, staffed by Ryukuans, is the organ of local self-government.

It has been the policy of the U.S. Civil Administration to encourage the Government of the Ryukyu Islands in the development of effective and responsible government. Recent significant steps in that direction

have included the assignment to a Ryukyuan agency of the function of supervision of banks and insurance agencies, and the expansion of the jurisdiction of local Ryukyuan courts in fields that do not directly affect the security, property, and interests of the United States.

Cooperation in the economic field has produced most encouraging results. During the past 3 years all the conventional indicators of economic growth have shown substantial increases. For example, per capita income has risen over 30 percent since the end of fiscal year 1961, and revenues available to the government have risen from \$27.3 million in fiscal year 1961 to \$50 million in fiscal year 1964.

In achieving these important economic gains, a balanced development program guided by well-defined goals has been adopted and has made efficient use of the direct U.S. aid (\$7.7 million in fiscal year 1964) appropriated by the Congress. The program and its goals were derived from a realistic appraisal of the current and potential resources available in the Ryukyus. Accordingly, important progress was made during the year in modernizing the sugar industry; agricultural production has been increased; and continuing efforts were made to make Ryukyuan farmers aware of the advantages and opportunities of a diversified agriculture.

Electric power has been brought to many new areas, while the over-all cost to the consumer has been reduced 20 percent. A major electric powerplant at Kin, financed in part by a U.S. loan, will be completed in 1965 and will add 80,000 kilowatts to local electric power resources.

The problem of water supply in the Ryukyus has been a subject of concern and special efforts by the Department of the Army and the U.S. Civil Administration. Although the total annual rainfall in the Ryukyus would seem sufficient in most years, the bulk of the rainfall usually comes during the typhoon season and runs off too rapidly. Water consumption, especially on Okinawa, has been progressively increasing. Starting with a major study initiated several years ago, a long-range master plan was evolved, and as part of it a 5-year plan was initiated for phased development and expansion of water storage and distribution facilities. During the past fiscal year this plan was placed in operation using \$2 million of the funds appropriated by the Congress and \$2.5 million from the High Commissioner's General Fund. Active consideration is also being given to modern desalination facilities for the island of Okinawa.

Expanded educational opportunities have been provided the Ryukyuan people through a steady improvement in school physical plants, teaching equipment, and the quality of teaching. U.S. and Japanese grants have provided assistance to Ryukyuan students for study abroad. The University of the Ryukyus, established in 1950, has grown from a

faculty of 28 and a student body of 562 to a teaching staff of 174 and an enrollment of 2,467. Michigan State University has provided a consultative group under a Department of the Army contract which has aided the university's development since 1951.

A binational Friendship Center, a Ryukyuan-American Cultural Center, and five other cultural centers, all supported and operated by the U.S. Civil Administration, help provide varied recreation, education, entertainment, and information programs. Okinawa is frequently included on cultural presentation tours sponsored by the Department of State.

The highly successful Ryukyuan-American community relations and people-to-people program, the major part of which is carried out by the U.S. forces in the islands working together with the Ryukyuan people at the community level, has contributed greatly to a feeling on the part of Ryukyuan and American alike that they are working for the common good. This program has also significantly assisted the Ryukyuan people through numerous joint projects, usually small but filling genuine needs at the community level, in such areas as school facility improvement, village recreational facilities, village roads, emergency water supply, health and sanitation, and English language training by volunteer American instructors.

In the field of public health, continuous programs designed to reduce the incidence of such diseases as tuberculosis, poliomyelitis, and trachoma have been instituted. Construction of the Okinawa Central Hospital at Gushikawa is progressing and when finished will be a combination teaching and patient hospital. It is being financed by United States and Government of Ryukyu Islands funds.

The presence of a large foreign military establishment on these relatively small islands provides the elements of potential trouble. It is a credit to the Ryukyuan people and to the United States that there exists instead an attitude of mutual forbearance between the people and the members of the military establishment. The Ryukyuan have enjoyed social and economic benefits, and the U.S. forces have enjoyed a reasonable atmosphere of acquiescence in our bases and administration.

Europe, the Middle East, and Africa

U.S. Army, Europe

The U.S. Army, Europe (USAREUR), is the Army component of the unified U.S. European Command (USEUCOM) and a bulwark of the North Atlantic Treaty Organization (NATO). About one-fourth of the Army's strength is assigned to USAREUR—the U.S. Army's largest peacetime oversea command.

Along a 400-mile front of the Iron Curtain the major element of USAREUR—Seventh Army—has three mechanized infantry divisions and two armored divisions deployed in central Europe behind a screen of four armored cavalry regiments. These divisions, as well as the Berlin Brigade, completed reorganization under the ROAD (Reorganization Objective Army Division) concept during fiscal year 1964.

The over-all strength in USAREUR was reduced slightly through the withdrawal of some of the forces deployed to Europe on a temporary basis during the Berlin crisis in 1961. By reorganizing and improving management techniques, the Army has also reduced strength in other areas throughout the command.

To improve the combat readiness of the U.S. forces, the latest weapons and equipment continued to flow to USAREUR at a steady pace—the SERGEANT and PERSHING missile systems, self-propelled 175-mm. guns, 155-mm. self-propelled howitzers to replace the 105's in division direct support battalions, and additional HONEST JOHN rocket launchers.

The U.S. Army Southern European Task Force (SETAF) during the year provided NATO forces in northern Italy with a nuclear delivery capability including the SERGEANT missile system.

Berlin

In Berlin during fiscal year 1964, the prevailing situation vis-a-vis the Russians was a continuation of the status quo that took shape after the 1961 crisis. Two incidents, involving a confrontation of U.S. and U.S.S.R. forces, occurred in the fall of 1963 when U.S. Army convoys were denied access to the Berlin-Helmstedt autobahn on procedural grounds. Passage was effected when the United States demonstrated an unswerving determination not to bow to coercion.

The U.S. Government pronouncements on Berlin were visibly supported by continuing the augmentation of the Army garrison initiated during the crisis of 1961. Because of the Army's worldwide conversion to the ROAD organization, the source of augmenting units was shifted from battle groups with home stations in the United States and assigned temporarily in Germany on mobility exercises, to units permanently assigned to the U.S. Army, Europe. Since October 1963 Berlin has been reinforced by a battalion from the 24th Infantry Division located in West Germany.

During the fall of 1963 the Berlin Brigade was reorganized under the ROAD concept with three infantry battalions and tank, artillery, and engineer support replacing the two infantry battle groups. The flexibility and increased firepower inherent in the new organization

coupled with the latest equipment has strengthened the U.S. Army in Berlin.

The Berlin units maintain a high degree of operational readiness through a training program conducted within Berlin itself and by periodic travel to major training areas in West Germany. Training emphasis is focused on perfecting individual and unit skills essential to the accomplishment of the Army's Berlin mission.

BIG LIFT

In October 1963 the United States gave a dramatic demonstration of its ability to reinforce NATO forces in Europe rapidly. Army units from Texas, Oklahoma, Kentucky, Georgia, North Carolina, and Virginia—over 15,000 in all—flew to Europe in Exercise BIG LIFT. The main body, consisting of the 2d Armored Division, two artillery battalions, three truck companies, and a transportation battalion headquarters detachment, began to deploy on October 22 in Military Air Transport Service (MATS) planes and closed in Europe 2 days later. A U.S.-based composite air strike force deployed concurrently to provide close air support for the BIG LIFT units.

Moving quickly to depots where prepositioned stocks awaited them, the BIG LIFT forces drew their equipment and advanced to the assembly areas. By October 27 they were in place, 2 days ahead of the planning schedule. Shortly thereafter they participated in a NATO-sponsored field training exercise and turned in a superior performance. When the training exercise came to an end, the BIG LIFT forces returned the equipment to storage, moved to the airfields, and flew back to the United States.

The task of moving large forces to the airfields, loading them on aircraft, crossing the Atlantic safely, unloading and moving the forces to the depots, marrying them up with the equipment, and assembling them in the forward areas was carried out with no major obstacles. The exercise showed that the training and operating procedures of the U.S.-based forces were compatible with those in Europe and that the U.S.-based units could be integrated into combat operations with a minimum of orientation. BIG LIFT also successfully tested the concept that the prepositioned equipment could be stored, maintained, and issued in a combat serviceable condition despite some deterioration in the equipment as a result of outside storage. In addition, it provided an opportunity to use a large portion of the prepositioned equipment under field conditions. All in all, BIG LIFT was a tremendous performance by all participating units.

The Skopje Earthquake

During the night of July 25 a violent earthquake all but destroyed Skopje, third largest city in Yugoslavia. Severe damage to the city's

hospitals prevented thousands of victims from obtaining medical care. Upon President Kennedy's direction, the Force on July 27 airlifted an Army 120-bed intensive treatment unit of the 8th Evacuation Hospital from Germany to Skopje. Twenty-three aircraft carried over 200 medical personnel and over a half million pounds of equipment to Yugoslavia. The hospital became operational 2 days after arrival and provided treatment for some 121 patients, many of whom required major surgery. The Army also provided first aid supplies and antibiotics and left over \$40,000's worth of tentage and medical supplies when the units returned to Germany on August 14.

During October 1963, President Kennedy offered and President Tito of Yugoslavia accepted 250 prefabricated buildings for emergency shelter relief at Skopje. The Department of the Army was directed by the Secretary of Defense to provide and deliver the buildings to Skopje, provide personnel to train the Yugoslavs, and supervise and help erect the buildings. The first trainload arrived in the latter part of November 1963 and despite rain and snow the project was completed during January 1964.

Alaska

In the far north, the U.S. Army, Alaska (USARAL) is the Army component of the unified U.S. Alaskan Command. Headquarters, USARAL, is located at Fort Richardson. Major components of USARAL are two mechanized infantry brigades, which were converted from two infantry battle groups, two air defense artillery battalions, Headquarters Support Command, the Yukon Command, the Northern Warfare Training Center, and the Alaska Military District; the bulk of the troops are stationed at Forts Richardson, Wainwright, and Greely. Major units of the mechanized infantry brigades consist of an infantry battalion, a mechanized infantry battalion, an artillery battalion, a support battalion, a combat engineer company, and a tank company—all organized at reduced strength.

On March 27, 1964, the Alaskan earthquake caused extensive damage, especially in the Anchorage area, including limited destruction to military installations there. Under the over-all direction of the Commander in Chief, Alaska, who coordinated the effort with the Office of Emergency Planning and Civil Defense officials, Army forces quickly deployed throughout the stricken area.

The Army established initial radio communication with the affected communities, and immediately alerted field hospitals and other medical units for movement to Alaska. Overhead, Army planes helped in the search, rescue, and reconnaissance efforts and moved troops, evacuated civilians, and transported cargo of all types. An

Army medical team of 37 arrived at Elmendorf AFB near Anchorage on March 29, and water purification equipment and chemicals were sent to prevent an outbreak of disease. Approximately 900 Army troops took part in helping the civilian communities during the March 27–April 2 period.

In May the Army also arranged for the use of the vessel *Coastal Monarch* to transport 5,000 measurement tons of construction material donated by the citizens of Portland, Oreg., to Alaska. At the end of the fiscal year the Army was still furnishing some aid to the areas hit by the earthquake.

An estimate of the damage to Army installations in Alaska amounted to \$14.6 million, mainly in the Fort Richardson area and at Whittier. USARAL had \$820,000 available to handle initial emergency repairs, and the Army provided \$2,403,000 to be used for repair of warehouses and shops at Fort Richardson. Additional funds will be required in the next two fiscal years to complete the task.

Latin America

USARSO

Defending the southern approaches to the United States is the Army component of the unified U.S. Southern Command—the U.S. Army Forces, Southern Command (USARSO). Located at various posts in the Panama Canal Zone, USARSO in 1964 contained an infantry brigade, an air defense battalion, and a Special Action Force. Major units of the brigade were a mechanized infantry battalion, an infantry battalion, and an airborne battalion. In Puerto Rico, USARSO had the subordinate Antilles Command, with headquarters in San Juan.

Army Activities in Latin America

U.S. Army missions continued to function in 16 Latin American countries. Utilizing training teams supplied from the United States and USARSO, the missions helped Latin American armies develop workable techniques to solve internal security problems and promote civic action programs.

The School of the Americas, formerly known as the USARCARI School, founded February 1, 1949, is located at Fort Gulick, C.Z., and is operated by the U.S. Army Southern Command to provide training for officers and enlisted men of Latin American military establishments. The past year was a successful one. Two new courses were added, and a total of 2,400 students were graduated. The principal missions of the school are to offer a wide variety of military courses designed to train military instructors, leaders, and specialists, and to contribute to the development of mutual comprehension and goodwill among military establishments of the American republics. Ap-

proximately 8,000 students from the U.S. Army and approximately 12,000 Latin American students have passed through the school since it was established. They have received training in armament, automotive materiel, communications, military engineering, food service, military police, elementary and advanced tactics, and the functioning of command. The graduates have come from 21 countries of North, Central, and South America, and from all ranks, private to general.

Annually, U.S. Southern Command sponsors a joint-combined tactical exercise that involves participation by U.S. and Latin American military forces. The 1963 exercise, designated Operation AMERICA, was hosted by the Colombian Government during the period November 25-28, 1963. The U.S. Army Southern Command participated with forces from five Latin American countries—Bolivia, Colombia, Ecuador, Peru, and Venezuela. Participation was limited to a company-size force from each except Colombia, which provided an infantry battalion. The objectives of these exercises are to demonstrate U.S. interest in Latin America, the capability to reinforce militarily a selected Latin American country, the capability of the United States and Latin American countries jointly to plan and conduct a military training exercise and train staffs and troops in joint-combined military operations; to obtain theaterwide data to support possible future operations; and to test and improve anti-infiltration and alert systems in the host country.

Eighteen Latin American countries participated in the Conference of American Armies held in Panama July 15-19, 1963, and attended by the U.S. Secretary of the Army and Chief of Staff.

Administration of the Panama Canal

As personal representative of the President, the Secretary of the Army has a special interest in the administration of the Panama Canal. The Secretary is "stockholder" in the Panama Canal Company, a corporate agency of the U.S. Government responsible for the maintenance and operation of the canal. The Governor of the Canal Zone has always been an Army officer and serves as director and president of the Panama Canal Company under the supervision of the Secretary of the Army.

Since there had been some areas of discontent in the relations between Panama and the United States over the Canal Zone, discussions took place during fiscal year 1963 to eliminate several points of irritation. The Governor had participated in the negotiations and the Secretary of the Army was a member of the group that reviewed the specific proposals submitted to the two governments. One of the agreements reached in January 1963 was that the flag of the Republic of Panama would be flown together with the flag of the United States

on land in the Canal Zone where the U.S. flag is flown by civilian authorities.

On January 9, 1964, however, United States-Panamanian relations suffered a sharp setback following an attempt by Panamanians to raise their flag outside Balboa High School in the Canal Zone, where Canal Zone students had temporarily raised the U.S. flag in defiance of Canal Zone authorities. The Panamanians claimed that their flag had been torn and desecrated by Americans. Feelings quickly rose to a critical point.



Figure 2. Rioters grouping on President Kennedy Avenue, Panama City, in full view of the U.S. Army troops guarding the Canal Zone border, during the January 1964 riots.

By nightfall on January 9 serious riots had broken out along the border of the zone that the Canal Zone police were unable to control. At the request of the Acting Governor, the Commander in Chief of the U.S. Southern Command assumed responsibility for maintaining law and order in the zone. Over the next 4 days, mob action and snipers combined to create a tense situation during which four U.S. soldiers were killed. The civil police and U.S. soldiers maintained a high level of discipline and restraint in an effort to prevent the incidents from getting completely out of hand.

During the crisis, the Army commander made arrangements for housing U.S. dependents who resided in Panama and sought refuge in the Canal Zone. An airlift was put into effect for the evacuation of all dependents wishing to return to the continental United States.

Shortly after the riots began, Panama broke off diplomatic relations with the United States. President Johnson personally phoned the President of Panama in an effort to restore peace and then sent a high-ranking delegation, including the Secretary of the Army, to Panama to negotiate a settlement. After investigation on the scene, the Secretary reaffirmed on January 11 that both the United States and Panamanian flags would be flown outside public schools in the Canal Zone in accordance with the agreement reached in January 1963.

Order was finally restored on January 13 when the Panama National Guard deployed in force for the first time during the unrest, but troubled relations between the United States and Panama continued. Panama leveled charges of aggression against the United States before the Council of the Organization of American States (OAS) in late January and complained that the United States was unwilling to initiate negotiations for the conclusion of a new treaty on the Canal Zone. The United States denied the charges and urged that a full investigation be made of the riots, maintaining that the civil police and U.S. military forces in the zone had never made any attempt to enter Panama itself and had only tried to protect lives and property within the zone.

The Council of the OAS appointed an investigating committee on February 7, and the Secretary of the Army detailed an Army staff team to help the Special U.S. Representative to the OAS prepare the U.S. presentation to the committee. As of the end of the fiscal year, the committee had not issued a report of its findings.

In a separate development, the International Commission of Jurists sent a three-man team of observers to Panama in late February to investigate Panamanian charges that there had been violations of human rights during the riots. The General Counsel of the Army represented the United States in the preparation and presentation of its case before the team of jurists. The report issued by the jurists on June 10 unanimously rejected the Panamanian charges.

In assessing the actions of the Government of the United States and Panama and the measures taken during the incidents, the jurists concluded:

"92. Considering all the above surrounding circumstances, and in particular the grave acts of violence and the threat to life and security involved, we have come to the conclusion that, even if the force used by the Canal Zone Authorities and the United States Army may have been at certain stages some-

what in excess of what was absolutely necessary at the time, the force used seems to have been justified; taking into account such rapidly moving, critical and violent conditions, it is impossible to lay down a fine distinguishing line of what should have been the absolute minimum necessary.

"93. We regret deeply the Panamanian authorities made no attempt during the critical early hours, as well as for almost three days thereafter, to curb and control the violent activities of the milling crowds. On the contrary, there is considerable evidence to indicate that broadcasts over radio, television and loud-speakers, newspapers, and other means were adopted to incite and misinform the Panamanian public without any action by the Panamanian authorities to curtail or moderate such activities."

In the meantime, after many weeks of continuous efforts by the OAS, the United States and Panama signed a joint agreement on April 3. It provided for the immediate restoration of diplomatic relations and committed both nations to take prompt action to seek long-term solutions to their differences.

Despite the period of international tension, Panama Canal traffic experienced a strong upturn during the fiscal year with all sectors of traffic establishing new record highs. Ocean-going transits increased 7.8 percent to 12,200, compared with 11,317 transits in fiscal year 1963. The most marked advance occurred in commercial cargo movements, which increased 13 percent over 1963 and established a new record of 70.6 million long tons. Toll revenue for fiscal year 1964 totaled \$62.3 million as compared with \$57.8 million in fiscal year 1963. Canal traffic increases are attributed to generally favorable world economic conditions, wheat movements, and recovery of the Japanese economy following the recession during fiscal year 1963.

The 10-year program initiated in 1959 to improve the canal continued. Projects to widen, deepen, provide better illumination for the canal, modernize equipment, and improve lock overhaul procedures, were either underway or scheduled for completion before fiscal year 1970.

In 1962 a three-phase adjustment program was initiated in an effort to narrow the gap between the wages paid U.S. and Panamanian workers in the employ of the United States. The second phase went into effect on July 1, 1963, and raised the minimum wage from 60 to 70 cents an hour. Phase three, increasing the minimum wage to 80 cents an hour, is scheduled to go into effect on July 1, 1964.

Continental United States

STRAF-STRAC

The U.S. Strategic Army Force (STRAF) is normally located in the continental United States (CONUS) and its units are trained, equipped, and maintained for employment at the national level. As a major part of STRAF, the Strategic Army Corps (STRAC) contains combat-ready divisions and their supporting units, which are prepared to meet the initial requirements of a situation of national emergency immediately. Army units are added to the STRAC list when they attain STRAC combat readiness criteria.

At the present time STRAC is a two-corps force composed of eight divisions as well as combat, combat support, administrative support, and service support units. The XVIII Airborne Corps, with headquarters at Fort Bragg, N.C., includes the 82d and 101st Airborne Divisions and the 1st and 2d Infantry Divisions. In the III Corps, with headquarters at Fort Hood, Tex., are the 1st Armored Division, 2d Armored Division, 4th Infantry Division, and 5th Infantry Division (MECZ). Both corps are highly mobile, with one strong in airborne and infantry units, and the other powerful in armor and mechanized forces. Separately or together they give the Army great flexibility to cope with multiple crises around the world, whether the situation requires a company or a corps.

Army Component in Strike Command

The units listed on the STRAC troop list are assigned to the U.S. Army Forces, Strike Command (USARSTRIKE), and are under the operational command of the Commander in Chief, U.S. Strike Command. The Strike Command operates on the same basis as the overseas unified commands and is charged with the responsibility of providing a general reserve of combat-ready forces from the U.S. Continental Army Command (USCONARC) and the U.S. Air Force Tactical Air Command.

Thus, USCONARC and USARSTRIKE are one and the same and are manned and operated by a single staff. The staff maintains close liaison with the Army components of the unified commands overseas, since USARSTRIKE would provide the Army forces for increasing or reinforcing the Army units abroad.

Military Support of Civil Authority

Emphasis on civil rights continued during the fiscal year and the Army maintained its readiness to support civil authority in domestic disturbances. The year began with 150 active Army personnel on duty in Oxford, Miss., and 400 federalized National Guardsmen on duty in Tuscaloosa, Ala., enforcing Federal court orders and maintaining

law and order. Active Army troops remained at Oxford until July 24, 1963. The Alabama National Guardsmen were on duty at Tuscaloosa until December 14, 1963, when the last were released from active Federal service.

The Army was ready to support civil authorities during the civil rights demonstration in Washington, D.C., on August 28, 1963. Approximately 2,300 members of the District of Columbia National Guard in a multiple drill status (not in Federal service) were committed to help D.C. authorities during the demonstration, while approximately 5,200 active Army troops stationed nearby were alerted for immediate employment had such a decision been necessary.

In September 1963, Federal court orders called for the registration and attendance of Negro students at the secondary schools of Birmingham, Mobile, Tuskegee, and Huntsville, Ala.; Savannah, Ga.; Baton Rouge, La.; and Charleston, S.C. In defiance of the court orders, the Governor of Alabama and other Alabama State and local officials refused to allow the Negro students to enroll. Active Army troops were therefore alerted but never had to intervene. However, 15,000 Alabama National Guardsmen were called into the service on September 10, 1963. Of these, a total of approximately 400 were developed to Birmingham, Mobile, and Tuskegee to insure compliance with the Federal court orders. These Guardsmen were phased out of active Federal service over a 3-month period, with the last ones being returned to State control on December 14, 1963. The Army also responded to similar situations in Alabama in connection with the integration of Auburn University in January and the Shorter and Notasulga High Schools during February. In each case, active Army troops were prepared but never directed to support civil authorities.

Air Defense

During the fiscal year approximately 27,000 active Army and 7,000 Army National Guard personnel manned over 150 NIKE-HERCULES, NIKE-AJAX, and HAWK missile batteries on a continuous combat-ready status 24 hours a day, 7 days a week. The air defense batteries of the Army Air Defense Command (ARADCOM), an indispensable part of the North American Air Defense Command, protected selected population centers, industrial installations, and strategic retaliatory forces against air attack.

The last of the NIKE-AJAX batteries was phased out during fiscal year 1964. NIKE-AJAX, the first operational surface-to-air missile system in the free world, had been operational on-site in the defense of the continental United States since 1953.

The NIKE-X antimissile system is still being developed as a highly advanced defense against intercontinental ballistic missiles and shorter

range ballistic missiles such as those launched from submarines. The NIKE-X is an outgrowth of the NIKE-ZEUS system. It is considerably more effective than the ZEUS against attacks by many missiles arriving almost simultaneously and accompanied by highly developed penetration aids such as improved decoys. The NIKE-X system is unique among Army missile systems in design as well as function. It will be the first Army system to use phased array instead of conventional radars. SPRINT, a low altitude anti-ICBM, is a part of the NIKE-X system. The SPRINT will have the highest acceleration of any Army guided missile ever developed, a flight time measured in seconds. The Department of Defense has accorded the NIKE-X development program the highest priority.

Unit Readiness Reporting

The readiness objective of the Army is to maintain its combat forces in a condition of readiness to insure mission accomplishment. Attainment of this goal requires the best distribution of resources, training of personnel, and application of command emphasis at all levels. To determine the readiness of its units, the Army has developed procedures for objective measurement and reporting, using common factors in the areas of personnel, training, and logistics as readiness indicators. Analysis of unit ratings for each of these indicators permits commanders to identify potential problem areas where command emphasis may be required or corrective action initiated.

The new system came into effect on August 23, 1963, and initial quarterly reports were submitted by all company-size or larger active Army TOE units as of September 30, 1963. Comments from the field and analysis of the initial reports indicated a need for refinement of some of the readiness criteria. In addition, it was recognized that the readiness reporting system was easily adaptable for use as a management tool to establish requirements for resources (manpower, skills, maintenance) and a pattern for their distribution. As a result, the Army directed a management-oriented revision that came into effect on April 16, 1964. The first reports under the revised system are being evaluated by the Army staff. Several reports will have to be analyzed before the over-all effectiveness can be determined.

III. Plans, Organization, and Training

Behind successful Army operations lie careful planning, pliable organization, and thorough training of troops. In these activities the Army prepares itself to meet the challenges of future years.

There must be careful advance planning to determine the force levels, types of organization, and courses of training that will best prepare the Army to meet future situations. The problems of anticipating all the contingencies that might arise are enormous and involve many intangibles. Where and against whom may a war be fought? What kind of war will it be? Will nuclear weapons be used? What kind of force structure will be needed?

Flexibility in organization and versatility in training offer some of the answers to the challenges of an unpredictable future. To be able to adjust quickly, furnish the proper mix of forces to meet a given situation, and have troops available that can do many things well improves the Army's ability to support U.S. national objectives.

The New Family of Army Plans

Responsibility for strategic planning for the employment of military forces belongs to the Joint Chiefs of Staff (JCS). The Army Staff prepares plans to support the Chief of Staff as a member of the JCS. During the past year the Army has revised its planning concepts to bring them in line with the programming system instituted by the Secretary of Defense in 1961 and the Five Year Force Structure and Financial Program. The new Army planning concept is designed to provide the Chief of Staff with a strategic concept for presentation to the JCS, to give guidance for the development of the Army's part of the Five Year Force Structure and Financial Plan, and to stimulate imaginative thinking throughout the Army.

In the process of changing over to the new concept, three plans have replaced seven of the eight formerly used. The three new plans—the Basic Army Strategic Estimate (BASE), the Army Strategic Plan (ASP), and the Army Force Development Plan (AFDP)—all cover a 20-year period and are divided into short-, mid-, and long-range periods. They are designed to be closely correlated, progressive, and provide a singleness of purpose. The re-

maining plan—the Army Strategic Capabilities Plan (ASOP)—is a 1-year plan based upon the Joint Strategic Capabilities Plan and is undergoing revision.

The fundamental strategic plan in the new family is BASE, first published in November 1963. It is actually a long-range commander's estimate of the situation that culminates in the statement of a broad strategic concept. In the context of appropriate national policy and objectives, BASE projects a worldwide strategic appraisal and a forecast of scientific and technological advances for 20 years. It identifies long-range trends and evaluates their implications for the Army.

A strategic concept to meet the anticipated threat under conditions of cold, limited, and general war is developed as the basis for all other Army planning. The technological forecast provides the basis for more specific research and development guidance stated in the ASP.

The Army Strategic Plan is directed toward the determination and statement of the Army objectives, forces, and deployments for the execution of the strategic concept of BASE. The first ASP is in preparation and approval is anticipated early in the new fiscal year. It is prepared within the context established by the strategy, intelligence, and technological forecast of BASE. ASP presents a statement of the Army requirements cognizant of, but not necessarily inhibited by, the Army Five Year Force Structure and Financial Program. It provides realistic Army objectives and a broad force structure to implement the strategy. It also contains a statement of risks at force levels below the total objective. ASP and BASE together serve as a basis for developing the Army input for joint planning activities, particularly the joint midrange plan, the Joint Strategic Objectives Plan (JSOP).

The Army Force Development Plan, first published in March 1963 and revised in April 1964, was developed to provide the link between the objectives planning of BASE and ASP and the actual programming and budgeting processes of the Army Five Year Force Structure and Financial Program. The first version dealt primarily with materiel; the revised version concerned itself with most Army programs, either directly or indirectly, and has had a decided impact.

The Army Strategic Capabilities Plan provides guidance and instructions to Department of the Army staff agencies, major Army commands, and Army components of unified commands for conditions of cold, limited, and general war, and covers the complete scope of Army activities. It takes approved strategic guidance and concepts, combines them with the forces approved in the Five Year Force Structure and Financial Program, and converts them into specific missions and guidance for the Army. ASCP supports the Joint

Strategic Capabilities Plan (JSCP) and is based not only on existing but short-range projected capabilities as well.

The Army Force Development Plan considers all resource requirements in its search for a balance between structure, readiness, and modernization of forces and equipment and takes into account all fiscal, personnel, and other restraints imposed. It proposes trade-offs in personnel and equipment that might be made. Active Army and reserve component forces are closely integrated to insure that they are balanced internally and with respect to each other.

The AFDP presents vast amounts of information, but is not an end in itself. It is, rather, a new planning and programming technique and a manner of presenting staff analysis. In short, the AFDP constitutes the planning bases for the Army Five Year Program and is an instrument through which concepts and weapon systems, new organizations, and new emphases can be turned into programs.

Besides insuring that full use is made of the Army's available resources, one of the chief purposes of AFDP is to identify the weaknesses in the Five Year Force Structure and Financial Program and to indicate changes and improvements. The AFDP also develops and evaluates alternate courses of action to achieve the goals established in BASE and ASP and furnish guidance, justifications (other than strategic), and forecasts of manpower requirements and dollar costs to support changes proposed by the Army.

The chart below shows the relationship of Army plans to those prepared by the Joint Chiefs of Staff. (See fig. 3.)

In the 10-14-year period, BASE is the source of the Army input to the Joint Long-Range Strategic Study. In the 10-20-year period, ASP provides broad basic guidance to Army research and development activities. Both BASE and ASP furnish Army input to the Joint Strategic Objectives Plan during the 5-10-year period. In the 0-10-year period, AFDP affords guidance for changes to the Army Five Year Program. It also is a guide to decisions and actions necessary to phase in new weapon systems at the proper time during the 10-20-year period.

While the new family of Army plans occupies the center of the stage, the design of the Army of tomorrow is being determined in large measure by a series of major conceptual studies. For the immediate 5-year period, they usually take the form of organizational studies. RODAC-70 (Reorganization and Objectives Division Army Corps-1970), CO-STAR (Combat Service to the Army), and TASTA (The Administrative Support, Theater Army) fall into this category. They draw together the organizational, operational, and materiel concepts, thus providing a base for developing field manuals, tables of organiza-

Relationships in the New Army Planning Concept

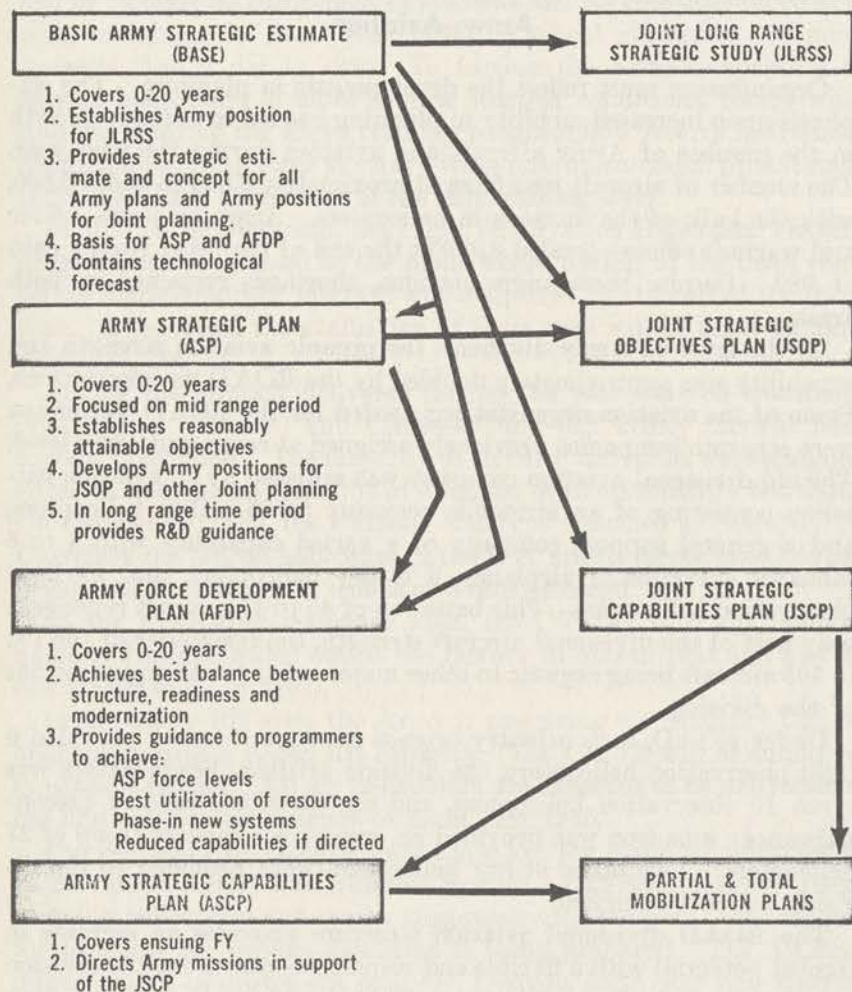


Figure 3

tion and equipment, qualitative materiel requirements, war games, troop tests, and field experiments.

These basic studies are, in turn, supported by a number of other detailed studies that examine specific aspects of Army operations. As an example, currently in progress is the TACOM study (Army Requirements for Tactical Communications). As the concepts contained in such studies and new plans are tested and proven, they will become part of the Army's doctrine until superseded by something better. With improvement as the continuing goal, there can be no final fixed

objective, only constant adjustment to new conditions, new weapons, and new techniques.

Army Aviation

Organization must reflect the developments in planning. The emphasis upon increased mobility in planning has led to a steady growth in the number of Army aircraft and aviators during the past year. The number of aircraft rose from approximately 6,000 to about 6,500, with the bulk of the increase in helicopters. Army aviators—officer and warrant officer—totaled 8,276 at the end of the fiscal year, a gain of 982. Despite these augmentations, shortages remained in both areas.

At the level of Army divisions, the organic aviation strength and capability was approximately doubled by the ROAD reorganizations. Some of the aviation organizations needed for the ROAD conversion were separate companies previously assigned at corps and army level. The old divisional aviation company was replaced by an aviation battalion consisting of an airmobile company of 25 utility helicopters, and a general support company of a varied capability with 4 to 6 Mohawk surveillance airplanes, 6 utility helicopters, and 10 light observation helicopters. This battalion of 45 to 47 aircraft represents only half of the divisional aircraft strength, the remainder of the 101 to 103 aircraft being organic to other major subordinate organizations of the division.

Under ROAD, each infantry brigade headquarters was provided 6 light observation helicopters, the division artillery headquarters was given 10 observation helicopters, and the division's cavalry (reconnaissance) squadron was provided an organic air cavalry troop of 27 helicopters. Two other utility helicopters were provided to the division support command.

The ROAD divisional aviation structure provides an increase in combat potential with a flexible and responsive system for the division commander and his subordinates. ROAD adds to the commander's battlefield air mobility, aerial surveillance and target acquisition means, and aerial firepower and provides a small fleet of general purpose helicopters for varied tasks within the environment of a division in the field.

To avoid using tactical aircraft for training, the Army is in the process of procuring helicopter primary and instrument trainers. When these are delivered, tactical aircraft now serving as trainers can be released to operational units, and the helicopter training program will be able to carry out its missions with cheaper and more efficient aircraft.

To keep pace with the numbers and types of new aircraft being delivered to the Army, the Aviation School at Fort Rucker, Ala., has had to increase its enrollment of students and its emphasis on rotary-wing training. In fiscal year 1964 the school graduated 400 more students than it did in 1963. To further the Army's capability to operate helicopters in more adverse weather conditions, rotary-wing students entering the flight training program now receive instrument training qualifying them as rotary-wing instrument-rated pilots; similar courses have been added at the unit training level.

In aircraft development, the Light Observation Helicopter (LOH) program has progressed to the point where testing of the three competing manufacturers' aircraft was completed by the end of the fiscal year. A report on the evaluation of these tests will be made on September 30, 1964.

Among the aircraft delivered during the year were 83 transport-type planes (Caribou and Chinook) and 385 utility tactical helicopters (Iroquois). The majority of the new deliveries were assigned either to units in the Republic of Vietnam or to air mobility test units. On October 23, 1963, the Chinook was type classified as Standard A. Currently the largest helicopter in the U.S. armed forces, the Chinook is capable of carrying 32 troops or 3 tons of cargo.

In the fixed-wing transport area, the CV-7A, with the popular name of Buffalo, rolled out of the factory in March 1964 and had its first official flight in April.

In the heavy lift area, the Army is procuring six Sikorsky CH-54 helicopters with a 10-ton lift capacity. The CH-54 will be employed in concept testing. All six helicopters are expected to be delivered in the first and second quarters of fiscal year 1965.

The Secretary of Defense gave approval for planning purposes to an Advanced Aerial Fire Support System (AAFSS) to escort troop-carrying helicopters and render suppressive fire support. The request for proposal for project definition is being prepared. The AAFSS represents an improvement over the Iroquois helicopter now used to carry weapons. It will have a speed differential sufficient to permit it to rejoin troop-carrying helicopters after short excursions from the flight formation to provide suppressive fire support. Development is continuing on aerial weapons to provide the suppressive fire support for helicopters.

The Army continued its V/STOL program this year. Two XV-4A's, known as the Hummingbird, completed their 50 hours of contractor flight test and demonstration. The aircraft transitioned in flight during November 1963. In another of three approaches to the V/STOL effort, the XV-5A, known as the fan-in-wing, flew conventionally in May 1964 and is scheduled for transition in flight dur-

ing the first quarter of fiscal year 1965. The Hawker P-1127 program being conducted in England was subjected to a tri-Service, tripartite technical review during May. The review team recommended continuance of the program, and operational evaluation trials are scheduled to begin on April 1, 1965.

Special Warfare Forces

During fiscal year 1964 the Army has continued to expand and train its Special Warfare Forces as part of its effort to help developing nations combat Communist-inspired insurgency. An additional 2,529 spaces were programed; actual strength increased from approximately 9,000 at the end of fiscal year 1963 to almost 11,000 a year later. With the added spaces, Special Warfare Forces were organized to provide six modest but adequate Special Action Forces (SAF)—each oriented toward a major area of the world: Asia, Latin America, Europe, the Middle East, and Africa, and a CONUS Base SAF to provide backup for the others.



Figure 4. The Army CH-47A (HC-1B) troop and cargo helicopter, shown here in the 11th Air Assault Division training, will deliver and instantaneously emplace the LITTLE JOHN missile.

Special Forces were reorganized under a new table of organization and equipment during 1964. All Special Forces Groups (SFG) were reorganized, their communications capability significantly enhanced

with the addition of a signal company, and their organic administrative and logistical capabilities improved with the strengthening of medical, automotive maintenance, supply, parachute maintenance, and aerial delivery capabilities. Activated were a full-strength Special Forces aviation company for the CONUS Base SAF (7th SFG) and reduced strength aviation companies for the Middle East SAF (6th SFG) and Latin American SAF (8th SFG), the latter in CONUS for future deployment to the Canal Zone.

Special Action Forces are area-oriented, language-trained, tailored forces, including selected augmentation units such as intelligence, civil affairs, military police, security, engineer, medical, and psychological warfare detachments. These units are given thorough instruction in such diverse fields as population and ethnic groups; history; geography; religious cults, customs, and taboos; and the comparison of democratic and Communist policies, government, philosophy, and objectives—all to prepare them for advisory operations in their special area.

During the past year there has been an increasing number of requests for Special Action Forces as their effectiveness became better known. In some of the less developed areas the presence of foreign military forces generally is regarded with deep suspicion. Surveys conducted by the Departments of Defense and State and the Agency for International Development indicate that some of the nations in these areas are now more favorably disposed to accept SAF teams.

In the Republic of Vietnam, detachments from the Asia Special Action Force, consisting of the 1st SFG (augmented) from Okinawa and elements from the 5th SFG from Fort Bragg, N.C., devoted the major portion of their efforts to supporting the Civilian Irregular Defense Group program. During the year the commitment of the Asia SAF increased substantially as the struggle for the people and terrain continued. Working for the most part with the hill tribes in the most remote regions, Special Forces personnel from the Asia SAF sought to win the tribesmen over to support the Republic of Vietnam Government.

In addition, the 1st SFG participated in counterinsurgency exercises in Thailand and on Taiwan. In the latter exercise, the 1st SFG helped prepare the plans and evaluated the results, as well as taking part in the operations.

Latin American requirements for SAF mobile training teams expanded 100 percent over fiscal year 1963. The Latin American Special Action Force, consisting of the 8th SFG (augmented) and located in the Canal Zone, used its teams to provide instruction in 15 Latin American countries. There appeared to be a growing awareness in Latin America that military civic action and low-phase coun-

terinsurgency operations are among their most pressing military requirements.

Besides furnishing teams to conduct counterinsurgency training, the 8th SFG provided instructor assistance to the U.S. Army School of the Americas and to U.S. Army units in the Canal Zone and in Puerto Rico. It also participated in field training exercises with the Panamanian National Guard and acted as the aggressor force in three exercises conducted by the U.S. Army 193d Infantry Brigade.

In the Middle East, the 6th SFG (augmented) has taken over from the Europe SAF full responsibility for the conduct of Special Warfare operations. Activated in May 1963, the 6th SFG provided mobile training team assistance and survey teams to Iran and Pakistan during the year. In Iran, SAF teams helped the Imperial Army organize and conduct a large-scale counterinsurgency training program that culminated in a field exercise involving three combat divisions. Over 100 personnel of the Middle East SAF engaged in combined desert training with the Pakistani Army.

On December 5, 1963, the 3d SFG (augmented) was activated and oriented south of the Sahara. At the end of the fiscal year the 3d SFG was in the process of organization and training. Nevertheless, it has provided mobile training team personnel for 682 man-weeks in African countries, over twice the Department of the Army effort of the previous year.

In addition to the teams furnished to the Middle East, Asia, and Africa, the Europe SAF participated in exercises ranging from winter training in Norway to combined training with allied forces in the eastern Mediterranean. It also furnished extensive training at its home station to allied military and paramilitary personnel working in Special Warfare activities.

Backing up the oversea groups is the CONUS Base SAF, the 7th SFG. It serves as a cadre group, a reserve for the emergency deployment of detachments, a rotation base for deployed Special Forces elements, a source of detachments for training exercises, and provides a SAF company for contingency operations.

Also in the United States are four area-oriented brigade-size forces that have been designated as backup for the SAFs. The 4th Infantry Division has been named to support the Asia SAF; the 82d Airborne Division, Latin America; the 101st Airborne Division, Middle East; and the 2d Infantry Division, Africa.

Because of the late President Kennedy's interest in Special Warfare, the center at Fort Bragg, N.C., was redesignated the John F. Kennedy Center for Special Warfare in March 1964.

Civil Affairs

Increased awareness of the importance of the civil affairs aspects of contingency operations and their impact on the long-term results of such operations prompted the Department of the Army during the past year to examine the status of its civil affairs resources, both in the active Army and in the Army Reserve. As a result, the Regular Army civil affairs resources, consisting of one civil affairs group and two civil affairs companies plus the four augmentation civil affairs units with Special Action Forces, were given a higher priority for personnel. The units thus attained a much improved state of readiness.

The 77 civil affairs troop program units of the U.S. Army Reserve are also in a much better position to support contingency plans. The assignment of more specific area and language training missions and of a higher category of readiness, which has permitted increased authorized drill strengths and improved equipment status for 10 of the units, has contributed to this improvement. The byproduct of these actions has been a definite increase in the interest and enthusiasm of the individual reservists involved. Thirty-two of the 77 units received superior ratings as compared to 24 last year.

Communications-Electronics

In view of the worldwide deployment of Army forces, an ever-increasing capability for positive command and control is mandatory. To insure high standards of communications, the Army has reorganized its communications and electronics staff and command organization during the past year.

The Army eliminated the Office of the Chief Signal Officer and established the Office of the Chief of Communications-Electronics (OCC-E). The change in title is designed to give a completely new orientation to the office, although it is still under the Office of the Deputy Chief of Staff for Military Operations. OCC-E has practically no command functions and its internal staff organization has been arranged to give increased emphasis to the field of tactical communications without, however, neglecting other important areas.

To fulfill the operational requirements of the Defense Communications Agency, the Army set up the U.S. Army Strategic Communications Command, with headquarters in the Washington area. If present plans are carried out, this new major command will direct the operation of all Army-owned or Army-leased CONUS long-haul communications and that part of the worldwide Army communications facilities identified as elements of the Defense Communications System (DCS).

During fiscal year 1964 considerable progress has been made in integrating and consolidating the worldwide long-haul communications networks of each of the three Services into the single DCS. The main objectives behind this effort are to improve the over-all command and control communications for the Department of Defense in the most economical way and to increase flexibility, speed of service, transmission security, and responsiveness to military demands. At the same time, any overlap and duplication of management and operational direction that was inherent in having three separate military Service systems is being eliminated.

The establishment of the DCS began in fiscal year 1962 as a phased multiyear objective, and its major impact upon the military Services occurred in fiscal year 1964. The earlier phases of joint planning, organizational reorientations, and technical studies have given way to physical change, such as that in the STARCOM system. Engineering and installation improvements, rearrangements of circuits, standardization of procedures, multiple interconnections of Army, Navy, and Air Force systems, and consolidation of major Service communications facilities in such places as Alaska, Asmara, Puerto Rico, Táiwan, Okinawa, Japan, Panama, and Hawaii, are either in progress or have been completed. Further changes and improvements will take place through fiscal year 1968.

This major reorientation has produced a demonstrable improvement in the flexibility of the total system and in the standardization of operations. In an evolutionary process, the Army's strategic communications systems have expanded and been modernized. The Army has made marked progress in the engineering, development, and procurement areas directly related to such multimillion dollar communications programs and projects as the Automatic Voice Switching Network (AUTOVON), the Automatic Digital/Data Switching Network (AUTODIN), the European Tropospheric-Scatter System, the Pacific Tropospheric Scatter System, the Southeast Asia Communications System, the Department of the Army Command and Control Network, and the Latin American Military Communication System.

Because of the changing environment at the Defense level, the complexity of Defense command and control communications, the development of automatic display systems, and the introduction of automation techniques in communication and weapon systems, there is a fluid situation in command and control communications. Army communications are in a transition period between semiautomatic and fully automatic switched systems, and Army communications experts are striving to keep abreast of the rapid rate of development in those areas of electronics affecting strategic communications.

Information and Data Systems

Early in fiscal year 1964, the need to improve management of automatic data processing (ADP) equipment and systems became apparent. To meet this need, the Office of the Special Assistant to the Chief of Staff for Army Information and Data Systems was established on November 8, 1963. The goal of the office is to develop information and data systems which are coordinated, standardized where feasible, and which meet the essential needs for information and data at all echelons of the Army under all conditions from peace to general war.

The primary means for achieving this goal is the establishment of appropriately centralized control of these systems and their associated automatic data processing equipment. This centralized control includes control of computers and punchcard machines, but is aimed primarily at the systems which use this equipment.

At the end of fiscal year 1964, the Army had 495 ADP units which used 250 computers and several thousand pieces of punchcard equipment. During fiscal year 1964, this represented 17,432 man-years of effort and costs of \$215.2 million. It is estimated that approximately 200 requirements for new or revised information and data systems will originate during fiscal year 1965.

In May 1964, procedures for establishment of new information and data systems and acquisition of ADP equipment were changed. This change established centralized control by requiring approval at Headquarters, Department of the Army, for new systems, major changes in existing systems and acquisition of ADP equipment, and centralized in one highly specialized unit the selection of ADP equipment to meet approved needs.

Centralized control will cause systems efforts to shift from development by Army agencies for their agency to development by Army agencies for the Army as a whole. Where two or more organizations of similar size have like missions, one standard data processing system can be developed and used by each of these organizations.

Centralized selection and approval of ADP equipment to operate approved systems permits concentration in one unit of the technical talent required to select equipment for all users. Previously, equipment selection had been by users. Centralized equipment selection causes the user to concentrate on what the systems should accomplish, rather than the configuration of equipment to operate the system.

By centralized control of equipment acquisitions, Government-owned ADP equipment no longer needed in its present job can be reutilized in other jobs. Procedures instituted during fiscal year 1964 require screening at Headquarters, Department of the Army, to deter-

mine if Government-owned ADP equipment suitable for a proposed use is available before action is taken to acquire additional equipment.

Centralized control is resulting in an improved product with manpower and monetary savings. The most significant savings result from the development of standardized systems. Several standardized systems are now being developed. In addition, significant dollar savings have been identified as a result of centralized equipment purchase and centralized control of contracts for ADP services.

Training

Whether it is sophisticated intelligence instruction or simple infantry drill, efficient training is vital to the effective functioning of the Army. Men properly trained today may save the Nation tomorrow.

During the past year the Army has worked diligently to improve and enhance the training of recruits. The Under Secretary of the Army visited Army training centers in 1963 and observed closely the policies, methods, and personnel employed in basic combat training. On his return to Washington he submitted a report to the Secretary urging that steps be taken to improve the lot of trainees and trainers and to raise the quality of training. The Under Secretary's recommendations covered virtually every aspect of recruit training, including standards and methods, personnel policies, and organization and staffing of training centers.

In September 1963, the Army Staff began to carry out these recommendations. Action is underway to insure that the training centers are properly organized and adequately staffed with both commissioned and noncommissioned officers to carry out the assigned training mission. New policies have been established governing the selection of trainer personnel in order to obtain experienced and qualified instructors for this important task. To attract and retain first-rate trainers, Army Promotion Selection Boards have received instructions that duty at a training center is to be considered equivalent to duty with tactical units in assessing a man's qualifications for promotion. The Army is also offering additional incentives for trainer personnel through the provision of distinctive insignia, liberal leave policies, stabilized tours, and preferred treatment for future assignments.

Experienced and qualified instructors should improve the quality of training and at the same time promote better personal relationships between the trainers and the recruits. Revised training methods now stress the personal relationship by providing more instruction by trainer personnel of the basic training company and less by members of impersonal committees.

Recruits will benefit from the adoption of uniform standards at all

training centers for those who require further training. To provide incentive during the training period, the Army has adopted a program of accelerated promotion for recruits to grade E-2 when they perform in an outstanding fashion. A new Soldier's Handbook will be released in September 1964, to furnish the trainee with valuable information in a format suitable for ready reference.

The increased emphasis on recruit training aroused by the Under Secretary's report will continue. In the meantime, other efforts have been launched to improve the training situation. An experimental plan, initiated in July, to reduce basic combat training from 8 to 6 weeks was tested at Forts Dix and Jackson, but did not prove feasible. The 6-week program simply did not produce a soldier adequately prepared to undergo advanced training. Instead, the 8-week course was revised, deleting branch-oriented subjects more properly included in the advanced training phases. More hours are now devoted to physical training, drill, inspections, weapons, marches, and bivouacs. All basic training centers have adopted the revised 8-week program enthusiastically.

Changes have also been made in the advanced individual training courses. Seventeen courses have been reduced in length by 1 to 4 weeks to permit more rapid assignment of trained personnel to operational units. In an accompanying move, over 25,000 graduates of basic combat training were assigned directly to units for advanced individual training.

Problems related to the training of the new soldier are of direct concern to the Human Resources Research Office (HUMRRO), which is under contract to the Army. HUMRRO has concentrated all of its research and development on basic combat and advanced individual training in the Human Resources Research Unit at the Presidio at Monterey, Calif. The unit will be known as the U.S. Army Training Center Human Research Unit and will work closely with the Army Training Center at Fort Ord, Calif.

Recruit training is but one phase. Every year thousands of Army personnel attend advanced schools across the country and around the globe to sharpen their skills and broaden their perspectives. Over 154,000 students completed resident courses in 43 Army service schools and colleges during the fiscal year. An additional 1,072 received training in scientific, academic, and technical fields at civilian institutions and through industrial organizations, when such training was not available in Army or other Federal agency facilities.

Programs of instruction at Army service schools are constantly undergoing review and revision to insure that they are responsive to modern Army needs. For example, two functional supply courses begun at the Quartermaster School in October 1963, replaced four

branch-oriented courses at other schools. Next year maintenance courses will be revised along functional lines. In conjunction with this, multilevel training for maintenance personnel has been established that will reduce school training time and set up a pattern of training and progression from lower to higher skills. This method will train more soldiers in a given period and may provide additional incentive for reenlistment.

In response to the long-standing Army position that 50 percent of the annual input to the regular Army officer corps should come from the U.S. Military Academy, Congress passed legislation in early 1964 authorizing an ultimate corps of cadets strength of 4,417. Beginning in the coming year, 200 additional cadets will enter the academy for each of the next 4 years. In addition to increasing the number of appointments allocated to each appointing authority, the recent legislation provides a new category whereby 150 qualified congressional alternates will be selected for admission, based on competitive scores made on the regular entrance examination.

In October 1962 the Secretary of Defense assigned to the Army the responsibility for all language training in the Department of Defense. On July 1, 1963, the Defense Language Institute (DLI) became operational, combining the language training programs of all the Services under a single authority, with headquarters at the Anacostia Annex of the U.S. Naval Station, Washington, D.C. The former Army Language School at the Presidio of Monterey, Calif., was redesignated Defense Language Institute, West Coast Branch, and the former Foreign Language Department of the U.S. Naval Intelligence School was redesignated Defense Language Institute, East Coast Branch. During its first year of operation, the DLI graduated 4,750 students.

Similarly, in February 1964, the Army was assigned responsibility for the management of all information training for the Department of Defense. Information training for all of the Services, except graduate school training at civilian universities, will be consolidated, effective July 1, 1964, at the Defense Information School, formerly the Army Information School, Fort Slocum, N.Y.

Civil Defense

Among the important changes that took place in the Army during the fiscal year, the transfer of the Office of Civil Defense from the Office of the Secretary of Defense to that of the Secretary of the Army ranks high. Since the functions of civil defense are essentially operational, the Secretary of Defense decided that they should be administered by a military department. The report of the Office of

Civil Defense, covering its activities in fiscal year 1964, is attached as an annex to this report.

The transfer of civil defense activities to the Army did not produce radical alterations in the Army Staff's contribution to the over-all effort, but a new military concept approved by the Secretary of the Army in June 1964 promised to broaden the base of the Army's support in the future. Under the new plan the State Adjutants General and the State National Guard headquarters and headquarters detachments will serve as State-level military headquarters for coordinating, planning, and prior to or immediately following a nuclear attack controlling military operations in support of the civil authority. The State Guard headquarters will prepare military support plans for operations following an attack and would use the forces of the military Services and Defense agencies (active and reserve) that were made available to them by the Zone of the Interior Army commanders. Before or immediately following a nuclear attack, the State headquarters would be mobilized and assume operational command of designated forces; they will also develop a system for reacting to anticipated requirements for military assistance in natural disasters.

While the planning for postattack operations went on, the Army continued to mark and stock all available nonoperational shelter space. This task is scheduled to be completed by September 1964.

During the year the Army has provided military support of civil defense in the fields of communication and training assistance. By the end of the year 3,500 local and State civil defense personnel had been trained as radiological monitors and 500 to 600 civil defense affiliated personnel had received instruction covering the handling of mass casualties. The U.S. Continental Army Command trained 5,714 civilian police and civil defense authorities in explosive ordnance reconnaissance, bringing the total number trained in this specialty since January 1959 to nearly 28,000. Over 500 U.S. Army Reserve members, assigned to the Standby Reserve, are participating in this program.

Promotion of Rifle Practice

The Assistant Secretary of the Army (Financial Management) is president of the National Board for the Promotion of Rifle Practice (NBPRP), which consists of 15 military and 10 civilian members. Organized to promote the growth of rifle practice with military-type weapons among citizens who are not reached through the training programs of the active components of the armed forces, the board provides opportunities for the participants to qualify as instructors and marksmen.

During the past year the Civilian Marksmanship Program enrollments increased to 397,489, organized into 5,645 rifle and pistol clubs. Fifty percent of this total—198,965—are in the 12-18-year-old age group. Marksmanship support was provided for a total of 203,232 members of junior, school, and college clubs taking part in the program under the Director of Civilian Marksmanship. Upon request, 14,802 medals and appropriate qualification bars were approved and provided by the director for members of junior clubs.

As a further incentive to training the NBPRP, in conjunction with the National Rifle Association, sponsors the National Matches. Small Arms Firing Schools, conducted by the Army Infantry School, help to prepare the competitors for the National Matches, and in the 1964 fiscal year, 6,638 students attended the schools for rifle and pistol training. Some 43 civilian pistol teams and 41 civilian rifle teams, accompanied by 2 juniors for each rifle team, went to Camp Perry, Ohio, partially at NBPRP expense, to participate in the National Matches. Approximately 9,000 competitors attended the matches, and 30 National Trophy plaques were awarded to the winners.

The NBPRP also sponsored 38 "leg" matches held in conjunction with National Rifle Association Regional Rifle and Pistol Matches. Civilians and military alike fired for scores that gave them credits toward the award of the distinguished designation rifle and/or pistol badge.

Since the adoption of the U.S. Distinguished International Shooter Badge in 1962, 70 badges have been awarded for outstanding individual and team accomplishments by U.S. marksmen in international competition; 28 of the badges were retroactive awards for achievements made before 1962. Civilians, members of reserve components, and active Army personnel have all won awards.

IV. Reserve Components

The close of the fiscal year marked the first anniversary of the reorganization of the 29 combat divisions and 11 brigades of the Army National Guard (ARNGUS) and Army Reserve (USAR) under the ROAD concept. These units have shown steady improvement in their mobilization readiness and the quality of their personnel.

All nondivisional combat units, including 21 infantry and 17 armor battalions of the reserve components, completed conversion to ROAD by May 1, 1964. The conversion had the effect of providing nine separate brigades with a base consisting of an artillery battalion, an engineer company, a cavalry troop, and a support battalion. The separate combat battalions are now available to round out to the optimum mix of maneuver battalions for active or reserve divisions and brigades, replace active Army school troops, or serve as unit replacements. The transition to ROAD was carried out smoothly, a tribute to the skilled, professional leadership in the reserve components.

At the start of the fiscal year the actual paid-drill strength of the ARNGUS was 360,714, while the authorized paid-drill strength was 400,000. In the USAR, actual paid-drill strength was 236,985, and the authorized paid-drill strength was 300,000. The understrengths resulted as an aftermath of the order to active duty of reserve component units, the active duty tour extensions of obligors during the Berlin buildup of 1961 and 1962, and the realignment of the reserve components in 1963.

New legislation for a uniform enlistment program was obtained on September 3, 1963, when the 1963 Reserve Enlistment Program (REP) replaced the program provided for in the 1955 Reserve Forces Act. The revised program, together with more emphasis on recruiting, increased ARNGUS and USAR paid-drill strengths to 381,546 and 268,524, respectively, as of June 30, 1964. Some minor overstrength problems developed in realigned units, but the overstrengths were reduced by May 1, 1964. To insure that personnel were MOS-qualified, the Enlisted Evaluation System was extended to the reserve components. The Army conducted a successful pilot implementation on a limited basis in the fall of 1963 to identify and resolve problem areas, and full implementation is scheduled for the reserve components in November 1964.

This year, increased emphasis has been placed on nonunit USAR Ready Reserve personnel administration. In the various Army Reserve corps areas a uniform system for administration of both unit and nonunit Ready Reserve personnel was developed and put into operation. Support for the system is provided by the CONUS Army Headquarters Automatic Data Processing System. The effectiveness of the system is being tested and evaluated.

Recognizing the requirement for adequate USAR technician support, the Department of Defense in October 1963 released funds to hire the additional 1,587 technicians called for in the Army Reserve technician program. However, in February 1964, the Department of Defense directed the Department of the Army to suspend hiring reserve component technicians until the entire program could be reviewed to determine the gains in combat readiness that would result from the additional personnel scheduled to be employed during fiscal year 1964. As a result of the study, the Department of Defense in March 1964 directed a reduction of 847 spaces in the reserve component technician authorization. By the end of the fiscal year the number of technicians authorized for the ARNGUS program had been reduced 423 spaces—from 22,770 to 22,347—and the USAR authorized level had been cut 424 spaces—from 5,265 to 4,841. During June 1964, common manning criteria for technicians in both components were approved by the Secretary of the Army to provide adequate numbers of full-time technicians and to insure proper training, administration, and maintenance within the units. To permit Immediate Reserve units to meet increased readiness requirements, staff training assistants were authorized for units down to and including battalion level.

The mobilization readiness of the reserve components improved in fiscal year 1964. There was marginal improvement in the materiel readiness of troop units scheduled for early mobilization. Among the major items of new equipment procured in sufficient quantity to permit distribution to high priority reserve component units as well as to active Army units were the M-108 self-propelled 105-mm. howitzer and the M-113 armored personnel carrier. Reserve component units also received some fallout equipment that became available when the active Army received new equipment. Such fallout equipment, although less modern, is normally combat serviceable and adequate to provide effective training for reserve component troops. The equipment included M-48A1 medium tanks, 5-ton stake (bridge-transporting) and dump trucks, $\frac{3}{4}$ -ton cargo trucks and trailers, and 1,200- and 5,000-gallon fuel trucks. Reserve component units not listed in the Partial Army Mobilization Plan also received some fallout equipment.

During the fiscal year, the accuracy and quality of the reports of materiel assets held by Army reserve component units improved. The Army supply status equipment reporting system was revised in order to insure more accurate reporting procedures. Data processing personnel from the field took four 1-week courses of classroom-type instruction in the preparation of asset reports. The instruction was given at the Letterkenny Army Depot, Chambersburg, Pa., by the Major Item Data Agency (MIDA), under the general supervision of the Army Materiel Command.

At the end of the fiscal year, reserve component units generally had sufficient equipment for effective training. The significant shortages were modern equipment items, many of which were also in short supply for the active Army.

The reserve components of the Army utilize armory-type facilities as home stations in which to carry on regular training and administration and to maintain equipment. In the fiscal year 1964 increment of the construction programs, joint construction and utilization of these facilities by the Army Reserve and Army National Guard and the reserve components of the other military Services have increased considerably. Emphasis toward improved readiness and mobility has increased the use of training areas for weekend unit-type field training. A system of area maintenance shops of the Army Reserve is resulting in more economical care of the equipment in the hands of the reserve units.

The reserve components' expanding need for facilities, combined with the rapid disposition of military installations excess to the requirements of the active Army, the deterioration of World War II facilities, and the curtailed availability of construction funds, has greatly increased the backlog of new facilities required. A recent study indicates that the order of magnitude of the total remaining requirement for reserve component construction of armories, maintenance shops, ranges, equipment pools, weekend training sites and facilities, and storage facilities now approximates \$410 million. Requirements for passive defense construction for the reserve components, to include space for fallout shelters within armory-type facilities, will add substantially to this estimate.

Although paid-drill strength was higher than that included in the President's budget for 1964, personnel funds provided by the Congress were sufficient to support the strength and almost all of the additional costs of the military pay raise. Participation by reserve component units in joint maneuvers was supported at the expense of a relatively small part of the planned improvement in the minor equipment status.



Figure 5. Reserve components are shown participating in DESERT STRIKE, a recent exercise typical of the accelerated training that keeps the reserve components in a high combat readiness condition.

To establish an effective means to measure and portray reserve component unit readiness, a new readiness reporting system and implementing Army regulation have been developed. The initial report is due in the fall of 1964. Unit readiness is essentially a product of personnel, training, logistical, and mobilization readiness.

The new reporting system is related to deployment objectives, or requirements, for specific units. Categories of combat readiness have been established relating the deployment objectives to a required readiness condition. Readiness indicators (personnel, training, logistics, and related fields) have been developed to facilitate management procedures that will permit timely detection and correction of inadequate allocation or improper distribution and utilization of resources. The system, properly used, will permit accurate portrayal of unit readiness, and will insure that reserve components are always in the combat readiness condition required by the deployment objective.

There has been a definite upward trend in the level of training achieved during the fiscal year. This is attributable to several factors. During May approximately 10,000 Army Reserve and National Guard troops participated in Exercise DESERT STRIKE in the Mojave Desert of California and performed satisfactorily in combat and combat support units up to brigade size. Participation in this and other joint maneuvers and field training exercises with the active Army con-

stituted a graphic example of cooperation and definitely enhanced the combat readiness of participating units.

Approximately 13,000 reserve component troops were airlifted to new training sites during the summer of 1964 in mobility exercises to and from Puerto Rico, Hawaii, and Alaska, as well as in the continental United States. Fourteen each USAR and ARNGUS Immediate Reserve units had an opportunity to engage in actual air mobility exercises and practice their acquired skills in locales closely related to their deployment mission.

The Army expanded the weekend training assembly concept to authorized multiple drills on successive days for units that could profitably train in this manner. The program provides increased training time and the opportunity to conduct small-unit tactical problems during the weekend assembly. Over 75,000 National Guardsmen in 800 company-size units and 6,500 Army Reserve troops in 40 units participated in weekend training during the fall of 1963 and into the summer of 1964. The gain in training hours in combination with the opportunity to train in the field under tactical situations has materially improved the combat readiness of participating units. Weekend training has proven to be so beneficial that the program will be extended to more Immediate Reserve units.

Selected Guard and Reserve units were administered Army Training Tests (ATT) during their summer training period. Two infantry battalions, 2 engineer battalions, 1 tank battalion, 1 artillery battalion, an ordnance company, and a separate engineer company will be tested during August 1964 to determine actual unit readiness. Brigades and divisions will spend an average of 11 days in the field, 4 of them under tactical conditions.

As previously indicated, while there was only marginal improvement in the materiel readiness of troop units scheduled for early mobilization, the level of training and of unit readiness showed marked improvement during the year.

V. The ROTC Program

Minor changes characterized the Reserve Officers' Training Corps (ROTC) and National Defense Cadet Corps programs during fiscal year 1964. Currently there are 247 colleges in the senior division, 40 institutions in the military school division, and 254 secondary schools in the junior division. Total enrollment in the ROTC program at the beginning of the 1963-64 school year was 232,642 cadets. In addition, the National Defense Cadet Corps program included 113 schools with an enrollment of 26,285 cadets.

In the senior division, 116 institutions sponsored Army ROTC flight instruction. The purposes of the program are to motivate college students to seek a career in Army aviation, screen applicants for future Army aviation training, and act as a career incentive for cadets to accept Regular Army commissions. A total of 2,883 students has completed the program. The over-all attrition rate for commissioned officer student-flyers at the Army Primary Flight Training Schools has been 25 percent. ROTC flight-trained officers, on the other hand, have experienced an 11-percent attrition for the same training. This significant record represents an important saving to the Army in money and manpower.

Six ROTC summer training camps were conducted starting in the closing days of the fiscal year, attended by approximately 13,850 cadets, who had successfully completed Military Science III (junior year).

In view of the changing pattern of higher education and the increased demands on the student's time, modifications to the current program were developed by the Department of Defense and submitted as a proposal to the Congress. The House Armed Services Committee rewrote the proposal and introduced it as H.R. 9124. The House of Representatives passed the bill on June 23, 1964. At the end of the fiscal year the bill was pending in the Senate. Provisions of H.R. 9124 apply to all Services and include: Increases of present on-campus allowance to \$50.00 per month and present summer camp pay to \$111.00 per month; up to 8,000 scholarships per Service for qualified ROTC cadets enrolled in the senior division 4-year program; freedom of institutions to offer both a 2-year and a 4-year program. Instruction in the 2-year program would take place during the junior and

senior years on campus and would be preceded by a basic summer camp period not to exceed 6 weeks. The camp period would take the place of instruction normally given in the freshman and sophomore years of the 4-year course. The pay for the basic camp would be \$78.00 per month.

The ROTC program continues to be the most important source of young officers for the active Army and reserve components. During fiscal year 1964, 11,515 cadets received commissions. Of this group, approximately 1,100 officers will receive Regular Army commissions.

ROTC counter guerrilla units, authorized during the 1962-63 school year as an extracurricular training activity, have been expanded and are now located at 100 institutions in the senior division ROTC. The first graduates with this type of Special Forces training will enter active duty during fiscal year 1965. CONARC provides general training guidance and suggested training activities adapted to the local environment are provided to professors of military science by the John F. Kennedy Center for Special Warfare at Fort Bragg, N.C. In addition, 6 hours of counterinsurgency orientation are included in the program of instruction for the senior and military schools divisions. Counter guerrilla and counterinsurgency training are integrated during summer camp training. The extracurricular counter guerrilla training is considered very successful in recruiting for ROTC and generating interest in active Army and reserve component Special Forces activities.

VI. Personnel Plans, Policies, and Problems

Men are the backbone of the Army. All the plans, organization, and training are worthless without intelligent and dedicated soldiers to give them meaning. The problems of attracting and holding such men in a highly competitive market are challenging since many of the skills the Army requires most in an age of rapid technological change are those in demand in industry. Greater opportunities for advanced education and promotion, increased pay, and better family housing are helping the Army in its task, but the problems are constant and will require thoughtful consideration and timely action in the years ahead.

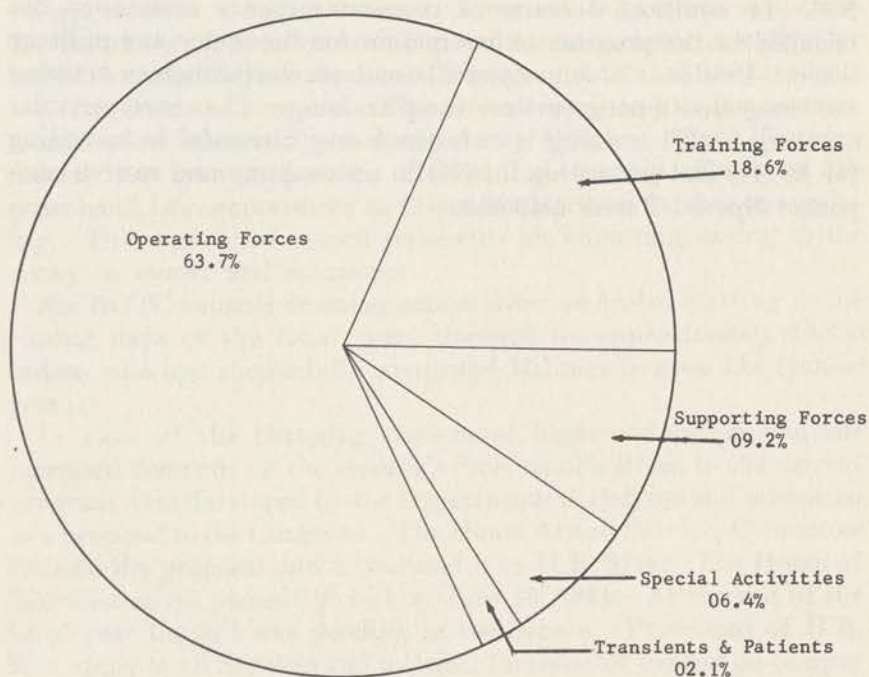


Figure 6. Distribution of Army personnel by major activities.

Military Personnel

The actual strength of the Army on June 30, 1963, was 975,916, including reimbursables. The initial authorized strength for fiscal year 1964, exclusive of reimbursables, was 960,000 to which was added an allocation of 15,000 for the testing of air mobility concepts. Transfers and reductions further lowered this initial authorized strength to 971,527. The actual strength at the end of fiscal year 1964 was 973,238 (including 793 reimbursables). Distribution of actual strength was: Officers (male and WAC), 97,224; warrant officers, 10,230; enlisted, 860,514; nurses and medical specialists (officer), 3,416; and cadets, 1,854. Of the 860,514 enlisted personnel on active duty, approximately 24 percent were draftees or reserves.

In consonance with established requirements, the Army's operating forces were 63.7 percent of total strength; training forces, 18.6 percent; supporting forces, 9.2 percent; special activities, 6.4 percent; and transients and patients, 2.1 percent.

During the 1964 fiscal year, officer accessions totaled 19,468. There were 2,626 officers appointed in the Regular Army, including 494 from Service academies, 986 from the ROTC Distinguished Military Graduate Program, 21 from civilian life, and 1,125 from the Active Duty Integration Program.

PROCUREMENT OF OFFICERS BY SOURCE IN FISCAL YEAR 1964

Source	Gains
Service Academies.....	494
Reserve Officers' Training Corps.....	10,837
Officer Candidate School.....	1,688
Voluntary Active Duty.....	1,042
Professional (JAGC, WAC, MSC, CHAP).....	600
Medical Corps, Dental Corps, Veterinary Corps.....	2,473
Regular Army Appointments (from civilian life).....	21
Miscellaneous.....	75
Nurses and Medical Specialists.....	539
Warrant Officers.....	1,699
Total.....	19,468

NOTE: The "Miscellaneous" category includes administrative gains such as recall from retired list and inter-Service transfers. The grand total does not include 1,350 officers and warrant officers of the Alabama National Guard, called into Federal service during civil disturbances.

The retention of junior officers beyond their tour of obligated service remained a major problem. To maintain the proper strength and structure of the officer corps, 2,511 young officers must extend their service each year. Only 83 percent of this minimum figure elected to remain in the Army in fiscal year 1964, slightly less than the 85 percent of the previous year. The Army offered extensions for any period less than 1 year to young Reserve officers on their initial tour and approximately 1,400 took advantage of this option. To increase retention, the Army strongly supported career incentives such as better pay and improved housing.

For enlisted personnel the situation was mixed. First enlistments reflected an appreciable gain, as did first-term Regular Army reenlistments, the latter largely because of a policy change in October 1963 authorizing reenlistment upon completion of 1 year of active Federal service. Over-all Army reenlistments reflected a gain of 9,936 over fiscal year 1963, even though career Regular Army and inductee rates declined. The decline in the inductee reenlistment rate for fiscal year 1964 does not reflect the steady upward trend that existed during the last 8 months of the fiscal year. This is due to the fact that reenlistment rates during the first 4 months of the fiscal year were extremely low. Reserve and National Guard reenlistment rates remained about the same. (See figs. 7 and 8.)

For those who remained in the Army, assignment to the job for which they were most qualified was a major consideration. The Army participated fully in a Government-wide program to promote efficient management and proper utilization of manpower resources. One of the most important Army measures was the development of a comprehensive plan to assure proper assignment and employment of enlisted and officer personnel. The approaches under the plan include expansion of manpower surveys to include an inquiry into the utilization of enlisted personnel, increased emphasis in the mission of Army military personnel management teams that provide consultative assistance to commanders at all levels, inquiries by inspectors general into the effectiveness of classification and employment of enlisted personnel throughout the active Army, and close monitoring by major commanders to insure that procedures and practices in their commands do in fact assure proper personnel management and administration. In addition, the Army is attempting to use the skills and potential of enlisted women more effectively and has added 16 military occupational specialties to the WAC-authorized MOS list.

To increase the potential of Army personnel so that they may effectively fill the more difficult professional and technical positions,

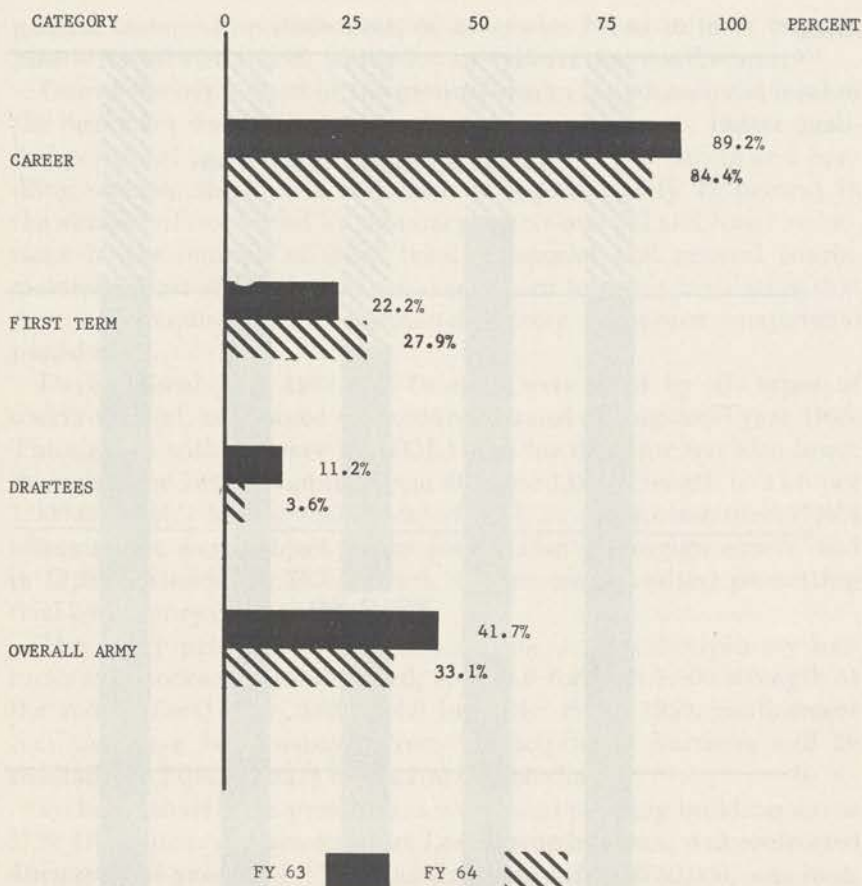


Figure 7. Army reenlistment rates.

the Army continued the drive to raise educational achievements and levels in 1964. Approximately 73 percent of all officers now have college degrees, and over 75 percent of enlisted personnel have completed high school requirements. A major portion of the educational opportunities made available to military personnel were provided under the General Educational Development (GED) Program. During the past year the average GED enrollment exceeded 136,000 students, and approximately 42,000 were able to complete the high school GED equivalency test. Some 46,000 military personnel participated in off-duty college study, with over 700 receiving degrees. For the Army overseas, Boston University began a graduate program in international relations in Heidelberg. It is anticipated that this program

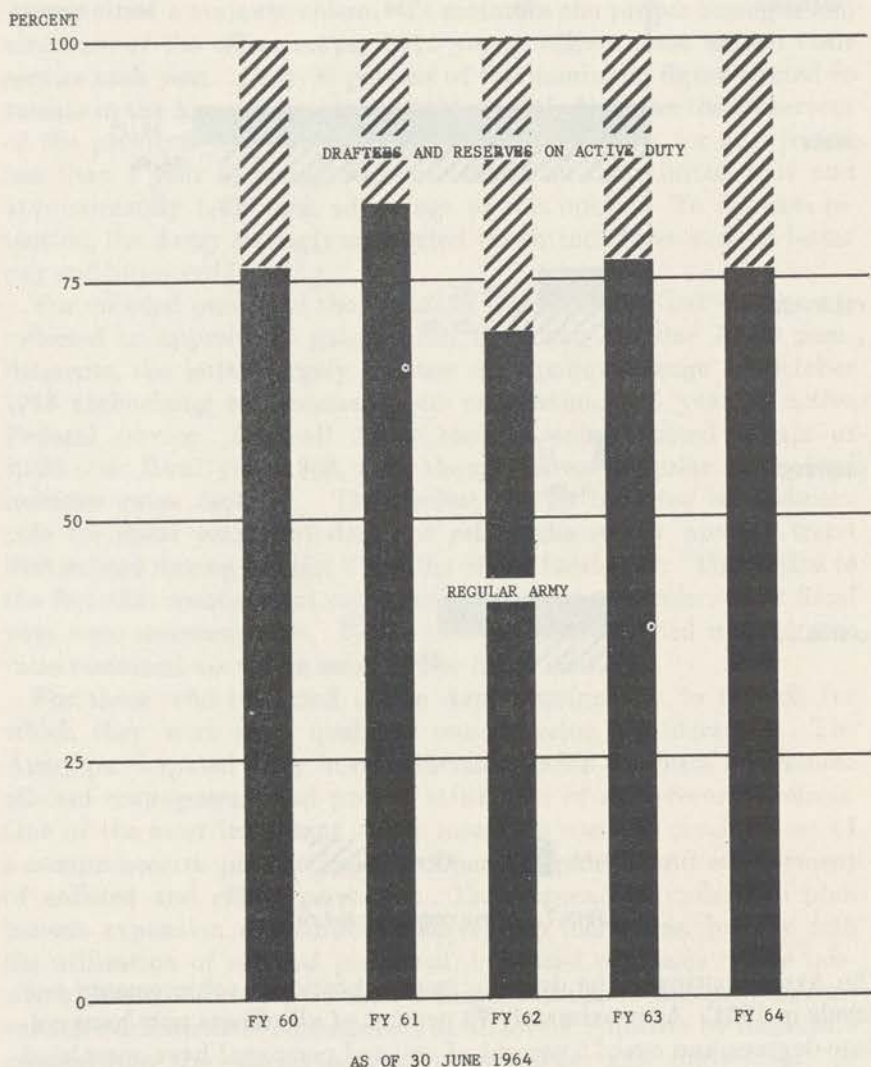


Figure 8. Status of enlisted personnel.

will be expanded to include courses in education and business administration. In the development of a second language, reports from 305 education centers indicated a constant increase in the number of soldiers taking advantage of the opportunities afforded them in foreign language training.

The Army placed increased emphasis on identifying, counseling, and assisting enlisted personnel who had potential for development but who lacked a high school education, scored less than 90 in the

general technical aptitude area, or otherwise failed to meet requirements for service school admission or criteria for reenlistment.

One of the byproducts of the gradual rise in the educational level of the Army is a decrease in serious disciplinary problems. Better qualified personnel combined with better methods for preventing and handling offenses resulted in a decline of approximately 71 percent in the number of cases tried by summary courts-martial and lesser reductions in the number of cases tried by special and general courts-martial. Most of this decline could be traced to recent legislation that gave commanding officers increased powers to impose nonjudicial punishment.

During fiscal year 1964, 42,773 cases were tried by all types of courts-martial, as opposed to 59,883 cases tried during fiscal year 1963. The absence without leave (AWOL) rate for this year was also lower than that for 1963, dropping from 49.4 per 1,000 strength to 47.6 per 1,000 strength. Military personnel of the U.S. Army committed 17,861 offenses that were subject to the jurisdiction of foreign courts, and in 12,584 instances, or 70.5 percent, waivers were obtained permitting trial by military courts.

The Army prisoners-in-confinement rate in U.S. disciplinary barracks and stockades also dropped, from 4.6 for each 1,000 strength at the end of fiscal year 1963 to 4.0 in 1964. Since 1959, confinement facilities have been reduced from 2 disciplinary barracks and 50 stockades to 1 disciplinary barrack and 46 stockades.

To help rehabilitate prisoners, a vocational training building at the U.S. Disciplinary Barracks, Fort Leavenworth, Kans., was completed during fiscal year 1964. This building, valued at \$750,000, was built with prisoner labor under a grant of \$350,000 from the Federal Prison Industries. The cost to the Government in appropriated funds was only \$25,000 for connecting utilities.

In the field of morale, the Uniformed Service Pay Act of 1963 provided a decided boost. It was the first time since 1958 that basic pay had been adjusted. Major provisions of the new act were a 14.2 percent increase in basic pay for members with over 2 years of service, a \$30 per month family separation allowance, multiple payment of incentive (hazardous duty) pay, hostile fire (combat) pay, and authority to designate certain overseas areas for special pay for enlisted men serving there.

Nevertheless, the pay of military personnel still does not equal the salaries of technical and professional people on comparable levels in other segments of the economy. Consequently, the Army supported the new pay raise pending in Congress at the close of the fiscal year as a means to help procure and retain quality personnel in a competitive market.

Another aid to military morale was the \$45.9 million for construction of troop housing and support facilities and the \$10.1 million for bachelor officer quarters (BOQs) that Congress appropriated in fiscal year 1964. The billets for enlisted men are designed as a complex to include the basic support facilities and such units as the gymnasium, chapel, dispensary, and a branch PX. This design allows for greater unit control, convenience and esprit, savings in construction, and economy and efficiency in operation and maintenance. When completed, the new facilities will provide permanent quarters for approximately 1,300 bachelor officers and 12,500 enlisted personnel.

Ultimately the Army hopes to provide adequate permanent housing for all military personnel at permanent installations. The current deficit in permanent housing is about 180,000 enlisted spaces (about 50 percent of the total requirement), and 14,000 bachelor officer spaces (about 66 percent of the requirement). Construction was begun during the 1964 fiscal year on 9,165 barracks spaces and 730 BOQ spaces. During the same period 3,148 barracks spaces were completed at a cost of \$6.5 million; no BOQ spaces were completed. The Army has developed a program for the construction of troop housing that, if approved by the Congress, will largely satisfy known requirements in about 10 years.

In family housing, however, the situation is less promising. The program for new construction for fiscal year 1964 funded by the Congress was 1,366 units, while approximately 2,270 units, authorized in previous years, became available for occupancy. Since the Army estimates that it will need 14,540 units of family housing during the next 5 years, the current rate of construction will result in a continued deficit.

The scope of the leasing program, both overseas and in the United States, was considerably reduced when the Congress established a \$160 cost average for rent and utilities and reduced the total Department of Defense authorization to less than 5,000 units, prescribing that these units were for tactical or temporary use only. The Army's allocation was correspondingly lowered to 3,662 units, a reduction of 2,162 units. These restrictions deprive the Army of a flexible means of relieving financial hardship upon eligible personnel in areas where government housing is not available and where suitable community support housing is expensive. They also forced the Army to renegotiate or cancel approximately 2,000 leases to bring the cost within the ceiling with a resultant dislocation of the families involved.

Overseas, OSD authorized the Army to lease 998 units of family housing in foreign countries in fiscal year 1964. This low figure, coupled with the Defense policy that leasing for personnel below the rank of colonel may be accomplished only with prior approval of

OSD, had a serious impact on mission and attaché personnel in areas where housing costs are high. Adjustment in station housing allowances has helped in some countries, but in many areas leasing by the individual is not practical because of required large advance rental payments and other initial costs.

The maintenance of a high level of Army morale requires continued progress in the areas of basic pay, allowances, family quarters, and exchange and commissary services. Recent attacks upon commissary and post exchange privileges are viewed with concern by many Army career soldiers as steps that would seriously weaken their ability to support their families. Every effort should be made to maintain these services and to avoid a damaging loss of morale.

Among the encouraging facets of Army morale during the fiscal year was the continued high attendance at religious services. Over 20 million participated in the services, and Army chaplains gave increased attention to administering to the needs of soldiers in troop training areas. Funds were provided for construction of five regimental chapels and five chapel centers, which, when completed, will provide over 4,000 seats and 134,763 square feet of space at an estimated cost of \$4.1 million.

Immediately after the Alaskan earthquake the Chief of Chaplains made an appeal to all Army chaplains suggesting that designated offerings be requested at services to help the victims of the earthquake. As a result, over \$28,000 was collected and given to the Command Chaplain, U.S. Army, Alaska, for distribution to various relief organizations.

As another aid to morale, the Department of the Army has continued its vigorous implementation of a policy of equal treatment and opportunity for all military personnel and their dependents without regard to their race, creed, color, or national origin. This policy has presented no unusual problems at military installations.

The physical health of the Army also reflected favorably upon the state of morale and the more careful selection of personnel. In fiscal year 1964 the rate of admission of Army active duty military personnel to hospital and quarters decreased for the sixth consecutive year; the average daily noneffective rate for this period was the lowest ever recorded. The admission rate to hospital and quarters for all causes of 272 per 1,000 troops per year was 9 percent lower than the very favorable rate of 298 experienced in the previous year. The noneffective rate, based on the average daily number of Army personnel in an excused-from-duty status because of illness or injury was 10 per 1,000 strength in 1964 compared to 11 in 1963, which to that date had been the lowest such rate in Army experience.

A continuing problem in medical care, however, has been the growth of the backlog of unserviceable and obsolete equipment in Army hospitals that has mounted steadily over the years because of funding limitations. To reduce and eventually eliminate this backlog, an aggressive program was initiated in fiscal year 1964 to ascertain requirements and obtain funds. Against worldwide requirements of over 8.6 million, 1.5 million was made available. Since new requirements generate at a rate of approximately \$3.5 million annually and only about \$2 million is normally available for equipment within command resources, the backlog will continue to increase.

In preventive medicine, oral attenuated poliomyelitis vaccine (Sabin) was substituted in fiscal year 1963 for the inactivated vaccine (Salk) previously used to protect personnel against poliomyelitis. It is noteworthy that not a single military person in the Army has developed poliomyelitis since the oral attenuated vaccine has been used.

The Dependents' Medical Care Program as a whole continues to be a factor in maintaining morale among Service personnel and their dependents. However, there are limitations on outpatient care from civilian sources and on dental service for dependents in the United States. The majority of civilian employee health plans, sponsored by industry and labor, include some outpatient care. Moreover, the nonavailability of routine dental care for dependents in the United States, from military facilities, places a monetary burden upon the military man.

The shortage of military nurses is a continuing problem. To attract high school seniors and eligible enlisted personnel into the profession, the Walter Reed Army Institute of Nursing in Washington has established a 4-year degree program in connection with the University of Maryland. Under this program selected applicants will enlist for 4 years as privates first class. During the first 2 years they will attend a college of their own choice and then spend the final 2 years of training at Walter Reed Medical Center. Students will matriculate at the University of Maryland while at Walter Reed and receive degrees of Bachelor of Science in nursing upon successful completion of the program. Graduates will then be given a commission in the Army Nurse Corps with a 3-year active duty commitment.

A medical materiel program for defense against chemical and biological agents was established by the Department of Defense to increase the capability of the armed forces to defend against these agents. The program provides for augmentation and pre-positioning of medical supplies for military and noncombatant personnel in overseas commands and for military personnel assigned to Strategic Army Force units in CONUS. Medical supplies are being pre-positioned in

two phases. Phase I includes broad spectrum antibiotics for the prophylaxis and treatment of infectious diseases naturally or artificially induced, and atropine syrettes and automatic injectors for treatment of casualties resulting from exposure to anticholinesterase agents (nerve gases). Phase II is limited to pralidoxime chloride, an oxime to be used as an adjunct to atropine in the treatment of nerve gas poisoning.

On September 16, 1963, the Secretary of Defense directed completion of Phase I in fiscal year 1964 rather than fiscal year 1966 as originally programed. The decision further indicated that Phase I would be funded within total resources available to the Army in 1964. Action was taken to assure that required supplies were requisitioned and shipped to oversea commands in time to complete pre-positioning with individuals, at treatment facilities, and in depot reserves before the end of fiscal year 1964.

A special program to prevent accidents as a means of keeping Army personnel and materiel in condition to perform effectively is a matter of continuous interest in the Army. During recent years the Army has successfully reduced the frequency and severity of accidents, thereby increasing its combat efficiency. Fiscal year 1964 was the sixth consecutive record low year in the category of civilian injuries. The military injury rate and the Army aircraft accident rate were the best on record. Improved liaison with other Federal departments having responsibility for accident prevention, added training for Army personnel, especially in nuclear weapons and aircraft safety measures, and efforts to raise the qualifications of Army safety management career personnel have all helped to lower accident rates. To improve an already commendable accident prevention record, a considerable amount of time and funds will be needed for research into the human factors associated with error-free performance, and into the various types of mechanical and operational safeguards that will be required as weapon systems increase in complexity.

Civilian Personnel

Behind the men in uniform is the civilian work force, which supports the military personnel in peace or war. At the close of fiscal year 1964, the Army employed 462,818 civilians. Of this number, 148,000, including 128,100 foreign nationals, were employed outside the continental United States.

Reductions and reorganization are affecting a number of civilian personnel. On December 12, 1963, the Army announced the establishment of a streamlined supply and maintenance system that will affect 13,000 civilian employees and will result in a reduction of 3,725

civilian positions in the Army supply system during the next 3 years. On April 24, 1964, the Department of Defense announced additional installation and base closures and transfers of function that will directly affect 4,500 Army civilian personnel. The consolidation of contract administration offices under the Defense Contract Management Agency will affect another 6,900 Army employees.

To insure that career employees were not adversely affected by these shifts and reductions, the Army set up a policy and program for stability of employment for career employees. The program will provide job opportunities for employees affected by these management decisions.

Overseas, the Department of Defense directed the Army to reduce the strength of the non-U.S. citizen work force by 23,000 employees before December 31, 1964. By the end of fiscal year 1964, local national strength had been reduced by 18,000 employees.

As the number of civilian employees shrank, the Army sought to use its work force more effectively. It conducted an annual survey to identify underutilized employees and found more Negroes in this category, in proportion to their total in the civilian work force, than Caucasians. To implement the Equal Employment Opportunity Program, Army staff personnel visited 28 activities in Southern States and consulted with managers and supervisors on means and methods that might be put into effect to improve the situation. Representatives of the Army appeared before the President's Committee on Equal Employment Opportunity to discuss program status, progress, and plans. The Army program received favorable comment. The Army also gave more emphasis to the employment of women and the handicapped.

In other personnel developments, the Army established a program for analyzing and improving the design of positions. It also developed and tested a plan for training middle managers in position management. To control any undue escalation of grades and the tendency toward an increased proportion of employees in the higher grade levels, the Army took three steps: An improvement in job structure; more direct review by managers of jobs as they were set up, vacated, or advanced in grade; and improved standards and guides to standards that would be applied to Army positions.

To boost civilian morale and provide adequate compensation, a pay raise approved by Congress and the President in 1963 went into effect on January 1, 1964. Selected employees were rewarded with educational opportunities as well. Secretary of the Army Fellowships were given to nine employees and Ford Foundation grants to five others. The latter afforded 1 year of graduate education to the recip-

ients. Another Army civilian was given a year at the Woodrow Wilson School of Public and International Affairs at Princeton University. During the year 75 Army civilian executives attended the pilot program at the Executive Seminar Center, Kings Point, N.Y. For the first time, an Army civilian attended the Army War College at Carlisle, Pa.

In addition to these special awards, the Army career management program provided broader opportunities for civilians to develop their capabilities. Some 50,000 were included in the program by the end of the year. Plans are under way to cover approximately 23,000 engineers and scientists under the program in the near future. To assist in the process, automatic data processing equipment has been purchased, programing initiated, and employees trained to operate the machines.

This was the second year of operation under the policy on labor-management relations issued in Executive Order 10988 on January 17, 1962. The Executive order emphasized the rights of Federal civilian employees to establish and participate in employee organizations. Since that time, membership of Army civilians in employee organizations has increased from 40,000 to approximately 67,000 members. Bargaining units established at the local level mounted from 110 at the end of fiscal year 1963 to 213 in 1964, with exclusive recognition in 105 units and formal recognition in the remainder. At the national level formal recognition has been granted to the American Federation of Government Employees, the National Federation of Federal Employees, and District 44, International Association of Machinists.

To supply the demands for teachers and educational administrators overseas for the dependents of military and civilian personnel of the Department of Defense, the Office of the Secretary of Defense established a joint Army, Navy, and Air Force recruiting program in October 1963. The Army became coordinator of the program and provided leadership for a centralized teacher recruitment office handling the teacher applications and interviews.

In sum, fiscal year 1964 has witnessed a considerable improvement in the personnel situation, military and civilian. The problems yet to be solved center mainly on the retention of qualified personnel. Proper recognition of their talents with adequate compensation and opportunities for advancement offer the best long-term prospects for a satisfactory solution.

VII. Management, Budget, and Funds

Management

The goal of management in any field is to get the job done in the most economical way. In the Army this goal is to provide effective ground forces required for the Nation's security at the least possible cost to the taxpayer. In fiscal year 1964, increased attention to the use of scientific management tools and new and streamlined reporting systems have been the two principal subjects of the Army's continuing effort to improve the management of its resources.

A survey made this year ascertained that the measurement of the amount of work produced by an individual or group in comparison with a standard of performance is a technique not being used to full advantage in the Army. As a result, an intensive program is now underway to obtain much broader use of work measurement techniques. In particular, work measurement will be introduced into laundry operations, commissaries, finance and accounting offices, shops that maintain field equipment, and the industrial activities of arsenals and depots. Pilot tests will first be conducted in Army installations both in the United States and overseas.

The complex problem of applying limited resources to a variety of competing weapon systems has led to increasing emphasis on "cost effectiveness." The Army has encouraged planners at all levels to consider more carefully the question of costs in relation to results likely to be obtained; in addition, it has set up small groups in the Office of the Chief of Staff and in the Army secretariat manned by experienced military and civilian specialists to concentrate on systems analysis and to apply the broad techniques of operations research to Army problems.

PERT (Program Evaluation and Review Technique), first mentioned in the fiscal year 1962 report, continues to be used in many Army operations, principally in planning, controlling, and synchronizing the main phases of weapon systems projects and other large-scale undertakings. This managerial tool has been built into the project management system developed by the Army Materiel Command. As originally developed, the PERT technique dealt with time and costs involved in carrying out a project. A study is now underway to expand PERT so that it will provide a means for anticipating the reliability

or chances of success of various phases of a project. It is hoped that PERT will eventually enable a project manager to predict with reasonable accuracy the reliability of various components of a weapon system before the system is actually completed.

Last year the Army found that 87 percent of the uses of PERT were in the Army Materiel Command and the Corps of Engineers, and this year the two agencies continue to be the principal users. However, PERT techniques are being applied by other agencies of the Army and to other activities.

As an additional aid, the Army Logistics Management Center developed a management tool known as CAPERTISM (Computer Assisted PERT Simulation), using PERT techniques and computer calculations to provide management with a very rapid method (several hours) for learning the probable results of alternate decisions before deciding between them. By using CAPERTISM, managers are able not only to practice making decisions but in some cases to learn the appropriate effects before actually committing resources to actual undertakings.

The Army's Work Simplification Program provides both military and civilian supervisory personnel at all levels with easily applied techniques of management analysis so that they can improve their own operations. The Army realized \$88,895,438 in benefits through 87,634 installed improvements during the fiscal 10-year period 1953-63. In the past year 153,158 supervisors received 12 or more hours of on-the-job training in such techniques as the work distribution chart, flow process chart, work count, motion economy, and the layout study. Significant steps were taken during 1964 by a number of major commands, including the Continental Army Command, Fifth Army, Army Materiel Command, and the Office of The Adjutant General, to strengthen further and revitalize the work simplification effort by providing appropriate command direction and support for successful application of these proven management analysis techniques.

The commanders and staffs of higher Army headquarters must guide the efforts of subordinate commands and be informed of their activities to assure that the Army's job is properly done. However, it is just as important that undue restrictions not be imposed on the initiative and freedom of action of subordinate commanders. As a preventive measure, the Chief of Staff in March 1963, directed that all major Army headquarters review their directives and reports and take steps to eliminate unnecessary or overly restrictive controls over subordinate commands. This has resulted in substantial benefit to subordinate commanders by granting them greater authority and flexibility in many activities.

Review and analysis for top management in the Army—for its senior military and civilian leaders—focused sharply on the mission accomplishments of the major Army commands and the combat capabilities of their forces. Such review and analysis media as the annual command analyses of the major Army commands, the quarterly functional reviews by Army programs, and the biweekly Army status report made extensive use of data provided by the new operational readiness reporting system (see ch. II). The status report provides a new and effective tool for relating a wide variety of functional programs and resources such as personnel management, training, and logistical activities to the major objectives of the Army.

The mushrooming requirements for rapid costing of many alternative courses of action associated with the size, composition, and deployment of Army forces has posed a demand for modernization of cost estimating processes. To this end, an Army force structure cost model is being developed, using automatic data processing machines, to measure the cost impacts of proposed force structure changes in basic Army and joint plans, and in planning studies initiated by the Army or by the Office of the Secretary of Defense.

The model, which was first operational in January 1964, is somewhat limited in both scope and refinement, but it provides a point of departure from which improvements will be made, with a view toward wider application to planning problems. Research is currently being conducted to improve the model's structure, automated routines, costing methodology, operational factors, and cost factors.

Audits of contractors and the increasing frequency, scope, and importance of requests for audits received from top-level management within the Department of Defense and the Department of the Army had an appreciable effect upon audit planning and objectives during fiscal year 1964. Management techniques, audit approaches, and audit methods were developed and/or revised to meet the growing and changing needs of the Army and to keep abreast of the latest developments in industry.

For each major defense contractor, an annual audit plan was established that provides information relating to the reasonableness of the contractor's cost and pricing proposals, the adequacy of practices and controls bearing on the contractor's management decisions, and whether these decisions equitably consider the interests of the Government. Under this system, geared to the issuance of interim reports on specific functional areas and an annual summary report for each major defense contractor, 18 comprehensive reports on management audits of major defense contractors were issued during the fiscal year, and an additional 12 reports were nearing completion at the end of the year. This represents a substantial increase over earlier years.

Also released during the year were reports on approximately 150 installation audits, 6 comprehensive vertical audits of major Army commands and programs, and 2 lateral audits of Army-wide functions and areas of activities.

Special audits performed by request of higher authority or the various elements of Army command and management indicate a substantially greater utilization of audit service in furnishing information required for more effective management of Army resources. The following major special audits were completed or in process during fiscal year 1964:

Special Audits Completed

Profitability Study of Selected Major Army Contractors, Calendar Years 1960 and 1961

Study of Financial Management of Research and Development Contracts at Contractor Plants

Automatic Data Processing System, U.S. Army Weapons Command, Rock Island, Ill.

Special Service, Transportation, Commissary and Food Service Activities, Joint U.S. Military Advisory Group, Thailand

Administration of NASA Construction Projects (Fort Worth, Tex.; Albuquerque, N. Mex.)

Review of Project PLUS Activities at U.S. Army Electronics Materiel Command

Evaluation of the Practice of Procuring Engineering or Engineering Services

Special Audits in Process

Department of Defense Cost Reduction Program (Scheduled through fiscal year 1965)

U.S. Army Commanders' Requests

Office of Civil Defense

Tropospheric Scatter Communications System (ET-A)

Study of Army Aircraft Provisioning Ratios

A consolidated vertical audit of the NIKE-HERCULES system and the Army Air Defense Command was also started during the fiscal year. The object is to furnish an over-all evaluation of Department of the Army effectiveness in maintaining its NIKE-HERCULES air defense guided missile sites in a perpetual state of operational readiness as economically as possible. Unlike other vertical audits, to accomplish its purpose this audit cannot be restricted to operations of a particular segment of the Department of the Army, but must include coverage of all Army elements having responsibility for support or operation of the weapon system. The vertical audit will include cov-

erage of over a hundred CONUS and oversea procurement offices, supply and maintenance installations, and missile sites, in addition to several major defense contractors.

Audit services were provided for Department of Defense Project 60, Consolidation of Contract Administration Services. The Army furnished audit liaison and support in connection with both internal auditing and contract administration test operations being conducted for the Defense Contract Administration Services Region (Pilot Test), in Philadelphia, Pa.

The Army made significant progress in refinement and application of the mission-oriented approach to the audit of an installation. Under this concept, evaluation of the ability of the installation to perform its major mission or missions effectively is established as the audit objective and becomes the starting and focal point of the total audit. For example: In the audit of post supply activities of a Class I installation with the primary mission of providing logistical support to STRAC units, examination of post supply functions, under conventional audit procedures, may be audited either simultaneously with or before the audit of STRAC units. The mission-oriented audit approach, however, suggests that since support of STRAC units represents the major mission, the audit actually should begin with STRAC units. Where it is ascertained that the STRAC unit is effectively supported, this determination establishes that post supply activities also are performing effectively, and audit coverage of the post supply activities can be reduced accordingly.

As an added audit service, a reporting technique was initiated during the year to permit greater utilization of audit information at the Department of the Army secretariat and other organizational levels of Department headquarters. An executive-type brief accompanies each internal and major contractor audit report forwarded to these levels. The brief furnishes the most pertinent information contained in the audit report and obviates the necessity for detailed reading of the audit report at these levels.

The rising incidence of General Accounting Office (GAO) reports on Defense activities has attracted considerable interest throughout the Department of Defense. Special emphasis in fiscal year 1964 was placed upon internal coordination of actions and information relating to audits of the GAO, and upon the timely identification of those areas of Army operations requiring improvement, in order to minimize GAO reporting of adverse conditions.

Activities being reviewed by GAO furnish pertinent details immediately following the completion of GAO on-the-spot investigations and periodically thereafter on all incomplete actions. At the Department of the Army Staff level, action agencies are required to

designate a project officer to monitor the audit from its inception until all actions are completed. This added emphasis enables project officers to acquire essential background information on the problems raised in order to provide the audited activity with necessary policy guidance for effecting immediate corrective actions.

To help Army management use audit reports more effectively, a series of letters is being distributed throughout the Army citing deficient or repetitive conditions frequently revealed in both Army Audit Agency and GAO audit reports. These provide a basis for management at all levels to initiate action to correct similar conditions that may exist in activities other than those audited.

Budget and Funds

Nine months before the beginning of the fiscal year, the Army submitted to OSD a budget estimate of \$14.3 billion in new obligational authority (NOA) for fiscal year 1964. As a result of OSD and Bureau of the Budget review, the President's budget, submitted to Congress on January 21, 1963, contained \$12.8 million in NOA for Army.

The actions on these budget requests are traced, by appropriation, in figure 9.

During the Korean war the United States furnished logistic support on a reimbursable basis to the armed forces and other organizations of United Nations member governments participating in that operation. Included among the 19 governments provided this support were the British Commonwealth Governments of the United Kingdom, Australia, and New Zealand.

In fiscal year 1964 the British Commonwealth Governments initiated negotiations with the United States to settle their accounts. An agreement was consummated on February 5, 1964, whereby the three Commonwealth governments agreed to reimburse the United States the sum of \$45,400,737 no later than June 30, 1964, in full settlement of the amount due. This amount represented \$49,503,319 due the Department of the Army and \$2,037,632 due the Department of the Air Force, less a credit of \$6,140,214 due to the Commonwealth Governments for bulk petroleum, oil, and lubricants (POL) supplied the U.S. Army. Payment was made by Australia on behalf of the Commonwealth Governments on March 6, 1964.

Figure 9
DEPARTMENT OF THE ARMY
CHRONOLOGICAL SUMMARY OF THE BUDGET ESTIMATE FY 1964,
(In Thousands of Dollars)

Appropriation title	Submitted to OSD 1 Oct. 62	President's budget	Appropriated PL 88-149 (10/17/63) PL 88-220 (12/21/63)	New obligatory authority	
				Supplemental appropriation PL 88-317 (6/9/64)	Total FY 1964
Military Personnel, Army-----	4, 157, 996	a 3, 885, 000	a 3, 785, 000	b 189, 000	3, 974, 000
Reserve Personnel, Army-----	236, 074	210, 100	210, 100	500	210, 600
National Guard Personnel, Army-----	253, 280	240, 300	242, 800	6, 200	249, 000
Operation and Maintenance, Army-----	3, 821, 974	3, 395, 200	3, 369, 071	-----	3, 369, 071
Operation and Maintenance, ARNG-----	184, 931	176, 600	180, 800	-----	180, 800
National Board for the Promotion of Rifle Practice-----	555	528	528	-----	528
Procurement of Equipment and Missiles, Army-----	3, 444, 387	3, 202, 000	2, 931, 094	-----	2, 931, 094
Research, Development, Test and Evaluation, Army-----	1, 643, 283	1, 469, 900	1, 386, 141	-----	1, 386, 141
Total (exclusive of Military Construction)-----	13, 742, 480	12, 579, 628	12, 105, 534	195, 700	12, 301, 234
Military Construction, Army-----	579, 276	249, 500	200, 646	-----	200, 646
Military Construction, AR-----	8, 500	4, 500	4, 500	-----	4, 500
Military Construction, ARNG-----	14, 200	3, 500	5, 700	-----	5, 700
Total Construction-----	601, 976	257, 500	210, 846	-----	210, 846
Total Military Functions-----	14, 344, 456	12, 837, 128	12, 316, 380	195, 700	12, 512, 080

a In addition, \$150 million transferred from Stock and Industrial Funds.

b In addition, reimbursements from the British Commonwealth governments were used in lieu of new obligatory authority as follows: \$20.7 million transferred to MPA from OMA; \$6.5 million transferred to MPA from PEMA; and \$16.2 million in reimbursement credits to MPA.

Obligations

Obligation authority comes from two primary sources—appropriations by Congress as new obligation authority and customers' orders, which provide reimbursable obligation authority. Both sources are identified in the President's budget, although the latter is only a forecast. The current fiscal accounting system does not identify obligations by source or type of obligation authority; in addition, actual obligations incurred in any fiscal year will, for the no-year appropriations (PEMA, RDT&E, and construction), include obligations against obligation authority appropriated in earlier years. Thus, actual obligations cannot be measured directly against new obligation authority.

A comparison of total obligations by appropriation for fiscal years 1963, 1964, and 1965 is shown below:

(Millions of Dollars)

	FY 1963 (actual)	FY 1964 (actual)	FY 1965 (estimated)
Military Personnel, Regular Army----	\$4, 115. 1	\$4, 329. 6	\$4, 386. 0
Reserve Personnel, Army-----	189. 7	207. 2	244. 0
National Guard Personnel, Army-----	218. 9	247. 5	278. 0
Operation and Maintenance, Army---	4, 086. 0	4, 154. 8	4, 109. 0
Operation and Maintenance, ARNGUS-----	175. 4	181. 0	190. 0
Promotion of Rifle Practice-----	. 6	. 5	. 5
Procurement of Equipment and Missiles, Army-----	3, 090. 6	2, 836. 7	2, 850. 0
Research, Development, Test and Evaluation, Army-----	1, 297. 3	1, 389. 4	1, 516. 0
Military Construction, Army-----	425. 9	617. 0	532. 0
Military Construction, USAR-----	7. 9	6. 3	10. 0
Military Construction, ARNG-----	12. 3	13. 4	12. 0
Total General Appropriations--	13, 619. 7	¹ 13, 983. 3	¹ 14, 127. 0

¹ Details do not add to total due to rounding of figures.

The Army expanded its efforts to reduce expenditures in oversea areas as part of the Department of Defense program to reduce the U.S. adverse balance of international payments. Oversea commands carried out programs to encourage personnel to curtail expenditures on local economies and to promote personal savings through increased bond deductions, soldiers' deposits, and savings in American institutions. Award of construction projects and procurement of materials and supplies continued to be diverted from foreign to U.S. sources whenever practicable. Strenuous efforts continued to promote further

sales of U.S. weapons and materiel to allies and, through cooperative logistic arrangements, to expand use of facilities. Reorganization and improved management techniques resulted in some force reductions that in turn have reduced oversea expenditures.

More than 2 years have passed since the introduction of the new OSD program system. It has become increasingly apparent that the Army must improve the correlation of planning, programing, budgeting, and the program-budget execution system. Each of these systems serves a different purpose and has a different structure.

The project to make the systems compatible enough to insure continuous correlation began in the fall of 1963. Some of the specific subprojects have been substantially completed, such as the integration of the Army fiscal code with the Army management structure, the establishment of realistic schedules for annual program and budget actions, and the revision of the budget cycle to allow for funding adjustments once in the middle of the fiscal year rather than quarterly. The over-all program is scheduled for completion in the fall of 1964.

VIII. Army Cost Reduction Program

During the past year the Army intensified its efforts to economize under the Army Cost Reduction Program. The Secretary of Defense had established a Defense-wide, 5-year program at the beginning of fiscal year 1963 that had three essential objectives—buying only what was needed, buying at the lowest sound price, and reducing operating costs. By the end of fiscal year 1964 the cost reduction program encompassed 26 functional areas and had been expanded to cover all Army operations, including civil works functions of the Corps of Engineers.

The Army monetary cost reduction goal established for fiscal year 1964 totaled \$818 million, 78 percent higher than the \$459 million objective set up for 1963. The Army not only met this goal but managed to exceed it by about 20 percent with validated cost reductions amounting to approximately \$978 million for the year.

In fulfilling the objective "buying only what was needed," the Army staff made a complete review of materiel development, procurement, and allocation procedures, since a large portion of the Army budget is spent in this area. By adjusting the qualitative and quantitative requirements for equipment to closely calculated needs for current operations and mobilization reserves, the Army can save substantial sums that can be used for other essential items. The effects of this review will also be felt in future years through the cancellation of planned purchases. For example, savings of \$18.4 million were realized in fiscal year 1964 by refining peacetime replacement factors for aircraft. The Army saved another \$10.2 million by revising requirements and inventory objectives supporting Army Strategic Logistic Studies. Additional savings are anticipated from these and other reviews of equipment requirements and authorization documents.

Substantial savings have also been realized in the elimination of gold-plating—nice-to-have-but-not-essential features in the Army's equipment specifications. Through a program of value engineering, the Army reduced the unit cost of many items resulting in a savings of \$62.7 million for fiscal year 1964. For example, by substituting a modified commercial design transmission for the military transmission in the M-113 tracked-vehicle family, a savings of \$4 million was realized at no sacrifice to the operational capability of the vehicles. Also,

by substituting lightweight steel wheels for magnesium wheels on the jeep, a unit savings of \$19.11 for each wheel has been realized with an over-all fiscal year savings of \$977,000.

Through "buying at the lowest sound price" the Army has increased the percentage of procurements let by two-step formal advertising and competitive negotiation. Improvements over the base year (fiscal year 1962) measured by dollar percentage of all procurements placed by these two methods and resulting dollar savings are as follows:

	FY 1962	FY 1963	FY 1964
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Formal Advertising.....	17.6	17.8	20.4
Two-Step Formal Advertising.....	0	2.8	4.5
Negotiated Price Competition.....	26.3	27.7	26.9
	43.9	48.3	51.8
Savings (in millions).....		\$72	\$157

The Army instituted the use of two-step formal advertising in fiscal year 1963 as a means of further complying with the intent of public laws governing military procurements. This technique has contributed to the increase in price competition.

In order to increase the extent of competition in procurement, the Army also took measures to improve the usage of those types of contracts that are most advantageous to the Government and to reduce the application of the cost-plus-a-fixed-fee (CPFF) contract, which provides relatively little incentive to reduce costs. The following figures illustrate the progress achieved:

	FY 1962	FY 1963	FY 1964
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Firm Fixed Price Contracts.....	50.1	56.8	61.6
CPFF Contracts*.....	27.3	15.6	13.5
Cost Avoidance (in millions)*.....		\$120	\$127

*The base period is the 9 months ending March 31, 1961, at which time 37.5 percent of Army contracts were of the CPFF type. Cost avoidance figures are computed against the base period results.

Recognizing the advantages to be gained from stabilized production of fairly complex items of equipment with attendant high startup costs, the Army instituted a study to determine the feasibility of awarding a single contract for 2 or 3 years' requirements. The proposed technique was approved by the Department of Defense and the General Accounting Office and was used late in fiscal year 1963 and during

1964 for the procurement of a number of items of equipment. Results to date indicate that competition for multiyear requirements is keen and that unit prices for the larger quantities are substantially lower than those bid or quoted for 1-year requirements. Business firms not previously interested in small quantity production have entered into competition for the larger amounts, thus broadening the production base. A multiyear contract gives industry the advantages of a stabilized labor force and a good position with respect to subcontractors. It also provides the Army with a base for continuous production of the items under contract.

In the process of "reducing operating costs," the Army expanded its program to include operations at all echelons of command with the addition of the new area "Army Operating Expense Savings." The objective encompasses the discontinuance of facilities, termination of unnecessary operations, simplification of paper work, standardization of procedures, and reduction in the cost of operations and maintenance. The most significant savings are in the area of terminating unnecessary operations. The actions have eliminated unnecessary overhead costs, reassigned personnel to higher priority duties, and released property for more productive use by the civilian economy. Ultimate savings of \$145 million will result from these actions. An additional \$168 million has been saved through improvements in the management of telecommunications, transportation and traffic, equipment maintenance, noncombat vehicles, military housing, and real property; through improvements in the area of packaging, preserving, and packing; and through the use of contract technicians.

IX. Logistic Services

The drive to save money through cost reduction has been accompanied by an effort to increase the effectiveness of the Army's logistics structure. A major reorganization to improve the ability of the Army to manage its logistics structure took place during the fiscal year. Among the management changes that emerged were a new integrated supply and maintenance system; a new Army equipment records system; the establishment of an inventory control point in the Pacific covering all Army inventory in that theater; a worldwide system of unit asset reporting to include full participation of the reserve component forces; the expansion of the system of measuring equipment serviceability; a number of significant improvements in managing aircraft repairables; and the increased use of automatic data processing equipment in the Army logistics system.

Improvements in Management

The Army reorganization of 1962 left the existing supply system operated by the seven technical services almost intact, though under different management. However, one purpose of the reorganization was to create an environment that would permit the establishment of a single Army supply and maintenance system. Comprehensive studies showed that consolidation of functions would improve operational readiness and also reduce costs, as some 3,725 personnel could be released and \$33.7 million in annual operating expenses could be eliminated.

The Army Supply and Maintenance System (TASAMS) required the reduction of the number of National Inventory Control Points (NICPs) from 11 to 7 by July 1, 1964, and the transfer of stock control functions for 10 Army depots to NICPs, with a target date of February 1, 1965. The old system of funneling all logistical transactions for Army forces abroad through the three Overseas Supply Agencies (in New York, New Orleans, and San Francisco) was phased out at the end of the fiscal year. In the future, logistical transactions will flow directly to commodity managers at the NICPs, and the managers will control the flow of materiel throughout the system.

One of the first byproducts of TASAMS was a better utilization of storage space and maintenance facilities. Five depots involving 13.6 million square feet of covered storage space were declared excess and will be phased out or turned over to the Defense Supply Agency (DSA).

Although TASAMS is no panacea for all logistics problems, it does eliminate duplication of supply responsibilities and makes more effective use of supply installations.

Inventory managers at the NICPs were given added assistance in December 1963 when the Army instituted a daily transaction (as-it-happens) reporting system for all installed and uninstalled aircraft engines and time-change repairable components. In accordance with the Aviation Materiel Management Improvement Program of the Department of Defense, the Army report covers 80 percent of the dollar value of the Army's inventory of aircraft repair parts and gives the inventory manager knowledge of every change in condition, location, and status of parts by individual serial number.

In the Pacific, the Army organized a theater inventory control point to bring the wholesale Army stocks in depots throughout the area under the centralized management of U.S. Army, Pacific. Centralization will provide more efficient control of the supply pipeline through centralized requisition processing, redistribution of assets, reduction of theater inventories, stock leveling, and reduction of excesses. The reorganization will result in a supply organization more responsive to peacetime and combat demands.

In the field of equipment records, the Army Equipment Record System (TAERS), initiated 2 years ago, has been improved. Designed to provide detailed statistics on all defects and failures of equipment in the hands of troops, TAERS automates the data coming in from field units and keeps supply and maintenance managers abreast of the problems as they arise. The improved TAERS will become fully operational on July 1, 1964, and will help the managers in parts support and maintenance scheduling. It will also be of assistance in design engineering and modification work analysis and permit commanders in the field to compare their equipment performance with that of similar units through the use of detailed print-outs.

The supply status reporting system that employed punched card procedures for reporting assets in the possession of active and reserve forces was improved internally and expanded to cover the Army National Guard during the fiscal year. The Army also made progress in establishing additional criteria for measuring the readiness status of equipment at the unit level.

Throughout the Army logistics system, data automation has steadily increased during the past year. The necessity for control of equipment and supplies means the centralization of huge stores of information, and only automatic data processing machines have the quick retrieval capability that can handle the vast and detailed information rapidly and intelligibly. The Army has consolidated and standardized data processing activities for more economical and efficient operations.

Reorganization of Line of Communications

Overseas, the Army in October 1963 instituted a reorganization of the line of communications in Europe in an effort to reduce the gold outflow from the United States by some \$32 million each year. Through reorganization, U.S. Army, Europe, returned 2,705 military personnel to CONUS and reduced 3,520 civilian spaces by the end of the fiscal year.

To maintain its capability for providing initial emergency combat support in the face of these personnel losses, USAREUR began to reorganize its logistics structure. Approximately 326,000 tons of supplies had left the theater for other destinations as of June 30, 1964. Five main supply and maintenance complexes became operational in France, permitting 10 depots to be placed on a reduced activity level in fiscal year 1964 and 5 more to be scheduled for similar status in the year ahead. Military highway transportation functions and units were transferred from France to Germany and inbound cargo arriving at ports in western France was reduced to 10,000 tons per month. As a part of this reorganization, the 4th Logistical Command returned to the United States in January 1964.

Materiel Program

The expansion of management controls throughout the logistics structure helped to provide a sounder basis for procuring new materiel and maintaining and storing the supplies already in hand. The acquisition of essential new weapons, vehicles, and other equipment is costly and must be accompanied by an efficient use of all assets currently available.

Procurement

In fiscal 1964 new procurement authority rose to a record \$2.9 billion, 10 percent higher than 1963 and almost double the 1957-61 average.

Included in the 1964 procurement of new aircraft for \$511 million were 1,121 modern fixed- and rotary-wing aircraft, an increase of 44

percent over the 850 units of the previous year. Additional Chinook, Iroquois, Mohawk, and LOH aircraft were ordered. At the present time, Army purchases represent about 70 percent of all helicopter sales in the Nation and about 80 percent of all military helicopter purchases.

The Army spent \$380 million for missiles during the past year. Final production contracts for the NIKE-HERCULES and the HAWK and first limited quantity production contracts for the RED-EYE were awarded. Procurement of PERSHING, HONEST JOHN, and SERGEANT missiles continued.

Among the weapons and combat vehicles ordered at a cost of \$365 million were additional M-60 tanks, M-60 machine guns, 175-mm. self-propelled guns, M-16 rifles, DAVY CROCKETT weapons, and new nuclear rounds for the 155-mm. howitzer.

More than 70,000 tactical and support vehicles in the $\frac{1}{4}$ -, $\frac{3}{4}$ -, $2\frac{1}{2}$ -, and 5-ton truck categories cost \$307 million. The majority of the unarmored vehicles were replacements for older trucks.

The Army used \$286 million to modernize communications and electronics equipment. Smaller, more rugged, more powerful radios with stamped circuits and transistors received particular emphasis.

To support the combat forces, \$139 million was assigned to procuring such items as amphibious lighters, mobile assault bridges, crane shovels, materials handling equipment, and power generators.

Ammunition of all kinds cost \$378 million, including conventional, atomic, antipersonnel, and chemical rounds.

Approximately \$90 million was allocated for the maintenance of production base support. This sum sustained industrial facilities needed for production of end items and components, advance production engineering, and pilot lines for some new items. It also provided for layaway of Government-owned plants and equipment that would be required in the event of mobilization.

As an aid to small business, Army agencies awarded \$1.3 billion in prime contracts to small concerns during the fiscal year—23.5 percent of the \$5.4 billion total of all business awards.

Production deliveries of materiel amounted to \$2.9 billion, an increase of \$100 million over fiscal year 1963. Among the significant new items that began to come from the production line in quantity were UH-1B/D helicopters, XM-106 mortar carriers; M-578 recovery vehicles, M-132 flame throwers, M-72 rockets, XM-16E1 rifles and ammunition, and infrared searchlights for tanks.

Materiel Readiness

The Army materiel readiness posture is affected by changes in requirements, modernization, and the status of the inventory of Army

assets. Constant review is a prime requisite to keep these elements in balance. For example, the changeover from the pentomic to the ROAD concept of Army units has produced new requirements in weapons and equipment, and modernization has made many items in the inventory obsolete or obsolescent.

Requirements for major items of materiel funded by the Procurement of Equipment and Missiles, Army (PEMA) appropriation remained at \$23 billion under present OSD logistics guidance issued on August 28, 1963. Through the increased PEMA appropriations of the last 3 years, some reduction of critical shortages has been made possible. The Army has also modified existing equipment, a less costly process than purchasing new replacements, and has introduced new weapons and vehicles with significantly increased capabilities to bolster its combat readiness position.

It is important that adequate PEMA funds be provided each year to permit the Army to carry out a program of measured modernization. Block buying in any one year means block obsolescence later on and tends to dislocate the production base and the lives of thousands of people employed by industry. An orderly flow of new equipment and weapons into the inventory enables the Army to replace the worn-out, consumed, and obsolete items, to maintain a stable production base, and to avoid the waste of surge buying.

Fully as vital to combat readiness as the provision of new materiel is the maintenance of the old. The Army spent over \$370 million in prolonging the serviceability of materiel during the past year. Overhaul activities costing \$171.9 million resulted in the restoration of approximately \$1.2 billion's worth of equipment. Modification, renovation, and minor repair operations improved other materiel assets at a cost of \$77.7 million. The rest of the \$370 million was spent for maintenance engineering and technical assistance (\$93.7 million), procurement of modification kits, basic issue items, and capital equipment (\$21.3 million), and overhead costs (\$6.2 million).

Under the Army Technical Assistance Program, the Army Materiel Command provides maintenance specialists on a worldwide basis, including civilian, military, and contract personnel. The last named are used primarily to develop an internal Army capability to maintain new equipment. In an effort to cut down the number of contract personnel, the Army replaced or released approximately 935 men who were performing functions not associated with new and/or complex equipment. Some were replaced with military or Army civilian personnel and others were dropped without replacement. Some new contract personnel were hired in connection with new equipment just entering the Army inventory, but the over-all reduction in contract personnel from the total employed in fiscal year 1962 was 748 personnel.

An early support concept is now under consideration in the maintenance field that will tie together all the elements required in the support of a new item and make the producer of the item an active partner of the Army. Under this plan the producer would assist the Army in providing repair parts, training, maintenance, and, in some instances, operating personnel during the early stages of equipment use. A test of the concept with a specific new item of equipment may be attempted in the coming fiscal year.

Storage and Distribution

Economic storage and efficient distribution of assets are important elements of any materiel program. Strategically located, well-run depots, responsive to conditions of peace and war and served by rapid lines of communication, are essential to the Army.

Under the Depot Improvement Plan, initiated in 1959, the Army has selected a number of hard-core depots as essential and began to phase out other depots that were deemed uneconomical to maintain. At some of the hard-core depots, storage and maintenance missions were reduced. By January 1, 1964, seven depots, seven depot activities, and storage and maintenance missions at eight other depots had been abolished, with an annual recurrent savings of \$73 million and a reduction of 8,000 civilian spaces.

As a result of the study, "The Army Supply and Maintenance System (TASAMS)," mentioned above, the Army announced on December 12, 1963, that five more depots would be shut down or released during the next 3 years—Schenectady Army Depot, N.Y.; Erie Army Depot, Ohio; Fort Worth Army Depot, Tex.; Utah Army Depot, Utah; and Memphis Army Depot, Tenn. A complete survey in 1964 of ammunition storage and outloading facilities led to an announcement on April 24, 1964, of closures of three facilities—at Sioux Army Depot, Nebr.; Black Hills Army Depot, S. Dak.; and Beaver Army Terminal, Oreg. Phaseout of the five depots will save almost three-quarters of the \$33.7 million mentioned above (\$24.5 million annually); closure of the three ammunition storage and outloading facilities will eliminate an additional \$6.5 million in recurring costs.

Overseas, an inspection team reported in February 1963 that the pre-positioned equipment in Europe was in a marginal condition and stored outdoors for the most part. To halt further deterioration, reduce cyclical inspection, and lower care and preservation costs, construction of controlled humidity storage has been recommended and approved by the Army. If funds are approved by Congress, equipment valued at \$246 million will eventually be given protection at a cost of \$7.73 million in construction funds.

In an effort to improve and standardize military supply distribution systems throughout the Department of Defense, a new, automated



Figure 10. Pre-positioned armored equipment at Germersheim, Germany, used 2d Armored Division personnel deployed from the United States in Exercise BIG LIFT.

procedure will be implemented in the coming year. Titled MILSTEP (Military Supply and Transportation Evaluation Procedures), it will measure the effectiveness of various Defense supply distribution systems in responding to the demands of the Service customer. MILSTEP will also identify problems areas and assign responsibility for corrective action. By examining the total performance of each supply system as requisitions are made, processed, and filled, the best features of each may eventually be combined and a standard system for all Defense distributing agencies adopted.

One of the supply distribution systems is the Army Stock Fund, which handles secondary items such as tank, automotive, and air materiel. Commanders purchase items from the Stock Fund on a cash basis as needed. During fiscal year 1964 the Army extended the "command channel stock fund" concept, which sets up a separate stock fund division for each command, to include all CONUS stations and U.S. Army, Pacific. Under this concept the commander is responsible for both supply and financial management, and it is expected that the arrangement will foster cost consciousness and thrift.

Installations

For fiscal year 1964 Congress approved \$200.6 million for Army construction, exclusive of family housing, and \$10.2 million for reserve components construction. Initiation of new construction, other than family housing, for the Army totaled \$164.1 million, including \$18.6 million for the reserve components. For the active Army, construction completions, exclusive of family housing, during the year totaled \$110.0 million. The Army also contracted for construction valued at \$780 million for other Government agencies, primarily for the Air Force and the National Aeronautics and Space Administration.

In accordance with the President's policy for reducing the outflow of gold from the United States, construction at foreign base sites was limited. To reduce foreign payments, the Army made a maximum effort to utilize U.S. contractors, flag carriers, and military labor and to return procurement of construction materials and equipment to the United States.

The Army has current permanent construction requirements of more than \$3 billion for replacing and modernizing its real property inside the United States. If this construction deficit is to be eliminated in an orderly manner, approximately \$300 million a year should be spent. During the fiscal year \$82.5 million was allocated. Although the Five Year Force Structure and Financial Program provides for increased efforts in replacement and modernization construction in future years, it still falls significantly short of the Army's goal. The Army will continue to seek an adequate level of programing for replacement construction.

Around the world as of June 30, 1963, the Army owned or controlled 12.1 million acres of land, which, with improvements constructed after initial acquisition, cost \$10.7 billion. During the year the Army disposed of 79,814 acres that, with improvements, had an original cost of \$128.4 million, and reported as excess to GSA an additional 6,156 acres that, with improvements, had an original cost of \$36.3 million. The Army out-leased approximately 1,375,000 acres and gained receipts of \$6 million for the U.S. Treasury. Some new land was acquired for Army Reserve centers and the Army obtained use permits for 12.8 million acres of land required for field training exercises conducted during 1964.

As real estate agent for other Government agencies, the Army acquired approximately 11,000 land tracts for the Air Force, principally to support the ICBM program; 570 land tracts for NASA to expand Cape Kennedy; and 2,061 tracts in Mississippi and Louisiana for the Mississippi Test Facility.

Besides the depots that were closed or scheduled to be shut down during the next 3 years, the Army has decided to inactivate a number of other installations. Among these are Camp Leroy Johnson, La.; Fort Chaffee, Ark.; Fort Lawton, Wash.; Forts Tilden and Totten, N.Y.; and Watertown Arsenal, Mass. These, together with all other installations and activities announced during the fiscal year for closing, will ultimately result in an estimated savings of \$72.5 million annually; in addition, over 2,000 military and 6,600 civilian spaces will be made available for higher priority needs.

About \$627 million was spent on local maintenance and management of Army facilities in fiscal 1964, and while there were increases in building footages and in material and salary costs, funds were not increased. The backlog in deferred maintenance at year's end totaled over \$112 million. A uniform system for the management of real properties was developed and is being applied at Army installations worldwide.

The Army also had 55 Government-owned industrial plants under its control in fiscal year 1964. Those not required for current output are being held for emergency production in the absence of an adequate capability in private industry. Funds to maintain these facilities have been short in recent years, creating a backlog of about \$25 million in deferred maintenance. Since this represents an obstacle to mobilization production schedules, funds to eliminate the backlog have been programmed over a 5-year period, starting with \$5 million in 1965.

Transportation Services

Oversea cargo movements approximated 7.6 million measurement tons during the past year, most of which moved by surface transportation. The increase over fiscal year 1963 of more than 95,000 tons is attributable to implementation of the international balance of payments program and to an acceleration of support in Southeast Asia. The payments program influence was responsible for the shipment of over 1.4 million metric tons of solid fuel from CONUS to Europe as compared with 446,000 tons in fiscal year 1963.

Overwater passenger travel, surface and air, totaled 753,100 Army-sponsored personnel. Judicious use of commercial air facilities on a selected basis to move military passengers has resulted in an over-all saving in costs over military air transport and has reduced the outflow of gold.

During the year the Army continued its activities in transportation engineering designed to improve road service for military installations and access to missile complexes. Brochures were published identifying highway routes possessing the new 16-foot height clearance and routes

capable of handling oversize loads from the interstate system to major ports.

Support Services

As of June 30, 1964, there were 3,378 Army troop messes in operation. During the fiscal year these messes served nearly 589 million meals. Complementing the Army's mess operations, 26 meat processing facilities, 18 pastry kitchens, and 27 bread bakeries were engaged in providing food for the troops. The Army also operated 304 commissaries and commissary stores worldwide with a total sales volume of about \$368 million. The total dollar value of subsistence issues was nearly \$270 million for the fiscal year. There were 134 clothing stores and 8 clothing issue points in operation in the United States and overseas, along with 71 laundries and 39 drycleaning plants.

In its plan to develop more acreage in Arlington National Cemetery to provide additional grave sites for Service personnel and veterans, the Army selected a 26-acre section immediately behind the Custis-Lee mansion. Local opposition to the plan resulted in a determination to maintain this section as a parklike area, particularly because some of its trees are reputed to be over 100 years old. Arlington National Cemetery presently contains 419.47 acres. Plans for 1965 include the development of the former horse show grounds and 21 acres of the South Post of Fort Myer. In the Springfield, Mo., National Cemetery, an additional 3.5 acres are being developed to provide approximately 1,800 grave sites. No national cemeteries under the jurisdiction of the Department of the Army were closed to interments during 1964.

Approximately 43,000 interments were made in the national cemeteries under the jurisdiction of the Army during this fiscal year. In addition, 145,000 Government headstones and markers were furnished to mark the graves of eligible deceased members and former members of the armed forces interred in private cemeteries throughout the United States and various foreign countries, and all graves in national, post, and military cemeteries.

Of greatest importance during this period was the tragic assassination of President John F. Kennedy. The Army participated in planning for his interment in Arlington National Cemetery. After ascertaining that the Kennedy family desired that he be buried on the terrace leading down from the Custis-Lee mansion, the Army made an appropriate resting place available in that national shrine. Approximately 3 million people had passed by the burial plot marked by the eternal flame by the end of the fiscal year. The Army has handled an increasing amount of correspondence relating to Arlington Cemetery since President Kennedy's interment.

X. Research and Development

The Army has continued a broad research and development program in fiscal year 1964. Several important systems have been released to the troops in the field, and progress have been made toward developing equipment for the field army of the next decade.

Research

Environmental Sciences

Research in the environmental sciences promotes the Army's capability to fight in all regions of the world. There were advances in several fields during the year.

The Army's Tropical Test Center has initiated a program designated Environmental Data Base for the collection and cataloging of environmental data pertaining to several subtypes of the humid tropics. This work is of considerable interest to the Advanced Research Projects Agency (ARPA) and has received financial support from that Defense agency.

As a part of the Army's program in tropical meteorology, data collected from local sources in several countries of southeast Asia is being analyzed and compared with satellite cloud pictures. The aim of the project is to learn more about weather in that area and to determine the degree to which local meteorological information can be acquired from satellite information. Since the character of weather phenomena in the tropics is so different from that in the more familiar middle latitudes, a great deal more must be learned about it.

Under the responsibility of the Department of the Army for support of the White Sands Missile Range, the meteorological support has been expanded to provide off-range assistance for those firings being made at a distance with impact on the range. To adequately forecast the path of the weapon it has been necessary to develop specific meteorological techniques utilizing computer methods to permit constant monitoring of the meteorological situation. In a recent event in which a portion of a vehicle departed from its forecasted path, it was determined that the meteorological corrections and the forecasted impact were accurate. The portion of the vehicle whose performance was otherwise normal followed the forecasted trajectory.

At the request of ARPA, Army scientists investigated various means of infrared detection of heat sources obscured by tropical rain forest vegetation.

The nuclear powerplant at Camp Century in Greenland was shut down and initial steps were taken for its removal. In the past 18 months, the Army has shown that a nuclear powerplant could be installed in an underground ice camp and its power used to support research, testing, and training activities in isolated areas. Knowledge gained has been used for similar employment of nuclear power in the Antarctic.

Work continued on Project BOLD SURVEY, a joint U.S.-Canadian remote sensing program dealing with ice- and snow-covered terrain. Research conducted during the winter of 1963-64 was concerned primarily with imagery obtained during Arctic night conditions. Not only can infrared sensing be used during periods of darkness, but results also indicate that it can, in a number of situations, detect subsurface features.

Better instrumentation and computer processing of data have helped in the search for a better understanding of the interaction of vehicle wheels and the soils on which they operate. Patterns of pressure distribution and the effects of slipperiness were measured between various pneumatic tires and soft soils. The first phase of mobility environmental research studies (MERS) in southeast Asia was completed under the sponsorship of ARPA. Headquarters was established in Thailand for Army operation of an extended environmental project under ARPA sponsorship. Through cooperation with Thai military authorities, research sites have been selected and environmental data is being collected.

Considerable effort has been made to develop a greater capability in geodetic research in the United States because of an increasing difficulty in obtaining European talent. The Army has encouraged graduate research in the geodetic sciences, and research in the Army's laboratories has led to advances in methods for determining the figure and gravity field of the earth and for determining the center of the earth by astrogeodetic techniques.

The Army began preparing a series of atlases to show worldwide distribution, seasonal occurrence, and other characteristics of disease vectors and annoying arthropod species of insects. A program of mountain environment research oriented especially toward limited war was initiated to determine the environmental stresses affecting men and materiel at elevations above 10,000 feet. A current investigation of methods of forecasting destructive hail should soon evolve into a specific method for field application. It has been customary to

forecast conditions under which hail formation may occur; the new technique will permit specific forecasting of hail.

Life Sciences

In the life sciences, the Army continued its effort to solve the complex problems involved in providing improved medical support for military operations in any environment in the world. Special emphasis has been directed toward the maintenance of the health and effectiveness of the soldier involved in Special Warfare operations. Progress has been made in the search for methods to acclimatize large numbers of soldiers rapidly to environmental extremes and to cope with the medical hazards of military operations at high altitudes. Field tests evaluated the effectiveness of a new dengue fever vaccine developed by the Army; research directed toward protection from other militarily important diseases continued. Life sciences investigators have successfully identified the German measles virus and may soon have an effective vaccine. A program to survey in depth the health of soldiers returning from southeast Asia has been extremely fruitful in identifying specific diseases not recognized in the past and has revealed a number of medical conditions that will need further study. A medical research unit has been established in Saigon, Vietnam, to study problems of disease and wounds encountered in the area. The unit is closely coordinating its work with that of other major Army research facilities in the Far East, as well as with those in the United States. During the past year construction of a laboratory for the Army Research Institute of Environmental Medicine at Natick, Mass., was authorized. The new laboratory will permit vastly increased research in the fields of climatic effects on individual performance.

The Army initiated a program to improve field medical equipment and shelters, and prototypes of the various items are being tested and evaluated. It is anticipated that this program will result in an improved capability for providing medical support in all types of military operations.

Physical Sciences

The Army is continuing its efforts to produce new and improved materials for use in constructing the weapon systems and equipment of the future. Basic research in the physical sciences is directed toward this goal.

A complete motor case, 20 inches in diameter and 60 inches long, has been successfully tested recently at low temperature. The case exhibits the highest strength to density ratio ever demonstrated by a motor case of any material or design.

Several means of improving clothing material for protection against toxic chemicals have been discovered during this past fiscal year. Modification of polyamides such as nylon by irradiation grafting of acrylic acids and conversion of acrylic salts, such as calcium and silver, promises a much greater capacity for providing protection against liquid toxic chemicals. An additional achievement has been that of greatly increasing the absorptive capacity of carbon particles. To achieve this, the effective surface area has been increased by dispersing the particles in a foamed polymer used as a thin clothing liner.

The Propellants Laboratory of Picatinny Arsenal has developed a novel approach to fabricating consumable cartridge cases. The new containers are absolutely inert and yet can be completely consumed during firing. They can also be molded in various shapes and forms and still retain high tensile strength. Various additives required to control flash and increase the life of the barrel can be incorporated in the walls of the cases. The cases can be used with pyrotechnic items, especially flares, where eliminating reuse of the empty cases by the enemy is of importance.

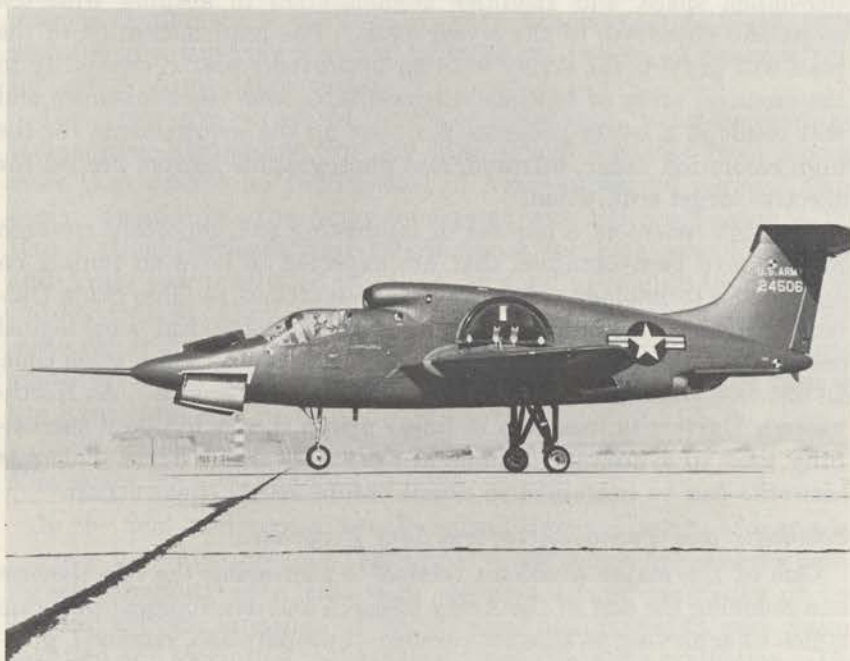


Figure 11. The new XV-5A jet V/STOL aircraft shown in vertical takeoff configuration tests at Edwards AFB, Mass.

Because of the Army's need for Vertical and Short Takeoff Landing (V/STOL) aircraft, greater emphasis has been given to propulsion systems and handling qualities (stability and control) for this type of aircraft. Specific accomplishments include: Development of a boundary-layer-control aircraft for advancement of low-speed aerodynamic theory; formulation of a method for obtaining theoretical solutions of the ground static pressure distribution under an impinging jet; development of analytical methods to predict the aerodynamic loads and stresses experienced by helicopter rotors in steady flight; and development of the fan-in-wing and ejector jet V/STOL aircraft.

As part of a program to improve the Army's capability in combat surveillance and target acquisition, a 5-year plan has been approved and implemented. The intent of this plan is to improve the research capability at the Army Electronic Laboratories, Fort Monmouth, N.J.; clearly define and separate the functions of research and equipment project monitorship; and provide a more effective link between Government and industry. A detailed plan for fiscal year 1965, delineates a revised task structure, provides for an improved organizational pattern within the electronics laboratory, and will result in personnel, space, and facilities augmentation in keeping with the scope and objectives of the 5-year plan. The implementation of the plan will provide the Army with an improved research capability in the essential areas of battlefield surveillance and reconnaissance and will result in a better program for meeting the requirements for the high resolution radar, infrared, and photographic sensors needed for effective target acquisition.

Through contracts, a number of interesting and important research results have been obtained that are expected to have an impact on science and technology. For example, researchers at Ohio State University Research Foundation have used mathematical and logical methods to improve computer programs and reduce computation time. In one case time was cut from 720 seconds to 0.3 seconds. At Northwestern University, research in linear graph theory has been successfully used to synthesize communications networks. Thus, elaborate networks can be examined in detail before actual construction.

Scientific and Technical Information Program

One of the major problems related to increasing the effectiveness and reducing the cost of the Army research and development program is that of achieving an adequate system of preparation, retrieval, processing, storage, and dissemination of scientific and technical data and information. In this area, the Army has established a comprehensive program in which important advances have been made during

the past year and which has been acclaimed by the Department of Defense as a well-conceived plan for other Federal agencies to follow.

Among the significant gains in implementing the Army scientific and technical information program is the Chemical Information Data System (CIDS), which was the subject of an October briefing for some 300 chemical and drug industrial leaders who are cooperating in putting the system into effect. The Army Chemical Typewriter (ACT), developed at Walter Reed Army Institute of Research, is the key to the system, which is being built around a network of 22 of the machines. The first ACT production model is scheduled for delivery in July 1964.

An automated reporting system to provide current information on each Army research task is becoming operational. Developed during fiscal year 1964, the system in recent months produced more than 250,000 copies of over 3,000 research task reports in response to requests. It provides information on a much more timely basis than the former Army Research Task Summary published annually.

Extensive activities were conducted to improve communication within the Army scientific community and with outside scientists and engineers through seminars and symposia. The fourth biennial Army Science Conference at the U.S. Military Academy, June 17-19, 1964, manifested a superior standard of technical papers on research performed at Army laboratories.

The Army also sponsored the Second National Junior Science and Humanities Symposium for 140 high school students from among more than 4,000 who participated in Army-sponsored regional symposia. In addition, the Army cooperated with Science Service on the 15th National Science Fair-International for high school students, and Army judges selected 20 of the outstanding students for summer employment in Army laboratories. In the latter effort, Army Reserve research and development unit members throughout the United States served as judges and otherwise helped promote science fairs at the local level.

Development

Firepower

In the field of firepower, work continued on the design of a special purpose individual weapon that would combine and improve the point target capability of a rifle with the area target capability of the 40-mm. grenade launcher. Four different design models were manufactured and submitted to the Army for comparative evaluation. The most promising design—or the most desirable features of all designs—will be selected for full-scale development.

Development was completed on the XM-102 lightweight towed 105-mm. howitzer, redesignated the M-102. This 3,000-pound weapon will be used by airborne and air assault forces for direct support.

Development test firings of the SHILLELAGH missile system neared successful completion. During these tests the system demonstrated an exceptionally high degree of accuracy and reliability.



Figure 12. TOW, the lightweight new tank-killer being developed for the Army, has demonstrated an exceptionally high degree of accuracy and good launching characteristics in fully guided test missile firings.

Progress on the TOW (Tube launched, Optically automatically tracked, Wire command link) antitank missile system was highlighted by 14 fully guided missile firings. When all components functioned properly, the system demonstrated excellent accuracy and good launching characteristics. The system will provide a significant improvement over present infantry heavy antitank weapons.

Development of the General Sheridan armored reconnaissance airborne assault vehicle continued, including successful airdrop tests. The vehicle was fully operable immediately upon landing.

In August 1963, the United States and the Federal Republic of Germany reached an agreement to undertake the joint development of a new Army main battle tank for use in the 1970's.

Approval was given in May 1964, for development and test of prototypes for a mechanized infantry fighting vehicle for possible employment by the Army in the 1965-70 time frame. This will be a full-tracked vehicle for use by the mechanized infantry rifle squad.

For air defense, the Army continued development of the antimissile capability for the HAWK system to provide a defense against short-range tactical ballistic missiles. Development of a similar capability for NIKE-HERCULES progressed into engineering/service tests.

The Army continued development both on the MAULER low altitude, surface-to-air missile system and on multisystem test equipment, which will have application to the MAULER and other systems of the future. The multisystem test equipment represents an important effort to reduce the multiplicity and cost of special guided missile test and checkout equipment. Successful test flights of the REDEYE shoulder-fire air defense missile were followed by initiation of limited production. The REDEYE will provide close-in air defense protection for forward area ground forces.



Figure 13. REDEYE, the world's smallest guided missile, is shown here just after clearing the shoulder launcher.

Three contractor teams made technical feasibility and trade-off studies for the Army surface-to-air missile development, formerly

AADS-70's. Two teams were selected as having the best technical approach to the problem and have been awarded 15-month contracts for development of those components expected to present the highest technical risks in development of this system. In addition, trade-off studies will be made and other technical approaches investigated. If this effort warrants it, the Army will recommend a full development program for initiation in fiscal year 1966.

During fiscal year 1964, the Army's antimissile activities were highlighted by achievements in several areas. System definition was completed and work was initiated or continued on all major NIKE-X system components. Revised funding estimates and a new technical development plan were prepared as a result of the completion of system definition. Construction of the multifunction array radar (MAR I) at White Sands Missile Range was completed. SPRINT missile component tests were conducted to determine optimum materials and design criteria. Progress in system development was most encouraging and the program remained on schedule.

The emphasis in ZEUS testing was shifted from intercept tests to gathering data on reentry phenomena using the ZEUS radars. Controlled experiments with advanced reentry vehicles have produced valuable data to assist in the NIKE-X system design. Intercept tests will continue at a reduced rate, however, for sometime.

During the year the Secretary of Defense directed the Army to assume command of the Department of Defense national range facilities at Kwajalein Atoll. A detailed transfer plan was prepared in conjunction with the Navy, the present range command agency, and approved by the Secretary of Defense. The Army will assume responsibility for Kwajalein on July 1, 1964.

In July 1963, Secretary of Defense McNamara directed the Army to study in depth the effectiveness of NIKE-X against the anticipated ICBM threat of the future. This study, called "Threat Analysis," was nearing completion at the end of the fiscal year and will be forwarded to the Secretary of Defense.

LANCE, the future division support missile system, continued in the engineering development phase in 1964. LANCE will replace the HONEST JOHN system and possibly the LITTLE JOHN. The engineering concept review of the LANCE was conducted in fiscal year 1963, followed by the engineering design release of the ground-support equipment in February 1964. Since then engineering models of the track vehicle and of the lightweight launcher have been delivered to the prime contractor for test.

The SERGEANT and PERSHING missile systems completed extensive field tests including service test firings and became operational

in Europe with both United States and Federal Republic of Germany troop units.

This year, the White Sands Missile Range started a new concept of operations whereby selected missiles are launched at distances from the range, fly over sparsely populated areas, and then land within the reservation boundary. The Army's SERGEANT and PERSHING missile systems were launched from sites located from 60 to 300 miles from White Sands. The Air Force ATHENA, a four-stage test vehicle for reentry experiments, was launched from Green River, Utah, a distance of approximately 450 miles. In some of these tests, local inhabitants were evacuated from preselected hazardous areas. For the ATHENA tests, radar and telemetry located at Green River determined the flight path and instantaneously transmitted the information 450 miles to a computer and control center located at White Sands. The data were then analyzed and flight corrections were relayed by radio to the ATHENA to steer it toward the target.

Air

There were developments in mobility as well as firepower during the report period. The Army has been examining the air mobility concept. In accordance with Army efforts to improve battlefield mobility through the increased use of organic aircraft, high priority has been given to acquiring the means to test doctrine, organization, training, and equipment in the field.

During the past year the testing of the air mobility program became a reality. The two major units involved in the concept—the 11th Air Assault Division and the 10th Air Transport Brigade—completed their test organization and received the bulk of their authorized personnel and equipment. In October 1963, the Army conducted an initial air assault infantry battalion test at Fort Stewart, Ga., with results that showed a promising potential.

In March 1964, the Secretary of Defense, upon the recommendation of the JCS, decided that the Army would unilaterally train its personnel and test its air mobility concepts for the remainder of the calendar year. When the unilateral tests are concluded, the Chief of Staff of the Army will recommend to the JCS what joint tests, if any, are warranted. As a consequence of the Secretary of Defense's action, the Army has begun a set of field training exercises that will culminate in a single full-scale division test to be held in North Carolina and South Carolina during October and November 1964.

The 82d Airborne Division will play the role of aggressor, and the 11th Air Assault Division and the 10th Air Transport Brigade in their test configuration will be called upon to operate against the 82d under simulated combat conditions. To conduct the test and monitor the

field exercises, the Army has organized the Test, Evaluation, and Control Group, composed of experienced Army military personnel and civilians. The group will submit an evaluation to the Combat Developments Command, covering operations, logistics, airline of communications, antitank defense, and counter-air and night operations.

In the meantime, functional tests of materiel and concepts are in progress or contemplated. The effectiveness of OV-1 Mohawks as they engage in photoreconnaissance, problems involved in rearming and refueling helicopters, the feasibility of low-level navigation systems, and techniques of maintenance and air traffic operations are a few of the areas being tested or scheduled for testing. Results of these functional tests will provide a base for the final evaluation of the strengths and weaknesses of the Army's concepts.

When the Combat Developments Command receives the results of the field and functional tests, it will prepare a report to the Chief of Staff of the Army, using the findings of other analyses, studies, and war games as well. An interim report will be submitted before the end of the calendar year; the final report is due by February 15, 1965. The reports should provide the Chief of Staff with all the information he will need for his recommendations to the JCS on further tests.

The Air Force is also conducting air mobility tests under the aegis of the Strike Command. Using the 1st Infantry Division in its test, the Air Force will try out its own concepts for improving the mobility of ground troops and CINCSTRIKE will report the results to the JCS.

Over a period of many months, the Department of the Army Staff, Combat Developments Command, and Army Materiel Command have carried out an extensive overhaul of the avionics development program, shaping it to the complicated and demanding requirements of modern warfare. The object is to give Army aircraft the ability to operate in any weather except that limiting the airframe itself. Such an improvement will give the Army an air mobility capability it does not now have.

Ground

In wheeled vehicles, development of new 1 $\frac{1}{4}$ -ton, 2 $\frac{1}{2}$ -ton, and 5-ton trucks continued. Test rigs of the 1 $\frac{1}{4}$ -ton truck XM-561 and the 5-ton truck XM-656 were delivered to the Army for evaluation before additional vehicles for engineering and service testing were procured. The 2 $\frac{1}{2}$ -ton XM-410E1 is scheduled for delivery in early July 1964.

The newly designed mobile assault bridge/ferry was placed in limited production to procure 66 units for high priority units. Test units have performed extremely well and field acceptance is uniformly high.

Introduction of this equipment will give the Army an outstanding capability for crossing major water barriers rapidly.

Communications and Electronics

During the year, development continued on the Army's 25-mile manpack and the 100-mile vehicular high frequency single sideband radio sets. These sets are part of a family of which the 50-mile vehicular radio is already in production.

As part of the family of forward area frequency modulation (FM) sets for tactical forces, the lightweight transmitter AN/PRT-4 and receiver AN/PRR-9 for use at squad and platoon level are in the testing phase. The equipment consists of a separate transmitter and receiver with a total weight of 30 ounces. Other members of this family are in production and include a 5-mile manpack radio for company-level use, a 20-mile vehicular radio for use up to division and corps level, and an aircraft radio.

For division and higher units, the Army successfully developed and standardized pulse code modulation (PCM) multiplexing equipment that provides up to 96 channels of secure communication over radio relay links of the area communication system. Engineers are continuing to adapt this multiplex equipment to the AN/TRC-112 tropospheric scatter radio set, which is still in development and will afford up to 150 miles point-to-point communications in a single hop.

Development has continued in the field of surveillance and target acquisition. A new drone, a ground radar, and a facility to help interpret aerial imagery are currently undergoing feasibility tests and cost effectiveness studies. Experiments on new higher resolution aerial sensors are expected to lead to the initiation of development of user-type equipment within the next year. An infrared aerial sensor for the Mohawk aircraft has recently been approved for troop use.

One area of Army research and development effort that is not unique to the Army or to any of the military Services involves the use of electronic computers or automatic data processing (ADP) equipment. In tactical ADP application there is the Command Control Information Systems for 1970 (CCIS-70) project. One of the latest accomplishments of that project was the delivery to Fort Huachuca, Ariz., on June 1, 1964, of a random access computer (RAC). The RAC will be used to help bring modern computer techniques to the battlefield as an aid to the commander who must base tactical decisions on volumes of information concerning all aspects of enemy and friendly forces, including the status of equipment and supplies.

During fiscal year 1964, the Army continued its effort to develop the ground environment for the Defense Communications Satellite Program (DCSP) and to support the DoD-NASA SYNCOM satellite

tests and experiments. The Project Definition Phase was completed for the Mark Ib transportable terminals and the Interim Satellite Communications Control Center (ISACCC). A contract was awarded to the Hughes Aircraft Co. for development and fabrication of six Mark Ib terminals, three terminal simulators, and ancillary equipment. Development of the ISACCC was deferred pending DoD decision on the space segment of the DCSP. After the successful launching of SYNCOM II on July 26, 1963, the Army conducted numerous tests and experiments during the remainder of the fiscal year, logging over 2,000 hours of communications time through the satellite with teletype voice, and facsimile type traffic. Point-to-point communications links were tested and successfully demonstrated up to distances of 8,600 miles (Washington to Manila). A small, highly transportable link terminal, developed by the Hughes Aircraft Co., was leased by the Army for tests and experimentation. The terminal was utilized in conjunction with the SYNCOM II satellite in successfully demonstrating the feasibility of tactical communications via satellites and lightweight terminals. Based on the results of tests with the experimental terminal, a Qualitative Materiel Requirement for a lightweight, highly transportable terminal was formulated, approved, and published. The Army Materiel Command was given responsibility for development. The Army continued preparations for support of the SYNCOM III launching by deploying terminals to selected Pacific area locations.

Combat Support and Special Warfare

During fiscal year 1964 the Special Warfare Office continued its operation in three primary fields: Army point of contact for ARPA's Project AGILE, operational control of the U.S. Army Limited War Laboratory, and monitorship of the materiel and nonmateriel research, development, test, and evaluation of the Army's Special Warfare program.

In supporting ARPA-AGILE to provide research and development assistance to indigenous forces of southeast Asia, the Army has conducted evaluation, development, and test of airborne navigational equipment, radios, weapons, clothing, equipment, and rations. The Army has also maintained research teams in southeast Asia to analyze communication propagation conditions, military evaluation of geographic and environmental conditions, and casualty and medical surveys.

The U.S. Army Limited War Laboratory, which was activated on June 15, 1962, with a strength of 6 officers and 69 civilians, has continued expansion of its capabilities to respond rapidly to Special Warfare requirements. During the year the laboratory moved into perma-

nent facilities, thereby increasing its in-house research capability, and augmented its strength to 7 officers and 79 civilians. Examples of significant items being developed by the laboratory are:

AN/PRC-64 Jungle Radio—an 8-pound radio with a voice and code capability in excess of 200 miles when operated under optimum conditions.

Helicopter Refueling Pumps—prototypes weighing 65 pounds with a 45-g.p.m. refueling capability, presently being evaluated overseas to determine the degree to which they facilitate refueling of Army aircraft in remote areas.

Leech Repellent—a nontoxic, durable, semisolid repellent being tested overseas; shows promise of evolving into an effective and long-lasting remedy against both aquatic and land-type leeches.

Captive Balloon-Borne Communications System—an aerodynamically stable balloon, generating equipment for inflation, reels, wire, antenna, and an AN/VRC-10 radio; five systems are being readied for shipment overseas for evaluation.

Individual Aid and Survival Kit—600 of these kits were assembled and delivered to the Special Warfare Center on July 3, 1963; 4,000 kits were subsequently procured as a result of Department of the Army action; The Surgeon General is to type classify the item.

Long-Range Patrol Subsistence Packet—these packets offer different meals and were designed to weigh 9 ounces and provide approximately 1,000 calories each; were tested in Panama during the first quarter of the fiscal year; Department of the Army took action to procure 300,000 meals after the item was type classified for limited production in February 1964.

In the Army-wide RDT&E program a number of items with Special Warfare application were type classified during 1964.

Multipurpose net—usable as a hammock, sniper's roost, seine for subsistence fishing and catching game, and a carrier for bulky loads.

Surveillance system, infrared, AN/USA-4—designed to produce a continuous strip-type image of the terrain traversed by Army reconnaissance aircraft.

Armament subsystem, helicopter, 7.62-mm. MA: Twin Gun, M-2 w/e—designed to provide OH-13 and OH-23 helicopters with a suppressive fire capability.

40-mm. cartridge, XM 397—designed for the M-79 grenade launcher, was type classified during the last quarter of the fiscal year.

In the field of combat support, a lightweight LASER rangefinder for artillery and mortar observers that will provide precise data for

increasing primary fire support effectiveness entered the engineering and service test phase of development.

The night vision program made rapid progress in fiscal year 1964. Three first-generation passive night vision devices completed engineer design tests and were widely demonstrated in the United States and internationally with enthusiastic receptions everywhere. Engineer and service tests are in progress. Meanwhile, planning has been initiated for expedited procurement to meet requirements for extensive troop unit experimentation and international commitments for sales.

XI. Public Works and Military Engineering

Public Works (Water Resources Development)

During 1964 the Army, through the Corps of Engineers, continued its water resources development program at an accelerated pace. The program constitutes a major share of the Federal effort for conserving, developing, and using the Nation's water resources.

Development continues on comprehensive river basin plans, with the goal of having plans for the major basins of the country by 1970. In coordination with the other Federal agencies involved, the Army evolved a modified approach to the comprehensive planning that has resulted in a substantial reduction in the estimated cost of the program.

Aside from carrying forward the water resources program for which it has primary responsibility, the Army continued to participate in the activities of the Area Redevelopment and Urban Renewal Administrations, the President's Appalachian Regional Commission, and other Federal and State agencies, as well as with such bodies as the Federal Council for Science and Technology and the National Academy of Sciences.

Status of Projects

The Army had 93 channel and harbor and 20 lock and dam projects under way during the fiscal year. To meet the needs of commerce and navigation, primary consideration was given to work on deep draft harbors and major inland waterways in the allocation of funds. In addition, the Army participated in the construction of seven beach protection projects and two bridge alterations. Maintenance and operations costs for navigational projects totaled \$109 million.

Thirteen replacement structures are being built, at an estimated cost of \$630 million, as part of the \$1.6 billion program to modernize canalized waterways. Replacement or reconstruction of existing locks and dams on the Ohio and Mississippi Rivers, the Black Warrior-Tombigbee system, and the Monongahela River are among the most important projects scheduled under this program.

In the vital area of flood control, the Army in fiscal year 1964 was working on 142 projects, and since 1936 has completed over 600. Despite this progress, large areas are still vulnerable to severe flood dam-

age. The disastrous floods of the past year further emphasize the need to translate flood control plans into completed projects.

Activities in the field of power added 276,000 kilowatts of hydroelectric generating capacity at four multiple-purpose projects during fiscal year 1964. At the close of the year 39 multiple-purpose projects located in 20 States possessed a generating capacity in operation of 8,514,400 kilowatts. This represented 4 percent of the total generating capacity and 21 percent of the total hydroelectric generating capacity in the Nation. The Army's generating facilities marketed 33 billion kilowatt hours of electrical energy—3.5 percent of the Nation's total electric energy and 19.6 percent of the hydroelectric energy produced in the Nation. The Army is operating and maintaining more hydroelectric capacity than any utility or Government agency and more kilowatts of generating capacity than any private utility in the Nation. The generating capacity of the Army is exceeded only by the total thermal and hydro capacity of the TVA.

During the fiscal year the House Subcommittee on Natural Resources and Power, Committee on Government Operations, held hearings at various locations throughout the country, and representatives of the Army presented testimony concerning the Army's role in pollution control activities. In addition, the Army and the Department of Health, Education, and Welfare participated in detailed joint planning to include water quality control storage in those projects that were in an early construction stage and where planning is still in progress.

During the calendar year 1963, 147 million visitors used recreational facilities at Army civil works projects, bringing the total using them since 1946 to over a billion visits. Nearly 4 million acres of new waters are now open to the public for outdoor recreation activities including fishing, boating, camping, water skiing, and picnicking as well as for an opportunity to see wildlife in natural surroundings.

Construction continued through the fiscal year on hurricane protection projects at Providence, R.I.; New Bedford-Fairhaven-Acushnet, Mass.; and Texas City, Tex. Preconstruction planning continued on hurricane protection projects for New Orleans-Venice, La.; Wareham-Marion, Mass.; Port Arthur, Tex.; and Fire Island Inlet to Montauk Point, N.Y.; and preconstruction planning has started on Narragansett Pier, R.I.; New London, Conn.; and Point Judith, R.I.

Over 3,600 projects are included in the present water resources development program. The estimated construction cost for the program will total over \$22 billion. More than \$12 billion has already been appropriated; projected construction costing \$5 billion more has been authorized, but funds have not yet been appropriated.

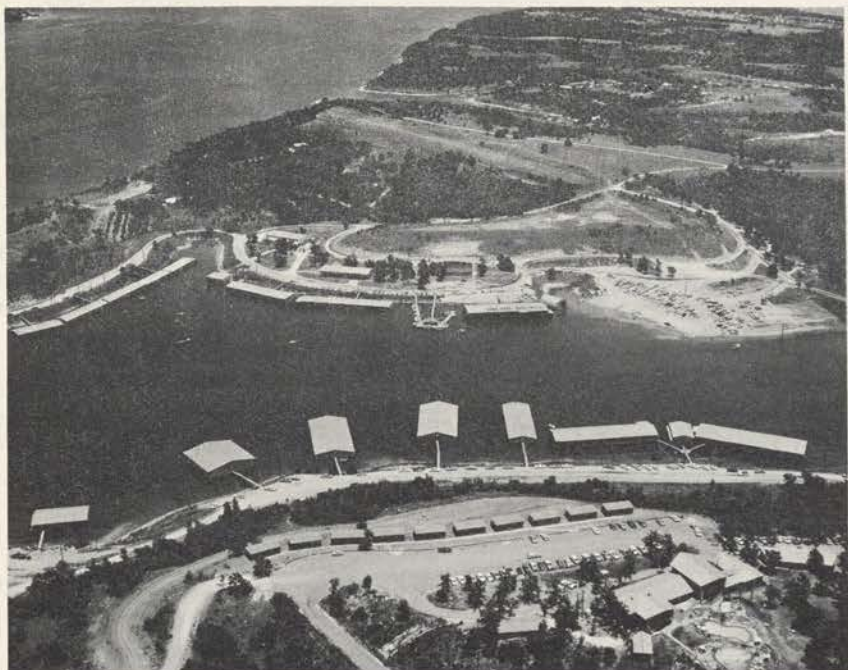


Figure 14. Recreational facilities at Lake Texoma on the Denison Dam project are typical of those enjoyed by millions of Americans at Army civil works projects throughout the country.

The probable water resources needs that will exist by 1980 were subjected to appraisal a few years ago. Based on median projections of population, gross national product, and industrial development, the appraisal indicated that about \$28 billion in capital investments would be required to meet the 1980 requirements. Gradual increases in annual water resources development appropriations would be necessary to keep pace with the mounting demands upon the Nation's water supply.

Appropriations

Congress appropriated nearly \$1.1 billion for civil works in fiscal year 1964. (See following table.)

CIVIL WORKS APPROPRIATIONS

(In Thousands of Dollars)

Construction, General.....		827, 146. 5
Planning and Design.....	21, 364. 5	
Construction.....	805, 782. 0	
Operation and Maintenance, General.....		*115, 700. 0
Mississippi River and Tributaries.....		77, 862. 0
General Investigation.....	110. 0	
Planning and Design.....		
Construction.....	54, 252. 0	
Maintenance.....	23, 500. 0	
Expenses, General.....		15, 000. 0
Investigations, General.....		19, 115. 0
St. Lawrence River Joint Board of Engineers.....		10. 0
Permanent Appropriations (Maintenance and Operation of Dams; Hydraulic Mining; Payment to States).....		2, 000. 0
Total.....		1, 096, 833. 5

*Includes \$1,700,000 in deficiency appropriation for fiscal year 1964.

Construction

The number of projects underway or placed in use during fiscal year 1964 are listed below:

Type of project	Number under construction	Number placed in useful operation
NAVIGATION:		
Channels and Harbors.....	93	27
Locks, Dams, and Canals.....	20	2
Bridge Alterations.....	2	2
FLOOD CONTROL:		
Reservoirs.....	58	10
Local Protection.....	84	17
MULTIPLE-PURPOSE, INCLUDING POWER.....	28	4
BEACH PROTECTION.....	7	0
Total.....	292	62

Progress and Utilization

Performance and progress in water resources are presented below:

NAVIGATION:

Commerce (Great Lakes and Inland) (CY 1963) ($\frac{1}{6}$ of U.S. total).....	234 billion ton-miles
Commerce increase, 1953-63.....	16 percent
Dams; Navigation with locks.....	162
Harbors, Commercial, improved.....	500
Locks.....	241
Waterways, improved.....	22,000 miles
Traffic (Domestic and Foreign) (CY 1963).....	1,174 million tons

FLOOD CONTROL:

Damages Prevented, cumulative (June 30, 1964).....	\$12.5 billion
Damages Prevented, increase, 1954-64.....	70 percent
Projects in Operation:	
Reservoirs—237 (Includes multiple-purpose reservoirs)	
Local Protection—600 (Includes 180 under general authorities)	
Reservoir Storage (June 30, 1964).....	184 million acre-feet
Flood Control—75 million acre-feet	
Other—109 million acre-feet	

HYDROELECTRIC POWER:

Installed ($\frac{1}{6}$ of U.S. total).....	8.5 million kw
Under Construction.....	4.3 million kw
Additional Authorized.....	8.6 million kw
Cumulative energy (June 30, 1964)	
33 billion kwh (FY 1964).....	318 billion kwh
Increase, 1954-64.....	4.8 percent

WATER SUPPLY:

Municipal and Industrial Storage.....	2.3 million acre-feet
Irrigation Storage.....	5.5 million acre-feet
Storage Increase (1954-64).....	85 percent

RECREATION ATTENDANCE (CY 1963).....	147 million
Increase, 1953-63.....	260 percent

Nuclear Power

The Army's first trailer-mounted nuclear powerplant—the ML-1—is undergoing engineering tests at the Atomic Energy Commission Reactor Test Station in Idaho following minor modifications made after the first test run. Field units of this plant will provide the Army with highly mobile units of 300 kilowatts of electric power for field operations. The military compact reactor—a larger version of the mobile reactor—with a capacity around 3,000 kilowatts, is presently under design. MH-1A, a 10,000-kilowatt nuclear powerplant mounted on a floating barge was nearly 50 percent complete at year's end. Testing is scheduled to begin in the summer of 1965.

Currently in operation are four stationary nuclear powerplants—at Fort Belvoir, Va.; Fort Greely, Alaska; McMurdo Sound, Antarctica; and Sundance, Wyo.

Significant progress has been made in the development of a fuel for the propulsion of Army vehicles that may be produced in the field by means of nuclear power. The feasibility of the process has been established and adaption tests are continuing.

Emergency Operations

Under statutory responsibilities for emergency flood control and hurricane storm activities, the Army Corps of Engineers carried out flood emergency activities, including flood fighting and rescue operations and repair and restoration of damaged flood control works. In connection with major disasters, the Army also provided assistance at the request of the Office of Emergency Planning (OEP). Approximately a hundred times during the year, elements of the Army helped civil authority after it was determined that all civilian resources had been utilized and additional aid was needed to meet the situation. The emergencies included floods, tidal waves, tornadoes, hurricanes, forest fires, grass fires, avalanche control, acute water shortages, airplane crashes, train wrecks, an earthquake, and starving, snowbound cattle.

In July 1963 there a major flash flood in and around Hot Springs, Ark., and August brought localized flooding in Buffalo, N.Y., and around Albuquerque, N. Mex. In September Hurricane Cindy caused torrential rains in the vicinity of Port Arthur, Tex., and subsequent flooding along the Sabine River. Extremely heavy rainfall in March 1964 caused widespread major floods in the Ohio River and Susquehanna River basins with damages estimated at \$106 million in the Ohio River basin and \$19 million in the Susquehanna River basin; there was also serious flooding in the White and Black River basins, Ark., and the Connecticut River basin, Vt. The President declared "major disasters" in the affected areas of Arkansas, Kentucky, Indiana, Ohio, West Virginia, and Vermont. In April 1964 heavy rainfall caused major flooding in the upper Wabash and White River basins, Ind.; in the Scioto, Hocking, and Muskingum River basins, Ohio; and along the southern half of the Illinois River, Ill. Moderate to heavy rainfall in June 1964 accompanied by melting snow brought flooding to the Sun, Teton, and Marias River basins of Montana, and to the upper Flathead River basin, Mont. Concurrently, there were damaging high-water flows in the Kootenai River basin, Idaho, and on the upper Snake River, Wyo. On June 16, a flash

flood in the Papillion Creek basin caused a reported six deaths in the suburbs of Omaha, Nebr.

Disaster assistance provided by the Army also included the emergency repair and restoration of shore protective works on the Florida east coast, damaged by the heavy storm of December 1962. This project was completed at a cost of \$1.3 million. Debris clearance and emergency repair and restoration of public facilities as a consequence of the failure in December 1963 of the Baldwin Hills Dam, a water supply facility owned and operated by the city of Los Angeles, Calif., was completed in March 1964 at a cost of \$1.2 million. During October and November 1963, the Army furnished OEP-requested technical advice and assistance to State and local officials within the drought areas of Missouri, Kansas, Kentucky, and Vermont.

As a result of the earthquake that struck Alaska on March 27, 1964, the Army undertook a large-scale nonmilitary program of disaster assistance under Public Law 81-875, which is supplementary to a program of restoration and replacement of navigational facilities also prosecuted under Corps of Engineers statutory authority. Pending definition of the scope of the program of Public Law 81-875 work, the projected program cost estimate is \$82 million. As of June 30, 1964, contracts awarded totaled \$7.2 million, with about \$5.2 million of work completed. The 44 contracts awarded cover such work as debris clearance and emergency repair and restoration of roads, public utilities, and other public facilities at various localities, as well as soils and foundation investigations; exploration of a new townsite at Valdez; and provision of architect-engineer services.

Seismic sea waves, resulting from the Alaska earthquake, struck the coasts of Oregon and California and caused major damage at Crescent City, Calif. The Army is proceeding with a program of debris clearance and restoration of public facilities, currently estimated to cost \$800,000 and approximately 90 percent complete at the end of the fiscal year.

At the request of the Civil Aeronautics Board in March 1964, the Army also undertook to recover wreckage of a plane that had crashed in Lake Pontchartrain, La. In the course of the dredging operations, an estimated 76,000 pounds of plane parts were recovered at a cost of \$60,000, reimbursed by the CAB.

Mapping and Geodesy

The Army has made significant progress in meeting the mapping and geodesy needs of the Department of Defense and improving our knowledge of the size and shape of the earth. An electronic satellite tracking device, using Sequential Collation of Range (SECOR) tech-

niques, has been developed to provide precise measurements between widely separated points on the earth's surface. A successful test launch was carried out in January 1964, and field operations are being initiated. The SECOR system is now a firm part of the NASA-Department of Defense-Department of Commerce Geodetic Satellite Program (Geodetic Explorer Project).

The United States has concluded agreements with Liberia, whereby the United States will help the two nations produce topographic maps. Military topographic troop units have already begun field surveys in Liberia. Also, field surveys have been started in Ethiopia in a cooperative program with that country. Other field surveys continue in Iran and those in Libya are nearing completion.

Coordination and cooperation between the Agency for International Development (AID) and the Army's Corps of Engineers on mapping projects of material interest in Latin America continued. In addition, technical advice and assistance is being provided AID in the physical resources inventories of Latin American countries.

Map production during the past year has materially added to the dissemination of the Army's knowledge of the physical world. Approximately 2,800 new or revised map sheets were completed, and over 40 million copies were printed of areas around the globe.

The greater knowledge of the terrain gained through mapping and surveying may be put to double use by the friendly nations receiving U.S. assistance. In time of peace the information can serve in planning for the exploitation and control of natural resources such as water power and mineral resources and for the construction of transportation networks. Should war come, accurate maps would permit commanders to deploy forces most effectively to take advantage of the terrain. Since many of the nations of the world have never been mapped or surveyed completely and accurately, the cooperative mapping agreements with the United States should provide a firm foundation on which to build up their store of information on their own countries.

XII. Military Assistance Programs

The value of materiel and logistical services, in terms of obligations, that the Department of the Army has furnished to friendly nations and international organizations during fiscal years 1963 and 1964 was as follows:

MILITARY ASSISTANCE PROCUREMENT AND SERVICES

(In Millions of Dollars)

	FY 1963	FY 1964
Materiel Procurement.....	587. 1	321. 1
Combat vehicles.....	35. 3	17. 2
Support vehicles.....	106. 8	37. 7
Ammunition.....	80. 3	66. 3
Guided missiles.....	103. 6	12. 4
Electronics and communications equipment.....	54. 7	33. 8
All other equipment and supplies.....	206. 4	153. 7
Logistical Services.....	199. 1	163. 7
Supply operations.....	96. 0	86. 9
Training.....	33. 0	28. 9
Administration.....	7. 8	7. 8
Construction.....	25. 1	0
All other services.....	37. 2	40. 1
Total Program.....	786. 2	484. 8

The Army has an active role in providing administrative, logistic, and training assistance to friendly nations in support of their economic development and security and U.S. foreign policy objectives. Training for foreign nations in U.S. Army schools, for example, has ranged from a basic officer leadership course for students from newly emerging nations to instruction in advanced air defense weapons technology. During fiscal year 1964 over 6,000 military students of allied and friendly nations attended resident courses of instruction at Army service schools in the United States. Enlisted men from six African

and Middle East countries attended a new course in officer leadership training designed to prepare them for commissions in their own armies.

The exposure of foreign students to our institutions and ideals in addition to formal military training can make them effective spokesmen for the American way of life. In this regard a broad information program, under DoD sponsorship, was established in the Army schools in 1964 to enhance their understanding of our society. Orientation programs provide films and lectures, and visits are made to historical sites, educational institutions, seats of government, and large metropolitan centers. The civilian aides to the Secretary of the Army have been most active in community relations programs.

Civic action is an important element of the Military Assistance Program. Our mutual security efforts and objectives have been furthered through the application of this program. Mobile training teams have contributed materially to U.S. prestige and to the establishment of a rapport between indigenous military personnel and the civilian populations—one of the primary aims of the program. U.S. civic action personnel from both theater and continental resources have helped friendly nations in the fields of engineering, public health, sanitation, governmental affairs, civil affairs/civic action, agriculture, psychological operations, education, and public relations.

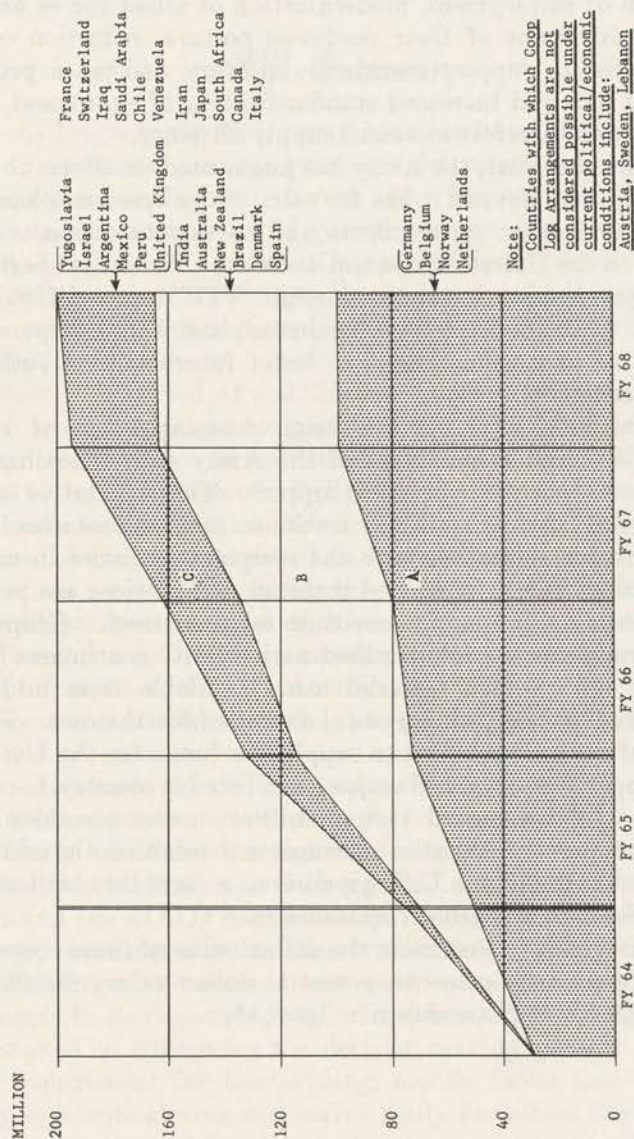
In the engineer field, for example, mobile training teams deployed to 12 Latin American countries, 3 countries in southeast Asia, and 6 countries in the Middle East and in Africa south of the Sahara. The most significant of these deployments was the provision of two engineer teams for Indonesia to help train a cadre of three divisions of the Indonesian Army for civic action operations.

The experience gained by the mobile training teams has been invaluable in improving the civic action course taught to both U.S. and allied officers at the Civil Affairs School at Fort Gordon, Ga. Army training films on worldwide civic action activities are being used to teach a dynamic program.

The Army's portion of the 1964 Military Assistance Grant Aid Program to 47 nations for materiel and services totaled \$537 million. A total of \$612 million in new and carryover authorization was delivered during the fiscal year, leaving an undelivered balance of \$781 million. Support operations in Vietnam received more emphasis this year as the result of visits of high-level officials and discussions with country officials and interested staffs in the Pacific area.

During the year the Army sold \$452 million in materiel and services to 48 foreign countries. These sales included missiles, weapons, tanks, and combat and support vehicles, aviation and surface materiel, ammunition, electronics and engineer equipment, and miscellaneous repair parts and support equipment. Sale of military equipment to

COOPERATIVE LOGISTIC SUPPORT ARRANGEMENTS
ESTIMATED DOLLAR VALUE OF SUPPORT - FY 64 THRU FY 68



foreign governments results in numerous benefits to the U.S. Government and to industry, including reduction of the U.S. balance of payments deficit, increased orders to U.S. industry with consequent stabilization of employment, modernization of allied forces and consequent improvement of their readiness posture, reduction of U.S. funds required to support worldwide military assistance programs under grant aid, and increased standardization of equipment within allied forces and therefore increased supply efficiency.

During the past year, the Army has augmented its efforts to publicize the items and services it has for sale. Sales brochures have been distributed to foreign governments and to various elements of the U.S. Army in the United States and overseas. Visits have been made to foreign governmental agencies, foreign "VIP" tours of U.S. installations and facilities have been conducted, and U.S. equipment has been displayed and demonstrated to foster future sales to authorized foreign governments.

Under the authority of the Foreign Assistance Act of 1961 as amended, OSD and Department of the Army authorities have discussed bilateral peacetime logistical support. The cooperative logistics system functions through military assistance sales so that item listings and costs are contracted for with the recipient countries in military assistance sales orders. Specified materiel and services are provided foreign customers through a one-time sales contract. Cooperative logistics arrangements provide allied nations with continuous logistical support on specified materiel made available from additional resources provided to U.S. logistical facilities for this use. Participating countries are requested to supply the funds for the U.S. pipeline that supports the specified major items listed in country-to-country agreements. In this regard various military assistance sales orders are used in cooperative logistics agreements to establish the additional funds needed to build the U.S. pipeline to a level that will support both the U.S. Army and allied requirements.

While it is difficult to estimate the dollar value of these cooperative logistics support arrangements, potential dollar values for the fiscal years from 1964 to 1968 are shown in figure 15.

XIII. Summary

The challenges to the U.S. Army have not lessened during the past year. In southeast Asia the prospects for peace and stability seem to be as remote as they were a year ago. The continued Communist pressure to subvert the lawful governments in such countries as the Republic of Vietnam and the Kingdom of Laos cannot be ignored. Doubtless the demands for military assistance and advice will not decrease in this area, and the Army's role may well become increasingly important.

In Europe, a period of stabilization appears to have set in. The tensions are less apparent, at least, and maintenance of the status quo seems to be acceptable to both sides. Although the Army's commitment in Europe has tapered off slightly, the forces still on station are ready, and exercises such as BIG LIFT have proved that they can be reinforced quickly in the event of an emergency.

Elsewhere around the world, the nations of Latin America and newly independent countries of Africa claimed more attention. The Army has provided military assistance and civic action teams to a number of nations in Latin America and Africa.

At home and abroad the Army has reacted quickly to natural disasters and given succor to stricken areas following earthquakes and floods. Assistance to civilian populations crippled by sudden onslaughts of nature are a continuing part of the Army's mission.

Internally, the Army has tightened its organization and control of personnel, administration, and operations. The Army reorganization of 1962 and the ROAD reorganization of Army units are now all but complete; adjustments rather than further radical changes are in prospect. Emphasis on command and control procedures have led to improvements in management, communications, and intelligence activities designed to strengthen the decision-making process.

The requirement for hard-hitting, mobile forces that can be sent quickly to a critical area and arrive ready for action has not abated. With the frontiers of freedom scattered around the world, the need has grown. The ROAD reorganization, the emphasis on Special Warfare troops and training programs, the testing of air mobility concepts, and the search for lighter, air transportable equipment reflect the Army's intense interest in meeting this requirement.

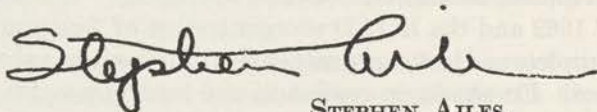
Behind the front-line troops and their ready support forces stand the reserve components. The Army has given special attention to the task of equipping and training key units that would be immediately called upon to back up the active Army during a mobilization.

Army forces cannot succeed without a flexible and responsive logistics system. The Army has streamlined its logistics activities to provide the best service in peacetime and wartime at the lowest cost. Further refinements in the ensuing months will continue to assure that support provided to the Army's fighting forces is second to none.

Manpower is the core of every fighting force, and the Army has continued to give thoughtful consideration to the selection and training of personnel. To attract and hold high-caliber soldiers in a period of expanding national economy requires that the Army offer opportunities for schooling and promotion and provide adequate living quarters. The Army has done its utmost to fulfill these conditions within the means at its disposal.

The expanding economy has led to rising costs and demanded greater efficiency in the management of funds. New methods have imposed tighter controls on expenditures, while the cost reduction program has set up workable guidelines for procurement. The Army wants and needs the best and most modern equipment it can get, but at the lowest possible cost.

To insure that the weapons and equipment in the hands of the troops are superior to those of any potential enemy, the Army's research and development staff constantly searches for new concepts and reexamines old ones. The design on the drawing board today may well lead to a breakthrough tomorrow and give the American soldier a strong advantage over any foe. The Army can and will make every effort to give its men the best tools and training for the job ahead. To do less would be folly indeed.

A handwritten signature in dark ink, reading "Stephen Ailes". The signature is fluid and cursive, with a long horizontal line extending from the end of the name.

STEPHEN AILES,
Secretary of the Army.

Annex
ANNUAL REPORT
of the

OFFICE OF CIVIL DEFENSE

July 1, 1963, to June 30, 1964

In addition to the operational achievements of the Office of Civil Defense during fiscal year 1964, there were developments that will have a continuing impact on the civil defense program. Principal among them were:

First, the statement of the Secretary of Defense before the House Armed Services Committee in January 1964. He said, in part:

Civil defense is an integral and essential part of our over-all defense posture. I believe it is clear from my discussions of the strategic retaliatory and continental air and missile defense forces that a well planned and executed nationwide civil defense program centered around fallout shelters could contribute much more, dollar for dollar, to the saving of lives in the event of a nuclear attack upon the United States than any further increases in either of these two programs. Indeed, our studies indicate that an effective civil defense program could increase the number of persons surviving a determined Soviet nuclear attack in the 1970 period by tens of millions, at a total investment cost to the Federal Government of about \$3½ billion.

* * * The effectiveness of an active ballistic missile defense system in saving lives depends in large part upon the existence of an adequate civil defense system. Indeed, in the absence of adequate fallout shelters, an active defense might not significantly increase the proportion of the population surviving an all-out nuclear attack. Offensive missiles could easily be targeted at points outside the defended area and thereby achieve by fallout what otherwise would have to be achieved by blast and heat effects. For this reason, the very austere civil defense program recommended by the President * * * should be given priority over procurement and deployment of any major additions to the active defenses.

Second, Senator Henry M. Jackson, the Chairman, Special Subcommittee for Civil Defense of the Senate Armed Services Committee, in a letter to the Assistant Secretary of Defense (Civil Defense) on March 4, 1964, commented on the committee's decision deferring action on civil defense legislation (H.R. 8200) passed by the House of Representatives. He said, in part:

This decision was based on several factors not necessarily related to the substance of the bill. Principal among them is the fact that ballistic missile defense and the shelter program have been closely related and it is believed that a decision as to both should be similarly related. * * *

It is believed that all civil defense organizations will be fully occupied during the coming months with their current efforts to organize a working shelter program under your present ground rules. * * *

Third, the Secretary of Defense, on March 31, 1964, assigned civil defense responsibilities, delegated to him by Executive Order 10952, to the Secretary of the Army. A Department of Defense news release issued on that date reads, in part, as follows:

Secretary McNamara stated that the civil defense functions are being transferred to the Army because they are essentially operational and therefore should properly be administered by one of the Military Departments. These functions originally were assigned to the Secretary's immediate office in order that he might exercise personal supervision while the program was first getting started under Defense Department direction. The Secretary pointed out that the initial shelter program is now well underway.

The Secretary of the Army immediately established the Office of Civil Defense within his office and delegated the functions to the Director of Civil Defense. The civilian nature of civil defense leadership remained unaltered.

Fourth, disaster operations following the Alaskan earthquake of March 27, 1964, demonstrated what coordinated local, State, and Federal civil defense preparedness can mean to any area of the Nation stricken by a disaster of major proportions, whether caused by nature or by enemy attack.

Fifth, a plan for use of State adjutants general and their staffs to coordinate military support of civil defense planning and operations within their respective States was approved by the Secretary of the Army on June 8, 1964. Responses received from State Governors by the end of the fiscal year indicated their general acceptance of the plan.

Major facts on the development of the nationwide fallout shelter system at the end of fiscal year 1964 were:

1. Fallout shelter space for approximately 121.4 million persons had been located in more than 143,000 facilities.
2. Owners of more than 70,000 facilities had signed shelter license agreements for use of space to protect nearly 63 million persons.
3. Shelter space to protect nearly 64 million persons had been marked in nearly 80,000 facilities.
4. Shelters in more than 45,000 facilities had been stocked with supplies to serve nearly 24 million persons, and cumulative procurement commitments included supplies to serve an additional 39 million.

Among other major accomplishments during the year were the following:

1. The Emergency Broadcast System (EBS) plan was implemented, making a nationwide system of radio stations available to the President and to State and local governments for civil defense emergency communications. More than 300 stations authorized by the Federal Communications Commission (FCC) to serve in the EBS had signed agreements providing for fallout protection, emergency generators, and special communication links to local emergency operating centers.
2. A packaged ventilation unit was developed that can be used to increase the capacity of unventilated public fallout shelters. Space for an additional 31 million persons, at an approximate cost of \$2.50 per person, could be obtained from presently unventilated shelters in this way.
3. It was established that use of a radio indoor warning system to alert people of impending attack is feasible. Such a system shows promise of being more economical to install than the National Emergency Alarm Repeater (NEAR)

system. Preliminary studies also indicated that the home receivers for such a system would be no more expensive than NEAR receivers.

4. State and local emergency operating centers completed or under development with the support of Federal matching funds totaled 378.

5. The National Warning System (NAWAS) was strengthened by increasing the number of warning points from 500 to 621; fallout protection was provided for 27 warning points, making at least 3 such points in each OCD region; using Federal matching funds in fiscal year 1964, State and local governments obtained NAWAS extensions to 262 key locations, an increase of more than 35 percent.

6. The National Communications System No. 1 (NACOM 1) was improved and strengthened; e.g., service was extended to Hawaii, OCD regional and State services were made full-time operational daily, and teletype equipment was upgraded from 75 to 100 words per minute.

7. The radiological monitoring network was strengthened by the addition of more than 9,700 monitoring stations, making a total of more than 48,200. Also, more than 56,000 radiation monitoring kits were available in public fallout shelters having a rated capacity for nearly 43 million persons.

8. The damage assessment system was strengthened by the adoption of a new concept of handling information to make resource data more readily available and adaptable for civil defense use.

9. A program of community shelter planning was inaugurated to assure full use of public fallout shelters and to stimulate expansion of the nationwide fallout shelter system. Covering at least one community in each State and the District of Columbia, the program is designed to provide balanced and diversified data for guidance in conducting similar studies in all types of communities.

10. New architectural and engineering design techniques and procedures were developed that provide for incorporating fallout protection features in new construction with little or no increase in cost and without sacrificing the functional or esthetic qualities of the building. Incorporation of these design and construction features is called "slanting." This includes the geometrical arrangement of structural elements, such as walls and windows, to provide maximum fallout protection. Use of slanting techniques will enhance the inherent fallout protection capability of a structure, or it may facilitate later improvements in this capability.

11. Techniques for a rapid system of evaluating fallout protection capabilities of single-family homes were developed, and a survey was started to determine the feasibility of using this method to assist residents and local governments in making full use of these fallout protection capabilities in community shelter planning.

12. Approximately 195,000 persons were trained in civil defense adult education, making a cumulative total of approximately 900,000; about 1 million persons were trained in medical self-help, making a cumulative total of 1.7 million.

13. Key civil defense personnel and instructors trained at OCD schools totaled 3,654, making a cumulative total of 22,391 so trained since fiscal year 1960.

14. The Civil Defense University Extension Program resulted in training 5,155 instructors in shelter management and 3,364 instructors in radiological monitoring, as well as in acquainting 25,125 key State and local officials with the civil defense program through conferences. About 3,600 local radiological monitors were trained by the Army.

15. Approximately 2,900 architects and engineers completed the fallout shelter analysis course during fiscal year 1964, making a cumulative total of nearly

DEPARTMENT OF THE ARMY
OFFICE OF THE SECRETARY OF THE ARMY
OFFICE OF CIVIL DEFENSE

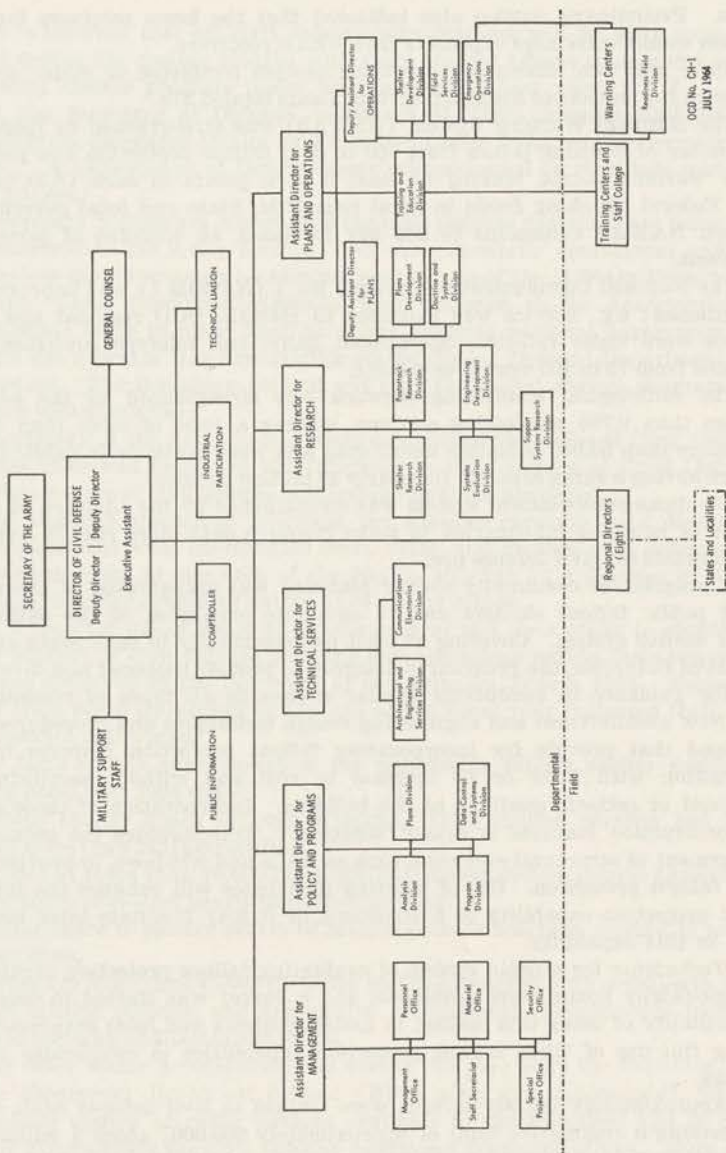


Figure 1

6,800 graduates qualified for listing in the *National Directory of Fallout Shelter Analysts*, FG-F-2.

16. Rural civil defense information and education programs were in operation in each State and in Puerto Rico.

Some of these developments are summarized in the body of this report. A more detailed report is published separately by the Office of Civil Defense (OCD).

Nationwide Fallout Shelter System

Shelter Space

The basic concept is to locate or develop sufficient fallout shelter space to accommodate the entire population and to mark and stock public fallout shelters that meet certain minimum requirements. Plans call for providing approximately 240 million fallout shelter spaces within the next few years; i.e., space to accommodate about 210 million persons. This takes into consideration expected growth in population and duplication of shelter needs resulting from movement of people between home and work or school.

National Shelter Program—This program is expected to provide shelter space for over 100 million persons. Since becoming operational in September 1961, it has been the principal source of fallout shelters. Key operational elements of this program are: (1) Locating suitable fallout shelter space in existing facilities, (2) securing signatures of facility owners on license agreements to permit use of acceptable space, (3) marking shelters with distinctive signs, (4) stocking licensed shelters with survival supplies, (5) locating additional shelter space where needed, and (6) keeping shelter data current.

At the end of fiscal year 1964, fallout shelter space for approximately 121.4 million persons had been located; space for nearly 64 million had been marked; space for nearly 63 million had been licensed; and space for nearly 24 million had been stocked. The following table summarizes fiscal year 1964 progress in this program.

SUMMARY OF PROGRESS IN NATIONAL SHELTER PROGRAM FISCAL YEAR 1964

Shelter action	Number of facilities (in thousands)				Number of spaces (in millions)			
	Fiscal year 1963	End of fiscal year 1964			Fiscal year 1963	End of fiscal year 1964		
	Total	Total	Gain	Percent gain	Total	Total	Gain	Percent gain
Located.....	125.4	143.7	18.3	14.6	103.7	121.4	17.7	17.1
Marked.....	53.8	79.8	26.0	48.3	42.8	63.8	21.0	49.0
Licensed.....	50.0	70.7	20.7	41.4	47.4	62.8	15.4	32.5
Stocked.....	20.9	45.7	24.8	118.7	9.7	23.8	14.1	145.4

Public fallout shelters included in this program must: (1) contain space for at least 50 persons, allowing 10 square feet per person in ventilated space and 500 cubic feet in unventilated space, and (2) have a protection factor of at least 40; i.e., radiation inside the shelter would be reduced to one-fortieth or less of that existing outside. At least 1.1 cubic feet of storage space is generally required per person. This is taken into consideration during the licensing and stocking process.

The initial nationwide shelter survey, completed in fiscal year 1963, resulted in locating acceptable shelter space in more than 125,000 facilities with a capacity for 103.7 million persons. Updating operations conducted in fiscal year 1964 gave priority to areas having large shelter deficiencies. This increased the nationwide shelter inventory by more than 18,000 facilities with an aggregate capacity for 17.7 million persons, and boosted the grand total to more than 143,000 facilities having an aggregate capacity for approximately 121.4 million persons. Shelter space for an additional 2 million persons has also been located in facilities too small to meet the 50-person accommodation requirement.

During fiscal year 1964, general shelter supplies were issued to local governments for stocking fallout shelters for more than 14 million persons, making the cumulative total of shelter supplies issued sufficient to accommodate 23.8 million. These supplies were located in 45,663 facilities having an aggregate rated capacity to shelter 36.1 million.

At the end of fiscal year 1964, 56,242 radiation kits had been stocked in 51,956 shelters having a rated capacity to shelter nearly 43 million persons. These kits were distributed separately from the general shelter supplies.

The average cost to the Federal Government of shelter stocking during fiscal year 1964 was approximately \$2.43 per shelter space.

Procurement of food, sanitation kits, and medical kits initiated in fiscal year 1964 was sufficient to accommodate 13 million persons, making cumulative procurement initiated sufficient to accommodate 63 million. About 16 percent of these supplies were in shelters as a result of prior operations, 22 percent were placed in shelters during fiscal year 1964, and the remaining 62 percent were in the supply line undergoing processing, delivery, assembly, or distribution at the end of fiscal year 1964.

Studies completed during fiscal year 1964 showed that many shelters have water and sanitation facilities that can easily be adapted for emergency use. Local governments were issued instructions enabling them to take advantage of this opportunity to save storage space, which is at a premium in most shelters. Since earlier procurement of water containers and liners is sufficient to accommodate more than 50 million persons in shelters, these items were excluded from procurement initiated in fiscal year 1964. However, cumulative procurement of some survival items is slightly in excess of those required to accommodate 63 million persons. This is necessary to permit use of standard packaging and shipping containers for balanced stocking of shelters of various capacities.

Federal Buildings Program—Contingent upon future appropriations, this program could produce fallout shelter for 5 million persons. This is about 2 percent of the shelter space needed in the nationwide shelter system. However, the importance of this program extends beyond the goal of developing additional shelter; e.g., it is a means of (1) stimulating local and private shelter construction by Federal example, (2) acquiring cost and technical data on public shelter construction, (3) developing less expensive methods of incorporating shelters in public buildings, and (4) acquiring practical experience in protective designing which may be applied nationwide.

The only fund for incorporating shelters in new and existing Federal buildings, \$17.5 million contained in the civil defense appropriation of the 1962 Department of Defense Appropriation Act, was allotted to several agencies during fiscal year 1962. At the end of fiscal year 1964, fallout shelter space for more than 100,000 persons had been developed from this source. Development of shelter space for more than 400,000 additional persons awaited completion of shelter projects that the General Services Administration (GSA) continued to hold in abeyance.

As a result of the limitation on shelter construction contained in Section 303 of the Independent Offices Appropriation Act of 1963, the GSA suspended further shelter development based on the use of fiscal year 1962 funds. During fiscal year 1963, they submitted a prospectus of 476 buildings to the Public Works Committees of the Senate and the House of Representatives, requesting specific approval to continue shelter development.

Other sources of shelter space—Independent private initiative is expected to provide shelter space in homes and business facilities for about 50 million persons. This effort is supported by various OCD activities, e.g., educational programs, shelter research and design development, and surveys identifying shelter space in homes. To the Federal Government, this is the least expensive source of shelter space, but Federal action in developing shelter space from other sources is considered essential to stimulate private initiative to make this source sufficiently productive.

Another source is needed to provide the balance of the estimated 240 million fallout shelter spaces required to protect the entire population. Legislation (H.R. 8200) passed by the House of Representatives and referred to the Senate Armed Services Committee on September 18, 1963, would authorize a dual-purpose shelter development program in governmental and nonprofit institutional facilities to fill this gap in the nationwide shelter system.

Shelter Support Activities

The nationwide fallout shelter system was supported by work in the fields of protective structures and professional development of architects and engineers. These activities included:

1. *Construction of protective emergency operating centers*—The center for OCD Region 5 became operational in February 1964, and specific site investigation was made for the Region 1 center. Funds appropriated in fiscal year 1962 will be used to finance construction of this center and to make site surveys for other regional centers, construction of which is subject to future budgeting. Pending completion of this construction, action was taken to provide OCD regional offices with emergency communications facilities having a minimum fallout radiation protection factor of 100.

With the help of Federal matching funds, construction of five centers for State and local governments was completed, making a total of 44; 91 were under construction, 123 were in the planning stage, and Federal matching funds have been obligated for the modification of 120 buildings to provide minimum protection from radioactive fallout.

2. *Protection of radio stations*—At the end of fiscal year 1964, more than 300 radio stations had signed agreements providing for fallout protection, emergency power generators, and special communication links to local emergency operating centers. Of these stations, 83 have provided fallout protection and 56 have also met the other requirements. The purpose of these arrangements is to enable stations serving in the Emergency Broadcast System to provide for continuous operation under conditions that would exist after a nuclear attack. Since most radio stations are not prepared for this as part of their normal operations, the OCD helps EBS stations by providing them with limited funds and equipment for this purpose.

3. *Protection of warning points*—In preparation for establishing a nationwide operation to provide warning points with fallout protection, emergency power, and ventilating and special communications equipment, OCD conducted a prototype operation of this nature during fiscal year 1964. A selected group of 27 warning points was included. This protection and equipment are needed at warning

points to assure effective and comprehensive operation of NAWAS under initial and subsequent attack conditions.

4. *Prototype shelters*—Funded by allocations from fiscal years 1960 and 1961 appropriations, prototype shelter construction in fiscal year 1964 was limited to eight projects that remained in design or construction stages. However, 641 prototype shelters, completed prior to fiscal year 1964, were available for demonstration purposes. Benefits derived from these projects included development of shelter space for about 50,000 persons, nationwide demonstration of family and community shelter construction, and acquisition of technical data in developing shelter designs as well as for planning the National Shelter Program.

5. *Engineering case studies*—These studies, being completed by use of fiscal years 1962 and 1963 funds, continued to provide shelter data on major types of structures especially relating shelter designs to variations in soil, climate, construction methods and costs, and building codes in different geographical areas. At the end of fiscal year 1964, final reports had been received on 180 studies and 10 reports were being prepared; selected studies on schools and hospitals were also being edited for publication. Data from these studies, extremely useful in planning proposed shelter programs, will continue to yield valuable results as they are analyzed further and programed for storage by automatic data processing equipment for future use.

6. *Breakthrough in design techniques and procedures*—Late in fiscal year 1964, new architectural and engineering design techniques were developed that provide for incorporating fallout protection features in new construction. Incorporation of these design and construction features with little or no increase in cost and without sacrificing the functional or esthetic qualities of the building is called "slanting." This includes the geometrical arrangement of structural elements, such as windows and walls, to provide maximum fallout protection. Use of slanting techniques will enhance the inherent fallout protection capability of a structure, or it may facilitate later improvements in this capability. It is anticipated that the concept of slanting, as it is introduced to architects and engineers, will become an important basis for developing fallout shelter space in future construction.

7. *Use and improvement of fallout shelters*—The OCD conducted several projects designed to provide technical guidance for improvement and use of fallout shelters.

8. *Professional development of architects and engineers*—The fallout shelter analysis course offered in fiscal year 1964 was taught at several universities and professional schools on a semester basis as well as by traveling instructor teams. It was an adaptation of the 2-week course developed in fiscal year 1962 to qualify architects and engineers for conducting the nationwide shelter survey. About 2,900 architects and engineers completed the course in fiscal year 1964, making a total of nearly 6,800 qualified graduates. About 300 participated in an extension of this course that emphasized immediate effects of nuclear detonation on structures; approximately 180 engineers completed pilot classes in a course on unique problems of shelter environment control engineering.

Several other efforts to develop architects and engineers were made. An industrial shelter design conference at Rice University in Texas resulted in publication of *Industrial Architecture—Fallout Shelters* which shows how well-designed factory buildings can be planned to incorporate fallout shelter protection space for dual use, economically, and without interfering with their functional or esthetic qualities. Continued use of summer institutes at architectural and engineering institutions increased to 195 the number of faculty

members qualified to teach fallout shelter analysis. Design competition administered under contract by the American Institute of Architects produced material for a publication that will show how community planners can incorporate fallout shelters in an entire community. More than a dozen universities and technical institutes conducted research for OCD on protective construction. Continued technical liaison with professional, technical, educational, and military societies provided guidance in promoting and developing interest in protective construction among architects and engineers. OCD sponsored or cosponsored workshops and symposiums included 2-day workshops held at 62 locations to bring architect-engineer shelter analysts up to date on latest techniques of shelter design and analysis.

Complementary Civil Defense Systems

Complementary civil defense systems include civil defense warning, communications, radiological monitoring and reporting, and damage assessment. They are essential to effective use of shelters and to preattack planning and postattack operations.

Civil Defense Warning

The Federal Government provides for sending warning to certain points throughout all parts of the United States to warn people of impending attack and let them know when to take shelter. From these points, State and local governments are responsible for warning the public.

The National Warning System (NAWAS) serves the continental United States, except Alaska. From 9 OCD warning centers, manned and operated by OCD warning officers, warnings and warning information can be sent to 621 warning points. Seven warning centers are located at major North American Air Defense (NORAD) installations; one is at OCD Region 1 Headquarters, and one is in the Washington, D.C., area. Using a special voice communications system, they can directly and simultaneously alert the 621 warning points within a few seconds. These warning points are at key Federal locations and in State capitals and numerous cities, and warnings can be sent from them to the public via State and local warning systems within a few minutes. Federal warning systems also serve Alaska and Hawaii as well as Guam, American Samoa, Puerto Rico, and the Virgin Islands.

Improvements in NAWAS during fiscal year 1964 included (1) an increase in the number of OCD warning centers from 8 to 9 and an increase in the number of warning points from 500 to 621; (2) provision of fallout protection for 27 warning points, making at least 3 protected points in each OCD region; and (3) relocation of the Warning Center at Syracuse, N.Y., to OCD Region 1 Headquarters to explore advantages of closer association of regional and warning activities.

During fiscal year 1964, attention was focused upon developing a radio warning system that would alert the public of impending attack. Several reasons prompted this decision. Restrictions on broadcasting in times of emergency had been lifted by discontinuance of CONELRAD (Control of Electromagnetic Radiations). Recent research studies indicated that modification of existing radio transmitters or erection of new ones required for a radio warning system would be less costly than installation of special signal generating equipment required to operate the National Emergency Alarm Repeater (NEAR) system using electric utility lines. In addition, it was concluded that reduction in prices of radio components would make possible the obtaining of radio receivers for this purpose.

at approximately the same cost as that of NEAR receivers. Accordingly, OCD made contractual arrangements providing for evaluation of data affecting design of radio warning systems and for developing radio transmitters and receivers adapted to operational requirements of these systems. As a result of these developments, contracts for analyzing 170 electric utility systems for installation of the NEAR warning system were terminated. However, upon completion of systemwide NEAR tests, underway in Michigan during calendar year 1964, basic engineering data required for installing the system will be available; prototype NEAR components and installations have been proved technologically satisfactory.

Communications

Civil defense communication systems provide for addressing the public and for directing postattack operations in the event of a civil defense emergency. The Emergency Broadcast System, managed by the FCC to meet requirements of the White House, the Office of Emergency Planning, and the OCD, relies upon the use of selected radio broadcasting stations for emergency communication with the public. After approval by the FCC to serve in the EBS, the OCD helps these stations meet minimum requirements by providing limited funds and equipment.

National Communications System No. 1 (NACOM) is specifically designed for speed, flexibility, and continuity of service required in civil defense emergency operations. It consists of a leased teletype network, with alternate telephone facilities, connecting OCD national and regional headquarters, an OCD relocation site, and State civil defense offices. The system provides the primary means of communications for coordinating Federal and State civil defense emergency operations. NACOM 1 improvements accomplished in fiscal year 1964 included: (1) Its extension to Hawaii, (2) upgrading of teletype equipment from a speed of 75 to 100 words per minute, (3) installation of telephone facilities between OCD regional and State offices, (4) installation of more efficient equipment at several OCD regional offices, and (5) conversion from standby to full-time daily operational status of those portions connecting OCD regional and State offices. Those portions connecting OCD and its regional offices have been in full-time operation since fiscal year 1962.

The backup system for NACOM 1 is National Communications System No. 2 (NACOM 2), a high-frequency radio network using voice, code, and radioteletype transmissions. At the end of fiscal year 1964, NACOM 2 remained operational at an OCD emergency relocation site, at all OCD regional offices, 23 State installations, and in Puerto Rico. NACOM 2 improvements during the year included initiation of equipment procurement for extension to additional States and consideration of signature of extension agreements by 14 States.

Radiological Monitoring and Reporting

During fiscal year 1964, more than 9,700 radiological monitoring stations were established, making a grand total of more than 48,200. Of this total, about 9,500 stations were at Federal facilities and the balance were at State and local facilities. A minimum of 150,000 monitoring locations are needed in the nationwide radiological defense monitoring system designed to collect, evaluate, and disseminate radioactive fallout information in case of nuclear attack.

More than 500,000 radiological defense instruments were distributed during fiscal year 1964. This included (1) those contained in monitoring sets granted to Federal, State, and local monitoring stations, (2) those contained in radiation kits issued for use in licensed public fallout shelters, (3) about 340,000 dosimeters

for use by emergency civil defense workers, and (4) instruments issued to States and Federal agencies for training purposes.

Damage Assessment

The primary purpose of OCD damage assessment plans and systems is to provide guidance for postattack survival operations. During the preattack period, this is accomplished by a series of vulnerability analyses (probability studies) of possible effects of various enemy attacks on human and material resources and services. In the postattack period, an assessment of surviving resources based upon the actual attack will provide necessary data for this purpose.

Preattack assessment in fiscal year 1964 included completion of an extensive analysis covering cost and effectiveness of various alternative civil defense programs in the event of attacks of various types and magnitudes. Using data derived from analyzing effects of a range of hypothetical attacks, OCD continued to provide guidance to Federal, State, and local agencies for preattack planning.

For use in postattack assessment, quantitative amounts of resources existing in each 2.5 kilometer square area have been computed and graphed to provide a quick manual method of damage assessment. This will permit appraisal of damage by State and local governments and will reduce the need for information from OCD headquarters. OCD will also develop initial postattack damage estimates quickly by using centrally located automatic data processing computers. However, more accurate damage estimates will be produced later from comparison of preattack and postattack aerial photographs. Finally, damage assessment will be based on exact data obtained by on-site inspection.

Information maintained by OCD on resources essential for survival and for which damage assessments are made or planned is known as the OCD data base. The principal improvement of the data base during fiscal year 1964 was the development and adoption of a data base concept more suitable for civil defense purposes. It provides for (1) arranging and storing survival resources data by automatic data processing equipment in a manner that will permit quick summarization according to any combination of individual items or categories for any geographic or government location, and (2) making data more readily available and adaptable for use in applying several methods of determining vulnerability of resources at specific locations. It will also make possible the application of simpler methods of making damage assessments.

In preattack planning, work was continued on techniques and procedures for determining emergency supply demands and on providing continuing data on survival resources for governments at all levels. For guidance in operational planning to supply postattack deficiencies, work was continued on policies and programs for implementing a nationwide system of claiming emergency survival supplies at national and regional levels if not available at State and local levels.

Federal Assistance Programs and Activities

The OCD continued to use several types of Federal assistance to help State and local governments develop maximum civil defense capabilities efficiently and economically.

Technical Assistance and Guidance

The standard means for issuing policy and program guidance as well as instructions is the *Federal Civil Defense Guide* (FCDG). As portions of this OCD publications series are printed, they are released for controlled distribution to OCD regional offices and to Federal, State, and local offices.

Technical guidance for improvement and use of fallout shelter were derived from (1) sample surveys of water supplies available in shelter facilities, (2) a pilot survey of fallout protection capability of single-family homes, (3) development of a packaged ventilation unit for use in public fallout shelters, (4) a pilot study showing how expedient fallout shelter can be used in an emergency to supplement existing shelter space, and (5) shelter utilization and management projects.

Other advisory and technical assistance included: (1) Help given State and local governments in planning use of secondary resources in the event of nuclear attack, (2) contractual arrangements for prototype rural fire defense training programs and for developing training material for auxiliary firemen, (3) training of law enforcement officers in civil defense by the U.S. Continental Army Command and contractual arrangements with Michigan State University to prepare a manual for police training in civil defense, (4) cooperation with the Bureau of Public Roads in developing emergency highway traffic regulations, (5) use of military Standby Reserve officers in local civil defense, and (6) contractual arrangements for American National Red Cross advisory services.

Training and Education

Key civil defense personnel trained in OCD schools during fiscal year 1964 totaled 3,654. The Civil Defense Adult Education Program, operating in 43 States, the District of Columbia, and Puerto Rico, trained 194,801 teachers and students in civil defense. Approximately one million persons were trained in medical self-help.

The Civil Defense University Extension Program, operational at 51 colleges and universities, acquainted more than 25,000 key officials with the civil defense program through conferences and trained 5,155 instructors in shelter management and 3,364 in radiological monitoring. By contractual arrangements, the U.S. Continental Army Command trained about 3,600 State and local radiological monitors.

Other training and education activities included: (1) Liaison with major national education organizations and contractual arrangements with the National Education Association and its National Commission on Safety Education that resulted in the preparation and distribution of several publications on civil defense; (2) contractual arrangements with the Extension Service of the U.S. Department of Agriculture that resulted in establishing rural civil defense information and education programs in each State and in Puerto Rico; (3) preparation of training materials for use by State and local governments in conducting standard civil defense training supported by Federal matching funds; (4) work on training requirements, status, and evaluation projects; and (5) training exercises conducted for State and local officials.

Financial Assistance

In accordance with the Federal Civil Defense Act of 1950, as amended, Federal matching funds were made available to State and local governments in support of civil defense. Funds obligated in fiscal year 1964 included more than \$4.4 million for emergency operating centers, approximately \$5 million for supplies, equipment, and training, and about \$14.3 million for essential personnel and administrative expenses. Course completion certificates issued to students attending OCD schools under the program for partial reimbursement of travel

and per diem expenses during fiscal year 1964 totaled 1,438, and the amount reimbursed was \$84,032.

Surplus Property

By authority of Public Law 655, 84th Congress, Federal surplus property valued at approximately \$33 million was donated to States for civil defense use in fiscal year 1964. Since the program was started in fiscal year 1957, property having an acquisition cost of approximately \$272 million has been transferred to the States.

Emergency Supplies and Equipment Inventory

This inventory included chemical and biological equipment, such as protective masks, chemical and detection kits, and decontamination sets, valued at approximately \$1.8 million, and engineering equipment valued at about \$10 million. The engineering equipment, including forty-five 10-mile units, is available for local use to pump and purify water during natural disasters or postattack operations. During fiscal year 1964, units were loaned to 15 States for use in 61 communities; at the end of the year, units were on loan to 8 States for use in 16 communities. Radiological defense equipment, formerly included in this inventory, is no longer considered part of it. This equipment is distributed to public fallout shelters and radiological monitoring stations where it is more readily available for emergency use.

Research

The substantial progress achieved in civil defense research during fiscal year 1964 was partly a result of the \$19 million made available for research in fiscal year 1962. The impetus provided by those funds carried research to higher levels of achievement in the next 2 years when smaller sums became available—\$11 million in fiscal year 1963 and \$10 million in fiscal year 1964. Many research activities initiated previously produced results during fiscal year 1964.

Continuity of effort was assured by following objectives of fiscal year 1962 when civil defense research activities were redirected to: (1) Identify and develop more economical hardware and operational procedures, (2) improve effectiveness of operational systems, (3) increase capability of men and equipment for postattack operations, (4) improve readiness of the entire civil defense program, and (5) provide more useful data for making basic decisions in planning and operating civil defense programs.

Those contractors whose past performance for OCD had demonstrated the highest level of technical competence and productivity were assigned additional and larger research projects. Consequently, the fiscal year 1963 trend of assigning fewer contractors larger workloads continued throughout fiscal year 1964. Comparative percentages of funds committed to various types of research groups during the last 3 fiscal years were:

	Percent		
	FY 62	FY 63	FY 64
Department of Defense (DoD).....	18.1	17.9	16.6
Federal agencies exclusive of DoD.....	15.8	22.1	15.2
Educational institutions.....	5.0	9.6	10.6
Private organizations, including industrial laboratories, research institutes and foundations, and quasi-Govern- ment agencies.....	61.1	50.4	57.6
Total.....	100.0	100.0	100.0

Close coordination of OCD research with that conducted by other DOD components has resulted in mutual support of some research projects. For example, the Advanced Research Projects Agency of the Directorate of Defense Research and Engineering gave mutual support with OCD to fire research projects in which both had a common interest. This included research on an infrared airborne scanner (a special camera) to detect and map large-scale fires not detectable by ordinary cameras because of smoke cover.

The OCD continued to conduct research in four major functional categories. These and the percentage of funds allotted to each during fiscal year 1964 were:

	<i>Percent</i>
Shelter.....	29.2
Support Systems.....	25.0
Postattack.....	22.4
Systems Evaluation.....	23.4
Total.....	100.0

Limited space precludes a discussion of individual research projects in this report. However, the impact of research on the civil defense program perspective and operational procedures became evident in numerous instances during fiscal year 1964. This was the result of research conducted during recent years. For example, more reliable calculations of the radiation protection factor were made possible. These calculations promote maximum use of existing fallout shelter space and contribute to improvement in shelter designs for new buildings, as well as to more effective and more economical modification of existing structures for shelter purposes. The feasibility of using radio for indoor warning purposes was established. Several radio systems, currently being further developed and tested, gave new perspective to the indoor warning problem. Development of a packaged ventilation unit offered the prospect of greatly expanding the capacity of many public fallout shelters.

Supporting Activities

An informed public, the support and understanding of industry and national organizations, and a nationwide and worldwide program perspective are important requirements of an effective and efficient civil defense program. In addition to those discussed in the ensuing paragraphs, major supporting activities designed to meet these requirements included: (1) Technical liaison with many technical and scientific organizations, (2) international activities coordinated with the Department of State, and (3) functions covered by contractual arrangements and a memorandum of understanding with the American National Red Cross.

Public Information

Throughout fiscal year 1964, the OCD concentrated its public information activities on producing informational material needed by civil defense directors in describing the purpose and scope of the civil defense program to important leadership groups, and on preparations to carry out essential information activities in time of emergency.

New informational tools produced included two 30-minute motion pictures—*One Week in October*, a documentary film on the Cuban missile crisis, and *The Day That Made a Difference*, describing the 1-day public shelter stocking activities in San Francisco and New Orleans. Three other films produced earlier,

About Fallout, *Town of the Times*, and *Shelter on a Quiet Street*, were released for national distribution early in the fiscal year, and prints of the Department of Defense annual film report *Partners in Freedom* were made available to OCD regional, State, and local civil defense offices. In addition, a new series of speakers' guide kits was started during the year to assist State and local civil defense directors in making person-to-person contacts.

Civil defense was publicized by (1) issuance of 46 information bulletins to State and local civil defense officials, (2) distribution of one *CD Newsfeature* and two *CD Newspicture* pages to 11,000 daily and weekly newspapers, (3) special information provided to newspapers, magazines, encyclopedias, and trade journals, (4) display of civil defense exhibits (including a major exhibit at the New York World's Fair) to an estimated 24 million persons, (5) display of public posters by the Outdoor Advertising Association, the Transit Advertising Association, the Post Office Department, and the General Services Administration, (6) extensive showing of several motion pictures, (7) use of television spot announcements, and (8) contribution of radio time by approximately 2,600 broadcasting stations.

As part of its work with national organizations, OCD produced three basic information items during the year: (1) *Community and Family Service for Civil Defense*, a publication that suggests ways in which club leaders can motivate members and organize them to support civil defense at the local level, (2) *The Citizen and Civil Defense*, a filmstrip outlining specific actions that organizations and individual citizens can show to support civil defense, and (3) *Civil Defense Directors' Guide to Citizen Participation*, which describes ways in which local civil defense directors can make use of the talent available in local organizations. In addition, the OCD information kit, *Organized Action for Civil Defense*, was distributed on request to several national organizations; 370,000 civil defense information packets were distributed to Cub Scout leaders, and 1.5 million copies of civil defense publications were supplied for use by Cub Scouts and their families.

A National Awards Program was started during the year to encourage public participation in and support of civil defense by giving recognition to individuals and organizations making outstanding contributions.

Industrial Participation

Throughout fiscal year 1964, the OCD continued to help business and industry make necessary provisions for (1) protecting industrial personnel in the event of attack, (2) minimizing the effects of attack on industrial facilities, and (3) assisting local governments in the development of effective community fallout shelter plans. In addition, liaison with industry helped expand the nationwide system of public fallout shelters. Guidance and assistance in carrying out the civil defense program were given to industry by means of publications and exhibits as well as by conferences with industrial leaders. Other Federal agencies and national trade and professional organizations joined the OCD in furnishing civil defense information and guidance to local industrial facilities. More than 350,000 copies of industrial civil defense publications were distributed with the help of industry, various Federal agencies, and State and local governments.

Approximately 25,000 business, professional, and civic leaders were informed of civil defense in conferences and seminars conducted in 38 cities by professional and civic organizations, colleges and universities, and governments at all levels. With OCD cooperation, the Agricultural Marketing Service of the U.S.

Department of Agriculture prepared the *Guide to Civil Defense Management in the Food Industry*, and about 81,000 copies were distributed to managers of food processing facilities. Civil defense guidance material was given to more than 10,000 senior military officers and key civilian leaders who attended national security seminars conducted by the Industrial College of the Armed Forces. The American Society of Corporate Secretaries, Inc., prepared an 89-page booklet, *Continuity of Corporate Management in Event of Nuclear Attack*, and more than 36,000 copies were distributed to business and industrial personnel.

In addition to responding to about 2,500 requests for industrial civil defense information, OCD negotiated with the headquarters of 110 multiplant industrial corporations to encourage them in adopting policies authorizing their local managers to sign public fallout shelter license agreements. They were also urged to provide dual-use shelter space in new construction. At the end of fiscal year 1964, favorable policies had been adopted by 52 corporations, making fallout shelter space available for many thousands of additional persons.

Labor Support

The American Federation of Labor and Congress of Industrial Organizations (AFL-CIO) reaffirmed support of civil defense when the Fifth Constitutional Convention of the AFL-CIO Council unanimously adopted a resolution that specifically urged greater support to strengthen and expand the nationwide system of public fallout shelters.

Manpower and technical support was evidenced by: (1) Free transportation and labor furnished for stocking shelters in many cities by the International Brotherhood of Teamsters, the AFL-CIO Building and Construction Trades, and the Longshoremen's Association; (2) assistance in combating the Alaskan earthquake disaster by providing skilled labor, mass feeding, and a cash donation of more than \$250,000; (3) assistance in combating floods and other disaster effects in five States as well as hurricane damage on the eastern seaboard, and (4) support of training labor personnel for disaster relief work in 30 States and training of apprentice personnel for similar purposes in 24 States.

In addition to supporting proposed legislation for disaster relief and civil defense, the AFL-CIO helped the OCD bring civil defense information to the public by: (1) Sponsoring three programs over a 700-station radio network, (2) distributing informational materials to organizations representing 13.5 million persons, (3) printing civil defense articles in the *AFL-CIO Weekly News* mailed to 85,000 labor officials, and (4) showing civil defense exhibits.

Civil Defense Organization

Headed by the Director of Civil Defense, the Office of Civil Defense (OCD), in the Office of the Secretary of the Army, is the basic organization responsible for conducting the civil defense program at the Federal level. The legal bases for this organization are (1) Executive Order 10952, *Assigning Civil Defense Responsibilities to the Secretary of Defense and Others*, effective August 1, 1961, and (2) subsequent departmental directives of the Secretary of Defense. From August 31, 1961, to March 31, 1964, the OCD was headed by the Assistant Secretary of Defense (Civil Defense). On March 31, 1964, civil defense functions and responsibilities delegated to the Secretary of Defense by Executive Order 10952 were assigned to the Secretary of the Army, who established the OCD within his office and delegated the functions to the Director of Civil Defense.

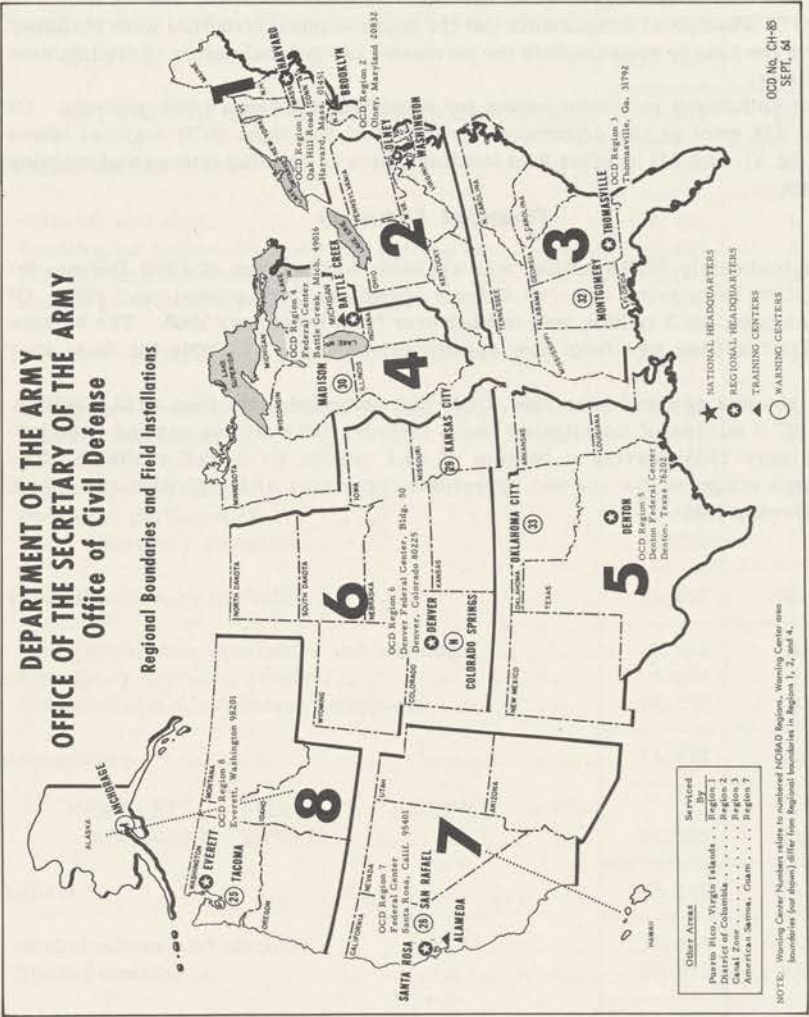


Figure 2

The new status given OCD in the Defense Department was recognition of its operational maturity. The Director of Civil Defense is responsible directly to the Secretary of the Army and is considered to be in a position equal to that of an Assistant Secretary of the Army. The civilian nature of responsibility and leadership in the civil defense program remains unchanged.

At the end of fiscal year 1964, the organizational structure was as shown in figure 1. Functional assignments and the organizational structure were realigned during the year to accommodate the increasing operational nature of civil defense activities.

The authorized personnel ceiling for fiscal year 1964 was 1,062 positions. Of these, 445 were at the department level, 476 at the eight OCD regional offices (see fig. 2), and 141 at other field locations, such as training centers and warning centers.

Financial Summary

Approximately \$129.9 million was available to the Office of Civil Defense for obligation in carrying out civil defense operations during fiscal year 1964. Of this amount, \$18.3 million was carried over from fiscal year 1963. The balance of \$111.6 million was from new appropriations, made available for fiscal year 1964.

At the end of fiscal year 1964, OCD had obligated more than \$112.4 million. The \$17.5 million of unobligated funds includes \$16.4 million carried over into fiscal year 1965, leaving a balance of \$1.1 million no longer available. The amounts obligated for specific operational programs and activities are shown in following table.

FINANCIAL SUMMARY FOR FISCAL YEAR 1964

(In Thousands of Dollars)

Budget activity	Funds available for obligation	Funds obligated
GRAND TOTAL	129, 856	112, 402
OPERATION AND MAINTENANCE, TOTAL	70, 312	69, 285
Warning and detection	5, 939	5, 877
Warning and alert	1, 735	1, 696
Radiological fallout detection and monitoring	1, 901	1, 901
Warehousing and maintenance	2, 203	2, 184
Fallout protection for warning points	100	96
Emergency operations	26, 335	25, 743
Emergency broadcast system	3, 720	3, 689
Damage assessment	2, 716	2, 686
Training and education	16, 701	16, 450
Public information	2, 832	2, 631
Industrial participation	97	21
Other emergency operations	269	266
Financial assistance to States	23, 967	23, 735
Survival supplies, equipment and training	5, 061	4, 976
Emergency operating centers	4, 584	4, 438
Personnel and administrative expenses	14, 322	14, 321
Management	14, 071	13, 930
RESEARCH, SHELTER SURVEY AND MARKING, TOTAL	57, 365	43, 075
Shelters	43, 143	31, 276
Shelter survey and marking	13, 131	7, 776
Shelter stocking	30, 012	23, 500
Research and development	14, 222	11, 799
CONSTRUCTION OF FACILITIES, TOTAL	2, 179	42

Federal Support

The OCD marshals support for civil defense from Federal sources principally by utilizing Department of Defense resources, developing military support of civil defense, and coordinating the civil defense efforts of Federal civilian agencies. Use of these resources, reflected throughout this report, are too extensive for complete coverage.

The Secretary of Defense, by departmental directive issued in fiscal year 1963, established civil defense functions to be performed by the armed forces during emergencies. Implementation of these functions continued during fiscal year 1964. A plan for use of State adjutants general and their staffs to coordinate military support of civil defense planning and operations within their respective States was approved by the Secretary of the Army on June 8, 1964. Responses received from State governors by the end of the fiscal year indicated their general acceptance of the plan.

Natural Disaster Operations

Statewide and locally, civil defense perspective is closely associated with natural disaster preparedness. This was dramatically demonstrated following the Alaskan earthquake on March 27, 1964. Civil defense supplies available in Alaska, as well as those airlifted from many distant locations, were used to the fullest extent. The National Warning System was used extensively for emergency communications as well as for warning Pacific States of dangerous tidal waves resulting from the earthquake. Staff members from OCD Region 8 assisted the Alaska State Civil Defense staff and OEP personnel throughout the emergency and restoration periods. Many Federal agencies, as well as the armed forces, provided assistance under the provisions of Public Law 875, 81st Congress, administered by the OEP.

The OCD regulations applicable to disaster relief were revised and published in the Federal Register of June 20, 1964 (29 F.R. 7981). The revised regulations clarified the authorization relating to the use of the following civil defense resources in preparation for and during other-than-enemy-caused disaster: (1) Supplies and equipment obtained with the help of Federal contributions and Federal contributions obtained for personnel and administrative expenses under the Federal Civil Defense Act of 1950, as amended, and (2) Federal surplus property donated under the Federal Property and Administrative Services Act of 1949, as amended. The authorization clearly allows Federal contributions and surplus property donations to be used for training, test exercises, planning, and administrative activities in preparation for and during other-than-enemy-caused disaster, provided these activities are included as an integral part of planning and administrative activities in preparation for enemy-caused disaster.

The Alaskan experience demonstrated the soundness of using civil defense equipment and personnel to combat local disasters. Positive response of State and local governments and industrial, organization, and community leaders to the civil defense program is a measure of its success. The role of civil defense

in dealing with disasters, such as the Alaskan earthquake, demonstrates the significance of this response, whether the disaster be caused by nature or by enemy attack.

A handwritten signature in dark ink, reading "William P. Durkee". The script is fluid and cursive, with the first name "William" and last name "Durkee" clearly legible.

WILLIAM P. DURKEE,
Director of Civil Defense.

The first of these is the fact that the United States is a young nation, and that its history is a history of growth and expansion. The second is the fact that the United States is a nation of immigrants, and that its history is a history of the struggle for the rights of these immigrants. The third is the fact that the United States is a nation of free men, and that its history is a history of the struggle for the rights of these free men. The fourth is the fact that the United States is a nation of law, and that its history is a history of the struggle for the rights of these laws. The fifth is the fact that the United States is a nation of peace, and that its history is a history of the struggle for the rights of these peace.

General Principles of History

History is the study of the past, and its purpose is to help us understand the present and the future. It is a science, and it is an art. It is a science because it is based on facts, and it is an art because it is based on interpretation. History is a science because it is based on facts, and it is an art because it is based on interpretation. History is a science because it is based on facts, and it is an art because it is based on interpretation. History is a science because it is based on facts, and it is an art because it is based on interpretation.

The first principle of history is that it is based on facts. Facts are the raw material of history, and without facts, history is impossible. The second principle of history is that it is based on interpretation. Interpretation is the process of making sense of the facts, and without interpretation, facts are meaningless. The third principle of history is that it is based on the present. The present is the starting point of history, and without the present, history is impossible. The fourth principle of history is that it is based on the future. The future is the goal of history, and without the future, history is impossible.

The fifth principle of history is that it is based on the human mind. The human mind is the source of history, and without the human mind, history is impossible. The sixth principle of history is that it is based on the human body. The human body is the source of history, and without the human body, history is impossible.

The Mission of the Department of the Navy

Annual Report

of the

SECRETARY OF THE NAVY

July 1, 1963 to June 30, 1964

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1. The Mission of the Department of the Navy

The mission of the Department of the Navy is to develop and maintain Navy and Marine Corps forces in constant readiness as a powerful, flexible, and economical instrument of national policy.

Purpose of Naval Forces

Forces of the Navy and Marine Corps constitute the maritime elements of national military strength which are maintained and employed, in conjunction with the other armed forces of the United States, for the following purposes:

1. To support and defend the Constitution of the United States against all enemies, foreign and domestic.
2. To insure the security of the United States, its possessions, and areas vital to its interests by timely and effective military action.
3. To uphold and advance the national policies and interests of the United States.
4. To provide assistance in civil defense as an additional task and, as feasible at the time, with forces not required for essential military operations.

Primary Functions of Naval Forces

The Navy and Marine Corps contribute to the support of national policy by providing to the Secretary of Defense and the Joint Chiefs of Staff suitable active combatant forces in the highest possible state of sustained readiness to perform three broad missions, namely:

1. The prevention of general war, and the effective execution of such naval operations as may be essential to a favorable outcome for the United States should failure of deterrent measures lead to general war.
2. Prompt, controlled naval reaction in response to limited warfare contingencies and insurgencies in order to protect U.S. interests, stabilize critical political conditions, and forestall the outbreak of hostilities, if possible; or to take such positive and forceful counter-measures against armed forces—regular or irregular—as may be necessary to effect their containment or destruction, in order to achieve the earliest possible restoration of stability to the conflict areas and to implement national policy as may be directed by the President.

3. Preparedness to exploit the ocean environment, control the seas, and to project U.S. power as a readily usable and effective contribution to the total national power. This implies that naval power must be freely adaptable to being used as an integral and independent force, to being used as a component of a unified military force, and to being used in support of other forces.

The principal functions and tasks of the Navy and Marine Corps which stem from the above missions are prescribed by various Executive orders and by statutory regulations pertinent to the organization of the Department of Defense. These functions are summarized below:

1. To organize, train, and equip Navy and Marine Corps Forces for the conduct of prompt and sustained combat operations at sea, such operations to include those designed to seek out and destroy enemy naval forces, to suppress enemy sea commerce, to gain and maintain general naval supremacy, to control vital sea areas and protect sea lines of communication, to establish and maintain local sea and air superiority in an area of naval operations, to seize and defend advanced naval bases, and to conduct such land and air operations as may be essential to the prosecution of a naval campaign.

2. To provide Fleet Marine Forces of combined arms for service with the fleet in the seizure and defense of advanced naval bases and for the conduct of such land and air operations as may be essential to the prosecution of a naval campaign; and to provide security forces for the protection of naval property at naval bases.

3. To organize, equip, and provide naval forces for the conduct of amphibious operations. Operating within guidelines defined by the Joint Chiefs of Staff, and in accordance with procedures for inter-Service coordination of joint actions, the Navy exercises responsibility for amphibious training of all forces assigned to joint amphibious operations and acts as the primary agency in developing doctrines and procedures for joint amphibious operations. Similar provisions establish the Marine Corps as primary agency for development of landing force tactics, techniques, and equipment for amphibious operations.

4. To furnish adequate, timely, and reliable intelligence for the Navy and Marine Corps.

5. To organize, train, and equip naval forces for naval reconnaissance, antisubmarine warfare, protection of shipping, minelaying, including the air aspects thereof, and controlled minefield operations.

6. To provide air support essential for naval operations.

7. To provide sea-based air defense and the sea-based means for control of defenses against air attack.

8. To provide naval forces as required for the defense of the United States against air attack, in accordance with the doctrines established by the Joint Chiefs of Staff.

9. To furnish aerial photography as necessary for Navy and Marine Corps operations.

On all matters of joint concern, the Navy and Marine Corps coordinate with the other Services.

II. Programs and Expenditures

Programs

Department of the Navy programs for the fiscal year 1964 totaled \$15.0 billion in direct obligational authority. Of this amount, 89 percent or \$13.1 billion was concentrated in three programs: Strategic Retaliatory Forces, General Purpose Forces, and General Support. In terms of the Department of Defense programing system classifications, program allocations were as follows:

TOTAL DIRECT OBLIGATIONAL AUTHORITY

FISCAL YEAR 1964

(In Millions of Dollars)

	<i>Amount</i>	<i>Percent</i>
Strategic Retaliatory Forces.....	1, 763. 4	11. 9
Continental Air and Missile Defense Forces.....	193. 0	1. 3
General Purpose Forces.....	8, 470. 5	57. 1
Airlift and Sealift Forces.....	35. 3	. 2
Reserve and Guard Forces.....	371. 7	2. 5
Research and Development.....	1, 095. 6	7. 4
General Support.....	2, 897. 7	19. 6
Total.....	14, 827. 2	100. 0

The largest program—General Purpose Forces—represents more than half of the Department's total direct obligational authority and comprises those forces maintained for employment in both limited and general warfare. Among these forces are included: The combatant elements of the attack carrier striking forces (attack carriers (CVAs), carrier air wings (CAWs), and anti-air warfare/antisubmarine warfare screen ships (AAW/ASW screen ships); destroyer-type ships, submarines, ASW carriers and air groups, maritime patrol aircraft; the division/wing teams of the Marine Corps; the amphibious assault force elements; and the major fleet support ships of the under-way replenishment groups.

The next largest program—General Support—amounted to about one-fifth of the fiscal year 1964 total. This program includes activities such as flight training, materiel maintenance, communications systems,

procurement, and supply operations, which are not readily allocable to missions, forces or weapon systems.

The third-ranking program—Strategic Retaliatory Forces—consists almost entirely of POLARIS missile forces.

The Research and Development (R&D) program category includes basic and applied research projects and those oriented to major warfare systems investigations. R&D support items associated with specific elements of other major programs are excluded from this category.

Most remaining resources were devoted to the Navy and Marine Corps Reserve programs and to surveillance systems of the Continental Air and Missile Defense Forces.

Expenditures

Expenditures totaled \$14.5 billion, as compared with \$14.0 billion in fiscal year 1963 and \$13.3 billion in fiscal year 1962.

The broad purposes or functions for which expenditures were made are set forth below:

EXPENDITURES BY FUNCTIONAL TITLE

FISCAL YEAR 1964

(In Millions of Dollars)

	<i>Amount</i>	<i>Percent</i>
Military Personnel.....	3,833.4	26.4
Operation and Maintenance.....	3,071.0	21.2
Major Procurement.....	6,042.2	41.6
Research, Development, Test, and Evaluation.....	1,577.8	10.9
Military Construction.....	190.3	1.3
Revolving and Management Funds.....	-194.7	-1.4
Total.....	14,520.0	100.0

Operation and maintenance costs plus military pay accounted for nearly half of the expenditures. Remaining expenditures were largely for the acquisition of new assets such as ships, aircraft, ordnance, and construction projects.

Research, development, test, and evaluation expenditures were concentrated primarily on antisubmarine warfare, missiles, ship design, and electronics.

The revolving fund transactions for the year reflect the operations of the Navy and Marine Corps Stock Funds, the Navy Industrial Fund, and the Navy Management Fund. Most of the negative expenditure for the year was caused by operating procedures which require advance payments for work done at industrial fund activities such as shipyards and ordnance plants.

III. Navy and Marine Corps Operations

The worldwide geographic distribution of ocean expanses and the demonstrated capability to exploit the seas and maritime regions of the earth permit the Navy and Marine Corps to organize, maintain, and operate global forces in being. The inherent endurance and staying powers of these forces are enhanced by their ability to replenish at sea and can be further augmented by logistic support provisions at advanced bases. Essentially independent of sovereignty issues, these two complementary elements of seapower are deployable to remote stations proximate to those areas of the world in which the policies and interests of the United States and its allies are most subject to challenge. Equipped, trained, and ready for both peaceful and combatant missions—from civil disaster relief and rescue operations to maritime blockade, to amphibious assault, and to nuclear strike—these forces provide the effective means for rapid and controlled response to a wide range of possible contingencies.

Combat-ready operating forces of the Navy and Marine Corps are provided on a rotational basis to the Sixth Fleet in the eastern Atlantic-Mediterranean area and to the Seventh Fleet in the western Pacific in order to maintain the strength and effectiveness of these deployed fleets on a continuous and steady-state basis. Forces of the Second Fleet, normally engaged in combat readiness training operations in western Atlantic waters, are available for augmentation of the Sixth Fleet if required and for response in other areas of the Atlantic. First Fleet forces in the eastern and mid-Pacific Ocean areas provide the Pacific and Alaskan commands with similar capabilities for contingency response.

The following partial listing of employment highlights involving Navy and Marine Corps forces serves to illustrate the practical value of the deployed naval posture and the resultant readiness for prompt response to the varying demands for support of national policy by U.S. seapower.

Southeast Asia

The focal point in southeast Asia continues to be Vietnam. The Seventh Fleet maintained throughout the year a readiness posture for contingencies arising from events in that area. In addition, Navy

and Marine Corps personnel continued to serve with activities ashore in South Vietnam itself.

On occasions when crises within South Vietnam threatened the safety of U.S. civilians and military personnel, Seventh Fleet ships with embarked Marines were rapidly moved into the immediate area and remained there throughout the periods of crises. Had events ashore required a show of force, an intermediate military reaction, or an amphibious assault, the appropriate response would have been immediate.

Haiti-Dominican Republic

During the latter part of 1963, the Atlantic Fleet was required to maintain general surveillance of Haiti and the Dominican Republic. This precautionary operation was undertaken in view of the general unrest in both countries and the possibility that U.S. citizens would have to be evacuated if the situation worsened. The Caribbean Squadron embarked a Marine Expeditionary Unit and took station in the Gulf of Gonaives from August 6-10 to support U.S. interests in this area.

The character of official U.S. interest in this area changed dramatically and abruptly when the passage of Hurricane Flora in October caused extensive destruction ashore. At the request of the Governments of Haiti and the Dominican Republic, Atlantic Fleet ships and aircraft assisted in the evacuation of survivors and the delivery of supplies. Upon completion of that 2-week mission, the Navy had evacuated approximately 1,000 people from hard-hit areas, mostly by helicopter, and had delivered 400 tons of supplies.

Cyprus

On several occasions in late 1963 and early 1964, the Navy was called upon to position ships in the vicinity of Cyprus for the possible evacuation of U.S. civilians endangered by the recurrent fighting on the island. In each instance, Sixth Fleet forces were in position in less than 2 days from the time the request was made. Excellent liaison was maintained between the Navy and the U.S. civilian authorities concerned.

Zanzibar-Tanganyika

On January 12, 1964, mobs in Zanzibar seized police arms and fighting ensued. The government was ultimately overthrown and the Sultan exiled. The Chargé d'Affaires requested the immediate evacuation of dependents. The destroyer U.S.S. *Manley*, which happened to be visiting neighboring Kenya, arrived off Zanzibar on the same day.

On the following day, the *Manley* evacuated 91 U.S. dependents to Dar es Salaam in Tanganyika.

On January 20, the Tanganyika Rifles mutinied. The *Manley* and other U.S. Navy ships stood by for possible evacuation of U.S. nationals in Tanganyika. This evacuation was not required as the situation was quickly brought under control.

Panama

On January 9, 1964, rioting erupted in Panama when Panamanian students attempted to raise a Panamanian flag in the Canal Zone. The situation deteriorated rapidly with further rioting and sporadic gunfire. Considerable damage to U.S. property was sustained, and four U.S. military personnel were killed. During the period of unrest Navy and Marine Corps units participated with those of the other Services in the security and alert measures required to maintain law and order in the Canal Zone. On April 3, 1964, agreement was reached between Panama and the United States on the restoration of diplomatic relations and on a joint effort to seek a mutually acceptable solution to the existing problems.

Alaska

The Navy was called upon to render assistance in the aftermath of the serious earthquake in Kodiak in March 1964. The first elements of a 150-man Seabee Disaster Recovery Team from Mobile Construction Battalion Nine, with rations and equipment, arrived within 1 day after the earthquake to commence round-the-clock restoration operations. The seaplane tender U.S.S. *Salisbury Sound*, the landing ship U.S.S. *Kodiak*, the landing ship, dock, U.S.S. *Alamo*, and the fleet tug U.S.S. *Sioux* all provided equipment, services, and personnel to the task of cleaning up and restoring essential services in Kodiak.

Space

During the past year no Navy space recovery support was required. The MERCURY program was completed in fiscal year 1963. The initial GEMINI mission this year was unmanned and thus required no recovery support.

An agreement has been executed between the Department of the Navy and the National Aeronautics and Space Administration (NASA) for Navy participation in future GEMINI and APOLLO manned space missions. The level of Navy recovery support for GEMINI missions will be similar to the recovery support previously provided to MERCURY missions.

The Marine Corps has initiated studies to identify and determine requirements in space systems in order to take maximum advantage of the potential offered by such systems.

Significant Exercises

The large-scale exercises in which Navy and Marine Corps units participate are divided into joint, combined, inter-Service, and uni-Service exercises. Their purpose is to increase United States readiness and the readiness of friendly nations by combined exercises.

The Navy-Marine Corps amphibious team maintains its proficiency by frequent large-scale exercises as well as small-unit basic training. QUICK KICK V, a joint amphibious and airborne assault exercise on the east coast; LIGHTAS, a SEATO-sponsored amphibious and airborne assault exercise in the Philippines; and BACKPACK, a bilateral (Republic of China) amphibious exercise in Taiwan, served to test the readiness of the United States and friendly force participants and to test the adequacy of contingency plans. Forty-five amphibious exercises were conducted by the Fleet Amphibious Forces and the Fleet Marine Forces during the year.

UNITAS IV, latest in a series of exercises with South American naval units, involved a U.S. task group of three destroyer-type ships, a submarine, and three aircraft. The exercise was designed to improve the antisubmarine capability of the South American forces. During its 3-month cruise, the U.S. task group worked with ships of eight different countries and contributed to the proficiency of their navies.

People-to-People Programs

The Navy people-to-people effort overseas has been carried out through Project Handclasp and the Overseas Community Relations program.

Within a \$99,000 budget, it was possible to intensify the latter program for fiscal year 1964. These funds were used to support various small civic action projects, such as purchasing medical supplies, athletic equipment, and other items not available from material donated to Project Handclasp.

Significant programs include the effort supported by Project Handclasp on the Concord Squadron cruise to the Indian Ocean in May. Ships assigned to the Commander, Middle East Force, carried on successful medical-civic action projects in Iran and in the small off-shore islands of the Persian Gulf in October, and followup projects were completed in January in conjunction with a visit by the American Ambassador to these areas. Some medical supplies were obtained from donations to Project Handclasp, and the rest were purchased

using the Overseas Community Relations Fund mentioned above. The UNITAS IV training cruise to Latin America created a favorable impact due, in part, to well-planned community relations programs. Marines of the 1st Marine Aircraft Wing heavy equipment section crews undertook an extensive land reclamation project which made possible the construction of a much-needed primary school at Hirao, Japan. Navy and Marine Corps personnel of the Sixth Fleet in the Mediterranean and the Seventh Fleet in the western Pacific were active in good-will programs which included entertaining children during ship visits, donating blood, and refurbishing orphanages, schools, churches, and hospitals in needy areas.

Many new companies and individuals have donated material to Project Handclasp during this past year, and ships deploying overseas can thus obtain additional unconsigned material for use in this community relations effort. Nearly 9 million pounds of material were carried, a total approximately twice that of the previous year. Ships are now carrying approximately equal amounts of consigned and unconsigned material on a space-available basis under the project. The efforts of the east and west coast project directors, the widespread interest in the program by Navy and Marine personnel at all levels, and the personal support of the fleet commanders have all contributed greatly to the success of Handclasp.

These programs have been highly successful in fostering better relations with people around the world by reflecting the initiative, warmth, and generosity of the United States. In addition, one fleet commander observed that these programs benefit the Navy and Marine Corps by engendering more responsible citizenship on the part of the participants.

Informational Objectives Program

The Navy inaugurated an informational program for foreign military officers undergoing training in the United States as part of a Department of Defense effort to increase their knowledge of American life and institutions. Known as the informational objectives program, this endeavor enlarges on the people-to-people activities of Navy training activities and seeks to expose foreign officers to many aspects of American life which they normally would not encounter as part of strictly military training. Training activities have been encouraged to accomplish the objectives of this program through trips and visits to local institutions such as schools, farms, courts, and factories where the foreign officers may be briefed on various nonmilitary aspects of American life. Special trips to Washington, D.C., and to State capitals have been scheduled, and additional funds have been made available to finance these special programs.

IV. Seapower Capabilities

Naval Warfare Capabilities

Strategic Warfare

Submarine-Launched Ballistic Missile Program—The funded program through fiscal year 1964 provided for 41 submarines (SSBNs) and 5 tenders.

Operational Status—Nine SSBNs were commissioned, bringing the total number in commission to 21. All SSBNs were equipped with 16 POLARIS missiles each. Most of the deployed submarines carried the A-2 missile while the remainder had the A-1 version. Logistic support for deployed SSBNs was provided by submarine tenders at oversea replenishment anchorages. This force, by itself, now represents an extremely effective deterrent to general war. In collaboration with the MINUTEMAN missiles of the Air Force and other nuclear striking forces, it presents any enemy with a prospect of overwhelming devastation should he start a nuclear exchange.

Shipbuilding and Conversion—Nine SSBNs were made ready for sea. Included among these was the first ship scheduled to be equipped with the POLARIS A-3 missile. Construction commenced on the final 6 SSBNs of the currently planned 41-ship force.

The investigation following the loss of U.S.S. *Thresher* (SSN 593) determined that the safety of submarines could be improved substantially. Major revisions to the SSBN construction schedules were made as a result of the decision to proceed with the submarine safety program. Of the 12 SSBNs originally scheduled to be ready for sea at the rate of 1 per month during the fiscal year, only 9 were made ready. However, on the basis of the revised schedule, 17 of the 18 SSBNs originally scheduled at the rate of 1 per month (beginning in June 1963) are expected to be ready for sea within the 18-month period and the remaining 1 shortly thereafter.

U.S.S. *George Washington* (SSBN 598), the first SSBN to be deployed, began her overhaul and conversion on June 20, 1964, after successfully completing a deployment of 3½ years. During this conversion, her nuclear reactor will be replenished.

Production—Production of POLARIS weapon system equipment and missiles continued to satisfy the requirements of a very demanding

schedule. No SSBN delivery was delayed by late delivery of equipment for the weapon system, and no deployment was deferred because of the late delivery of POLARIS missiles.

The production of POLARIS A-2 missiles to satisfy shipfill requirements was completed. Assembly of the first POLARIS A-3 missile began in February 1964. By the end of the fiscal year, an assembly capability adequate to meet future A-3 missile requirements was achieved.

Tests—Among the highlights of the fiscal year 1964 tests were successes in the first firings using a new launcher system, the first shot from a surfaced SSBN, and the first tests of an exercise POLARIS A-3 missile.

Research and Development—At the end of the fiscal year, developmental work on the POLARIS A-3 was essentially complete.

In late 1963, the Secretary of Defense authorized a project definition phase for a more potent missile system which is being considered to meet future threats. In its design and execution, the new system has been provided growth potential for future development.

Other research and development efforts were directed primarily toward improvements in navigational equipments and accuracies, refinements of the fire control and launching systems, and exploration, testing, and evaluation of communications techniques.

Carrier Strike Warfare

Carrier Program—The approved attack carrier (CVA) program maintains a force level of 15 CVAs. The CVA force now consists of one *Enterprise* (nuclear-powered), two *Kitty Hawk*, four *Forrestal*, three *Midway*, and five *Hancock*-class carriers.

Throughout the year, the Navy maintained three, and sometimes four, CVAs on station with the Seventh Fleet in the western Pacific, and two CVAs on station with the Sixth Fleet in the Mediterranean. In the western Atlantic and Caribbean, the Second Fleet operated all available CVAs in a wide spectrum of fleet exercises, training exercises in preparation for Mediterranean deployment, and operations in support of Caribbean contingency plans. In the eastern Pacific, the First Fleet performed similar duties with the available Pacific CVAs.

In addition, CVAs of both the First and Second Fleets conducted regular carrier landing qualification cruises for combat readiness air wing pilots at periodic intervals in coastal waters. In spite of these heavy commitments, the required routine carrier overhauls were accomplished on schedule in naval shipyards on both coasts.

The Marine Corps continued periodic deployment of aviation units aboard CVAs. A Marine attack squadron from the 2d Marine Aircraft Wing deployed as part of the carrier air wing embarked in U.S.S.

Independence when she was assigned to duty with the Sixth Fleet in the Mediterranean. In preparation for other deployments, all Marine fighter and attack squadrons continued field mirror landing practice and conducted carrier qualification and refresher landings when possible.

Modernization—Regular overhauls for four CVAs were provided. The introduction into the fleet of the Naval Tactical Data System (NTDS) continued. The automatic carrier landing system was installed in three CVAs, enhancing their ability to operate under all-weather conditions. Modernization of communication, radar, and electronic countermeasure equipments continued under the material improvement plan. Improved flight deck lighting and modernized optical landing systems were installed to improve safety of night carrier operations. The installation of the inertial navigation system to provide accurate navigation inputs to carrier based aircraft continued.

Carrier Aircraft Programs—The status of carrier aircraft programs is summarized below by model.

F-4 Phantom II—an all-weather, Mach 2+, interceptor/attack airplane continued in production for the Navy, Marine Corps, and Air Force.

F-111—a joint Air Force-Navy interceptor was in development status during the year.

A-6A—a twin-jet medium attack aircraft, capable of all-weather delivery of conventional and nuclear ordnance, was in production throughout the year. Training in the Combat Readiness Air Wing commenced in fiscal year 1964.

A-7A—a followon light jet attack plane with a marked increase in range and payload to replace the A-4E Skyhawk was competitively selected and a contract awarded.

RA-5C—the first six-plane squadron of these reconnaissance aircraft was readied for operational deployment late in the year.

RF-8A—to provide a continuing reconnaissance capability in older CVAs, an austere program was initiated to modernize RF-8A aircraft. The RF-8A has been the first-line photoreconnaissance aircraft in attack carriers since 1957.

Antisubmarine warfare (ASW)

Management—Rapid advances in propulsion and weapon technologies and the successful application of these advances to the submersible have stimulated steady growth in the military potential of submarine weapon systems since World War II. In contrast to this growth, the improvement of countermeasures against the submarine progressed

at a much slower rate, but in recent years major efforts in ASW have begun to show encouraging results.

In order to accelerate the growth of Navy antisubmarine capabilities and to increase the effectiveness and efficiency of naval operations in this critically important warfare field, it is essential that every feasible prospect of improved performance in submarine countermeasures be recognized and exploited to advantage. During the past year, significant steps were taken to revitalize ASW management as a means toward more systematic assessment of the over-all ASW program. These steps included a major recomposition of the ASW management structure.

In the latter part of the fiscal year, the Office of the Director, Anti-submarine Warfare Programs, was established. The mission of this new office is to exercise centralized coordinating authority over all ASW planning, programing, and appraising. The Director, a vice admiral, is responsible to the Chief of Naval Operations in all matters pertaining to determination of ASW requirements, selection of ASW work to be performed by the Chief of Naval Material, and appraisal of ASW work in progress as to its military worth and readiness.

Simultaneously, a Manager, ASW Systems Project, was created in the Naval Material Support Establishment. The Manager, ASW Systems Project, also a flag officer, represents the producer side of the ASW management effort and is responsive to and works closely with the Director, Antisubmarine Warfare Programs.

Under this centralized organization, ASW programs are receiving major attention in order to counter the submarine threat to our control of the seas. Specifically, ASW programs involve the development, production, and deployment of a large number of systems to detect, locate, classify, and destroy submarines. These systems include surface, air, and submarine-based detection and locating devices; fire control; and explosive ordnance items such as missiles, rockets, mines, torpedoes, bombs, and depth charges. The combination of many of these elements provides flexibility to meet varying circumstances under which the threat may be encountered.

Surface Ship Antisubmarine Systems—The addition of 2 new escort ships (DEs) together with 16 others building or under contract will represent a significant addition to fleet ASW capabilities. Two ships have the first operational models of new long-range sonars. In addition, experimental models have been installed in two other ships. This sonar will improve the effectiveness of standoff weapon systems such as the Drone Antisubmarine Helicopter (DASH) and the Antisubmarine Rocket (ASROC).

The long-range sonar program was reviewed in detail in May and June 1964. The review recommended that in order to assure success,

the technical management and control organization be strengthened, coordination with supporting oceanographic surveys be increased, and the program to provide trained sonarmen be augmented. These recommendations are being implemented.

During the past year the operational evaluation of DASH was successfully completed. DASH has proven its capability as an effective destroyer weapon system and has demonstrated a high order of reliability under operational conditions. This weapon system has been, or will be, installed in most modernized destroyers, in the new DEs, and in guided-missile frigates (DLGs) that are now entering the fleet.

The program for the installation of the ASROC system in all converted destroyers and new ASW ships continued. By the end of fiscal year 1964, 110 ships were equipped with ASROC. It is a quick-reaction weapon, designed to destroy an enemy submarine before the submarine can attack.

Aircraft Antisubmarine Weapon Systems—The modernization of Navy antisubmarine warfare aircraft squadrons was continued by equipping additional units with new models of aircraft. As squadrons receive new aircraft and improved weapon systems, their capability for detection, localization, and destruction of submarines improved markedly. Outfitting land-based patrol aircraft squadrons with the P-3A Orion provided long-range patrol aircraft with improved search rates, range, and speed and better flight crew performance. Improved aircraft sensor and navigation systems provided increased performance in carrier-based ASW tactical operations. New helicopters significantly improved ASW helicopter performance characteristics and capability.

Submarine Antisubmarine Warfare—Submarine ASW forces were augmented by the commissioning of three new nuclear attack class submarines. Two nuclear attack submarines were launched and contracts were let for five more.

A prototype of the primary acoustic sensor system to be installed in new nuclear attack submarines successfully completed technical evaluation and is undergoing operational evaluation. The at-sea performance of this system has demonstrated significant improvement compared to former submarine sonar systems. Submarine tactical analysis groups have been established to develop and improve tactics, doctrine, and operational procedures in order to keep pace with technological advances in performance characteristics and weapon systems, and to realize the full potential of the submarine antisubmarine warfare system.

Exercise Evaluation and Data Analysis—The increased detection and weapon delivery ranges for ASW systems, and the improved capabilities of the submarines that these systems are designed to combat,

have added to the difficulty of obtaining accurate ASW exercise data for postexercise evaluation. Underwater, acoustic tactical ranges are being installed to permit measurement of destroyer, submarine, and aircraft performance in ASW exercises conducted in a realistic environment. Data recorded on such a range will permit postexercise analysis of tactics and missed contact opportunities, and will provide the means for effective evaluation of ASW systems and weapons. The first range became operational early in the fiscal year.

Development of the Atlantic Underseas Test and Evaluation Center (AUTECE), which will provide facilities for deep water acoustic tests and measurement, is progressing. It will support testing of various ASW weapons and sensors, together with operational evaluation of systems requiring tracking in air, surface, and subsurface media.

Further, to meet the need for obtaining more definitive knowledge of our capabilities and deficiencies in operations against nuclear and conventional submarines, ASW analysis teams were established on the staffs of the fleet ASW commanders and the submarine force commanders. The ASW analysis teams will be of sufficient size and capability to develop the required programs and to analyze the results of ASW operations and exercises.

An advanced development effort is continuing to determine the feasibility of using a very high-powered sonar transducer and high-gain receivers, together with advanced data processing equipment, for locating submarines at very long range in large ocean areas. The melding of the scientific and seamanship effort of several diverse organizations under very deep sea conditions in this project resulted in significant progress.

ASW Requirements for Inshore Areas—During the year, the Navy promulgated an inshore undersea warfare policy which was designed to provide a quick-reaction capability to satisfy requirements for the defense of harbor approaches and other limited relatively shallow, inshore areas against the undersea threat. Units trained in undersea warfare are available for rapid deployment to any location in the United States or overseas.

Mine Warfare—Requirements for new ASW mines have been established. The number procured through fiscal year 1964 will provide the initial requirements in the Atlantic and Pacific areas. Planned annual procurement will continue to increase the stockpile. Limited numbers of units participated in exercises to maintain fleet minelaying capability.

Forces for providing mine countermeasures support for both amphibious assault and continental defense were maintained. The mine countermeasures systems are being revised to incorporate the most modern equipments. New environmental measuring devices will im-

prove the efficiency of minesweeping operations by permitting more accurate determination of swept paths.

Anti-Air Warfare (AAW)

Fleet AAW capability was strengthened by the commissioning of six TERRIER frigates (DLGs), four TARTAR destroyers (DDGs), and a TALOS/TARTAR cruiser. The program to increase the overall effectiveness of ships in commission was continued. Modification of existing DDG systems to fire a longer range, improved TARTAR missile was undertaken.

In November 1963, the long-range TYPHON surface-to-air missile development program was canceled in favor of a project for the development of a system offering equivalent capability in a smaller, less complex, and less costly package. This project will provide an improved standard missile to replace the present TERRIER and TARTAR missiles and will develop a new advanced surface-to-air missile system to meet the threat of the future.

Continuing strong centralized management control, exercised through the Surface Missile Systems Project, has resulted in increased surface-to-air missile system maintainability, availability, reliability, and effectiveness. Firm priority management of enlisted personnel assignments has increased the manning level of surface missile system technicians on board ships with attendant improvement in surface-to-air missile ship readiness postures.

For air-to-air AAW, the phase-in of the F-4 fighter aircraft continued. The continued phase-in of the F-4 increased fleet AAW capability. This increased effectiveness permitted reduction in the numbers of aircraft assigned to squadrons. In addition, an improved air-to-air missile for the F-4 was received in the fleet in quantity. Some F-8 squadrons will be retained in the inventory as long as *Hancock*-class carriers remain in attack carrier status.

Several new early warning aircraft were given operational trials. In addition, personnel were trained in preparation for the introduction of the new aircraft in the fleet. This aircraft is equipped with an airborne tactical data system which ties into the surface tactical data system on missile ships and carriers to give a continuous and integrated presentation of the AAW situation.

The steady increase in the equipment and the capabilities for surface and airborne electronics warfare has emphasized the close relationship of this warfare technique to AAW. Concerted efforts are underway by the Navy to develop and refine the tactics of electronics warfare and the doctrine governing them, so that this capability will more significantly contribute to improved AAW effectiveness in the fleet.

Following indications of Soviet aircraft operations well into the Atlantic and Pacific Oceans, the Navy initiated an antisnooper program. Aircraft equipped with air-to-air missiles were embarked in antisubmarine carriers (CVS) to provide fighter protection for these ASW groups. Two detachments of these aircraft were provided by the Marine Corps to assist in meeting these commitments. One was deployed from October 1963 to April 1964 during Seventh Fleet operations in the western Pacific. The other Marine detachment deployed to the Atlantic from October to December 1963.

Marine light antiaircraft missile battalions continue to provide the potential for surface-to-air missile defense in support of assigned operations. All units are capable of integrated operations in an objective area in accordance with established Navy AAW doctrine and procedures.

The Marine Tactical Data System (MTDS) will provide integrated control of interceptor aircraft and surface-to-air missiles in AAW. This system provides air traffic control for attack and support aircraft. MTDS, in conjunction with the shipboard NTDS, will provide inland coverage and will extend the capabilities of the systems over a much wider area.

Amphibious Assault Warfare

Amphibious warfare combat readiness was maintained at a high level by strenuous schedules of amphibious assault training with Marine Corps units, in joint operations with the Army and Air Force, in NATO and SEATO exercises, and in operations with Republic of Korea Marines and Republic of China Marines.

In two exercises, one in the Atlantic and one in the Pacific, Military Sea Transportation Service (MSTS) ships participated in amphibious assault exercises with Navy ships. These exercises provided both Navy and MSTS operational commanders with practical experience in the use of MSTS ships in amphibious assault operations. The more ambitious of these was Exercise BACKPACK, a large-scale United States-Republic of China amphibious exercise.

Combat-ready amphibious squadrons with Marine landing forces embarked were deployed in the Mediterranean, the Caribbean, and off southeast Asia. These deployed units participated in numerous landing exercises in preparation for possible contingency operations. Amphibious ships also provided services in support of operation DEEP FREEZE, the annual Arctic resupply, and other fleet operations.

The amphibious assault force level was increased by 1 to a total of 133 amphibious warfare ships. U.S.S. *Guadalcanal* (LPH-7) was commissioned on July 20, 1963, at the Philadelphia Naval Base.

U.S.S. *La Salle* (LPD-3) was commissioned February 22, 1964, at the New York Naval Shipyard. U.S.S. *Thetis Bay* (LPH-6), formerly a World War II jeep carrier, was inactivated in the latter part of the fiscal year.

Progress was also made in providing the equipment needed to support the Navy-Marine Corps concept for the conduct of amphibious assault warfare. Plans to increase the amphibious assault capability of the Navy and Marine Corps are underway. The approved 20-knot amphibious shipbuilding program will provide more responsive lift and increase the flexibility of the ship-to-shore movement for the division/wing teams. In addition to the necessary ships, new helicopters were introduced in operating units. These helicopters are providing increased lift and speed capabilities.

The development of the Short Airfield for Tactical Support (SATS) was completed and full procurement is underway. The SATS will enable the Marine Corps to introduce its air support into the objective area early in an amphibious assault.

Six- and eight-inch gun cruisers are available for fire support of amphibious operations, in addition to air strike and close air support from carrier-based aircraft. Air support capabilities have been greatly improved by new air-to-ground weapons, and a lightweight gun is under development to improve small ship gunfire support.

Counterinsurgency

All naval general purpose forces have an inherent capability to participate in and conduct counterinsurgency operations where direct deployment of U.S. forces in an acute insurgency situation has been authorized. However, the brunt of routine counterinsurgency training responsibilities has continued to be borne by personnel of the amphibious forces and construction battalions. Marine helicopter squadrons and SEAL teams also contributed to the counterinsurgency effort.

During the year, 77 Navy Mobile Training Teams were deployed in 29 countries in counterinsurgency training. Operations varied from basic instructions in organization and administration to duties in South Vietnam involving on-the-job training in river combat patrol operations, coastal amphibious operations, junk repair and maintenance, and coastal surveillance operations against infiltration by the Viet Cong. A total of 498 personnel sent to Vietnam during the year was given predeployment area orientation and instruction in self-defense and basic language.

In socio-economic civic action, Seabee Technical Assistance Teams (STATS) were particularly active and well received. For example,

four teams are being used in Latin America and six in southeast Asia on projects sponsored by the U.S. Agency for International Development. Projects of these special trained, skilled, field construction personnel have varied from road and airfield construction to building dams, bridges, and schools, and digging fresh-water wells in South Vietnam.

Naval Resources

Manpower

Military—The Department of the Navy military personnel summaries for fiscal years 1963 and 1964 are shown in the following table together with end-year approved strengths:

NAVY MILITARY PERSONNEL SUMMARY

(As of June 30)

Military Personnel on			
Active Duty (Totals) :			
	1963	1964	Difference
Navy	664, 647	667, 596	+2, 949
Marine Corps.....	189, 683	189, 777	+94
Total.....	854, 330	857, 373	+3, 043
Approved Strengths :			
Navy	664, 413	669, 992	+5, 579
Marine Corps.....	190, 000	190, 000	-----
Total.....	854, 413	859, 992	+5, 579

Retention was the major personnel problem in the Navy.

Low retention rates resulted in serious shortages in some grades and categories of officers, the most serious being in the unrestricted line surface officer category. Extensive officer retention efforts were made and improvements resulted. For example, the retention of regular officers from the Naval Reserve Officer Training Corps program has improved from 30 percent to 42 percent since 1960.

Enlisted retention continued to be an extremely critical problem for the Navy. In spite of passage of the 1963 military pay bill, the first-term reenlistment rate fell from 25.1 percent in fiscal year 1963 to 22.5 percent in fiscal year 1964.

Several military manpower management control actions were taken as a result of implementing recommendations in the Review of Management of the Department of the Navy. Among the more significant manpower actions were the following:

1. The Qualitative Planning Section of the Bureau of Naval Personnel was transferred to the Office of the Chief of Naval Operations, thereby consolidating the functions of qualitative and quantitative requirements for total manpower allocations. This revised method of operation contributes to more efficient manpower planning and pro-

graming methods and reduces reaction time for urgently required changes in the allocation of personnel.

2. Command, the authority vested in an individual for the direction, coordination, and control of military forces, is the primary goal to which unrestricted line officers aspire and mold their career patterns. Many of these unrestricted line officers have developed additional capabilities, or subspecialties, in fields of endeavor which complement or are associated with command. A subspecialty concept was developed as a management tool to assist in the more effective utilization of unrestricted line officer education and experience in fields other than naval warfare. Qualified officers were reassigned in their subspecialty areas when not assigned to naval warfare billets. These officers increase the operational fleet experience in the specialty areas. Approximately 9,000 unrestricted line officers were identified as subspecialists.

Two other 1964 programs are examples of the Navy objective toward improved stewardship of military manpower resources. These programs are:

1. A study program to design a system that will consolidate all current Navy manpower information systems and provide additional information system capability in order to meet the total manpower information requirements for the Navy manpower management function. The study, entitled "Total Integrated Manpower Management System (TIMMS)," is being conducted by the Bureau of Naval Personnel under a private contract. The first phase of the study, program definition and factfinding, was initiated and essentially completed. The results are under review.

2. A project entitled the "Navy Military Manpower Management Evaluation Project (NMMEP)." Its objective is review and evaluation of naval military manpower management at all levels to assure that it is in consonance with accepted management doctrine and practices. It will also aim to identify and correct deficiencies in current military manpower management practices throughout the Navy.

The Marine Corps manpower program provided personnel allocations with the broad objective of accomplishing assigned missions with an increased degree of readiness. The objective was attained by maintaining balanced and mobile Fleet Marine Forces and maintaining all other activities at minimum strength consistent with effective operation.

Department of the Navy efforts were oriented toward keeping the training establishment abreast of operational requirements and improving all levels of education and training of personnel. Emphasis was given to completing training facilities to raise the level of training

of personnel in the new weapon systems and techniques. Pursuant to this objective, training facilities for personnel in FBM submarines and ASW and AAW units were completed. Programs to monitor and coordinate the acquisition, training, and distribution of personnel for weapon systems programs and projects were initiated for AAW, nuclear power, ASW, and command and control. Leadership programs were broadened to include emphasis on general military training subjects. These programs included substantial emphasis on career motivation aspects of personnel development.

Recruiting programs increased the input of regular and reserve personnel, including increases in reserve first enlistments and reserve first extended tours of active duty.

Paid drill training reserve strengths are tabulated below:

(As of June 30)

	1963	1964	Difference
Navy.....	119, 611	123, 277	3, 666
Marine Corps.....	46, 257	45, 860	-397

The authorized Navy drill-pay strength for fiscal years 1963 and 1964 was 135,000. During the second half of fiscal year 1964, the Secretary of Defense reduced this authorization to 126,000. The strength at the end of the year was 2,723 below the authorization. Marine Corps strength remained fairly constant and the end strength of 45,860 may be compared with an authorization of 46,000.

Navy and Marine Corps inactive duty reserves increased over the preceding year. Although the strengths are not entirely adequate (especially in the Marine Corps), they provide a sizable manpower pool for mobilization needs. These strengths are:

(As of June 30)

	1963	1964	Difference
Navy.....	446, 712	471, 451	24, 739
Marine Corps.....	134, 336	136, 001	1, 665

Civilian—Considerable effort was devoted to placing career employees affected by reduction in force and base closures into other jobs in Government and private industry. Under the Department of Defense Stability of Employment Program, the total resources of the Department of Defense are available to assist in the placement of the affected employee within the Civil Service Region in which he has been employed. The largest effort in this connection was occasioned by the ordered closure of the Naval Repair Facility, San Diego, Calif., which had 1,485 career employees. By various measures, which included freezing substantial numbers of personnel actions at naval activities in California and Nevada, virtually all eligible

employees who sought placement assistance had been offered other jobs by the end of the fiscal year.

Civilian personnel summaries for fiscal years 1963 and 1964 are shown in the following table, which also indicates the geographical distribution of the civilian personnel.

CIVILIAN PERSONNEL SUMMARY
BY GEOGRAPHICAL DISTRIBUTION

(As of June 30)

Direct Hire Civilian Personnel in:	1963	1964	Difference
United States	319, 685	309, 435	-10, 250
Territories and Possessions	5, 327	5, 605	+278
Foreign Countries	18, 958	17, 638	-1, 320
Total	343, 970	332, 678	-11, 292

In implementing Executive Order 10988, the Navy granted employee organizations exclusive recognition in approximately 140 units employing about 120,000 employees and formal recognition in approximately 115 units employing about 110,000 employees. In addition, about 300 employee organizations have been granted informal recognition. As of the end of the fiscal year, about 60 exclusive recognition agreements had been negotiated, and a number of additional agreements are in the process of being negotiated.

Material

Ship Overhauls and Alterations—Twenty-five destroyers (FRAM I program) and 15 other ships (FRAM II Program) were modernized. Full overhauls were begun for 240 ships of the active fleet. Midcycle (interim) overhauls were canceled, and ship-operating intervals between overhauls were elongated. Experience thus far indicates that increases in unscheduled industrial repairs have occurred which formerly would have been accomplished during the more frequent overhauls.

A submarine safety program of \$26.4 million was initiated to improve the safety of submarine operations. This high-priority program had not been budgeted, and the cost had to be absorbed at the expense of other operations and maintenance programs.

Supplies and Equipage—Allowance deficiencies in ships of the fleets and the replacement of repair parts, especially expensive technical repair parts for modern equipment, continued to be a matter of concern. The fleets were not able to restore allowances at a rate commensurate to the depletion of existing levels of parts, thereby aggravating allowance shortages. Effort to resolve this situation continued.

Maintenance Management—The dramatic increase in both cost and complexity of military equipments has made the problem of fleet maintenance a critical one. A program to assist in the solution of basic problems of maintenance management in the operating forces has been initiated. The elements of this program include:

1. Development and installation of a standard system of programming, control, and accomplishment of maintenance of ships and aircraft.
2. Development and installation of a data collection and analysis system to measure effectiveness of maintenance and material support and to provide the basis for more efficient management of resources.

A standard system for shipboard-maintenance management is now installed in 221 engineering and 29 electronic departments of ships in the Atlantic and Pacific Fleets. This includes 32 prototype installations representing 155 additional ships. The system has been highly successful as a management tool at the ship level for accomplishment of maintenance. Its reception by fleet personnel has been enthusiastic. This system is now being developed for all ship departments and for all ship classes. The present goal is to complete installation of the systems by the end of 1966. A similar system is in effect on 13 aircraft models. All aircraft will be included by January 1965.

Data collection, analysis, and distribution are an essential aspect of maintenance management. A comprehensive system is being developed based on a survey and actual shipboard evaluation of a reporting system. It is being evaluated in three destroyer squadrons. The goal is to expand this system to all cruiser-destroyer forces by July 1965. It will provide all levels of management with a comprehensive range of useful data regarding:

1. Performance, quality, and control of the total maintenance effort.
2. Manpower utilization and skill requirements.
3. Maintainability and reliability performance of equipments and systems.
4. Effectiveness of supply support of maintenance.
5. Material usage and cost.

A similar data collection system has been developed for Navy and Marine Corps aviation units and will be implemented beginning in January 1965.

Fleet Logistic Support—Steadily increasing costs associated with technological advances and the use of more costly, sophisticated systems have increased the complexity of maintaining a balanced, ready naval force, capable of performing assigned missions. To alleviate this situation, a fleet logistic support improvement program to implement improved management concepts and adopt more stringent controls on positioning and distribution of Navy material assets has been established. Implementation of this program will include:

1. More specific definition of shipboard allowance list requirements.
2. Development of a program to code items of material as to military essentiality.
3. Increased use of civilian contractor resources to support new weapons and equipment.
4. Adoption of improved procedures for the formulation of budgets for operation and maintenance of naval operating forces.
5. Revision of the policy of positioning assets in the mobile logistic support force and the oversea bases.
6. Limited distribution of insurance-type support items to not more than one distribution point on each coast of the continental United States.
7. Increased use of airlift to provide continued responsive support to deployed Navy forces with fewer assets positioned overseas.

Marine Corps Material—Supplies and equipment necessary for the combat support of the Fleet Marine Forces during the initial phases of any conflict are maintained in a state of readiness by Navy and Marine Corps supply activities. Once again the effectiveness of this concept was tested when the situation in southeast Asia, at the end of August 1963, necessitated the release of certain of these protected stocks for units scheduled to deploy to that area.

A major project has been undertaken within the Marine Corps to purify these stocks. Requirements were previously computed on the basis of peacetime recurring demand or supply catalog rates and did not necessarily reflect predicted combat requirements. Headquarters, Marine Corps, has injected this latter philosophy in a program which involves a complete recomputation of requirements. The program is well underway and will be completed early in calendar year 1965.

A new system of reporting material readiness has been instituted within the Marine Corps by which means the Commandant is kept continuously abreast of the logistic capability of the Fleet Marine Forces to carry out their assigned missions. This system embodies periodic logistic status reports and reports of specific combat-essential equipments in a "not ready" condition. The reports are complemented by a tracer action system by which Headquarters, Marine Corps, can take the action necessary to correct serious deficiencies and call command attention to situations that so dictate.

Research

The Navy research effort is undertaken in each of the material bureaus, whose concern is primarily with application of research to existing or planned equipments, and by the Office of Naval Research (ONR), which conducts a broader and more fundamental effort. The table below summarizes the fiscal programs of the Office of Naval Re-

search for fiscal years 1963-64. At the same time it identifies the major activities participating in the programs.

ONR PROGRAMS

(In Millions of Dollars)

	1963	1964
Contract Research Program.....	78.1	78.8
Naval Research Laboratory.....	22.5	28.0
Naval Training Device Center.....	12.1	12.4
Underwater Sound Reference Laboratory.....	1.0	1.0
Field Administration.....	3.4	3.5
Military Administration.....		
Total.....	117.1	123.7

The Naval Research Laboratory (NRL) has become one of the largest and most completely equipped research establishments in the U.S. Government. During fiscal year 1964, a new general purpose laboratory building was started—a four-story, modern, concrete, 150,000-square-foot structure for office and laboratory space and a new sector-focusing cyclotron facility. Other new facilities were the test facility on Seneca Lake in Dresden, N.Y., and an electron linear accelerator (LINAC) constructed at NRL and operated within the last year.

NRL incorporates many areas of naval interests in its varied research programs. These fall into basic fields such as chemistry, physics, mathematics, psychology, astronomy, metallurgy, and engineering. The applied projects appear under headings such as fuels fracture studies, ballistics, transducers, phosphorescent materials, corrosion, communications, countermeasures, radar, and energy conversion.

Several large-scale research projects were undertaken, such as efforts in propagation and oceanography. Here special emphasis was placed on deep submergence research and work with large antennas (the 220 by 263 foot "hole in the ground") and other huge reflectors. The Space Surveillance (SPASUR) system has been completed and now has stations across the country to operate a receiving system which has greatly increased the detection range. Data are transmitted automatically to Dahlgren, Va., for processing.

NRL played an important role in the search for the submarine U.S.S. *Thresher* (SSN 593). The laboratory's research vessel was fitted with special sonar equipment and a newly developed slow-scan TV camera and still camera which photographed many deep ocean bottom pictures of the debris.

Noteworthy progress has been made in many projects responsive to the increased emphasis on ASW. Advances in undersea technology

have been achieved through the construction and operation of deep research vehicles known as *Alvin* and *Sealab* for environment studies with humans.

Oceanography focuses attention on the geophysics of the ocean bottom and borders. Research continues toward the development of instrumentation for measurements on the sea floor. Seismographs have been placed on the sea floor to increase our understanding of wave propagation phenomena. This research is uncovering a great source of information that may well contribute a means of forecasting earthquakes and their follow-on tidal waves.

New computer programs have been devised to sort out large amounts of the typically very noisy data on specific environmental properties and to identify those data of high significance. In recognition of naval problems concerning environmental data management, this program stresses research that will (1) optimize the acquisition of geographic information; (2) develop techniques for rapid analysis of environmental data; and (3) improve capabilities to store, interpret, retrieve, and display geographic information. An Arctic research laboratory has annually conducted 60 or more research tasks involving nearly 30 universities, colleges, and private research institutes. Hundreds of scientists and technicians carry on acoustics, aeromagnetism, oceanography, meteorology, ice, terrestrial, and atmospheric studies. Environmental effects on personnel and equipment are of continuing interest and the results of improved knowledge in these areas are of great importance.

Facilities

Management, Operations, and Maintenance—Fiscal year 1964 was the first year in which the Chief, Bureau of Yards and Docks, exercised single-manager authority for the operation of utilities and public works and the maintenance and repair of real property throughout the Shore Establishment. The bureau was allotted \$262.2 million to administer operations and maintenance programs at 450 activities. To this end, an integrated management system was established. Ten operation and maintenance programs were initiated by the assignment of funds to designated program managers. They control the use of operation and maintenance funds subject to certain constraints. In this way, financial management decisions affecting program management were delegated to operational program managers.

A detailed analysis of personnel support facilities revealed that 150 naval activities were operating under a backlog deficiency of \$500 million. Corrective programs have been integrated into the fiscal year 1966 and later military construction program plans to the maximum extent possible. Value engineering techniques were applied at

33 field offices, resulting in savings totaling \$4 million in construction costs.

A utilities inventory program to produce more data on plant and system capacity and a utilities equipment inventory system were initiated which are expected to yield significant long-range savings. A total of 1,059 units of transportation equipment was eliminated from the Department of the Navy inventory of 64,000 passenger vehicles, trucks, trailers, and construction and weight-handling equipment. This reduction, coupled with improved vehicular maintenance techniques, resulted in cost reductions exceeding expectations.

Construction—Actual construction put in place during fiscal year 1964 amounted to \$296.5 million. This construction included POLARIS submarine support facilities at several locations in the United States and overseas; firing ranges for the Marine Corps at Camp Pendleton, Calif., and Quantico, Va.; typhoon resistant facilities for the Marine Corps on Okinawa; and training facilities at the Fleet Anti-Air Warfare Centers at Dam Neck, Va., and San Diego, Calif.; and at the Fleet Antisubmarine Warfare Schools at San Diego, Calif., and Great Lakes, Ill.

New Navy and Marine Corps family housing starts totaled 17 projects comprising 2,602 units. Sixteen projects of 2,279 units were completed, and projects for 2,100 units from prior year starts are essentially complete.

Readiness—The Naval Construction Forces (NCF), composed of mobile construction battalions and amphibious construction battalions, continued to improve their readiness to provide assault area construction and other support as required by contingency and full-scale war plans. In addition, the NCF provided Seabee Technical Assistance Teams (STATs) for employment on civic action and counterinsurgency projects. To date, these STATs have been employed on counterinsurgency projects in Vietnam, and on civic action projects in Thailand, Chile, the Dominican Republic, Costa Rica, Liberia, and the Central Africa Republic on projects under the auspices of the Military Assistance Program, the Agency for International Development, or other Government agencies.

Military Sea Transportation Service (MSTS)

MSTS fulfilled its objective of providing ocean transportation to the Department of Defense. The following amounts of cargo, passengers, and petroleum were carried in fiscal years 1963 and 1964:

	1963	1964
Cargo Lifted (measurement tons).....	12, 555, 000	13, 426, 000
Passengers Lifted.....	412, 000	435, 000
Petroleum Lifted (long tons).....	16, 969, 000	17, 116, 000

Although 98 MSTs ships were utilized in this lift, U.S.-flag merchant ships were paid \$293.8 million, which was 65 percent of the total traffic expenditure. Twenty-eight ships supported oceanographic research, missile range instrumentation, and other special projects. In addition, operations, such as Arctic resupply, Guantanamo water supply, and amphibious training, all involved MSTs participation. Events of the year emphasized that development of immediate sealift capability to meet emergency military needs is more urgent than provision of routine sealift.

The MSTs fleet of 135 ships was maintained in a satisfactory degree of operational readiness but at increasing expense for maintenance because most of the ships are over 20 years old. Maintenance, repairs, and a tanker upgrading program cost \$26 million, divided among 127 private ship repair firms. The rising operational readiness costs reflect an aging mobilization base, and indicate the need for an orderly ship replacement program.

V. Economy and Efficiency

Management Improvements

Management improvement efforts this past year extended to managerial processes encompassing a wide range of functional areas. Many of these improvements are dealt with in some detail in other chapters. Noteworthy accomplishments include:

Planning and Programing

The creation of the Office of Program Appraisal and the Office of Navy Program Planning, noted in the next section, is intended to provide better coordination and review over Navy Department planning and programing efforts. Integral to these organizational changes are the changes made to improve the system for planning and programing decisions by Navy Department top executives. The Program Objectives (PO) document was made an authoritative statement of the Department position on its program levels to serve as a realistic basis for the preparation of Program Change Proposals (PCPs). Its format was also revised to be compatible with the Five Year Force Structure and Financial Program of the Department of Defense programing system, thereby making translation of decisions from one to the other easier. A change procedure was also developed which provides for the continuous updating of the PO to insure its currency.

Procedures for the processing of PCPs in the Navy were refined, and the responsibilities of the various organizations involved were more clearly identified. In addition, procedures for the appraisal of program execution were developed to provide adequate evaluation of program progress as a feedback into the programing process. In total, the many changes are a major revamping of the planning and programing system.

Public Works Management Information System

The Bureau of Yards and Docks has greatly improved its over-all management information system by establishing attainable, measurable objectives and determining the total essential information required for each of its 10 major programs, and by further integrating and mechanizing several existing systems. This has facilitated the cancellation of over 12 percent of the total reporting requirements of the

bureau and has improved management control during a time when the bureau's assigned responsibilities were greatly expanded.

Paperwork Management

Paperwork management, which embraces such matters as the control and improvement of the creation, use, and disposition of records, reports, forms, correspondence, and directives, has been a continuing management improvement effort in the Navy for many years. An intensive effort was made to emphasize paperwork improvement programs throughout the Navy during the past year. This included developing a program for the issuance of new paperwork improvement manuals, training courses, and promotional material, and an intensive review of forms, reports, and directives. A special effort, Project SCRAP, was established under the direction of the Navy Inspector General to achieve a prompt and drastic reduction of paperwork in the operating forces and to establish effective procedures to monitor and control paperwork on a permanent basis.

Industrial Engineering

The Bureau of Naval Weapons made progress in developing its Workload and Resources Evaluation System (WARES), which is to provide a common language communication medium between bureau and field activity management for planning workload, for controlling resources and related funds, and for measuring performance and progress against plans. Some of the goals toward which the Bureau has moved are: (1) Integration of engineered and statistical performance standards, (2) summarization of workload data into over-all weighted expressions of workload output, and (3) institution of a program whereby both bureaus and field managers will be furnished station workload, performance, and cost progress information.

The Bureau of Supplies and Accounts Methods Engineering Program was expanded to provide a means for more effective field activity management through modern industrial engineering techniques. These include: (1) Systematic approach to improved work methods; (2) use of engineered standards for segments of work; and (3) integration of engineered standards into supply management reporting. The work of about 22,000 employees will be reviewed. Of these, about 8,000 have already been covered by standards—3,300 during the past year. The Bureaus of Ships and Yards and Docks also made considerable progress in the development of similar programs and techniques covering work at their field activities.

Reorganization

Management improvements of major importance were accomplished in fiscal year 1964 through changes and innovations in the organization

of the Department. The more significant of these came about as a consequence of an inhouse management review of the entire Department completed in the preceding fiscal year. This led to the issuance by the Secretary of the Navy of a new General Order No. 5, governing the assignment and distribution of authority and responsibility for the administration of the Department. The basic objective of the new general order is to increase the responsiveness of the organization of the Department to executive direction through creation of a centrally directed organization which is administered on a decentralized basis. The order clarifies objectives to be accomplished, defines the role of policy and staff executives in relation to operating line executives, simplifies the relations among operating line executives, and establishes the authority of individual executives commensurate with their assigned responsibilities.

In a move to provide positive centralized direction in consonance with the new general order, the Secretary of the Navy elevated the other members of the Secretariat to the position of policy advisers and assistants to him on the administration of the affairs of the Department of the Navy as a whole. Their functional areas of interest were designated as, but not limited to, manpower, material, facilities, research and development, financial management, and general departmental administration. In addition, and in accordance with the principle of decentralized execution envisioned under the new general order, the Secretary distributed the work of accomplishing the fundamental objectives of the Department among five component or line organizations, each under the command of an executive who reports directly to him. These executives are the Chief of Naval Operations, the Commandant of the Marine Corps, the Chief of Naval Material, the Chief of Naval Personnel, and the Chief of the Bureau of Medicine and Surgery.

Another of the more significant organizational changes was the activation of the Naval Material Support Establishment, headed by the Chief of Naval Material (one of the five line operating executives named above), who assumed command of the Bureaus of Naval Weapons, Ships, Supplies and Accounts, and Yards and Docks. The action was designed to meet the recognized need for a single material support executive to be responsible to the Secretary of the Navy, the Chief of Naval Operations, and the Commandant of the Marine Corps for the effective management of Navy resource capabilities.

The Office of Program Appraisal was also established in fiscal year 1964, supplanting the former Office of Analysis and Review. The purpose of this office is to provide the Secretary of the Navy with a small appraisal staff to assist him in assuring that existing and proposed Navy and Marine Corps programs provide the optimum means

of achieving the objectives of the Department and that approved programs are executed in a timely, effective, and economical manner.

Several organizational innovations were established within the command structure of the Chief of Naval Operations, one of which was the Office of Navy Program Planning. The mission of this office is to exercise centralized coordination of the Navy program planning effort in order to insure the integration of planning, programing, budgeting, and appraising within the Office of the Chief of Naval Operations. A second new element was the Office of Antisubmarine Warfare Programs described in the preceding chapter.

The management review of the Department of the Navy among other things called for a reorganization of the shore establishment, the formation of a Fleet Activities Command to command shore activities providing direct support to the fleets. Naval operating bases were to be established at all major naval shore activity complexes to consolidate and command fleet support activities. On further study, it was determined that that exact concept would not be suitable. Therefore, an alternative organization was adopted which meets the basic objectives without its unsuitable features.

In this new concept, those shore activities which are a part of the mission of a bureau or office will be under the command of the chief of that bureau or office. Similarly, those shore activities which are really an extension of the fleets will be under command of the fleet commanders, thus assuring that support of the fleets will be appropriate. This new structure is considered to be a vast improvement over the existing structure, and will be placed into effect during the next fiscal year.

Another significant organizational improvement resulted from the formal institution of project management as a means of conducting business within the Department. Policy for its establishment and use was prescribed by Secretarial directive. Patterned along the lines of the management procedure successfully employed in the development of the POLARIS fleet ballistic missile, project management is proving to be a valuable means for providing effective weapons or equipment systems management. Project management is predicated on the theory that a management objective of sufficient urgency or importance to warrant extraordinary attention and emphasis can generally best be attained by an organization created solely to accomplish that objective. Other features of project management are the designation of a project manager of high rank or position, appropriate to the task assigned, who has unequivocal control of project funds, necessary staff, and other required resources. The major management projects established or reaffirmed were for the fleet ballistic missile,

the F-111B, surface missile systems, antisubmarine warfare systems, instrumentation ships, and the all-weather carrier landing system.

Another organizational adjustment substantially completed is the centralization of facilities maintenance management in the Bureau of Yards and Docks, previously discussed.

Additional studies in organizational matters by key executives of the Department are continuing. These are aimed at eliminating any remaining ambiguous assignments of responsibilities among members of the executive administration of the Department, with special emphasis being given to matters relating to the exercise of command and support to the vast complex of shore (field) activities of the Department of the Navy.

Analytical Studies

As indicated in the annual report for fiscal year 1963, decision-makers within the Navy Department are finding analytical cost effectiveness studies to be increasingly valuable tools for assessment of management and planning alternatives and for formulating programs in an efficient, economic manner. A marked growth in the demand for such studies has resulted from increased requirements generated within the Department and at higher levels.

Study Program

The growth in the study effort created demands for consolidation and coordination of scientific and operations research support and for increased efficiency in the utilization of the professional personnel talents available for this effort. These factors led to the creation of the Center for Naval Analyses during fiscal year 1963. The value of the center became more evident during fiscal year 1964, and it is now the focal point of Navy major analytic study activities. The principal subdivisions of the Center for Naval Analyses are:

1. Institute of Naval Studies. This activity consists of 40 professional analysts. It is primarily responsible for long-range conceptual studies, of an exploratory nature, aimed at identifying profitable areas for research and development.
2. Naval Warfare Analysis Group. This activity, consisting of 40 professionals, conducts analytical investigations of alternative force compositions and force levels 5 to 10 years in the future.
3. Operations Evaluation Group. This activity consists of 57 professional personnel who conduct analytical evaluations of current fleet operations, recently developed weapon systems, and naval tactics. The group also provides technical assistance to the warfare desks in the Office of the Chief of Naval Operations and to fleet commanders.

The studies conducted by the Center for Naval Analyses complement but do not duplicate the long-standing programs of study and research by outside contract, in the Office of Naval Research, and throughout the Navy laboratory system. These latter studies fall primarily within the field of basic research and the technological aspects of weapon systems development.

Coordination of the Study Program

The Navy Department has recognized the necessity for maintaining careful coordination and control of the analytical study program to insure complete and compatible coverage of important problem areas as well as to preclude undesirable duplication of effort. The Chief of Naval Operations has responsibility for coordination of all departmental study efforts relating to programs. This coordination is effected on a day-to-day basis by the recently established Office of Navy Program Planning through its Naval Warfare Analyses Division.

Contracting

Advance Procurement Planning

During fiscal year 1964, added emphasis was placed on the concept of advance procurement planning. Under the criteria established by the Secretary of the Navy, the Chief of Naval Material was required to review and approve all advance procurement plans for all negotiated development procurements estimated at \$300,000 or more for a fiscal year, and for negotiated production procurements estimated at \$1 million or more for a fiscal year. During the period from January 1, 1964, through June 30, 1964, a total of 79 advance procurement plans were received by the Chief of Naval Material for review and approval. These plans have a potential dollar value in excess of \$2.8 billion.

Cost Plus Award Fee Contracting

Special permission was received from the Armed Services Procurement Regulation (ASPR) Committee for selective use, on a trial basis, of a new type of contract called cost plus award fee contract. This type of contract has limited applicability, principally for level-of-effort work, but a thorough screening of proposed procurement resulted in a total of eight procurements being changed to this type of contracting. By use of this type of contract, it is hoped to bring discipline into what formerly were Cost-Plus-Fixed-Fee (CPFF) contracts, which provided no incentive to management to reduce costs.

Navy Contract Clause Book

In order to reduce the size of fixed-price supply contracts written by the Navy, the concept of a clause book was developed to provide

a means by which standard and frequently used clauses could be incorporated in these contracts by reference only. During the year, the Navy Contract Clause Book progressed from the discussion stage to printing and distribution. Authority was obtained from the ASPR Committee and the General Services Administration to use the clause book on a test basis to obtain actual experience and data on the feasibility of such a concept. The clause book will be tested in seven major field purchasing activities of the Bureau of Supplies and Accounts. The authority and responsibility for conducting the test has been delegated to the Chief, Bureau of Supplies and Accounts. Distribution of the clause book was made during the week of June 22, 1964, to all Navy and commercial users. Effective date for the official use of the clause book is August 1, 1964.

Contract Appraisal

During fiscal year 1964, savings of \$7,002,351 were achieved directly through contract review and approval actions in the Office of Naval Material. In addition, vigorous efforts were pursued to bring about a maximum reduction in the use of CPFF contracts and letter contracts. In many cases it was found that contracts proposed on a CPFF basis could, through a detailed analysis and discussion with the procuring activity, be changed to a more advanced type contract. This effort contributed materially to the Navy success in reducing CPFF contracting to 11.1 percent against a Department of Defense goal of 15.1 percent. The major Navy effort to reduce sole-source letter contracts resulted in a reduction in the number of such contracts from 133 to 30 and a reduction in dollar value of \$566.3 million.

Procurement Review

The Procurement Review Staff in the Office of Naval Material conducted extensive and comprehensive reviews of the procurement policies, procedures, and practices of the Military Sea Transportation Service, Special Projects Office, Bureau of Naval Weapons, Office of Naval Research, Naval Training Device Center, and Bureau of Ships.

Procurement Training

Active support of the Defense Procurement Training Program continued. A total of 2,700 Navy personnel attended Defense procurement training courses and workshops.

Expansion of the Barter Program in Foreign Procurements

The Navy has considerably expanded the use of barter in foreign procurement during the past 12 months. Two reasons for this expansion were (1) the authorization by the Department of Agriculture to combine many small dollar area requirements into one Navy requirement which would provide the basis for an economical barter arrange-

ment, and (2) increased recognition of the role that barter transactions can play in the Department of Defense international balance of payments program. From an initial beginning of \$2 million in barter agreements in effect at the beginning of calendar year 1964, the use of the barter technique is expected to expand by December 1964 to \$20 million. Continued development of barter as a means of financing Navy procurement overseas is being aggressively pursued in cooperation with the Department of Agriculture.

Financial Management

The Department of the Navy has adopted the concept that financial management systems are by no means the sole prerogative of controllers, but rather are the concern of all managers. With this underlying philosophy in mind, Navy financial management officials concentrated their improvement efforts on projects undertaken jointly with appropriate operating executives. They have worked to create a climate wherein all responsible officers are made aware of the need to consider economic choice and cost/effectiveness as major factors in their day-to-day decisionmaking. Many significant projects have been undertaken during the year, some of which are included herein.

Control of Military Personnel Appropriations

The need for improved control of military personnel appropriations has been recognized for many years but, because of the complexity of the task, progress has been slow. Through the joint efforts of personnel and financial managers, major steps toward system modernization have been achieved. A uniform appropriations structure and a standard budget and fiscal accounting classification of obligations and disbursements were implemented at the beginning of the year. Improved techniques for pricing and control of permanent change of station costs were initiated. The Marine Corps has tested a modernized military pay system utilizing punched card equipment. With this system, accrued entitlements for pay and allowances of military personnel are accurately and quickly reported to the appropriation manager in Washington to facilitate improved control of fund resources. Initial tests have been successful, and further developments are anticipated. Similar tests were conducted by Navy finance offices, but final plans have not yet been developed.

Coordination of Programing and Budgeting

The Navy Department has for many years used the management processes of planning, programing, and budgeting. Recent studies indicated that a tendency toward segmenting these processes had created some problems, and several major changes were made. Previously mentioned was the establishment of the Office of Navy Program

Planning. This action greatly strengthened planning and programming functions within the Office of the Chief of Naval Operations. In addition, revised instructions were issued covering actions and timing of the budget and programming processes. Primary emphasis was focused on accurate pricing of program objectives and on integrating program and budget reviews.

International Balance of Payments

The Department of the Navy participated in the national effort to reduce expenditures entering into the international balance of payments. To this end, a program was developed to reduce such expenditures with minimum disruption of operational requirements. The key points of the program were: (1) Development of an adequate planning and control system; (2) increased emphasis on barter financing, which was previously described; (3) increased sales of military material to foreign governments; and (4) increased use of excess foreign currencies held by the Department of the Treasury. Department of the Navy expenditures in fiscal year 1964 amounted to \$416 million.

Inventory Management

Greater emphasis was placed on centralization and efficiency of inventory management with the Department of the Navy supply systems. Adherence to prescribed material management techniques resulted in increased productivity and in improved utilization of manpower and other resources for effective and economical support of the Operating Forces and the Naval Shore Establishment.

Vigorous programs for the improvement of inventory management were instituted or continued to insure greater responsiveness in the support of the fleet. Principal among these were:

1. Installation of automatic data processing equipment in Navy supply system centers, depots, and inventory control points.
2. Installation of automated materials-handling equipment in warehouses.
3. Intensification of management control of a small number of selected high-value items.
4. Introduction of a semiannual stratification procedure by the Marine Corps to provide updated inventory and management data.

Standard Navy Maintenance and Material Management Program

The Standard Navy Maintenance and Material Management Program, sponsored by the Chief of Naval Operations, resulted in (1) development and refinement of a uniform supply, accounting, and budgeting system; and (2) development of uniform automated data processing equipment for performing supply and accounting func-

tions, in both logistic support and combatant ships, which continued to expand during fiscal year 1964. Eight additional ships commenced operating under mechanized inventory management systems, bringing the total number of ships mechanized to 30.

Cost Reduction Program

Department of the Navy goals and achievements in the Department of Defense Cost Reduction Program are:

(In Billions of Dollars)

<i>Fiscal Year</i>	<i>Goal</i>	<i>Achievement</i>
1963-----	\$0. 4	\$0. 6
1964-----	. 9	1. 0

The 1964 goal was exceeded primarily because of cost reductions realized from increased participation by field activities. Specific programs and projects which contributed to the cost reductions were:

1. Project THRIFT, directed at eliminating those costs which do not increase combat readiness.
2. The Navy Incentive Awards Program, which encourages employees to contribute to the achievement of greater economy and efficiency of operations.
3. Project WOW (War On Waste), initiated to bring working level personnel into the Cost Reduction Program.
4. Procurement based on refined requirements.
5. Procurement at lowest sound prices.
6. Reduced operating costs.

Automatic Data Processing

The Department of the Navy continued toward its long-range objective of a systematic evolution of automatic data processing equipment as a means toward a better information system for more timely actions and decisions. Thirty-nine computers were installed, bringing the total to 279. These machines are speeding more accurate information to managers in such functions as material and financial management, production planning and scheduling, and personnel management as well as aiding scientists and engineers in solving complex problems. Much of the equipment installed during the past year was to replace more expensive equipment or equipment no longer capable of handling the growing workload.

Approximately 7,000 employees operate and maintain the computers and associated equipments. The total cost of the automatic data processing complexes of the Department was \$180 million for the year.

The Naval Command Systems Support Activity was chosen to develop, establish, and manage a computer institute for all of the Department of Defense. An intensive course was developed for top civilian executives and flag and general rank officers to enable them to deal more effectively and efficiently with suppliers of equipment and the equipment itself, from contracting for procurement to eventual use.

Manpower Utilization

Manpower resources were more effectively utilized through an increase in emphasis and in central direction at the secretarial level. Significant accomplishments in fiscal year 1964 were:

1. Implementation of a coordinated and integrated system for manpower utilization and control.
2. Establishment of the Navy Manpower Validation Program which will provide onsite evaluations of military and civilian manpower utilization, validate manpower requirements, recommend redistribution of requirements, and verify staffing criteria afloat and ashore.
3. Intensification of effort in implementing the Navy-wide Staffing Criteria Program designed to provide those standards required to associate workload with both the military and civilian work force.
4. Initiation of a series of studies in industrial-type functions in order to use the resultant measures of productivity as a means of effecting savings.
5. Achievement of better manpower utilization by consolidation of functions and realignment of organization as directed by the Review of Management of the Department of the Navy. This has been the most comprehensive review of over-all management processes and structure of the Department in recent years.
6. Application of controls over the accountability and utilization of the contract service work force, including the measurement of man-years of workload, in order to achieve the optimum in total manpower planning as well as a more effective manpower mix.
7. Formulation of positive requirements to improve control over civilian grade levels.
8. Preparation and submission of manpower utilization reports and productivity improvement project reports, resulting from stimulus throughout the Navy to appraise and improve utilization of manpower.
9. Coordination of research effort in personnel subsystem planning and weapon system planning to insure timely availability of trained personnel when weapon systems become ready for sea and when operational replacements are needed.

Self-Evaluation of Activity Industrial Relations Programs

Fiscal year 1964 was the first year naval activities evaluated their own industrial relations programs. In the larger activities, senior management personnel evaluated all aspects of the civilian personnel administration program—staffing, training, leave administration, and employee-management relations—against standards of adequacy. Corrective measures were taken to remedy observed deficiencies and to institute improvements. One of the chief objectives in evaluating these programs is to improve Department of the Navy capability for accomplishing its mission more economically through more efficient manpower utilization.

Training

Employee training and development continued as essential elements in upgrading skills and knowledges of the work force and in supplying manpower in shortage categories to supplement normal recruitment programs. The training and development of employees aided greatly in meeting the needs for increased capabilities; introducing new and better work methods in the interest of efficiency and cost reduction programs; supplying manpower to cope with the increased complexity of production responsibilities; and facilitating the introduction of new fields of knowledge required by the development of special skills.

Through student trainee programs, scientific and engineering manpower was supplied at professional entrance levels. Apprentice and other skill development programs provided an input of manpower into occupational trades and skills. Management interns and others selected from the Federal Service entrance examination registers were a source of personnel with management potential.

Increased emphasis has been placed on career management education and training. To further this objective, provisions were made for the establishment of a pool of ceiling and funds for long-term civilian training requirements. Action was taken to strengthen and expand the scope of management training and development for naval research and development laboratories in order to increase the professional and managerial capabilities of present employees and to stimulate the recruitment and retention of promising engineers and scientists.

Wage and Salary Administration

A number of studies of ungraded and graded occupations were published which resulted in improved manpower utilization, better management-employee cooperation, and increased occupational knowledge. Schedules fixing wages of ungraded employees were issued

promptly whenever significant changes occurred in wages paid by private industry.

Auditing

The Department of the Navy audit organization devoted two-thirds of its effort to audits at contractor plants. This effort included audit services rendered to contracting officers of the Department of Defense and other Government agencies. The remaining third of the effort was devoted to audit of Department of the Navy internal management.

A brief quantitative summary of audit activity input and output is presented below:

CONTRACT AUDIT

Input:		
Contract audit costs.....		\$8, 044, 000
Output:		
Contract audit savings recommendations.....	\$651, 974, 000	
Amounts examined.....	\$12, 813, 000, 000	
Contracts examined.....	16, 837	
Contractors examined.....	1, 937	
Reports issued.....	14, 000	

Each dollar invested in contract audit brought a return of \$76 in savings recommendations.

INTERNAL AUDIT

Input:		
Internal audit costs.....		\$4, 238, 000
Output:		
Internal audit management savings recommendations.....	\$92, 517, 000	
Reports issued.....	433	

Each dollar invested in internal audit brought \$22 in management improvement recommendations. The above figures do not include many nonquantitative audit services which remain an important part of the audit mission.

Validation of savings reported under the Department of Defense Cost Reduction Program became a major internal audit program in fiscal year 1964.

DOD COST REDUCTION PROGRAM

Input:			
Audit Costs.....			\$736, 000
Output:			
CRP Feeder reports examined:			
	Reports	Examined (in billions)	
Approved by auditor.....	4, 581	\$1. 4	
Disapproved by auditor.....	1, 611	. 3	
Total.....	6, 192	1. 7	

The Department of the Navy Audit Improvement Program initiated in fiscal year 1963 resulted in significant changes in audit operations in fiscal year 1964. The emphasis was on audit of resource utilization rather than fidelity and compliance. An audit of ships repair parts was completed. The audit resulted in recommended management improvements and savings estimated at \$75.4 million. The equivalent computed rate of return for this audit was about \$160 per \$1 of cost as compared to \$8 per \$1 of cost of other internal audit effort.

Other projects under the Department of the Navy Audit Improvement Program include audit utilization, management data audits, and audit advisory services to management.

VI. Civilian Economy Relations

Industrial Facilities

Industrial Plants

The Department continued its program to reduce holdings of Government-owned industrial facilities and to rely on private industry for the production of material and furnishing of services. The number of industrial plants decreased from 119 to 111 as a result of the sale of interests in 8 plants.

The largest disposal involved the Naval Weapons Industrial Reserve Plant, Southington, Conn., an active Government-owned, contractor-operated plant which manufactured aircraft engines and parts. The plant was sold to the Pratt and Whitney Division of United Aircraft Corporation for \$22,050,000. An active Government-owned, Government-operated plant, the Naval Ordnance Plant, York, Pa., was sold by competitive bid to the American Machine and Foundry Company for \$10,025,000. Other plants sold included the following:

<i>Plant</i>	<i>Sold To</i>	<i>Amount (in dollars)</i>
Naval Industrial Reserve Shipyard, Kearny, N.J.	Union Minerals and Alloys Corp.	3, 557, 000
Naval Industrial Reserve Shipyard, Tampa, Fla.	Tampa Port Authority, Tampa, Fla.	1, 550, 000
Todd Shipyards, Inc., Galveston, Tex.	Todd Shipyard Corp-----	625, 000
Bethlehem Steel Co., Baltimore, Md.	Bethlehem Steel Co-----	477, 207
McKiernan-Terry Corp., Harrison, N.J. (National Security Clause interest only).	McKiernan-Terry Corp-----	20, 625
Industrial Forge & Steel Co. Inc., Canton, Ohio (National Security Clause interest only).	Industrial Forge and Steel Co., Inc.	500

The sale of these eight plants resulted in a return of \$38,305,332 to the U.S. Treasury.

In addition, the Naval Repair Facility, San Diego, Calif., was disestablished as a naval activity, although retention of the facilities under Government ownership is required for mobilization purposes. Actions were initiated to make this facility available for lease for operation by private industry early in fiscal year 1965.

Shipyards

The serious overcapacity in the Nation's shipyards—naval and private—resulted in the establishment by the Secretary of the Navy of a Shipyards Policy Board in December 1963. This board, which consisted of civilian and military policy-level officials from the Office of the Secretary of Defense and the Department of the Navy, conducted studies in depth into the naval requirements for shipyard capacity.

Industrial Production Equipment

The Navy reduced the inventory of Government-owned industrial production equipment in possession of private contractors from \$508 million to \$402 million, a reduction of \$106 million (21 percent).

The Merchant Marine

Fourteen large (600 or more troop capacity) privately owned U.S.-flag passenger ships are available to augment the trooplift capability of MSTS in emergencies. Although essential for troop movements in emergency, U.S.-flag passenger ships are diminishing in numbers. The sales of S.S. *America* (2,892 berths) and S.S. *President Hoover* (600 troop spaces) to foreign-flag operators are representative of this trend.

On June 30, 1964, the merchant tanker fleet numbered 298 ships, of which 98 have been built since 1950. Smaller tankers, with characteristics more suited for military support, are uneconomical for commercial use. Most of the 98 new tankers exceed 25,000 tons deadweight and 31 feet draft, thus restricting their military utility. The trend to larger tankers is expected to continue.

The subsidized cargo fleet includes 98 large, fast ships built since 1950, which could serve as valuable military auxiliaries. The bulk of the U.S. dry-cargo fleet dates from 1945 or earlier. Only 18 privately owned American refrigerator ships exist, and there is only one seagoing roll-on/roll-off ship under commercial ownership.

New merchant construction has been characterized by automation of ship-propulsion equipment, with consequent reductions in the size of crews. The trend toward smaller crews could lead to a diminishing market of maritime labor skills, with possible adverse effect upon the MSTS capability to man ships activated from the reserve fleet in time of emergency.

Small Business

The Navy increased its awards to small business by \$94 million, for a total of \$1,287 million. This represented a small business share of

15.2 percent of all awards to U.S. business firms. In spite of this increase, the Navy was slightly below its goal of 15.6 percent for the year. The share to small business would have been significantly greater had not the Navy made large procurements of aircraft for the Air Force which were not anticipated when the annual Navy goal was established by the Department of Defense.

Equal Employment Opportunities

Increased emphasis was placed on affirmative action to achieve utilization of minority group members in occupations and at grade and pay levels in which they had not previously been used. This included: (1) Stressing the fact that bureau chiefs, commanding officers, and key officials were expected to take a personal and vigorous role in the Equal Employment Opportunity (EEO) Program; (2) requiring each activity commanding officer (also the activity deputy employment policy officer) to appoint a civilian assistant deputy employment policy officer to avoid uneven emphasis on the program due to changes in commanding officers; (3) disseminating guidance material on the development of affirmative action programs; and (4) stressing the need to incorporate the principles of the EEO Program in all civilian personnel operations and transactions.

In addition to the above, teams of high-level headquarters personnel visited Navy and Marine Corps activities in 13 centers of employment in the South and in the San Francisco Bay area to review minority group employment patterns and to initiate corrective action where appropriate. The teams found no overt cases of discrimination but did direct a number of actions aimed at strengthening and extending affirmative action programs.

Labor Surplus Areas

Awards to contractors in surplus labor areas were \$1.1 billion. This amount was \$110 million less than such awards in fiscal year 1963. The share of total awards going into these areas decreased from 17 percent to 14 percent. This decline is primarily attributable to the fact that the average number of major areas with substantial unemployment decreased from 44 in fiscal year 1963 to 38 in fiscal year 1964.

VII. Conclusions

During fiscal year 1964, the Department of the Navy effectively demonstrated its capabilities to accomplish its missions. The world events which required Navy and Marine Corps participation amply indicate that Navy and Marine Corps forces are being maintained in a high state of readiness. These multipurpose forces are selectively available for rapid, effective, and decisive employment whenever directed by the Commander in Chief or the Secretary of Defense. Concurrently, the sea-based strategic retaliatory forces are constantly maintained in a keen state of vigilance, ready for rapid response if required.

Navy and Marine Corps forces were ready to accomplish a variety of naval warfare tasks for a variety of possible conflicts—counterinsurgent, limited, general non-nuclear, or nuclear. To improve these capabilities, particular emphasis was and is being devoted to the solution of antisubmarine and antiair warfare problems. These solutions entail massive efforts across the entire spectrum of Department activities, including research and development, product improvement, procurement, personnel training, and the use of advanced management techniques addressed to these specific problems.

Maintaining these forces in a high state of military preparedness levies unprecedented resource requirements on the Department of the Navy. During fiscal year 1964, all of the resources of the Department were directed toward enhancing the readiness and strengthening the quality and quantity of these forces as efficiently and economically as possible.

Pursuant to this effort, Department of the Navy management was reorganized where necessary to be more responsive to the need for efficient and economical administration of departmental programs; technological advances improved the flexibility, efficiency, and reliability of weapon systems and the associated command and control of these systems, and provided guidelines for the future Navy; and the Department of the Navy personnel, both civilian and military, furnished the competent leadership and the resolute, skilled, and dedicated service necessary to attain these accomplishments.

I am pleased to forward this report on the Department of the Navy for fiscal year 1964 and to report that the Department of the Navy constitutes a formidable, reliable, and ready component of the Department of Defense.

Paul H. Nitze
PAUL H. NITZE,
Secretary of the Navy.

Annual Report

of the

SECRETARY OF THE AIR FORCE

July 1, 1963 to June 30, 1964

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1. Introduction

The United States aerospace capability has been directed toward achieving a flexibility that would enable it to provide controlled response to aggression at any level of conflict from guerrilla operations to the peak of strategic nuclear warfare. By improving our ability to employ weapons in support of a variety of options, the U.S. Air Force, in fiscal year 1964, figured importantly in America's military posture, which has maintained, since 1945, a favorable balance of world military power.

The convincing nature of the balance in our favor was made public in the spring of 1964. Secretary of Defense Robert S. McNamara disclosed that the United States had over 1,000 long-range strategic missiles, including over 800 Air Force Intercontinental Ballistic Missiles (ICBMs), a number "more than four times greater than the Soviet Union's long-range rocket force."

That achievement took longer than one fiscal year to accomplish. Its beginnings go back a score of years to when a comparative handful of men, under wartime conditions of haste and secrecy, brought nuclear fission into being. Ten years later, in 1954, the Air Force gave highest priority to an ICBM which added a new operational dimension to the nuclear weapon. Since then, with no lesser sense of urgency, the Air Force has created new weapon and support systems, many of them more complex than the first atomic bomb—all of them equally demanding of our time and resources.

Ten years ago, the manned bomber was America's sole strategic delivery system. The Korean conflict had just come to an end while the U.S. Air Force projected a force goal of 137 aircraft wings heavily emphasizing the strategic bomber. Today, maintaining a superior strategic deterrent is still the principal Air Force objective, but our mission also requires that we seek greater operational flexibility. That change was dictated by technology and world conditions—such as the problems resulting from Communist incursions among the new nations emerging in Africa and Asia.

The changed scope and direction of operations are reflected by these developments: (1) On November 5, 1963, the U.S. Strike Command (USSTRICOM), a joint Army-Air Force undertaking, assumed

operational responsibility involving U.S. obligations in a large part of Africa and Asia, comprising the Middle East, India, Pakistan, and Africa south of the Sahara Desert. This mission assignment underscored substantial new tactical air and airlift tasks to be carried out by the Air Force in support of the Strike Command; (2) on March 19, 1964, at Geneva, the United States offered to destroy 480 B-47 bombers if the U.S.S.R. would destroy a like number of TU-16 bombers having equivalent range and speed; and (3) in fiscal year 1964, the USAF gave priority attention to two national security problems—extension of the useful life of manned strategic weapon systems no longer in production and survival of strategic weapon systems along with their supporting command and control systems.

The dispersal of our bomber and tanker forces has been completed and 50 percent of the bombers are now on 15-minute alert. At the same time, we turned to the costly and complex tasks of creating an effective and secure missile force. From liquid-propelled and extremely vulnerable ATLAS and TITAN I missiles, we shifted as rapidly as technology and budget would allow to hardened and dispersed TITAN II missiles, fueled with noncryogenic liquids which are storable within the missile, and to the solid propellant MINUTEMAN missiles. Updating that missile force during the past fiscal year also found us adding penetration aids (partly through the Advanced Ballistic Re-Entry System (ABRES) program) and developing the advanced MINUTEMAN II. Such qualitative improvements, in the light of our estimated 4 to 1 missile superiority over the U.S.S.R., reduced the urgency of increasing the missile force structure.

Qualitative advances in an environment of accelerating technology require time and organization as well as brilliant research. The pacing factor in acquiring better military technology is as much good management as it is scientific breakthroughs. Management is responsible for coordinating and advancing the multiple aspects of Air Force systems development—basic and applied research, training and utilization of our skilled people, testing, procuring, and producing—each of them ordered in a logical sequence.

For example, near the beginning of the Kennedy-Johnson Administration, systems and logistics planning was geared to bring TITAN II to operational readiness by December 27, 1963. Despite some setbacks, problem areas were spotlighted and subsequently corrected. The deadline date was met precisely.

The MINUTEMAN system is another example of the critical role of management in solving the problems of systems development. The first full-stage test of MINUTEMAN was conducted at the Atlantic Missile Range on February 1, 1961, scarcely 10 days after a new

Administration took office. Subsequent performance and readiness rates equaled or exceeded accelerated planning factors. Six hundred MINUTEMAN missiles (in four wings) were silo-borne by June 30, 1964. One wing of 150, sited at Whiteman AFB, Mo., joined the combat force on the last day of the fiscal year, precisely as scheduled many months before.

Concurrent development of subsystems made this success possible. The Air Force went into production before research and development was substantially completed. In contrast to the cycle of design, development, production, and testing on such major weapon systems as the B-52 which took from 6 to 8 years to complete, the MINUTEMAN was being sited in underground emplacements within 4 years after the first contract was awarded.

Coordinated management techniques also were focused on airpower in support of the Army. Our long-range transport force is already impressive, and the jet C-141 Starlifter will add a new dimension to this capability. The performance of the Military Air Transport Service (MATS) in Operation BIG LIFT in October 1963 involved the movement of over 15,000 fully equipped men to Europe in 63 hours. This job could have been done in even less time, had the Army required it.

In tactical air support, the Air Force has recognized the Army's requirement for greater mobility. Both Services worked this year under Strike Command auspices to better utilize technology in tactical air support in order to provide operational capabilities that were not possible in World War II or in Korea. Through extensive field exercises conducted during the past fiscal year, mutually acceptable solutions to the problem of adequate support and air mobility for the Army are being realized.

Under development by the Air Force Systems Command (AFSC), the F-111A, truly a giant step forward in tactical air warfare, had reached final assembly at the end of the fiscal year preparatory to roll-out and was scheduled for first flight in December 1964. Its most unusual aerodynamic characteristic—the variable sweep wing—will enable it to fly at Mach 2.5, yet take off or land at speeds lower than many present-day fighters. The F-111A reflects a half century of Air Force experience in acquiring and employing air support systems, in keeping aircraft operational, exploiting aerial firepower through central operational control, and extending airpower resources by centralized management.

In the field of manned aircraft reconnaissance, most of it keyed to air support of the ground forces, the first award of the Air Force Cross, the highest Air Force decoration, was made in January 1964 to Maj. Rudolf Anderson, Jr., the Nation's only combat casualty during the

Cuban crisis of October 1962. This posthumous award honored Major Anderson as one of the two USAF pilots who provided the first conclusive photographic proof of the Soviet offensive missile buildup in Cuba.

Halfway around the world, a less spectacular situation but no less dangerous to world peace, found Air Force personnel and aircraft helping the South Vietnamese people in their struggle against the decade-long Communist insurgency. During the past year, USAF C-123 squadrons in the theater airlifted 140,000 personnel, moved 30,000 tons of cargo, and airdropped 6,000 troops. In a real sense, these aircraft served as the backbone of the military transportation system in South Vietnam.

Any discussion of the USAF in South Vietnam must revolve around the activities of the Special Air Warfare force, first deployed in November 1961. Using T-28 and B-26 aircraft, the 1st Air Commando Squadron supported the Vietnamese Air Force (VNAF) with 4,500 operational training sorties in calendar year 1962 and doubled that support to 9,000 sorties in 1963. During the first 6 months of calendar 1964, over 3,200 operational training sorties were conducted. These hazardous operations resulted in the loss of only four strike aircraft in 1962 and nine in 1963. During the first 6 months of calendar year 1964, more effective Viet Cong antiaircraft fire had brought down seven USAF aircraft.

To update the tactical air capability in Vietnam, the Air Force began modifying the Navy A-1E aircraft to replace the T-28 while at the same time training VNAF pilots to fly them. Significant numbers of A-1E's began to arrive in the theater by the close of the fiscal year.

Military applications of space require continued exploration. The Manned Orbiting Laboratory (MOL) program is essentially a research concept to determine in what way the manned space vehicle may be militarily significant. We expect to acquire some of this knowledge through the GEMINI program under National Aeronautics and Space Administration (NASA) auspices, which we are supporting with men and money. We are also studying on a limited basis some problems and techniques of controlled re-entry which were previously an objective of the Dyna-Soar program.

In all these endeavors, the Air Force has responded vigorously to Secretary McNamara's cost reduction program. We were given a goal last year of \$982 million; we saved \$1.2 billion. During this fiscal year, our goal was \$1.8 billion; we saved \$2.2 billion, including \$1.4 billion in "hard" cash savings and \$800 million in cost avoidance. We believe that cost reduction is an "idea" program—the communication of ideas in both directions between imaginative command levels

and enthusiastic "grass roots." Cost-consciousness is contagious. We are doing our best to spread it to every area of management control under Air Force cognizance.

In this annual report of Air Force activities and accomplishments during the past fiscal year, I have been mindful of fundamental—and perhaps governing—considerations which have placed upon Air Force leadership unprecedented demands for perspective and imagination:

First, we have given great impetus to a reorientation of military strategy by providing an aircraft/missile force which makes possible a wide variety of deterrent or combat options, both at the level of strategic warfare and at lower levels of conflict;

Second, we have entered a period of nuclear proliferation in which additional nations may achieve the military potential for almost instantaneous destruction of other nations;

Third, world conditions have furnished evidence to justify our hope that the danger of all-out war is receding;

Fourth, military technology advances so rapidly that new, expensive weapon systems become obsolete much sooner than has been true in the past. The span of about 10 years (as in the case of the B-17, B-29, and B-36) has been halved to roughly 5 years in the case of ATLAS and TITAN. Thus, we encounter a sharp uptrend in costs plotted against a steep downtrend in military longevity; and

Fifth, science and technology are moving steadily toward higher levels of achievement. We must have the vision and imagination to use new discoveries. This calls for continuous study and revision of our concepts and doctrine which govern the employment of aerospace power.

In order to evaluate the impact of scientific/technological advances on Air Force concepts, doctrine, and supporting weapon systems, the Air Force organized Project FORECAST late in the preceding fiscal year. We studied anticipated problems of national security a decade ahead in a context of rapidly advancing technology and a breakup of East-West bipolarity of world affairs. This study has helped us to envision the requirements for national defense and to define a role which the USAF may be expected to play during the 1970-80 decade.

Project FORECAST, completed during the past fiscal year, brought together qualified people from the military Services, from government, industry, and the academic world. It has made us fully aware of the array of scientific and technological innovations which are now being brought into the realm of feasibility. Project FORECAST was a significant step in the continuing process of preparing for the future. The imaginative use of technology will enable us to preserve that

margin of aerospace superiority which has helped to guarantee the security of the Nation and the free world for two decades.

As we move forward in our search for new and better ways of exploiting aerospace power to achieve our national objectives, we shall continue to subject every aspect of our existing organization, manning, administration, and deployment to the tests of necessity, efficiency, and combat effectiveness.

II. Combat Forces

To carry out its assigned missions in national defense, the Air Force must maintain a flexible and powerful military posture in a high state of combat readiness. Many elements in combination fill this requirement—a mixed force of strategic missiles and manned aircraft providing a credible deterrent, defensive systems contributing to maximum force survivability, tactical aircraft and missiles capable of conducting many degrees of warfare and types of actions, reconnaissance vehicles providing reliable and comprehensive information for warning and targeting, airlift capabilities to deploy and support our military forces throughout the world, and dependable and survivable systems of command and control. In all these operational areas, the Air Force maintained its major objectives: A superior strategic strike capability and a readiness to engage an enemy at any level of conflict.

During fiscal year 1964 there were no large-scale deployments resulting from international tension, such as those occasioned by the Berlin and Cuba episodes of the 2 preceding years. Although over-all wing strength changed only slightly, the striking power of the USAF strategic and general purpose forces increased with the delivery of improved weapon systems. Large numbers of MINUTEMAN and TITAN II second-generation missiles entered the Strategic Air Command (SAC) arsenal while the phaseout of the B-47 continued and that of the ATLAS D first-generation missile began. The effectiveness of the general purpose forces, particularly those of the Tactical Air Command (TAC), rose perceptibly with delivery of the F-105F and F-4C in quantity. Air defense forces enhanced their capabilities against the threat from air-breathing aircraft and missiles as the Air Force completed first-phase modifications of the interceptor improvement program and refined operations of the Ballistic Missile Early Warning System (BMEWS), SPACETRACK, and the Backup Interceptor Control (BUIC) system. TAC and MATS improved their airlift and air assault capabilities with the receipt of additional C-130E's and repeated use of their forces in realistic field exercises. Meanwhile, the Air Force sought to achieve both flexibility and economy in its operations through such means as the Single Managed Tanker Force (SMTF) and the automated control of its air transport resources.

The Air Force gave heavy emphasis to problems of special air warfare in underdeveloped countries—particularly in Vietnam. USAF personnel were carefully selected for this challenging assignment. C-123 aircraft transport squadrons became the backbone of military logistics in Vietnam, airlifting 140,000 personnel, moving more than 30,000 tons of cargo, and airdropping 6,000 troops. USAF personnel trained and supported the Vietnamese in maintenance, electronics, communications, transport, logistics, and planning. They also assisted in the combat training and organizational buildup of the Vietnamese Air Force, which since 1962 has succeeded in increasing the number of pilots twofold, the number of combat aircraft fourfold, and the number of combat sorties more than eightfold. Airpower complicated Viet Cong insurgency operations, forced attacks to break off, and inflicted enemy casualties.

The Air Force in fiscal year 1964 obtained more survivable and responsive command and control systems. Operational capability of the 473L Command and Control System at Headquarters, USAF, increased significantly although completion of the system was delayed by late deliveries of some computers. Installation of Phase I, a prototype of the Nuclear Detonation Detection and Reporting System (NUDETS), was completed on June 30, 1964. Optical, seismic, and electromagnetic sensors at four sites in the Baltimore-Washington-Norfolk area are tied through leased communications to a data processing center. The center channels refined data to nine control centers for attack and damage assessments and fallout predictions. The National Emergency Airborne Command Post (NEACP) supporting communication system underwent revision and expansion during the year with a resultant growth in capability. More extensive use of airborne command posts was under study, and exercises tested their feasibility under varying conditions and environments.

Strategic Air

The Strategic Air Command (SAC) phased out older aircraft and missiles, added large numbers of new second-generation missiles, and improved its command and control equipment and techniques. During the fiscal year the number of aircraft in the strategic force continued to decrease with the phaseout of B-47's. This was counterbalanced by the growth of the missile force to provide an adequate deterrent.

The phaseout of B-47 and supporting KC-97 units amounted to 3 wings and 5 squadrons, respectively, leaving a total of 10 B-47 wings and 12 KC-97 squadrons. The remainder of the manned strategic striking force consisted of 42 B-52 squadrons and 6 B-58 squadrons—

unchanged from a year earlier. With the reduction of the medium bomber force, SAC consolidated its B-47 Reflex force overseas, withdrawing from two bases in England and one in Spain. On Guam, B-52's replaced the B-47 Reflex force at Anderson AFB in April 1964, the first time that they had engaged in the program. Established in 1958, Reflex requires elements of ready units to rotate from their home bases for temporary duty of 2 to 3 weeks.

SAC undertook several programs to strengthen the bomber fleet. Early in 1964 a special series of B-47 and B-52 exercises tested the capability of those aircraft to drop conventional bombs. The Air Force continued the structural modification program to extend the life and capabilities of the B-52's. Project HUSTLE-UP, completed in March 1964, eliminated certain B-58 deficiencies.

The Single Managed Tanker Force (SMTF), operated by SAC in support of both SAC and TAC operations, continued to increase in both size and scope of operation. The Air Force accepted delivery of 84 KC-135A's, raising the total to 702, and equipped 4 new squadrons. The enlarged force diminished the requirement to position tankers at advanced bases and permitted the Air Force to withdraw KC-97's from four Canadian bases. In May 1964 the SMTF extended its support of TAC to include tactical exercises in addition to deployment and routine training missions previously supported. The first instance occurred during DESERT STRIKE, the mock war fought in the southwest United States. Sorties in support of tactical operations totaled 4,200 during the year.

SAC missile strength increased greatly. The most significant addition occurred in the MINUTEMAN force, with 4 wings operational and approximately 600 missiles in place at the end of the fiscal year. The MINUTEMAN is fast-reacting, can be launched directly from its hardened underground silo, and is relatively inexpensive to maintain.

SAC assumed command of the final TITAN II operational squadron in December 1963. TITAN II carries the largest payload of any USAF strategic missile, uses noncryogenic storable liquid fuels, is fast-reacting, and is launched directly from its hardened silo. The TITAN operational force consists of 108 missiles (54 TITAN I and 54 TITAN II) organized into 12 squadrons.

In the light of advancing technology and the fast growing MINUTEMAN arsenal, the Air Force has been studying carefully the future of the first-generation, liquid-oxygen-fueled missile systems—the ATLAS D, E, and F and the TITAN I. Although these have made a valuable contribution to the national security, they are inferior to the newer systems in reaction time, maintenance cost, and vulnerability. Consequently, the Air Force has planned a gradual phaseout

based on effectiveness as compared to competing systems. Deactivation of the earliest system, the ATLAS D, is already underway, and it will be followed shortly by the ATLAS E and TITAN I and somewhat later by the ATLAS F.

SAC carried out realistic reliability and operational tests on several missile systems during the year. Three ATLAS F sites sustained damage from fire and explosions during propellant loading exercises, and the Air Force does not intend to repair them. The acquisition phase of the ATLAS program was officially completed in January 1964, with engineering management passing from the Air Force Systems Command (AFSC) to the Air Force Logistics Command (AFLC). ATLAS E updating modifications were completed at all operational sites and similar actions on the ATLAS F were approximately one-half completed by the end of the fiscal year, both well ahead of schedule.

Air Defense

The Air Force continued to direct its active air defense efforts primarily against the threat from airbreathing aircraft and missiles. Detection, identification, and warning systems also enhanced passive defenses against ballistic missiles and reinforced the reliability of counterforce reaction procedures, but an active defense against missile attacks from land, sea, and space remains a critical problem.

There was little change in over-all air defense strength during the past year. The Air Force reduced the number of interceptor squadrons in both Europe and the Far East, but the resources released went to strengthen the defense of the continental United States. In April 1964, the Air Defense Command (ADC) began inactivating the BOMARC A force, to be completed by August. These missiles will continue to serve a useful role as drone targets for TAC, ADC, and the Navy. The eight long-range BOMARC B squadrons remain operational.

No new weapon systems entered the air defense inventory. The existing interceptor force gained in quality under the Interceptor Improvement Program, which improved antielectronic countermeasure (ECM), search, tracking, and low altitude capabilities. In addition, the F-104 was being retrofitted to give this aircraft an improved capability.

The Secretary of Defense approved funding for an interceptor dispersal program designed to increase survivability under missile attack. Facility design engineering and construction are underway at selected bases.

The last SAGE control facility, the combat center at North Bay, Canada, became operational in October 1963. For reasons of economy,

the Air Force made a number of changes in its aircraft control and warning systems, but the over-all effectiveness was not seriously affected. The Air Defense Command phased out 6 SAGE direction centers, 17 long-range radars, and associated gap-filler radars, as directed the previous year by the Secretary of Defense. Plans were underway to use several of the deactivated direction centers as Automatic Digital Network (AUTODIN) switching centers. Meanwhile, Canada announced in December 1963, the closing of the western segment of the mid-Canada line and the closing down of long-range search radars in southern Canada.

In the area of ballistic missile and satellite detection and warning systems, BMEWS attained its programmed system capability on January 15, 1964, when Site III, Fylingdales, United Kingdom, became fully operational. Better satellite detection and tracking was achieved in the SPACETRACK system through the additional installation or modification of tracking radars, Baker-Nunn cameras, and data processing computers.

During the past year the Department of Defense (DoD) and the Federal Aviation Agency (FAA) continued to plan for common use of radars and of communication and control facilities to ease traffic control on the congested U.S. aerial highways. Use agreements already exist for 43 USAF and 16 FAA radars. Joint civil and military air traffic control began early in December 1963, at Great Falls Air Defense Sector, Great Falls, Mont. The Air Force is also participating with FAA in the fully automated air route traffic control center at Jacksonville, Fla., being built as part of FAA's national airspace system. Radar data will be transmitted simultaneously to FAA computers at Jacksonville and to USAF computers at Montgomery, Ala. Other long-range studies are underway to expand this joint use of air defense and air traffic control facilities to cover virtually all of the United States.

General Purpose Forces

USAF general purpose forces consist of tactical fighters, tactical missiles, reconnaissance aircraft, oversea air defense forces, and special air warfare units. These forces are assigned to TAC, U.S. Air Forces in Europe (USAFE), and Pacific Air Forces (PACAF). Their ability to perform the traditional tactical missions of air superiority, battlefield interdiction, close air support, and reconnaissance has steadily improved. Special air warfare units have acquired the capability to engage in counterinsurgency and unconventional and psychological actions. Older conventional aircraft, such as the T-28 and B-26, were used to support counterinsurgency or antiguerrilla operations in Viet-

nam. The Air Force also improved its support of the Army—new equipment and techniques were developed, certain organizational changes were adopted, and greater mobility for ground troops was provided. New techniques in the employment of assault transports, particularly the C-130, promised improvements in support of combat units in a battle area.

The Tactical Air Command, which provides the operationally ready air forces for the U.S. Strike Command (USSTRICOM), was strengthened by the transfer of one tactical fighter wing from USAFE, three squadrons from PACAF, and the activation of one new wing. The Air Force modernized and enlarged TAC's troop carrier and assault forces by activating two C-130E squadrons, converting one squadron from C-123 to C-130E aircraft, and transferring three C-130A squadrons from USAFE.

The current program calls for larger, modernized tactical fighter forces. In November 1963, TAC received its first F-4C tactical fighter, a modified version of the Navy F-4B, that can perform air support, interdiction, and air superiority missions. More than 1,000 of these twin-seat 1,600-mile-per-hour fighters will be produced during the next 5 years, greatly enhancing the striking power and versatility of the general purpose forces. For its air superiority mission, the F-4C is equipped with SPARROW and SIDEWINDER air-to-air missiles, and for close air support it can deliver up to 6 tons of weapons on frontline targets. The RF-4C reconnaissance version will be available shortly and is expected to increase greatly the Air Force's ability to obtain the accurate and timely intelligence so vital in tactical air warfare.

By the end of June 1964, TAC had equipped a combat crew training wing and three squadrons of a tactical fighter wing with the F-4C aircraft and had returned 27 F-4B's borrowed from the Navy for training purposes. The Air Force also decided to increase F-4C firepower. Early experience with the aircraft was exceptional. Aircraft utilization exceeded original plans even though some spares and aerospace ground equipment were not yet in place. Direct maintenance in man-hours per flying hour compared favorably with the F-105, which has been in the inventory for some time.

OSD also approved Air Force recommendations to introduce the F-4D and F-4E into the inventory. The new versions will improve air-to-ground performance as well as air-to-air combat capabilities.

The last F-105D tactical fighter was delivered to TAC in January 1964. The first two-place F-105F entered the TAC operational inventory in December 1963, and another 83 were delivered during the remainder of the fiscal year. An advanced all-weather tactical fighter, the F-105F, is also useful in transitional training. The remainder

of the F-105 force consisted of F-105B's. Project LOOK-ALIKE, an F-105 modification program, continued throughout the year to standardize configurations and reduce support costs. At the end of the fiscal year, all but 211 of the aircraft had been modified.

Throughout the year the Air Force conducted a high-priority program for a rapid buildup and an improved tactical delivery capability of conventional weapons and munitions. These efforts led to better conventional ordnance and refined tactics for their delivery.

The operationally ready forces of TAC and the Continental Army Command, functioning under the control of USSTRICOM, participated in a number of joint exercises. These exercises allowed the two commands to test new concepts of tactical air-ground cooperation separately developed within the Army and Air Force. The largest of these exercises was DESERT STRIKE in May 1964, involving over 100,000 soldiers and airmen. Participating units included more than 4 Army divisions and 15 USAF squadrons, the latter operating from 25 airbases from Texas to Oregon. In the BIG FEET exercise, TAC deployed three squadrons of fighters and a composite reconnaissance force to Europe.

TAC forces also participated in Exercise DELAWAR, a joint and combined exercise of United States and Iranian forces held in the Persian Gulf and Iran during March, April, and May 1964. DELAWAR provided valuable experience in planning and conducting combined operations under Central Treaty Organization (CENTO) auspices. The United States deployed a joint task force composed of an airborne brigade and two fighter squadrons, with associated airlift, from the United States through Adana, Turkey, to Iran. There the force joined with U.S. naval forces assigned to the area and with Iranian armed forces.

In December 1963, the Air Force established the Tactical Air Warfare Center (TAWC) under TAC to develop and test close support tactics and equipment. The center began a series of three unilateral tests—INDIAN RIVER I, II, and III—extending through the summer of 1964. These were to be followed during the fall of 1964 and the spring of 1965 by two USSTRICOM-directed joint tests—GOLD-FIRE I and II—to evaluate how tactical airpower can be employed most effectively with other USSTRICOM forces.

Also, in order to correct certain deficiencies, the Air Force established the Tactical Air Reconnaissance Center (TARC) at Shaw AFB, S.C., in July 1963. TARC examined the whole reconnaissance process, from establishment of a requirement to analysis of the intelligence product obtained. It trains aircrews and develops, validates, and tests tactical air reconnaissance equipment, tactics, and procedures.

The Air Force intensified its special air warfare activities. These include an air commando wing and a combat applications group at the Special Air Warfare Center, Eglin AFB, Fla. The Air Force has worked closely with the Army in providing air support for the expanding Army Special Forces in counterinsurgency and unconventional warfare operations as well as in day-to-day field training. During the past year the Air Force has sent mobile training teams overseas. These teams have functioned either jointly with the other military Services or as training cadres for friendly air forces. USAF special warfare personnel are drawn from the special force based at the Special Air Warfare Center.

The Air Force began to modernize the special air warfare force during the year. From the time of its original deployment to Vietnam, the 1st Air Commando Squadron employed B-26 and T-28 aircraft for the training mission there. In June 1964, these forces were supplemented with the A-1E, a two-place version of the A-1H used by the Vietnamese Air Force.

Air Transport

Modernization of the USAF airlift forces proceeded with the conversion of three C-118 squadrons and one C-121 squadron to C-130E's. This completed the interim airlift augmentation program of using C-135's and C-130E's pending availability of the C-141. The turboprop C-130E continued to give excellent performance. For example, in support of Operation DEEP FREEZE C-130E's replaced C-124's and did an outstanding job of airlifting cargoes from New Zealand to Antarctica.

Early in the year a special subcommittee of the House Committee on Armed Services, after extensive hearings, commented favorably on USAF progress in carrying out the committee's 1960 airlift recommendations. The committee pointed out that 10 recommendations had been implemented in whole or in major part and that the long-range airlift capabilities of MATS had increased by 60 percent over the past 3 years. Nevertheless, it noted that many serious airlift problems and requirements remained unsolved. Among them were certain strategic airlift deficiencies, the need for quicker reactions, the lack of an outsize cargo transport, inadequate TAC procedure for augmenting MATS, an unsatisfactory airlift command structure, and several Civil Reserve Air Fleet (CRAF) deficiencies. The Air Force is taking action in all these areas.

The MATS airlift mission has been broadened from an emphasis on routine scheduled flights along fixed routes to include joint airborne training, special assignment airlift, and air mobility exercises with

other combat elements. Commercial participation in routine channel airlift increased, and in fiscal year 1964 commercial airlines carried 73 percent of the passenger and 26 percent of the cargo loads. This represented a dollar decrease from \$211.9 million in fiscal year 1963 to \$192.5 million in 1964.

During the year MATS conducted frequent airborne operations with the Army airborne divisions at Fort Campbell, Ky., and Fort Bragg, N.C., as well as with the Army's 25th Division in Hawaii. It also provided support for extensive airborne training by Marine units on both east and west coasts. In addition to its increased ability to support Service requirements, MATS airborne operations have become more meaningful with the addition of the C-130E. Although some C-130E's are serving as an interim measure in the strategic airlift force, they will be assigned primarily to the assault role in TAC as the C-141 comes into use.

During fiscal year 1964 MATS participated in 12 major joint exercises and numerous smaller ones. The most widely publicized was BIG LIFT I, the deployment of the 2d Armored Division with supporting units and a composite airstrike force from the United States to central Europe. In 63 hours and 35 minutes, 204 MATS aircraft flew 234 missions to transfer 504 tons of combat equipment, 14,964 Army personnel, and 394 TAC support personnel from Texas and the east coast to the Federal Republic of Germany and France. Also noteworthy was SWIFT STRIKE III, the largest air-ground joint exercise since World War II. During the exercise, held in the Carolinas in July and August 1963, MATS airlifted 34,971 troops and 37,877 tons of equipment, flying almost 26,000 hours to accomplish 2,598 missions. The exercise was of particular significance in that it provided MATS the first opportunity to participate in actual tactical operations on such a large scale, and it provided valuable experience in applied tactics and field command relations. A third major joint exercise was DESERT STRIKE, held in Arizona and California during the spring of 1964, in which MATS collaborated with TAC in the deployment and redeployment phases. MATS and TAC aircraft flew 2,458 sorties and 37,918 hours in moving 33,393 troops and 24,135 short tons of equipment.

MATS continued to provide humanitarian and national emergency airlift on a global scale. In July 1963, it airlifted supplies from Washington, D.C., to Belgrade, Yugoslavia, to aid the victims of a devastating earthquake. At the request of Governor John Connally of Texas in February 1964, four aircraft flew 13 missions to drop 1,642 bales of hay to 7,000 cattle stranded by a severe snowstorm. The Air Force rushed aid to Alaska after the earthquake of March 1964. These airlift activities included 47 missions that brought 437 passen-

gers and 520 tons of cargo from the continental United States and many theater sorties to transport 132 passengers and 100 tons of cargo.

In October 1963, MATS assumed responsibility for three routes in the Middle East and African areas formerly operated by the European Command. This was the first step in a program to cut down the adverse gold flow by reducing airlift forces assigned to overseas theaters. By June 30, 1964, MATS was providing all scheduled operations in Europe, Africa, and the Middle East. To eliminate duplicating activities with USAFE, MATS also assumed total responsibility for airlift operations in Europe. It also planned to begin in July 1964, scheduled intratheater service in the Pacific area between Japan and Korea, Iwo Jima, and Marcus Island.

MATS war plans continued to depend on augmentation from the Civil Reserve Air Fleet, which at the end of the fiscal year contained 249 international and 100 domestic aircraft. CRAF is designed to respond to three varying degrees of emergency, as determined by the Secretary of Defense or the President. Since the fiscal year 1964 airlift contracts completed a 3-year cycle, MATS negotiated new contracts with CRAF members under policies designed to provide a commercial augmentation fleet adapted to the Nation's emergency needs. In placing contracts, MATS considered not only the price but the relative value of the aircraft to the MATS war mission. MATS also considered the success of a carrier in expanding its own commercial business, its success in negotiating "no work stoppage" agreements with employees, and its past performance on contracts. During the past year MATS carriers began complying with a requirement that all traffic be carried in turbine-powered aircraft except where circumstances, such as a short airfield, still dictated use of piston-engine airplanes.

The MATS safety record continued to be excellent. The major accident rate was 1-25 percent per 100,000 flying hours, an increase from the 0.94 percent figure of the previous year. Passenger fatalities in MATS military aircraft totaled 74, while contract carriers incurred no passenger mishaps.

Specialized Operational Services

The Air Force Communications Service (AFCS), completing its third year of operation as a separate command, performed the communication functions of all major commands except SAC and ADC. Near the end of the fiscal year, Headquarters, USAF, was reviewing the exception granted these two commands in 1962. The Air Force continued to study the possible reorganization of the Alaska Communication System, which AFCS took over from the Army in July 1962.

This system presents a special problem as it serves both military and public needs in Alaska.

The long-term modernization program of the Air Force Communications System (AIRCOM) proceeded in close accord with Defense Communications Agency (DCA) planning for the over-all Defense Communications System (DCS). A key element in the DCS is the Automatic Digital Network (AUTODIN), a data-transmission network which the Air Force transferred to DCA in February 1963 but continues to operate. In February 1964, the Secretary of Defense approved 4 additional switching centers in the United States and 10 overseas, bringing the total to 19.

The Air Weather Service (AWS) continued to operate a global network of more than 400 weather facilities for Air Force and Army operations. Its 3.5 million surface observations and 45,000 upper air observations formed the basis for 4.8 million weather briefings, 500,000 pilot-to-forecaster reports, and 30,000 weather warnings. Exploiting new vehicles and techniques, AWS added two new dimensions to its observing network—a chain of 15 fixed and 4 mobile television ground stations for receiving copies of photographs taken by TIROS weather satellites and an 8-station meteorological rocketsonde network for probing the upper (225,000 feet) atmosphere. The latter launched 272 rocket probes during the year. AWS also added new lightweight gear, supplanting obsolescent World War II items and improving its mobility in order to better support USAF and Army counter-insurgency or contingency operations.

The AWS weather reconnaissance and aerial sampling force consisted of 64 aircraft at the end of the fiscal year, including WB-50's, C-130's, WB-47's, and RB-57's. Replacement of the WB-50's by WB-47's continued as an interim measure pending availability of computer-equipped C-135's in 1965.

In December 1963 the AWS mission was expanded to include responsibility for space environmental support, a natural extension of the atmospheric mission. Simultaneously, AWS began solar flare and proton shower forecasting to 16 agencies.

The Air Photographic and Charting Service (APCS), continuing its global photomapping and geodetic survey program, was active in New Guinea, Australia, Central America, South America, and Ethiopia. The New Guinea geodetic survey required installation of ground stations in some of the most difficult terrain in the world. Photomapping teams employing RC-130's and RB-50's worked throughout the year in most of the countries of Central America and northern South America. There was good progress on the Ethiopian photomapping survey, but it will require another 4 years to complete.

On another project, the world gravity survey, APCS completed the coverage of North America and moved on to Europe and Africa.

APCS played a major supporting role in the joint civilian-military geodetic satellite program. Initial evaluation indicates that the satellite technique demonstrated in Project ANNA may provide an effective and economical way of accomplishing geodetic surveys and replace the current complex and time-consuming methods. For the short term, however, APCS awaited delivery of RC-135's, which would provide a much improved vehicle for photomapping and geodetic survey teams.

All local base rescue units of the Air Rescue Service (ARS) were equipped during the year with the HH-43B helicopter, a more versatile and efficient replacement for the HH-19. The Air Force also reequipped certain ARS units with modified C-97 tankers pending delivery of HC-130's in late 1964. These aircraft support tactical and strategic aircraft operations and manned space flights.

Although ARS is basically a military organization, it is often called upon to assist in civil emergencies. For example, when the Greek ship *Lakonia* began burning on December 22, 1963, about 200 miles north of the Madeira Islands, planes of the 57th Air Rescue Squadron promptly came to its assistance. Four HC-54's flew 10 sorties, and one plane remained on station over the area to spot survivors and direct surface vessels during the 2-day rescue operation. Their action contributed to the rescue of 896 persons and the recovery of 91 bodies.

During the year ARS local base helicopters flew 11,071 missions for a total of 6,659 hours, saved 92 lives, and assisted 483 distressed persons. Fixed-wing rescue squadrons flew 23,712 hours, saved 1,108 lives, and assisted 1,598 distressed persons. As inland coordinator under the National Search and Rescue Plan, ARS coordinated missions involving 25,262 flying hours. A total of 1,044 persons in distress were assisted, 483 were found dead, and several hundred remained missing.

III. Manpower

The Air Force's effectiveness is directly dependent upon its ability to obtain, train, and retain competent and dedicated people. Pay increases approved in August 1963, and August 1964, eased some of the personnel difficulties, although the Air Force still experienced manpower losses, some of them arising from lack of promotion opportunities and unsatisfactory housing in many areas. Pay and housing problems probably caused the most difficulty, but many technical and management people, often field grade officers, left because of a lack of advancement opportunities. Legislation on the Bolte recommendations to help relieve grade vacancy shortages was not enacted, but temporary relief from the Officer Grade Limitation Act was granted. Air Force leaders continued to emphasize that improved career incentives were fundamental to maintaining a high level of professionalism in the Service.

As previously planned, total military strength fell by more than 12,500 during fiscal year 1964—from 869,431 on June 30, 1963, to 856,798 a year later. The latter figure included 133,389 officers, 720,372 airmen, and 3,037 cadets. Most of the reduction occurred in airmen strength and was achieved by cutting back on enlistments. At the end of fiscal year 1964, 23,927 officers and 176,305 airmen were serving overseas. Directly hired civilian employment dropped from 296,982 to 289,700, a decrease of 2 percent.

Manpower Management

The Air Force continued to emphasize its manpower validation program by developing standards of performance for major military and civilian functions. By the end of June 1964, more than 275,000 jobs in 1,960 work centers had been examined against these standards. During the fiscal year, an additional 3,920 manpower spaces were assigned to more important functions, bringing to 10,420 the number of spaces redistributed since 1960, when the program began.

Within the operational commands, the Air Force instituted a dual deputy commander arrangement, with one deputy for operations and one for materiel. This provided a more clearly defined command structure and relieved commanders of all but their major responsibilities.

In previous years the size of the civilian manpower force has been controlled by establishing quarterly strength objectives. In fiscal year 1964, the Air Force allowed more flexibility to the commanders by changing to a man-year objective. Under the new system, commanders can adjust to seasonal and emergency factors in the workload by expanding and contracting the civilian force, as long as the total force stays within prescribed man-year limits.

With the continued application of strict manpower controls, the Air Force was able to maintain the major portion of its military personnel in operational functions. The table below shows their general utilization by function at the end of June 1964:

	Number	Percentage
Operations.....	590, 360	69
Support.....	136, 895	16
Training.....	128, 339	15
Miscellaneous.....	1, 204	-----
Total.....	856, 798	100

Officers

Fiscal year 1964 witnessed a continued shortage of young pilots to replace the loss of older pilots, about half of whom were trained during World War II. Training replacements imposes a strain on existing facilities and funds. To help alleviate in part the rated officer deficit, the Air Force adopted a management program to return qualified pilots to flying duties. Nearly 11,000 pilots who on October 18, 1963, were performing duties not requiring an aeronautical rating were screened for flight duty, and 1,674 were selected to return to flying during fiscal year 1965.

To improve the utilization and enhance the prestige of military scientists and engineers, the Air Force replaced its broad specialties in the scientific and development engineering career fields by more specific ones. Five new specialties and 33 subdivisions were added. In the materiel career field the Air Force also grouped most of the materiel functions into three career fields—supply services, supply management, and fuels utilization.

In April 1964, the Air Force applied its performance evaluation criteria to Air National Guard (ANG) and Air Force Reserve (AFRes) officers not on extended active duty. This made it possible to rate duty performance of all Air Force officers on the same forms and under the same general rules. Another change added a rating

form designed to collect information on junior officers being considered for regular commissions.

On June 6, 1964, the President reemphasized an earlier memorandum to the heads of all concerned Federal agencies urging that they send only the very best people to Vietnam. The Air Force has established the Southeast Asia Manning Section within the Directorate of Military Personnel, Headquarters, USAF, and set standards for service in Vietnam. Henceforth, a tour in Vietnam will serve as an indicator of professional excellence.

Airmen

The program to increase utilization of senior noncommissioned officers (NCOs) continued with excellent results during fiscal year 1964. In performing certain duties traditionally assigned to commissioned officers, senior NCOs not only broadened their competence, but they released many officers for technical and higher professional jobs. Approximately 400 officer spaces were converted to senior NCO positions during the year, bringing the total since inception of the program to about 2,700. Although the number of NCOs who can be trained for such duties in the future is not expected to be large, the effort to place NCOs in position of greater responsibility will continue.

Adjustments in the proficiency pay program are necessary in order to fund the program at the level of \$35.7 million approved by the Secretary of Defense. The program for fiscal year 1965 provides for: (1) Continuation of the current rates of \$30 and \$60 per month; (2) pay at the P-2 rate for certain airmen in E-3 and E-4 grades; (3) removal of approximately 9,000 airmen from proficiency pay during fiscal year 1965 and removal of additional specialties on July 1, 1965, to insure that the 1966 program would not exceed the \$35.7 million ceiling; and (4) 6 months' notice to airmen being removed from proficiency pay status.

Airmen promotion opportunities in many critical specialties were improved. Airmen assigned to select units, many of them in overseas unified and specified commands, will enjoy better opportunities. In July 1963, the USAF Security Service was permitted to keep operational personnel overseas for two tours and to award spot promotions to all NCO grades. Another new policy provided for the promotion before graduation of students in technical courses of longer duration than 22 weeks.

In April 1964, the Air Force decided to bar the enlistment of men without prior service if they had dependents. This policy was adopted because pay for married men in the first four airmen grades was generally inadequate. In fact, one survey showed that about

71,000 airmen, mostly heads of families and in the middle grades, were working after hours to supplement their income.

This reenlistment rate for first-term airmen in fiscal year 1964 was 29.5 percent, substantially below fiscal year 1963's rate of nearly 35 percent.

Women in the Air Force

At the end of fiscal year 1964, there were 5,567 women in the Air Force (WAF)—4,845 enlisted women and 722 commissioned officers. This was a gain of 41 enlisted women and 12 officers since June 30, 1963. Ten percent of the enlisted women and 25 percent of the officers were serving overseas. Officers served at all continental and overseas bases except for a few isolated locations. Enlisted women were assigned to 29 installations in the continental United States and 7 overseas.

Air Force enlisted women served in 15 career fields. Approximately 25 percent were in administration, 19 percent in medical and dental specialties, and 12 percent in communications. Others worked in such fields as air transportation, air traffic control, supply, accounting and finance, food service, photomapping, and education and training.

WAF officers served in all officer specialties except those requiring aeronautical ratings. Their main assignments were in the fields of intelligence, information, supply, transportation, education and training, and accounting and finance. Lesser numbers worked in the more technical fields such as communications, electronics, and research and development.

During fiscal year 1964, 45 percent of the WAF officers and 30 percent of the enlisted women were serving beyond their original 4-year commitments. While WAF officer retention was unchanged, enlisted retention dropped from 38 percent the previous year.

Civilian Personnel

Technological advances in American society continued to have an impact on Air Force operations, and consequently on the type of employees hired. This was illustrated during the past fiscal year by an increase of 2 percent in the proportion of salaried (classified or "white collar") employees to Wage Board ("blue collar") employees. During the past 10 years in this continuing trend, the ratio of white collar (which includes technical and professional) to blue collar workers increased from 42 percent to 54 percent. Partly reflecting this trend and mainly resulting from a substantial withdrawal of Air Force activities from overseas, there occurred another sharp

decrease in the number of foreign nationals employed indirectly through contract or agreements with other governments. The number fell to 32,700—a decrease of 5,700 since June 30, 1963.

Little change occurred in the turnover rate of full-time civilian employees; the average monthly accession rate remained at 1.4 percent and the separation rate dropped from 1.7 percent to 1.6 percent.

In the continuing program of self-evaluation of civilian personnel management, specialists conducted surveys at 39 Air Force installations in the continental United States and 5 overseas. These surveys were supplemented by 32 special inspections by the Civil Service Commission and 2 by boards of U.S. Civil Service Examiners.

Headquarters, USAF, emphasized the importance of supporting the OSD and Air Force cost reduction programs at command level. The incentive awards program contributed substantially to cost reductions. As an example of what could be accomplished through suggestions, 21 of the proposals submitted by Air Force employees brought estimated first-year benefits of \$100,000 or more.

To assure equal employment opportunity in the Air Force without regard to race, color, or religion, special surveys were made at 14 major employment centers in the South. Equal employment opportunity conferences were held at Riverside, Calif.; Dayton, Ohio; San Antonio, Tex.; and Montgomery, Ala. These meetings were convened to train employment policy officers and acquaint commanders with the importance of equal employment opportunities. The Air Force is maintaining a close surveillance of the program to determine whether further revision of regulations and additional guidance to the field may be needed.

Since July 1963, the Air Force has given special placement assistance to civilian employees who have lost their jobs as a result of a reduction in force. The Air Force helps to prepare resumés of their experience and qualifications and grants them priority rights to vacancies at other USAF installations, both in the United States and overseas. In December 1963, and April 1964, the Secretary of Defense announced the phasedowns or changes in mission of a number of Air Force units and bases, pointing out at the same time that affected employees would be given an offer of another opportunity. The major Air Force installation involved was the Rome Air Materiel Area (ROAMA) in New York, where about 2,700 jobs eventually will be eliminated. A special placement program, which freezes appropriate vacancies at all AFLC installations, has been established to assist ROAMA employees.

At the end of June 1964, the number of administrative supergrades (GS-16 to GS-18) totaled 97. During the past year, 56 scientific supergrade positions, exempted from quota restrictions, were approved

for the Air Force under provisions of the Salary Reform Act of 1962. The Air Force's quota of Public Law 313 positions stood at 138. In June 1964, the Air Force published its first regulation as guidance for determining the need for supergrade and Public Law 313 positions.

As a result of the Bureau of the Budget's expression of concern over the rise in the average grade of Federal employees, Headquarters, USAF, requested the major air commands to determine where and why the increases were occurring. Actually, the "grade creep" in recent years has been small. Since 1959, the average grade of the USAF classified civilian employee has risen from GS-6.3 to GS-7.2. During the past year the rise was 0.12, the smallest since fiscal year 1956. This rise reflected the growing complexity of USAF missions and the substantial increase in salaries throughout the American economy.

IV. Military Training

The Air Force demand for educated and trained personnel continued at high levels. New and sometimes difficult adjustments had to be made to maintain adequate training programs with fewer resources. Continuous planning will be needed to maintain pilot training in balance with changes in pilot requirements and inventory, and to keep the training programs in balance with trends in the recruitment and retention of personnel.

Flying Training

Training schools graduated 2,028 pilots during fiscal year 1964, an increase of 288 over the previous year. The total included 1,675 pilots for the Air Force, 238 for the Military Assistance Program (MAP), and 115 for the Air National Guard. New navigator graduates totaled 1,052—984 for the Air Force, 22 for MAP, and 46 for the ANG. This was 133 less than last year.

An increase to a peak rate of 2,760 pilots (including 60 helicopter pilots) per year to be reached by June 1967 was approved. This increase utilized the eight existing undergraduate training bases to full capacity. In order to accomplish the expansion within the existing base structure, flying time of newly graduated pilots was reduced from 262 hours to 240. The 60 helicopter pilots receive separate schooling, consisting of 120 hours in the T-28 at Randolph AFB, Tex., and 105 hours in helicopters at Stead AFB, Nev.

To permit Moody AFB, Ga., to expand its jet undergraduate flying training, the Air Force moved T-28 and C-47 training for MAP from Moody to Randolph AFB, Tex. Any T-28's that become surplus as a result of reductions in the MAP program will be used in the primary training of helicopter pilots.

A planned change in the flying training curriculum calls for using a commercial-type light aircraft, called the T-X, in the first phase of primary training. Piper, Beechcraft, and Cessna provided planes that passed evaluation tests and were qualified to compete for a contract. Instruction in this type of airplane will be done by civilian contractors on fields adjacent to USAF undergraduate pilot training bases.

Other changes in the training of flying personnel included: (1) Reducing the navigator training course at James Connally AFB, Tex., from 41 to 37 weeks; (2) shortening the counterinsurgency staff course at Maxwell AFB, Ala., from 3 to 2 weeks; (3) discontinuing the electronic warfare familiarization course at Mather AFB, Calif.; (4) establishing special survival mobile teams in USAFE and PACAF to provide training formerly available only at Stead AFB, Nev.; and (5) eliminating the T-29 and T-33 courses from the instrument instructor school at Randolph AFB, Tex. These changes stemmed chiefly from an effort to reduce flying training costs.

Technical Training

During fiscal year 1964, Air Force technical schools maintained a steady level of training. Matching the preceding year, an average of nearly one out of every seven active duty Air Force personnel graduated from a technical training course. The total of graduates numbered 116,965, 11,112 fewer than last year, but kept pace with an over-all decline of 12,633 in the Air Force uniformed strength.

The percentage of basic training graduates sent to technical training was reduced from 84 percent to 80 percent by the end of June 1964. In order to increase use of on-the-job training and reduce technical training costs, the Secretary of Defense has established 76 percent as a 5-year average of the proportion of basic training graduates to receive technical training. This substantial increase in on-the-job training places increased workloads on command training staffs. It is anticipated that preparation of on-the-job training course materials to cover certain career specialties deleted from the Air Training Command technical training curricula will not be completed before 1966.

In a related development, the Air Training Command (ATC) took under critical review the basic military training program conducted at Lackland AFB, Tex. It consolidated the two-course system—one for men scheduled to enter technical training and another for those not selected—to a single 6-week course for all recruits. This allowed the ATC to eliminate basic military training at technical training centers. In a second streamlining move, the Air Force cut 3 days from the basic military training course by reducing drills and personnel processing time.

The Air Force believes that these changes will save manpower spaces, eliminate the necessity for new construction at technical training centers, and improve the quality of basic training. When it is put into effect in October 1964, the Air Force will have the shortest basic training course in the Department of Defense.

Other training improvements occurred in November 1963, in the field of advanced communications and electronics. By June 1964, 3 new courses in the communications-electronics system career field had replaced 11 courses previously taught. The primary objective of the new method was to produce a technical supervisor qualified in three or four career subdivisions and able to move easily into new communications-electronics systems and advance to the level of superintendent. About 400 specialists will be graduated annually. The effectiveness of the training system will be evaluated during fiscal years 1965 and 1966.

A series of conferences with specialists from Indiana University inaugurated a continuing study of physical fitness in the Air Force. Yearly physical fitness reports from major air commands were analyzed while benefits and hazards among various age groups were defined. By the end of June 1964, the physical fitness program had undergone several changes as a result of study findings.

During the past fiscal year, OSD emphasized the need for joint training of men and women of the three Services whenever it could be done effectively. An aviation training study was established by the Secretary of Defense to determine if the Army and Air Force (and subsequently the Navy) could use the same training facilities and so reduce costs. It had not been completed by the end of the fiscal year. During the same period, the Air Force and the National Aeronautics and Space Administration arranged for increased joint use of their technical training resources. This closer coordination is expected to benefit both agencies and reduce training costs.

Professional Education

The legislative proposal authorizing departmental Secretaries to establish a 2-year Reserve Officers' Training Corps (ROTC) program in place of or in addition to the current 4-year ROTC and to award scholarships in both programs went to the Congress in July 1963. The House of Representatives, in passing the bill on June 23, 1964, made many changes, the most important of which eliminated scholarships from the 2-year program and provided for an expanded junior (high school) ROTC. To be eligible for the 2-year program, students would have to complete at least 6 weeks of summer camp before their junior year of college. This would serve as a replacement for basic ROTC. Students who chose to take only the advanced course could still draw a retainer payment of \$50 per month. The Senate had not yet acted on the measure at the close of the fiscal year. The Air Force considered several provisions of the new bill advantageous.

During July and August 1963, about 5,300 AFROTC cadets completed summer camp training at 28 encampments on 16 bases. Approximately 6,300 students were scheduled to train at 33 encampments on 18 bases during the summer of 1964. Finding adequate encampment locations is increasingly difficult because of the growing shortage of temporary housing at operating bases. Nevertheless, the need to give future officers an insight into actual USAF activities makes it desirable to hold encampments at active installations.

Of 100,662 AFROTC students enrolled during the fiscal year, 3,817 graduated and 3,692 received commissions. During the same period, 4,438 new officers obtained commissions through the Officer Training School (OTS).

During the past few years, the Air Force has been reviewing its commitment to a number of colleges whose AFROTC units graduated so few students as to make them uneconomical to continue. A recent General Accounting Office report underscored this condition. A joint Army-Air Force study on this subject was initiated on April 28, 1964.

On the brighter side, in October 1963, an Army-Air Force team inspected the four military colleges in the AFROTC program—The Citadel, Virginia Polytechnic Institute (VPI), Virginia Military Institute (VMI), and Texas A. & M. University—and approved them for retention of their formal designation as military colleges.

The Air Force Academy graduated 499 cadets in 1964, of whom 495 received commissions in the Regular Air Force, 2 in the Marine Corps, and 1 in the Army. One graduate was not commissioned because of failure to meet the medical standards. The Air Force assigned 365 of the new second lieutenants to pilot training; the remainder, including 10 recipients of Fulbright and National Science Foundation scholarships, entered various other types of training.

On March 3, 1964, the President approved Public Law 88-276, which allowed the Air Force and Army to increase their academy enrollments from 2,529 to 4,417, the current authorization of the Naval Academy. In addition, the law standardized nominating procedures, authorizing each member of Congress to make five appointments to each academy at any one time. It also increased the period of obligated active duty of academy graduates from 3 to 5 years, beginning with the class of 1968.

Once the Air Force Academy reaches full strength, it will graduate about 950 cadets per year, approximately 30 percent of USAF's annual increment of new regular officers. Current plans call for increasing the academy enrollment by about 200 students per year over the next 4 years. New facilities costing approximately \$41 million will be needed to accommodate the student body at its maximum authorized strength.

The General Officer Advisory Committee and the Board of Visitors met at the academy in November 1963 and in May 1964, respectively. Both groups recommended construction of an airfield and a fieldhouse, improvement of military training in the fourth year, wider publicity for the preparatory school, and appointment of all authorized permanent professors within the next 3 or 4 years.

The Navy and Army announced in August 1963 and January 1964, respectively, that they would no longer permit the transfer of their academy graduates to other Services. Although both modified these policies slightly in March 1964, they still represent a major change from the earlier practice of permitting up to 12½ percent of their graduates to obtain inter-Service transfers, most of them to the Air Force.

In April 1964, Headquarters, USAF, approved a substantial change to the course requirements of academy students. Under the revised curriculum each student must major in one of the following academic fields—basic science, engineering sciences, civil engineering, international affairs, management, humanities, or military affairs. This new arrangement allows each cadet to concentrate in a field of study that is both interesting to himself and important to the Air Force.

In fiscal year 1964, the Air Force Institute of Technology (AFIT) limited the entry of officers into civilian colleges and universities to graduate students, primarily in science and engineering. However, few USAF officers who were qualified to undertake graduate work in these subjects could be released from essential positions to attend college. Consequently, the Air Force revised its fiscal year 1965 requirements to allow about 333 officers to enter undergraduate courses in science, engineering, and management. At the same time, it reduced the quota for officers working on master's and doctor's degrees.

The Air Force is changing the emphasis of its college education programs to give priority to officer-students who undertake courses in science and engineering which will fit men to fill critical jobs rather than simply enable them to obtain graduate degrees. To meet shortages of qualified technical personnel and to cut the high cost of training, the Air University was asked to reduce the number of participating colleges in the AFIT program and to use more extensively those schools with lower tuition rates consistent with the quality and type of instruction offered.

Participation of USAF personnel in off-duty educational programs reached an alltime high in fiscal years 1963 and 1964—666,858 and 673,796, respectively—with the greatest increase occurring in the number of students taking college courses. The increase was significant since it took place during a period of much stricter control of money to subsidize such programs. In the fall of 1963 the Air

Force prohibited its personnel from receiving tuition grants from the Government unless they agreed to remain on active duty long enough to be useful to the Air Force after completing their courses.

Problems arose with off-duty education in some parts of the South after March 25, 1964, when the Department of Defense stopped tuition and leave grants for attendance at segregated institutions. Some bases obtained 1-year exceptions while they established acceptable educational programs. Headquarters, USAF, urged out-of-state colleges to give courses at some of the affected installations.

The USAF foreign language teaching experiment, mentioned in last year's report, terminated successfully at McGuire AFB, N.J., in August 1963. As the next step and with the approval of the Defense Language Institute, the Air Force established the program at Ent AFB, Colo., Offutt AFB, Nebr., Randolph AFB, Tex., and Travis AFB, Calif. The language courses are offered through local colleges and universities and carry full college credit. About 175 officers and airmen are studying French, German, and Spanish. If the reading and speaking proficiency tests, to be administered in October 1964, show satisfactory progress and achievement, the program will probably be expanded to include 22 bases in the United States and a smaller number in Europe.

Reserve Forces

Although there were no national emergencies requiring the recall of reserve units to active duty during fiscal year 1964, the Air Force continued to build and use the Air National Guard and Air Force Reserve to improve the Nation's military posture. Tactical and long-range airlift illustrate the use the Air Force makes of its reserve forces and the means by which it keeps them operationally ready. ANG and AFRes transport and heavy troop carrier groups are incorporated into the MATS worldwide system in order to give their crews realistic training. During the past fiscal year, ANG and AFRes units flew special missions for the President and Department of State and carried important military cargo on routine MATS flights overseas.

ANG units transported 69,849 people and 14,787 tons of cargo in conjunction with air crew training and flew approximately 32.5 million ton-miles on oversea flights in support of MATS. AFRes troop carrier groups flew more than 12,530 sorties, carrying about 152,000 people and 9,480 tons of cargo. These groups furnished more than half of the Air Force's support of Army airborne training. AFRes units airdropped in excess of 115,000 paratroops and 754 tons of equipment, not including the men and equipment dropped during special exercises. In addition, Reserve air rescue squadrons flew 117 sorties for the active force, including precautionary escort of aircraft in dis-

tress, support of fighter aircraft movements, and search and evacuation missions.

ANG fighter interceptor and aircraft control and warning units continued to support North American Air Defense Command (NORAD) in the air defense of the United States. Specialized ANG ground equipment squadrons saved the Air Force hundreds of thousands of dollars by repairing and installing communication facilities at various bases and stations—an extremely important byproduct of regular training. In addition, this work gained valuable time for the completion of essential links in the communication network.

Participation in special exercises with active Army and Air Force units enabled the reserve forces to gain experience in the kind of joint actions they would be involved in during wartime. In SWIFT STRIKE III, ANG and AFRes units gained realistic training in planning and conducting operations with the Army. AFRes troop carriers flew about 170 sorties and almost 2,000 hours in support of Exercise SILVER FOX I and III and Exercise KING CRAB V. Three provisional ANG fighter squadrons, composed of men from many different organizations, took part in DESERT STRIKE, and two ANG tactical control groups provided most of the control and communication system for the Air Force during this exercise. For their annual active duty training, two AFRes air terminal squadrons helped MATS operate oversea terminals—at Chateauroux, France, and Hickam AFB, Hawaii. This was the first time nonflying reserve units had trained outside the continental United States. ANG planes transported the two squadrons during scheduled training flights.

In an effort to increase the mobility of its reserve combat units, the Air Force held three oversea exercises involving ANG jets and their supporting tankers. In MINUTEMAN AFPHA, 12 RF-84F's deployed to Alaska, carried out photoreconnaissance missions, and returned to their bases in the southeastern United States. In CANE CUTTER, 12 F-100's flew nonstop to Puerto Rico and returned. In ABBEY TOWER, 8 RF-84F's and 12 F-100's flew to Puerto Rico, exercised with the local ANG, and returned home. In June, plans were being made for a practice nonstop deployment to Europe early in fiscal year 1965.

During the past year the reserve forces continued their efforts to become more responsive to the needs of the active force. Four ANG troop carrier groups were redesignated air commando groups and assigned U-10B aircraft in addition to the RU-16's and C-119's they already possessed. The ANG's aeromedical transport units were converted to the broader mission of general air transport; the tactical fighter wing at Niagara Falls, N.Y., was deactivated to permit the establishment of a new air transport wing at Brooklyn, N.Y.; and the

air defense wing at Pittsburgh, Pa., was replaced by an air transport wing. These actions produced a total ANG long-range airlift force of 7 wings with 25 air transport squadrons.

In the AFRes, 6 aerial port squadrons with 29 detachments were reconstituted as 45 aerial port flights, 1 in each troop carrier group. This organization offered greater flexibility, permitting the callup of aerial port flights with their parent groups, or separately, as the situation dictated. AFRes medical support units were in the process of a complete reorganization. All but 1 of the 10 hospitals and all of the casualty staging units were being reshaped into about 140 small, highly mobile medical service units, trained at regular USAF medical facilities to augment or replace active force medical units.

The AFRes recovery program was revamped to match the USAF general war survival plans. The Air Force keyed recovery squadrons against specific operational dispersal and recovery requirements, with the result that recovery groups were reduced by 40 and squadrons by 91. This left 43 groups and 112 squadrons for which there were firm and specific missions in support of the operating commands.

Ready Reserve manpower strength totaled 250,673 at the end of June 1964, approximately 7,966 more than a year earlier. This represented a gain of 9,074 for the AFRes and a loss of about 1,108 for the ANG. Ready strength at the end of fiscal year 1964 stood at 73,217 for the ANG and 177,456 for the AFRes. Standby Reserve strength totaled 129,903.

Both the ANG and AFRes experienced difficulty obtaining formal training for their personnel. There were not enough funds and classroom space to provide advanced instruction, the most critical deficiency occurring in pilot training. While the Air Reserve Forces Policy Committee had recommended training more AFRes and ANG pilots, which won approval by the Under Secretary of the Air Force, the Air Staff continued to study the matter. With an existing pilot shortage in the active force as well as the reserve forces, it was doubtful whether existing training facilities could fill both needs.

One important action permitted the Continental Air Command and the National Guard Bureau to reappoint former reserve rated officers to aircrew positions. Reappointments will be restricted to company grade officers who are either pilots or navigators. Recognizing that there will be a substantial loss of reserve officers during 1970-72 because of forced retirements under applicable laws, the Air Force stepped up its efforts to obtain junior officers by allocating a combined annual quota of 420 spaces in the OTS for the AFRes and ANG.

The ANG aircraft inventory increased during the year from 1,566 to 1,810, primarily due to the return of F-84's retained by the active Air Force after the Berlin mobilization of October-November 1961.

The F-100 and F-102 inventories also increased, but these were partially offset by losses of F-86 aircraft. ANG training is still hampered by an aircraft deficiency, but equipment readiness has been greatly improved by changes in the supply system. The AFRes aircraft inventory decreased from 734 to 722. At the end of June 1964, AFRes assault troop carrier groups had only 41 of their 48 authorized C-123 aircraft, with no more programed. The five C-124 groups had only 20 of 40 authorized aircraft, but enough additional C-124's were programed to correct this shortage by June 1965.

ANG military construction funds were used mainly for airfield paving, aircraft maintenance facilities, warehousing, gasoline and ammunition storage facilities, and operations and training buildings. The AFRes designed a single-cantilevered aircraft maintenance dock that is highly flexible and economical. Two of these docks are under construction at Richards-Gebaur AFB, Mo., and 18 more are being programed for other sites. A double-cantilevered hangar is being developed for Hamilton AFB, Calif., and, if funds become available, this hangar design will be adapted for seven other bases.

Measured in terms of USAF inspection criteria, ANG and AFRes flying operational readiness improved significantly during the year. On July 1, 1963, 63 percent of the ANG flying squadrons were rated operationally ready. On June 30, 1964, 67 percent were operationally ready. The other units were hampered primarily by recent conversions to new aircraft, reorganization, or modifications of their aircraft. AFRes troop carrier units raised their operationally ready status from 51 to 62 percent during the same period. Changing aircrew requirements and shortages of aircraft constituted the chief limiting factors in the AFRes flying units.

V. Health and Welfare

The Air Force continued to give officers and airmen the advantages of health and welfare benefits, which are fundamental to maintaining a professional force with high morale. In addition to medical service, hospital and clinic facilities, and religious chapels, the Air Force provided scholarships and interest-free educational loans for dependents and assistance to families with handicapped children.

Medical Service

Health in the Air Force

During fiscal year 1964 Air Force efforts to conserve and improve the high level of health among its personnel produced gratifying results. Preventive actions in the fields of military public health, occupational and flight medicine, and bioenvironmental work helped to reduce the number of military personnel sick in hospitals, per 1,000 people assigned to duty, to the lowest in U.S. military history. The following table presents significant data depicting this fine state of health of military personnel during fiscal years 1963 and 1964.

	FY 1963	FY 1964
Average personnel strength.....	870, 291	865, 517
Admissions to medical facilities per 1,000 average strength:		
All causes.....	199	189
Disease.....	176	166
Nonbattle injury.....	23	23
Noneffective ratio (per 100).....	. 74	. 71
Hospitalized ratio (per 100).....	. 57	. 55
Average number of AF personnel occupying beds in medical facilities.....	4, 998	4, 729
Average number of patients occupying beds in AF facilities.....		
Air Force.....	8, 772	8, 364
Other military.....	4, 200	3, 924
Nonmilitary.....	389	339
Nonmilitary.....	4, 183	4, 101
Number of births in AF facilities.....	66, 112	64, 819
Outpatients visits to AF facilities.....	15, 393, 665	15, 763, 887
Flight physical examinations at AF facilities....	212, 915	214, 665
Other physical examinations at AF facilities....	513, 087	519, 665

Medical Personnel

The Air Force Medical Service encountered two significant personnel problems during the year. First was the long-standing difficulty of retaining a sufficient number of career physicians and dentists. Only 13 percent of the physicians and 15 percent of the dentists had more than 10 years of active service. Only 2.7 percent of each group had more than 20 years. The Air Force objective was to have 43 percent with at least 10 years of service and 10 percent with 20 years.

The second major concern was to obtain adequately trained people for USAF aerospace medical research activities. To meet the requirements of current and future programs, the Air Force must increase its staff of technical and professional specialists in the life sciences.

In spite of the national shortage of professional nurses, the Air Force continued to fill its requirements, much to the credit of the USAF Recruiting Service, the agency responsible for obtaining nurses. Since the Air Force loses approximately 600 nurses per year, it must commission about that many each year from civilian sources. Of the 3,412 nurses on duty with the Air Force on June 30, 1964, about two-thirds were in a career status, either as regular or reserve officers. In recent years, career opportunities for nurses have been increasing. In addition to various specialties in nursing and aeromedical evacuation, a nurse is assigned to research at the School of Aerospace Medicine and two are working in bioastronautics at Patrick AFB, Fla., where they help prepare astronauts for space flight.

The table below provides comparative data on USAF medical personnel for fiscal years 1963 and 1964:

	30 Jun 63	30 Jun 64
OFFICERS:		
Hospital residents and interns.....	505	486
Physicians.....	3, 147	3, 384
Dentists.....	1, 995	1, 854
Veterinary Officers.....	331	337
Medical Service Corps Officers.....	2, 069	1, 982
Nurses.....	3, 409	3, 412
Medical Specialist Corps Officers.....	189	208
Total.....	11, 645	11, 663
AIRMEN:		
Medical.....	21, 876	22, 050
Dental.....	3, 225	3, 223
Total.....	25, 101	25, 273

Medical Facilities

The table below contains the most significant data on Air Force medical treatment facilities at the end of June 1964:

	Facilities	Beds
CONTINENTAL UNITED STATES:		
Hospitals.....	93	8, 163
Class A dispensaries.....	16	111
Class B dispensaries.....	18	-----
Total.....	127	8, 274
OVERSEAS:		
Hospitals.....	28	2, 185
Class A dispensaries.....	25	248
Class B dispensaries.....	29	-----
Total.....	82	2, 433
Grand total.....	209	10, 707

Medical Services

The Air Force continued its work in the fields of preventive medicine and health surveillance, much of it in close cooperation with the Armed Forces Epidemiological Board (AFEB) and the U.S. Public Health Service. The health education program for the prevention of cardio-pulmonary diseases caused by cigarette smoking continued into the twenty-third month. An article, "World Health and Preventive Medicine," published in the *USAF Medical Service Digest* in July 1963, aroused the keen interest of the American Medical Association, which distributed several hundred copies to its members and to State and county medical societies throughout the United States.

The high incidence of asthma in the Tokyo-Yokohama area, first reported to the AFEB in 1961, was still being studied in conjunction with the AFEB's Commission on Environmental Hygiene, the U.S. Public Health Service, and health authorities of the Army and Navy. The U.S. Public Health Service believed that the film, "USAF School Health Program," based on superior achievements in PACAF, will be useful in enhancing health programs in American public schools as well as in Air Force schools throughout the world.

The high incidence of streptococcal disease at Loring AFB, Maine, remained under careful surveillance, and a reporting channel was established between Loring and the AFEB's Commission on Streptococcal and Staphylococcal Diseases. The largest number of cases occurred among school-age children, but the immediate objective of

the surveillance was to detect any significant upward trend among military personnel. The USAF Surgeon General's Office also cooperated with the AFEB and the other Services on research aimed at prevention of bacterial meningitis.

Aerospace Medicine

In the field of aerospace medicine, Medical Service officers participated actively in system development programs to insure that health and disease prevention factors were carefully considered at the beginning of development and into the operational phase. The Surgeon General and his Chief of Bio-Environmental Engineering presented the DoD testimony before the Senate on air pollution control associated with missile testing. Medical Service personnel of AFSC took an especially active part in the proposed Manned Orbital Laboratory, establishing a liaison detachment at the Space Systems Division to help expedite the project.

During fiscal year 1964, the Surgeon General established physiological support teams for the B-57F high altitude tests at Kirtland AFB, N. Mex., and for the F-4C test program at MacDill AFB, Fla. Medical officials also improved and expanded the parachute and ejection-seat training programs conducted by ATC physiological units. They revised the subject matter of some courses and introduced new training aids, including jump towers, parasails, and ejection-seat trainers.

Chaplains

Headquarters, USAF, has authorized 1,140 positions for commissioned chaplains in the Air Force, and at the end of June 1964, 1,122 of the positions were filled, 5 more than the previous year. During the fiscal year, the Air Force ordered 88 chaplains to active duty, sending 65 to the basic chaplain's course at Lackland AFB, Tex., and assigning 23 directly to USAF bases. During the same time, the Air Force released 69 reserve and 13 regular chaplains from active duty and 1 died on duty.

There were 448 religious facilities on USAF installations in the continental United States and 228 overseas. These included 374 chapels and 302 annexes. Congress authorized construction of four new chapels, five chapel annexes, and four modifications or additions to chapels, at an estimated cost of \$2.3 million. The new facilities are to be built in Florida, South Carolina, Georgia, Alabama, Louisiana, Massachusetts, Arizona, California, and Washington. One annex will be constructed at Toul Rosieres Air Base in France.

During fiscal year 1964, chaplains conducted numerous missions, convocations, retreats, and religious rites for Air Force personnel of Catholic, Protestant, and Jewish faiths in most parts of the world.

A series of Catholic and Protestant missions were conducted for USAF people stationed in Labrador, Newfoundland, Greenland, Panama, Bermuda, Puerto Rico, most of the countries of Western Europe, Greece, Turkey, Crete, and Libya. In July and September 1963, chaplains held Torah Convocations for Jewish personnel in much of the same area. In August 1963, and April 1964, the Chief of USAF Chaplains sponsored Protestant retreats in Alaska for Army, Navy, and Air Force chaplains in that area. Catholic chaplains attended a retreat in Alaska during August 1963.

Spiritual life conferences were convened for Protestants during July and August 1963 in the Far East and at six locations in the United States. Professional development conferences for Catholic chaplains in the United States met in Arizona, Texas, Virginia, and Indiana, and for Protestants in California, Texas, and Washington, D.C. Communication seminars were held for Protestant chaplains in Western Europe, and Triduum and Cana conferences for Catholics in the Far East. During fiscal year 1964, the Chief of Chaplains launched a new effort to acquaint civilian churches of the United States with the moral and spiritual programs available to Air Force personnel throughout the world.

The following table is a summary of participation by military personnel and their families in religious services conducted by USAF chaplains during the year:

	Catholic	Protestant	Jewish
Attendance at Religious Services.....	10, 311, 729	7, 444, 149	99, 308
Attendance at Religious Instruction Classes.....	1, 059, 832	3, 792, 790	20, 963

Judge Advocate General

During fiscal year 1964, the Office of the Judge Advocate General obtained 145 new officers and lost 177. Total strength on June 30, 1964, stood at 1,250, a decline of 32 from the previous June. The Air Force has experienced no difficulty in recruiting young lawyers; in fact, it had a waiting list in fiscal year 1964. The Air Force continued, however, to lose a large percentage of these lawyer-officers after they had served their obligated tours.

Boards of Review rendered 803 decisions during the year. Of these, 175 were petitioned by the accused for review and 8 were certified by the Judge Advocate General to the U.S. Court of Military Appeals. The court granted 33 petitions, denied 150, and remanded 1 to the Board of Review for further action. The court reversed Boards of

Review in 19 cases and sustained them in 25. There were 22 cases pending on June 30, 1964.

The Claims Division received or reopened 1,913 claims amounting to about \$5.6 million and closed claims involving more than \$7 million. At the end of June, 789 claims amounting to more than \$6 million were still on hand. The Litigation Division received 655 cases and closed 732. On June 30, 1964, 1,343 cases were still pending.

VI. Installations

Allocation for Air Force construction projects was sharply reduced during fiscal year 1964, as the ICBM facilities program for the liquid-fueled ATLAS and TITAN missiles was completed. Those underway for the MINUTEMAN I were also finished and construction for the more advanced MINUTEMAN II was well underway.

Significant sums were requested and appropriated for military space activities, communications, and warning systems. By July 1, 1964, only about 260 projects totaling \$130 million remained unawarded. Some of these were at overseas bases where delay was unavoidable due to gold flow considerations.

Funding

For regular Air Force military construction in fiscal year 1964, the Air Force requested authorization for \$582 million, about 30 percent less than the \$831 million (exclusive of family housing) requested for the previous year. Congress approved an authorization of \$488 million and an appropriation (new obligational authority) of \$468.3 million, as against an appropriation totaling \$780 million approved last year. This represented a reduction of 40 percent from the previous year. The Air Force request in fiscal year 1964 did not include funds for family housing which had, during fiscal year 1963, been transferred to the Secretary of Defense's management fund. The total amount of funds available amounted to \$833.8 million—\$468.3 million in new obligational authority, \$362.7 million carried over from prior years, and \$2.8 million in reimbursements. The Air Force obligated \$501.4 million of this amount, leaving a carryover into fiscal year 1965 of \$332.4 million.

For reserve construction, the Congress appropriated \$20 million—\$16 million for the Air National Guard and \$4 million for Air Force Reserve.

In new obligational authority for minor construction, Congress appropriated \$10.5 million. Total funds available for this work amounted to \$18.8 million—to include \$7.1 million in carryover and \$1.2 million in reimbursements. Since approved minor construction requirements exceeded available funds, the Air Force submitted a

reprogramming request for \$4 million. Final approval was pending at the end of the fiscal year.

New Construction

Construction of facilities for the last of the five MINUTEMAN I wings (800 missiles) was finished during fiscal year 1964. In February 1964, construction action on MINUTEMAN II got underway with the awarding of a \$121.3 million contract for launch and launch control facilities at Grand Forks AFB, N. Dak. A \$7.5 million contract was also let for the MINUTEMAN II launch site at Vandenberg AFB, Calif. An important phase of the ATLAS and TITAN I updating program was completed with the construction of 193 sets of facilities to support the hardened SAC control communication system. Estimated cost of this work was \$6 million. A \$9 million project to increase the hardness and operational reliability of TITAN I sites neared completion, with only about 1 month's work remaining at two of the six squadrons. The Air Force timed this work to coincide with some weapon modification actions, thereby keeping "off-alert" time to a minimum.

At Vandenberg AFB and the White Sands/Green River Missile Range, contractors completed the first increment of construction required for Advanced Ballistic Re-Entry System (ABRES) testing, and design of the second increment was well underway. Contract awards for SAC bomber bases totaled \$13.9 million, and about 30 percent of the work was completed by June 30, 1964. The combat operations centers at SAC's Barksdale, March, Offutt, and Westover bases, built at a cost of more than \$8 million, became operational during the year.

The Air Force let \$24 million in construction contracts at Cape Kennedy Air Force Station, Fla., and Edwards AFB, Calif., in support of its space program. In August 1963, the last link in the \$7 million submarine cable from Mayaguez, Puerto Rico, to Antigua was installed, successfully concluding this 6-year-old project. The cable permits direct communication and telemetry transmissions between the downrange stations and Cape Kennedy. At Edwards AFB, the Air Force awarded \$8.7 million in contracts for propellant and propulsion test facilities. Contractors also completed rocket engine test stands there during the year.

For continental air and missile defense purposes, 10 of the 28 additional automated control centers of the Backup Interceptor Control (BUIC) system were under contract, and design of the remaining centers was well advanced. A total of \$4 million was programed for this work in 1964, and \$1.2 million for the following year. Of the

\$100 million for the radar improvement program authorized in the fiscal year 1959 military construction program, facilities costing \$87.7 million were under contract and about \$80 million of these were in place. Approximately \$25 million from this and the fiscal year 1962 Ground Control Intercept (GCI) appropriation was allocated for electrical emergency power, fallout protection, and three control centers in support of the BUIC system.

In September 1963, Texas Tower No. 2, one of two remaining early warning air defense installations, was demolished by explosives. The tower was among three constructed at sea in the mid-1950's at a cost of \$12.3 million. It became surplus to Air Force needs partly due to the shift in defense requirements from aircraft to missiles and partly due to the physical danger of the buffeting sea to occupants of this tower, which was located 137 miles east of Cape Cod.

The combined American-British construction effort on the third Ballistic Missile Early Warning System (BMEWS) station, located at Fylingdales in the United Kingdom, was completed in September 1963. The British Government financed and built the real property supporting facilities, while the Air Force expended about \$169 million in other construction and outfitting work. Improvements underway at the other two BMEWS sites included installation of an electric powerplant and a 9-mile pipeline feeder at Thule, Greenland, and an additional detection-tracker-gapfiller and supporting warehouse at Clear, Alaska.

Congress authorized \$45 million for a fighter-interceptor squadron dispersal program and appropriated \$39 million in the 1964 budget. To keep dispersal costs within this figure and to keep in line with tentative force guidance provided by OSD, some reprogramming was done. By mid-June, OSD had tentatively approved a dispersal program, and the Air Force had completed 80 percent of the design work and let contracts for \$6.9 million.

Construction companies completed in May 1964 the reinforcement of rock faults in the underground chambers carved into Cheyenne Mountain at Colorado Springs, Colo., for the NORAD Combat Operations Center.

The Air Force awarded \$9.2 million in contracts for high power UHF communication improvements along the Distant Early Warning (DEW) line. Troposcatter powerplant installation at Hall Beach, Canada, and at Thule, Greenland, were essentially complete.

With the acceptance and formal dedication of the chapel on September 22, 1963, the Air Force marked the closeout of construction on the Air Force Academy, at a total cost of \$141.5 million. However, congressional authorization in March to expand cadet enrollment from 2,529 to 4,417 necessitated renewed planning for a commensurate ex-

pansion of facilities. In the absence of design contract funds, Headquarters, USAF, and academy base civil engineering offices prepared the cost estimates, concept drawings, and planning studies. Final design and construction arrangements awaited congressional approval of expansion plans.

At the end of June 1964, the Air Force had 219 active major installations, a decrease of 14 (11 overseas and 3 domestic) over the year. Active bases were classified as follows:

Type	U.S.	Overseas	Total
Operational.....	76	53	129
Operational Support:			
Flying.....	6	6	12
Nonflying.....	12	4	16
Training.....	38	0	38
Research and Test.....	9	0	9
Logistic.....	10	0	10
Foreign Bases (non-U.S. property).....	0	5	5
	151	68	219

Family Housing

To support the Air Force family housing program for fiscal year 1964, DoD allocated \$257.4 million from the total family housing appropriation. The Air Force completed 3,269 new family housing units during fiscal year 1964 and had another 3,032 under construction at year's end. Of the finished units, 2,693 were built with appropriated funds (2,269 in the United States and 424 overseas). The other 576 were built under the Capehart-Rains (Title VIII) program. The entire Capehart-Rains program was completed on schedule on December 20, 1963, including 60,434 units built at a cost of \$968,354,324. Some 447 eligible builders obtained the necessary financing from private lenders under FHA-insured mortgages that are being amortized. Land and off-site utility facilities were bought with appropriated funds.

There were 1,030 conventional family housing units still under construction on seven bases in the United States. On three other bases, the Air Force had planned differing types of apartment dwellings—a 100-unit high rise, a 200-unit terrace, and a 150-unit garden. These held promise of substantial savings in land development and utility costs. In another approach to this same objective, encouraged by a new DoD folio issued on April 24, 1964, Air Force designers also drew

up plans of townhouses arranged in cluster courts for possible future construction.

After the pilot project to erect 135 movable-type houses at small or temporary installations proved successful in fiscal year 1963, the Air Force inaugurated a large-scale program in July 1963, awarding six contracts for a total of 1,262 movable units. Assembled in factories, the units will be transported to 14 U.S. bases by truck and to Clark Air Base, Philippine Islands, by Navy transport. A new design feature incorporated in 1964 permits the units to be tied into duplexes, with a consequent savings of \$0.8 million on the 800 being produced this year. Based on the pilot project findings and the current contracts, the Air Force felt that these units were the answer to its temporary housing needs, offering both economy and greater comfort.

The British Defense Ministry cleared the final surplus commodity project for construction, and a contract was awarded in March 1964. This 408-unit project for USAF personnel at Lakenheath/Mildenhall, United Kingdom, was originally authorized in fiscal year 1960.

The Congress, in Public Law 88-174, November 7, 1963, reduced the total DoD lease unit limitation from 7,500 to 5,000 units, of which the Air Force share was 1,250 units. This program was first started to provide housing for personnel assigned to Army NIKE missile sites. In 1962, the program had been expanded to permit its use at other installations and by the other Services. The Air Force agreed with the concept that leasing should be used primarily for tactical sites and at installations whose tenure was uncertain, but it also believed that leasing should be considered elsewhere under certain conditions. For example, in high-cost-of-living areas, businessmen might be able to build and lease dwellings for less money than it would cost the Government to build on-base housing. The Air Force also believed that if authorized to engage in multiple leasing (leasing a whole apartment building rather than just a few units in it, for example) it could obtain better terms from owners.

The Air Force awarded contracts for \$2.7 million in Wherry housing improvements on eight bases during the year. By June 30, 1964, 34,886 Wherry units had been renovated. The Air Force also let contracts totaling \$1.6 million for the repair and improvement of non-Wherry housing at six other bases.

The number of family housing units in the Air Force inventory as of the end of June 1964 was as follows:

Program ¹	Units existing
Appropriated Funds.....	36,539
Title VIII (Capehart-Rains).....	60,433
Wherry.....	35,544
Rental Guaranty.....	2,070
Surplus Commodity.....	5,980
MAP.....	160
Leased.....	856
Lanham (Adequate).....	764
Other.....	108
Total.....	142,454

¹ Excluding 5,885 inadequate units and 2,347 trailers.

Base Maintenance

The Air Force added new facilities valued at approximately \$0.9 billion to its real estate inventory. Over the past decade the value of USAF real property facilities has grown from \$3.8 billion to \$15.8 billion. Actual replacement value is approximately \$27 billion. The cost of operating and maintaining these facilities more than doubled—\$402 million to \$879 million. During this same period, the Air Force, through standardization and centralization of base maintenance practices, has actually reduced the number of persons required to operate and maintain its physical plant. In continuance of this program, Headquarters, USAF, established model base maintenance centers at six air bases across the United States during fiscal year 1964. Five key supervisors at each model base were given intensive instruction in centralized base maintenance concepts and procedures, including a 1-week special course at the Civil Engineering Center, Wright-Patterson AFB, Ohio. The Air Force will test the adequacy of current base maintenance directives under field conditions at the model bases, and civil engineering personnel from other bases will visit them to study the improved techniques in operation.

There were 2,944 fires reported during the year, 599 more than the previous year. Aircraft accounted for 313; the rest were structural (buildings, material, equipment, etc.). The structural fires caused injury to 142 men, the deaths of 16, and damages totaling \$17.9 million—\$7.9 million in buildings, \$5.7 million in contents, and \$4.3 million other. Two fires involving missiles in silos accounted for \$13.8 million or 77 percent of these losses. Total aircraft losses from both impact and fire cost \$204 million, an increase of \$26 million over the previous year. Fifty-three persons were rescued in the aircraft incidents.

VII. Research and Development

The Air Force, in the spring of 1963, had organized a special study known as Project FORECAST to examine trends in science, technology, and the cold war and their possible impact on the Air Force in the decade between 1965 and 1975. Project FORECAST became a year-long effort which involved several hundred key USAF military and civilian planners and scientists, assisted by Army and Navy representatives and experts from university and industrial circles.

Partly on the basis of the scientific, technical, and planning reports and studies completed by Project FORECAST, the Air Force began to support an expanded program in several areas of advanced technology. The Air Force also initiated a program definition study of a new large transport aircraft and undertook a limited study of a new manned strategic bombardment aircraft system. A variety of aircraft weapon systems were also identified by FORECAST and remained under consideration at the end of the fiscal year.

In support of USAF research, development, test, and evaluation (RDT&E) activities, Congress appropriated \$3.453 billion, about \$150 million less than the previous year. The reduction was attributable in large part to the fact that USAF ballistic missiles were nearing the end of their RDT&E cycle. Together with funds transferred from prior years, the DoD emergency fund, and other appropriations, the amount available as of June 30, 1964, had increased to \$3.707 billion, an amount comparable to the fiscal year 1963 figure.

On November 20, 1963, the Defense Department announced several changes in the management of ballistic missile and space test ranges. The principal one involved the establishment of a central authority within the Air Force to coordinate planning of ICBM and space vehicle launching instrumentation support and tracking activities centered at Cape Kennedy, Fla., and at Point Arguello and Vandenberg AFB, Calif. Responsibility for certain elements of the Pacific Missile Range was transferred to the Air Force from the Navy.

To implement these changes, Headquarters, USAF, established the National Range Division under the Air Force Systems Command and directed it to take over these new responsibilities, effective July 1, 1964. Subsequently, the Air Force redesignated the Atlantic and Pacific

Missile Ranges to Air Force Eastern and Western Test Ranges, respectively.

In September 1963, the Air Force and the National Aeronautics and Space Administration reached an agreement for NASA's use of the USAF-developed ATLAS, ATLAS-AGENA, and THOR-AGENA launch vehicles. The agreement incorporated a standard nomenclature for the launch vehicles and stages and listed the separate responsibilities of USAF and NASA for development, testing, and procurement of basic ATLAS and THOR boosters and AGENA D stages, and their launching at the Eastern and Western Test Ranges.

DoD and NASA formally agreed in October 1963 to coordinate all advanced exploratory studies and follow-on actions on manned orbiting research and development stations. This agreement preceded by several months a decision by the Secretary of Defense authorizing the Air Force to initiate development of a near-earth Manned Orbiting Laboratory (MOL) as an experiment.

Headquarters, USAF, negotiated a number of cooperative research and development agreements during the year with several NATO countries. It agreed to cooperate with the French Air Force in the areas of vertical and short takeoff and landing (V/STOL) aircraft technology and light amplification (LASER) research. The Air Force also agreed to participate with the British Ministry of Aviation in a joint beryllium research and experimental program for aircraft engines.

Weapon System Development

Strategic Systems

Research, development, and testing of an entire category of USAF strategic weapons systems—the long-range liquid-propelled missile—came to an end during the year with the successful launch of the thirty-third and final TITAN II research and development ICBM on April 9, 1964. The launch closed out the liquid intercontinental ballistic missile experimental test flight program which the Air Force had begun on June 11, 1957, when an ATLAS was fired for the first time. Although other TITAN and ATLAS missiles were scheduled for launchings from Cape Kennedy and Vandenberg AFB, their flight objectives would no longer relate to liquid-propelled missile research and development.

The Air Force also neared the end of its MINUTEMAN I test flight program with a launch on March 20, 1964, of the solid-propellant ICBM some 5,000 miles down the Eastern Test Range. This was the fifty-third MINUTEMAN I test flight, and only one more launch remained to complete the flight program that began on February 1, 1961. Meanwhile, work on the advanced MINUTEMAN II missile

with a capability for either larger payloads or greater range continued.

To insure that U.S. ballistic missiles would penetrate known or anticipated enemy defenses, the Air Force vigorously pursued research and development on re-entry technology, designated the Advance Ballistic Re-Entry System (ABRES) program, development work included five full-scale test flights using ATLAS boosters at the Eastern and Western Test Ranges. In addition, the Air Force launched two ATHENA vehicles from Green River, Utah, toward the White Sands Missile Range, N. Mex., as part of a low-cost test program using scaled re-entry vehicles. Both launchings were partially successful.

On the recommendation of the Air Force, OSD in March 1964 reduced the B-70 experimental program from three to two aircraft. On May 11, the first delta-winged XB-70—the heaviest plane ever built—was rolled out of Air Force Plant 42 at Palmdale, Calif. Flight tests, scheduled to begin during the summer of 1964, and run until November 1965, will be limited to investigating the feasibility of high speed flight (to Mach 3) by large aircraft.

The Air Force supported various advanced studies including those of Project FORECAST for a follow-on aircraft to the B-52. On the basis of these studies, it sought \$52 million from OSD to initiate development of the new system.

Tactical Systems

Development of the F-111 (TFX) tactical fighter remained on schedule during the year. Detailed aircraft specifications were completed and fabrication of airframe components and subsystems for the test aircraft began after the successful development engineering inspection in August 1963. Plans call for the new fighter to be equipped with Pratt & Whitney JT-10A (TF-30) engines, variable sweep wings, and terrain avoidance and attack radars to facilitate supersonic penetration to a target. The first F-111 test flight was scheduled for December 1964.

Two USAF contractors completed a comprehensive study of a V/STOL fighter aircraft. The study included parametric analyses of performance and operational factors including command and control, logistic, and various basing concepts.

In the area of conventional munitions, the Air Force continued an expanded program to develop improved nonnuclear weapons. The program resulted in standardization and production, which should materially increase the effectiveness and flexibility of USAF tactical forces.

The Air Force began development work on the Mobile Mid-Range Ballistic Missile (MMRBM) following successful completion of the program definition phase in June 1963. The concept called for a small

two-stage, solid-propellant MMRBM for oversea deployment. In early 1964, however, congressional doubts over DoD plans for operational control, oversea siting, and related factors led to funding restrictions. The Air Force, nevertheless, kept the MMRBM contractor team intact at a minimum work level pending a decision on whether to proceed with the program.

Earlier, OSD directed USAF to undertake a related study of a Transportable Mid-Range Ballistic Missile (TMRBM), a weapon to be used in a mobile mode to accomplish part of the MMRBM mission. The Air Force awarded a \$1 million contract to Space Technology Laboratories to conduct the study, to be completed in October 1964.

In fiscal year 1964, the Air Force initiated a study aimed at developing advanced guidance techniques for a proposed air-to-surface missile that would meet requirements for a high accuracy weapon with superior characteristics. USAF officials hoped to demonstrate the feasibility of such improved guidance and begin its development as part of the tactical fighter technology program.

Defense Systems

The President on February 29, 1964, revealed the existence of the A-11 aircraft, which the Secretary of Defense later identified as the YF-12A, an interceptor aircraft. Testing of this formerly secret aircraft was proceeding at the end of the fiscal year.

The Air Force started feasibility studies of both the F-102 and B-57D to determine which could provide the best high altitude target for ADC interceptor training. In a related move, the Air Force planned to convert 45 BOMARC A missiles to targets. These vehicles, being phased out of the interceptor inventory, would otherwise be scrapped. Modification to the target configuration was estimated to cost \$12,000 per missile. Another 34 BOMARC A's were retained to meet TAC and AFSC drone requirements. ADC was designated executive agent for the BOMARC drone program and made responsible for all launches conducted from the Eglin Gulf Test Range. In addition, the Navy will use 125 BOMARC A missiles for its drone program being conducted over the Western Test Range.

Space System Developments

Manned Orbital Laboratory

On December 10, 1963, the Secretary of Defense assigned responsibility for the development of a near-earth manned orbital laboratory (MOL) to the Air Force and simultaneously terminated the Dyna-Soar (X-20) project. The MOL will consist of a pressurized cylinder

approximately the size of a small house trailer, launched into orbit by a TITAN III booster, to serve as a vehicle in studying the military usefulness of man in space.

The laboratory will be designed so that astronauts can move about freely in it without a space suit and conduct observations and experiments over a period of up to a month before returning to earth. During the launch into orbit, the astronauts will sit in a modified GEMINI space vehicle; once in space, they move from the GEMINI to the laboratory. After completion of their tasks, they will return to the GEMINI capsule for the flight back to earth. The first manned flights are tentatively scheduled for late 1967 or early 1968.

Advanced Re-entry and Precision Recovery Program

With the termination of Dyna-Soar, the Air Force gave increased attention to its ASSET advanced re-entry and precision recovery program. ASSET (Aerothermodynamic and Elastic Structural Systems Environmental Test) is the first USAF vehicle to use the lift force of wings as a re-entry aid and should provide the technology for a possible future ferry vehicle to support the manned orbital laboratory. The Air Force launched the first 1,140-pound ASSET vehicle on September 18, 1963, from Cape Kennedy, and it reached an altitude of 200,000 feet and a velocity of 16,000 feet per second. Although the vehicle was not recovered because of a malfunction in the recovery system, the Air Force obtained most of the desired data by telemetry from 130 temperature, pressure, and acceleration pickup points.

The September flight established the feasibility of operations at velocities up to 16,000 feet per second with respect to structural integrity and also demonstrated that communications were possible during the re-entry portion of the flight. A second ASSET test flight, on March 24, 1964, failed when the second stage of the THOR-DELTA booster misfired. A third launch was scheduled for July 1964.

TITAN III Space Booster

Development of the TITAN III, a standardized space booster capable of launching payloads of 5,000 to 25,000 pounds into a great variety of orbital paths, continued on schedule and within cost estimates. On July 10, 1963, the Air Force awarded a contract for construction of the TITAN III integrate-transfer-launch facility at Cape Kennedy, and work there proceeded on schedule.

Meanwhile, a new TITAN III solid motor test stand was completed at Edwards AFB, Calif. In May 1964, the first attempt to static ground test the five-segment 120-inch motor there failed. It was the first failure after three successful test firings at the contractor's Coyote, Calif., facility and was attributed to faulty fabrication and inspection.

A special test of a single-segment motor was conducted at China Lake, Calif., during the period. Placed on a sled, the motor accelerated and then impacted against a steel-faced solid barrier. The test demonstrated that the propellant would not detonate but would merely continue to burn during a motor failure.

By the close of the fiscal year, the Air Force had formally accepted the first complete TITAN III flight vehicle and scheduled it for the initial test launch during August 1964.

Solid-Propellant Rocket Motors

On September 13, 1963, the Air Force Rocket Propulsion Laboratory at Edwards AFB, Calif., achieved an important first by successfully terminating the rocket thrust of a solid-propellant motor, restarting, then throttling it. The thrust, throttling, and on-off pulsing capability opens the way for using comparatively low-cost solid rockets in applications where heretofore only liquid-propellant systems could be used.

On August 17, 1963, the Air Force selected three contractors to begin the feasibility development of large, solid-fueled 156- and 260-inch diameter motors capable of generating up to 1 million and 3 million pounds of thrust, respectively. Final approval was held in abeyance for a time, pending a DoD-NASA reevaluation of requirements and management responsibilities. Subsequently, OSD confirmed the Air Force as project manager and approved development of the 156-inch segmented motor as well as the general program for technology advancement.

The Air Force believed that it could use the 156-inch motor in both missile and space applications. In the case of the 260-inch motor, primarily of interest to the civilian space agency, NASA and DoD agreed that the latter would fund development only through the end of fiscal year 1964. NASA would finance and manage any work beyond existing contracts.

No serious technical difficulties were encountered during the year except for some unforeseen manufacturing problems with the new high nickel content steel being used for the cases in both the 156- and 260-inch motors. After a number of satisfactory subscale motor firings were completed, one contractor, in May 1964, conducted a highly successful test of a single-segment 156-inch motor. It developed just under 1 million pounds of thrust and employed jet tabs for thrust vector control.

Related Space Development Projects

On August 6, 1963, OSD authorized the Air Force to undertake program definition studies of a standardized space guidance system for the TITAN III and subsequent space boosters. The new system

would be capable of achieving precise boosts into orbit, precision navigation and guidance in and during orbit change maneuvers, and precision de-orbit, re-entry, and recovery guidance. At the close of the period, the Air Force was evaluating proposals from four competitive study contracts, let on January 29, 1964.

In support of NASA, the Air Force made a special effort to improve the GEMINI launch vehicle (GLV), basically a modified TITAN II booster. Several operating problems, including longitudinal oscillation and combustion instability, were resolved. The Air Force also undertook a general improvement in the design of the TITAN II engine to eliminate certain minor deficiencies. The success of this effort was demonstrated on April 8, 1964, with the first unmanned launch of the 7,000-pound GEMINI capsule. The booster lifted off within 1 minute of its scheduled time after a countdown that proceeded without any unscheduled holds. The second stage of the TITAN II and the GEMINI capsule entered an orbit with a perigee of 99.6 miles and an apogee of 204 miles.

During the year the Air Force submitted to the Secretary of Defense a new exploratory development plan that called for perfecting and evolving interceptor vehicle-borne terminal guidance sensor techniques to aid in the detection and tracking of satellites. OSD approved the plan on June 26, 1964, and released a half-million dollars for development work on sensors.

In another development, also in June 1964, the Air Force began testing of a remote maneuvering unit, a small remote-controlled "baby satellite" in "weightless" flight aboard a KC-135 tanker. The 125-pound box-shaped device contains a TV camera. In further experimentation, it will serve as a laboratory tool for exploring different techniques.

In the fall of 1963 the Air Force began a series of tests of the SPACETRACK network to determine its ability to predict satellite positions with high precision. Results of 26 individual tests indicated that the network could predict the position of a given satellite to within 2 miles along and 1 mile across its orbital path.

Work on military communication satellites remained in the program definition phase during the year, awaiting completion of DoD negotiations with the civilian Communications Satellite Corporation on the possibility of a shared system. The Air Force kept a contractor working on design specifications for the communication satellites and a multiple launch disperser, pending final decision on the shared system.

In addition to the space-oriented projects described above, the Air Force routinely launched and orbited a number of capsules over the Pacific. The Air Force also conducted a number of successful flights

of the standardization of the ATLAS space launch vehicle. The Air Force also accepted the first of these standardized ATLAS SLV-3 flight articles and scheduled its launch for the summer of 1964. Earlier, the ATLAS launch vehicle achieved a perfect record of reliability in a series of 14 consecutive flights, several of them for NASA.

Supporting Developments

Transports

A giant step forward in military airlift capability was taken during fiscal year 1964. On December 17, 1963, the C-141A Starlifter completed a successful maiden flight at Dobbins AFB, Ga. The jet transport, the first one designed for modern military airlift, can cross oceans nonstop with a 33-ton payload at speeds of over 500 m.p.h. to drop as many as 123 fully equipped paratroopers on target.

Even beyond the C-141 concept, the Air Force initiated studies of a heavy logistic support aircraft (C-5A) that would provide rapid airlift of very large cargoes directly to forward areas anywhere in the world. As conceived by the Air Force and proposed by Project FORECAST, the new aircraft would take off and land on short fields and would provide a logistic system superior to the C-135B or the new C-141. The Air Force selected three airframe and two engine manufacturers during the year to begin design studies.

In the special purpose field, the HC-130H, an improved-performance Hercules transport, was designed to retrieve astronauts from any spot on the globe. As announced in September 1963, the HC-130H will include an aerial delivery system that can drop a variety of survival equipment into a small area, special electronic gear to aid in locating and identifying aerospacecraft, and additional fuel tanks for better coverage of remote areas.

In June 1964, the first XC-142 tilt-wing V/STOL transport rolled out of the contractor's plant in Dallas, Tex. This tri-Service project under USAF management is primarily directed at evaluating the operational suitability of such aircraft. The first XC-142, one of five prototypes being built, was scheduled to make its first test flight in late August 1964.

Earlier, the first X-19 VTOL aircraft made its initial hovering flight in November 1963. During a second lift-off attempt, however, an accident caused the left main landing gear to collapse. The aircraft was subsequently repaired and completed its ground testing. On June 26, 1964, a major milestone was reached when the X-19 flew both vertically and horizontally to inaugurate the flight test program. The X-19 is also a tri-Service project under USAF management.

In connection with V/STOL operations, Air Force personnel conducted tests of a very promising material for use in preparing landing pads. The material consists of polyester resin and fillers reinforced by continuous fiberglass which successfully withstands high temperatures. Field tests on a 25-foot diameter pad one-half inch in thickness disclosed that the material would set in 15 minutes on dry plowed and powdery soil. An X-14 aircraft used in these tests hovered at altitudes between 30 feet and 1 foot, took off and landed twice, and ran at up to 90 percent military power for 1 minute, generating 800° C. temperatures on the pad. Neither the pad nor aircraft sustained any damage. The experiments indicated that while application techniques needed refining, the material's effectiveness had been proven.

Facilities

In December 1963 the largest simulated high altitude rocket test facility in the free world was completed at Arnold Engineering Development Center, Tenn., making possible the testing of 500,000-pound thrust rocket engines under simulated high altitude conditions. The Arnold facility can be modified as required to test boosters developing thrusts of up to 1.5 million pounds.

Work also was completed on a new \$890,000 command and control system laboratory at L. G. Hanscom Field, Bedford, Mass. This laboratory is used in advanced system analysis, planning, research, experimentation, design, and intersystem engineering for USAF and national command and control systems. In October 1963, the Air Force dedicated the Frank J. Seiler Research Laboratory at the Air Force Academy. One of the three Office of Aerospace Research (OAR) field installations devoted to basic research, the laboratory will concentrate on aerospace mechanics and chemistry.

Advanced Technology

Research Vehicles

On July 19 and August 22, 1963, the X-15 rocket-powered research aircraft made record flights to heights beyond 350,000 feet (67 miles). Most of the aerodynamic objectives of the joint NASA-DoD X-15 programs have been attained, and the program has been reoriented to support scientific experiments which use the X-15 as a test-bed vehicle.

OSD conducted an over-all review of the X-15 program to verify that anticipated research results would justify expenditure of funds to modify and repair the No. 2 airplane damaged in an accident on November 9, 1962. Modifications were completed on schedule, and the repaired X-15-2 made its first test flight on June 25, 1964. The modifications increase the design speed capability to 8,000 feet per second

and provide for testing subsonic and supersonic burning ramjet engines with liquid hydrogen fuel.

In August 1963, the second of two X-21A laminar flow control aircraft entered its flight demonstration phase. It achieved slightly more laminar flow over the wings due to an improved surface with fewer manufacturing irregularities. These tests plus extensive wind tunnel experiments confirmed that the leading edge radius of the X-21 was too large. The program was reviewed, \$500,000 was reprogramed, and both X-21A's were modified to benefit from additional research.

Propulsion and Power

Prior to June 1963, all USAF hypersonic propulsion efforts were focused on the aerospaceplane project, the objective being to develop a manned vehicle that could be launched into orbit, returned from orbit at the pilot's convenience, and landed at a conventional airfield. In July 1963, the Air Force shifted its emphasis from a space-oriented to a sustained hypersonic cruise program. Development of a Mach 8 ramjet engine continued under contract, with the immediate objective of building and demonstrating an 18-inch diameter flight-weight regenerative cooled version.

The most ambitious and advanced concept of all the air-breathing propulsion units was the supersonic combustion ramjet engine. Three USAF contractors continued to investigate problems of inlet, nozzle, and combustion for such an engine. In April 1964, the Air Force requested proposals for a small flight test vehicle to prove the concept. Evaluations of several proposals were under way at the end of the period.

Early in 1964, the Air Force initiated research on a turbo-accelerator. Contracts were awarded to fabricate and test critical components of a turbo-ramjet engine and then select an optimum cycle. If test findings justify it, the Air Force will build a demonstrator engine and carrier to conduct demonstration flights in the 1969-70 time period.

Work proceeded during the year on flight tests of Systems of Nuclear Auxiliary Power (SNAP). On September 23, 1963, the Air Force successfully orbited a Navy SNAP 9A device aboard a THOR-ABLE-STAR vehicle. The radioactive generator, weighing 27 pounds, is capable of producing 25 watts of power for 5 years. SNAP 10A, another unit under development, is scheduled for future flight testing. The Atomic Energy Commission (AEC) will assume funding responsibility for test flights after fiscal year 1964.

Major experiments were completed during the year on the joint USAF/AEC SNAP-50/SPUR turbine development, the heat transfer equipment, and the bearings. OSD approved USAF plans for the preliminary design of a flight test vehicle. The purpose of this

joint work is to demonstrate a nuclear reactor as a source of energy for space power in the range of 300 to 1,000 kilowatts.

The Air Force also continued to support ORION conceptual studies on the feasibility of a series of small nuclear explosive charges propelling a space vehicle. In April 1964, the USAF Scientific Advisory Board reviewed the findings and concluded that the concept should be actively pursued in underground experimentation.

Avionics

In July 1963, the Air Force awarded a fixed-price contract to develop a prototype Stellar-Inertial-Doppler System (SIDS) for aircraft navigation to be delivered to the Central Inertial Guidance Test Facility, Holloman AFB, N. Mex., for laboratory and flight testing. This navigation system is an outgrowth of the SKYBOLT technology.

In February 1964, the Air Force proposed to OSD a development plan for a lightweight, helicopter-transportable version of the LORAN C low frequency hyperbolic navigation system. The Air Force asked for authority to procure and test a single ground transmitting chain of three stations and a number of airborne, vehicular, and man-packed receiver stations consisting of receivers, computers, and control-display units. On March 27 OSD approved what became known as the LORAN D advanced development program, directing that the Air Force emphasize test and evaluation. In June, OSD authorized \$3 million from its emergency fund and from USAF internal reprogramming actions. The Army promised a half-million-dollar contribution. At the close of the period, the Air Force was soliciting contractor proposals.

Another precision inertial navigation system, this one suitable for flights of long duration, is being developed by the Instrumentation Laboratory of the Massachusetts Institute of Technology. This small, lightweight unit would incorporate many of the inertial components developed for ballistic missiles. Preliminary work, begun in March 1964, aims to test components of the navigation system to adapt it for use in aircraft.

Development of an improved "all-weather" landing system progressed rapidly during the period. The major problem involved the emergency reversion from automatic to manual control during the critical flight phase. In conjunction with the FAA, the Air Force conducted flight research to solve the control-display problems associated with letdown, approach, landing, and takeoff of high performance aircraft during "blind" flight conditions. Forty-one USAF, FAA, and commercial pilots participated in the first phase of the program that consisted of some 1,200 blind takeoffs and landings.

Materials

During the year the Air Force expanded its program in advanced materials technology. In laboratory experiments a combination of boron fibers and a plastic binder were formed into a very lightweight, high strength, and rigid material. Composite of this nature may provide considerably higher performance if it can be incorporated into aerospace vehicle structural or propulsion systems. OSD recognized the potential of the technology and approved funding to expand USAF developmental work. Meanwhile, in-house laboratory and contractual research concentrated on a possibly significant cost reduction in the manufacturing process.

The Air Force also intensified its research to improve toughness in high strength metals. One highly worthwhile benefit would be in the fabrication of stronger and lighter steel rocket casings. The Air Force also pushed research on the dispersion of a small percentage of an oxide through a metal to raise its useful temperature limits. Successful extension of this technique might raise jet turbine inlet temperature limits to as high as 2400° F., providing a substantial increase in thrust and efficiency.

USAF in-house work on an experimental heavy load grease to lubricate the F-111 variable sweep-wing pivot bearings was successful. The bearings are expected to be under extremely heavy loads and must function over a wide temperature range. According to the F-111 prime contractor, the USAF-developed grease proved to be best among a number of lubricants evaluated. A unique formulation of a specific silicon-type fluid with an aryl urea thickener, the grease contains an additive which greatly improves its load-carrying capacity and reduces wear.

Research

Space Experiments

To gain more precise information on the rate of decay of the enhanced Van Allen radiation belt caused by nuclear detonations, the Air Force during the summer of 1963 launched a 50-pound instrument package aboard a satellite with an apogee of 2,568 miles and a perigee of 206 miles. The package was part of a satellite ejected into polar orbit from another space vehicle launched from Vandenberg AFB. It measured the angular distributions and energies of charged particles in the earth's magnetic field and upper ionosphere.

In another experiment, on October 7, 1963, the Air Force launched into nearly circular polar orbit two identical nuclear detection satellites. The purpose of these vehicles was to provide data on the operation of nuclear test detection sensors in space and information on the natural radiation environment in which they functioned. Each

spacecraft weighed about 500 pounds and contained 14,000 solar cells and 40,000 electronic components. The experiment, which proved outstanding in all respects, was conducted for the Advanced Research Projects Agency.

The Air Force also successfully launched into orbit the tetrahedral research satellites to obtain information on radiation damage in space. The twin research vehicles, measuring 6 inches on a side and weighing only 1½ pounds, were developed to provide an inexpensive, flexible satellite capable of making accurate scientific measurements in space. The information will assist in design and construction of future manned and unmanned vehicles.

The Air Force's Sacramento Peak Observatory continued its studies of the sun and its influence on the earth's environment. As part of its solar patrol program, by monitoring the gradient of the magnetic fields around solar flares, the observatory was able to forecast dangerous periods in which proton showers would exceed safe levels for an unmanned or manned space flight.

On October 14, 1963, the Air Force Cambridge Research Laboratories produced a continuous, time-lapse solar motion picture—the first of its kind. The movie, accelerated 960 times, compressed into 20 minutes viewing time the activity of the sun during a 15-day interval and revealed the evolution of active solar centers. The film showed development of an intense magnetic storm in the earth's atmosphere one day and a great cosmic ray flare the next.

In other research, USAF scientists using the 84-foot radio telescope at Sagamore Hill, Hamilton, Mass., continued explorations of radio emanations from the sun, radio stars, and the planets. Measurements were made of flare stars to determine the mechanisms of radio emissions and to discover if there were flaring similarities on these stars and on the sun.

Upper Atmospheric Research

On July 1, 1963, the Air Force set up on five continents a worldwide network of 19 "riometer" stations to measure "relative ionosphere opacity"—the amount of radio energy from space penetrating the ionosphere. As the ionosphere increases its density, less radio energy can penetrate. Density is increased by solar disturbances and by nuclear explosions at great altitude. Riometers will study effects of such explosions on communications.

During the solar eclipse of July 20, 1963, USAF, NASA, and Canadian scientists joined in an extensive study of the upper atmosphere. Using various rockets, instruments were carried aloft to measure variables in the ionosphere regions, the electron density and temperature of the upper atmosphere, and the absolute intensity of

spectral features in the far ultraviolet region of the night airglow, both during and after the eclipse. Rockets were launched on a tight schedule from the Air Force Churchill Research Range, Fort Churchill, Canada. During the short period of the maximum eclipse, three different types of rockets—BLACK BRANT, AEROBEE 105, and NIKE APACHE—were in the air simultaneously. The experiments proved generally successful.

In another research program, the Air Force began studies of high altitude clear air turbulence (CAT), a condition which has been blamed for a number of accidents including the loss of several B-52's. To collect necessary data on CAT phenomena, the Air Force installed special instrumentation in a U-2 aircraft and, on February 20, 1964, made the first checkout flight. The Air Force plans to conduct regular flights over a 3-year period to obtain precise measurements of clear air turbulence in the altitude ranges from 50,000 to 70,000 feet.

Aerospace Medical Research

The Air Force and NASA undertook to coordinate their separate aerospace medical research at the USAF's Aerospace Medicine Division (AMD), Brooks AFB, Tex., and NASA's Ames Research Facility, Moffett Field, Calif. During a series of meetings beginning in August 1963, the two agencies established procedures to insure continuing coordination of their separate bioastronautics or life science work.

AMD's Aerospace Medical Research Laboratory initiated lunar gravity research under simulated conditions. Using an aircraft flying a zero-gravity parabolic flight path, the laboratory tested man's ability to move about at one-sixth of the earth's gravity. Low frictional forces caused the "astronauts" to stumble backwards when trying to turn while running forward. In another area of research, AMD completed the Cobalt 60 Radio-Therapeutic Clinic at the Wilford Hall USAF Hospital. The clinic uses the most powerful (6,700 curie) cobalt source now available in the United States.

VIII. Procurement and Production of Materiel

Air Force funds programed for aircraft and missile production totaled over \$7.06 billion, a decline of 5.6 percent over funds available in fiscal year 1963, which in turn had dropped 4.7 percent from the previous year. The decline was partly due to the termination early in fiscal year 1963 of the B-52 and B-58 production lines and the termination of the ATLAS and TITAN production about a year later. There was a partly compensating factor, the increased procurement of missiles and related equipment for the MINUTEMAN strategic force and the BULLPUP tactical missiles. In the net, however, the procurement figures declined somewhat, with the prospect of a continuing reduction during fiscal year 1965, as the production rate of MINUTEMAN was expected to pass its peak.

The following table compares funds available for new procurement during the past 3 fiscal years:

AIRCRAFT AND MISSILE PROCUREMENT

(In Millions of Dollars)

Fiscal year	Aircraft and support equipment	Missiles and support equipment	Other ¹	Total
1962-----	3,695.1 (47.1%)	2,973.4 (37.9%)	1,178.1 (15%)	7,846.6 (100%)
1963-----	3,939.1 (52%)	2,638.7 (34.8%)	997.0 (13.2%)	7,574.8 (100%)
1964-----	2,340.5 (33.1%)	1,865.1 (26.4%)	2,859.4 (40.5%)	7,065.0 (100%)

¹ Modifications, facilities, components, etc.

Aircraft and missile deliveries held up very well during the fiscal year. Aircraft deliveries exceeded the final production schedule by 1 percent, and there were no significant production problems encountered in missile production. The Air Force accepted a total of 11 ATLAS, 46 TITAN, and 487 MINUTEMAN ICBMs. Tactical missile acceptances included 4,170 operational BULLPUP air-to-surface missiles and 2,750 trainer BULLPUPs.

In November 1963, the first two F-4C tactical fighters were delivered to TAC. By the end of June 1964, 129 had been accepted as well as 4 RF-4C's.

Production of the F-105D tactical fighter ended in January 1964 with delivery of the last aircraft. Delivery of a two-place version, the F-105F, remained on schedule and 84 had been accepted by the end of June.

F-104's came off seven assembly lines in the United States, Canada, Japan, Belgium, Italy, the Netherlands, and Germany. Total production from these sources was 134, bringing total acceptances of aircraft procured for recipient countries under grant aid and military assistance programs to 250.

Production of the C-130E continued on schedule, with 148 delivered. Total acceptances through June 1964 reached 227. Early in the year the Air Force contracted for 15 HC-130H's, the long-range aerial recovery version of the basic C-130 Hercules with an improved engine. The new plane will augment and improve search and rescue work. Rollout of the first-production HC-130H is scheduled for October 1964.

In June 1964, the Air Force accepted the first two KC-135B aircraft to be used by SAC for airborne command and control functions. The Air Force also accepted 84 additional KC-135A's for SAC inflight refueling.

The first production CH-3C—a high-speed, twin-turbine cargo or personnel helicopter—was accepted in July 1963. The first 3 of 20 CH-3C's delivered during the year were utilized in the FAA certification program. Subsequently, during a June 1964 flood disaster in Montana, CH-3C's assigned to the SAC missile wing at Malmstrom AFB rescued scores of people and transported supplies to persons isolated by high water. For this emergency, the aircraft were flown as much as 14 hours a day, well above the programed 2 hours.

The first UH-1F helicopter was delivered to the Air Force on March 31, 1964, and then returned to the contractor for testing. The UH-1F will be used to support ICBM sites as well as to provide airlift of critical supplies and personnel to areas that cannot be properly supported by surface or fixed-wing transportation. The procurement program through fiscal year 1964 calls for 51 aircraft.

Delivery of 15 crash-rescue, firefighting HH-43B's by June 1964 completed the 175 purchased. USAF acceptance by January 1964 of 24 U-10A/B utility transports also completed that program of 52 aircraft.

The Air Force reduced procurement of the T-37B primary jet trainer from 83 to 62 because of revised student pilot training requirements and changes in training techniques. First delivery is scheduled

for September 1964. Production of the T-38 supersonic basic trainer continued on schedule with 12 planes coming off the assembly lines per month. As of June 30, 1964, the Air Force had accepted 144 T-38A's. In October 1963, the last of the 143 T-39 utility trainers was delivered to the Air Force.

Aircraft engine production during fiscal year 1964 totaled 2,562, a decline from the 2,751 engines manufactured during the previous year. Expenditures for communication and electronic equipment for command and control, missile and aircraft warning, nuclear detonation detection, and other systems totaled \$428.2 million.

Procurement Policy

The Air Force reduced the volume of obligations on cost-plus-fixed-fee (CPFF) contracts to \$1.378 billion or 14.4 percent of total obligations. This compared favorably with the 27.8 percent (\$3.1 billion) on CPFF contracts in fiscal year 1963 and 46.8 percent (\$5.0 billion) in fiscal year 1962. In addition to this record, the Air Force also sought to award even more contracts of an incentive or fixed-price type.

Increased competitive procurement is an important part of the USAF cost reduction program and the concerted effort to save dollars. The Air Force awarded on a price competitive basis 21.2 percent of the total funds obligated on all contracts—a new high. The figure exceeded the OSD goal of 19.5 percent and the 18 percent for this type competition in 1963 and 17.3 percent in 1962.

These encouraging gains resulted from several new management practices, including the use of two-step formal advertising to obtain more competitive bidding. This procedure provides a way to obtain fixed-price competition in cases where initial specifications are not sufficiently definitive. In the first step of this procedure, the Air Force advertises for suppliers to qualify technically as sources and, in the second step, seeks price bids from among those found competent.

Late in fiscal year 1964, in procuring the T-X light trainer, the Air Force first employed this method for aircraft. During the first step, flight evaluation tests were conducted on competing aircraft supplied by several companies. Eight aircraft successfully qualified—three Pipers, two Beechcrafts, and three Cessnas. On June 30, 1964, invitations for bid were issued to the qualifying companies. Bids were to be opened in mid-July and the successful contractor announced on August 1. The projected procurement is for 170 aircraft.

The Air Force further reduced letter contract obligations. By the end of June, it had cut the amount in this category to \$347 million, which represented only 3.6 percent of total obligations. Two years

earlier there was more than \$2 billion on letter contracts, about 20 percent of total obligations. The Air Force accomplished the reduction through sustained efforts at all levels of management. In a related development, the Air Force required new letter contracts to include a schedule of events and dates leading to a definitive contract. The efficiency of individual managers will be measured in part by their ability to meet their schedules.

Significant savings were achieved during the year by eliminating "gold plating" while still obtaining superior equipment. Through the third quarter of fiscal year 1964, the Air Force had saved some \$55 million by eliminating certain quality requirements that exceeded actual need. This saving surpassed the established goal of \$41 million.

In the interest of further savings, in February 1964, the Air Force hosted a DoD working-level value engineering conference and described techniques in design, development, procurement, production, maintenance, and supply. It also chaired a DoD subcommittee organized to develop value engineering training guides. A military specification published on May 13, 1964, established minimum requirements for a value engineering program when such a feature is included in a contract. Use of the specification was made mandatory by the Services and the Defense Supply Agency (DSA).

The Air Force negotiated a project stabilization agreement between contractors and building trade unions to standardize construction costs and labor-management practices at Cape Kennedy and Patrick AFB, Fla. Acting on recommendations of the Missile Sites Labor Commission, the Air Force accepted the cost provisions of the agreement as standard compensation on all USAF contracts at Cape Kennedy, effective December 1, 1963, in order to insure uninterrupted, economical operations.

Air Force awards to U.S. business concerns amounted to \$9.76 billion in fiscal year 1964, a substantial decline of 12.9 percent from procurement of \$11.2 billion in the previous year. However, small business companies fared proportionately better during fiscal year 1964, receiving \$939.9 million, or 9.6 percent of prime contracts, contrasted with awards of \$978 million during the previous year, only 8.7 percent of the prime contracts. In addition, large prime contractors awarded \$1.5 billion to these small concerns in subcontracts.

Industrial Resources

Since World War II the Air Force has provided industrial production equipment to weapon system contractors. By June 1964, the Air Force estimated that it had an active inventory of some 92,000

items of equipment originally costing about \$1.37 billion. Since more than 60 percent of this equipment exceeded the useful life of approximately 10 years, it tended to increase manufacturing costs and reduce reliability of items produced.

To lessen this problem, the Air Force has disposed of the oldest and most inefficient items and replaced part of its inventory with modern equipment. Over-all size of the inventory was to be reduced by about two-thirds over an 8- to 10-year period.

To support its industrial facilities, the Air Force received \$51.6 million during the fiscal year—\$1 million less than in the fiscal year 1963 budget. The amount approved for aircraft industrial facilities came to \$24.3 million, 30 percent less than last year. Because of a reduction in facilities needed to support MINUTEMAN, the missile facilities apportionment was only \$9.7 million, 27 percent below the \$13.3 million for last year. RDT and E facility requirements were set at \$12.5 million.

In October 1963, the Air Force began a series of studies on the utilization of its industrial facilities. On May 22, 1964, it submitted a report to the Secretary of Defense on the 63 industrial facilities involving real property interests, including plants, runways, and test sites that were in the USAF inventory. Of these facilities, 16 were in the process of being or had been declared excess. Of the remaining 47, the Air Force reported that it would try to sell 28 to the using contractors, offer 7 for transfer to other agencies and 1 to ADC, and temporarily retain 11. Six of these were liquid oxygen/nitrogen and hydrazine facilities which the AFSC was studying for possible disposal.

The Air Force established Project TIDE (Tooling Inventory and Disposal Evaluation) on October 31, 1962, to improve the identification and control of facility-type items in the Government-owned special tooling inventory. Early estimates revealed that items valued at about \$55 million—such as special test equipment, amplifiers, etc.—were improperly classified as special tooling. Originally unique, these items have become commonplace in the aircraft industry. Target date for completion of the project was June 30, 1964.

During the year the Air Force made significant progress in reviewing contractor policies and procedures for acquiring special tooling and in identifying and reclassifying previously acquired items that qualified as facilities under current usage. As of June 30, 1964, 2,121 contractors were participating in the project and 1,989 had completed their work on it. A total of 67,279 items with a value of more than \$74 million was identified and reclassified as facilities. Of this total, 3,256 items with a value of more than \$3 million were found to be excess to

the contractors' requirements and were redistributed to satisfy other USAF needs.

The Air Force funded its program for improving manufacturing methods at a level of about \$18 million. The most significant technical areas being investigated were: (1) Processes for production of integrated electronic circuits; (2) boron filaments for structural applications; (3) more efficient solar cells; and (4) very large rocket motor cases. Studies continued to improve technology for machine tool control and to find new techniques for processing and fabricating superior metals.

Effective June 17, 1964, the Air Force executed an agreement with NASA on industrial facility services and support for both USAF and space agency projects. In general, it provides that services performed by the Air Force for NASA will be done on a reimbursable basis and that NASA will fund for new facilities required to support its own programs. This over-all agreement should eliminate the earlier practice of writing separate agreements whenever individual USAF-controlled industrial plants became involved in NASA work. Specifically, the new agreement covers facility expansions, administrative support, equipment modernization, plant custody, construction, capital-type rehabilitation, property damage, and joint facilities utilization. Capital-type rehabilitation costs will be shared on the basis of the division of labor in a plant working for both agencies.

Military Assistance Program

During 15 years of participation in the Military Assistance Program, the Air Force has helped to transform obsolescent and non-descript air arms of recipient countries into soundly equipped, well trained air forces. New accomplishments were recorded during fiscal year 1964 as grant assistance and sales assistance continued to be major components of the USAF program. The F-104G's produced by a consortium of European countries and Japanese-produced F-104J's were introduced into the inventories of their respective air forces during the year and a further degree of self-sufficiency became evident. There was an increasing willingness of our more prosperous allies to finance their own defense costs.

Special emphasis was placed on military assistance sales to improve the defense posture of the free world and to alleviate U.S. balance-of-payment difficulties. With economic prosperity all but eliminating grant aid for Western Europe and Japan, those areas were in fact beginning to share the burden of military assistance to the financially incapable countries.

However, requirements for grant aid from the United States increased in other areas. Stimulated by the rising tempo of counter-insurgency activity in South Vietnam, southeast Asia accounted for a significant portion of the new USAF assistance. India also received substantial military assistance, an outgrowth of the aggression by Communist China against that country in late 1962. In addition, a number of newly independent nations, especially in Africa, became eligible for military assistance on the basis of various Presidential determinations made under provisions of the Foreign Assistance Act of 1961, as amended.

In discharging its worldwide MAP responsibilities, the Air Force by the end of fiscal year 1964 had expended about \$9.45 billion of the \$10.24 billion authorized since the inception of the grant aid program. Additional equipment valued at some \$752 million had also been furnished from excess assets, with costs not chargeable to MAP appropriations. Over and above this, the Air Force provided materiel valued at almost \$111.2 million under MAP credit financing arrangements. USAF activities were also extensive in the field of military sales, with the cases funded having a cumulative dollar value in excess of \$1.5 billion by the end of the period.

An analysis of MAP recipients on a regional basis indicated that the \$9.45 billion, exclusive of excess and credit financing, was allocated as follows: Europe (including Turkey), \$5.53 billion or 58.5 percent; Asia, nearly \$2.16 billion or 22.9 percent; Latin America, \$161.8 million or 1.7 percent; and Africa-Middle East, \$140.5 million or 1.5 percent. The balance of \$1.46 billion, or 15.4 percent, was allocated on a worldwide basis.

Defense articles comprise the major portion of the costs involved in USAF military assistance programs, with aircraft valued at some \$5.35 billion being the principal item. Other major categories of materiel in the program included missiles, at \$578 million; communication and electronic equipment, \$555.7 million; ammunition, \$496 million; support equipment, \$407.7 million; vehicles and weapons, \$242.5 million; and maintenance, \$206 million. Training and supply operations cost some \$1.46 billion, while construction activity was priced at over \$154 million.

Aircraft deliveries under USAF military assistance programs now approximate 14,902, with jets accounting for more than 10,000 of them. Currently, some 280 squadrons (both jet and conventional) in foreign air forces are equipped with aircraft provided by the Air Force. Most of the advanced operationally ready units continue to be in the NATO area and in selected Asian countries.

During the past 15 years, some 4,447 foreign nationals have completed pilot training in USAF schools under grant aid, while 8,495

have completed other flying training courses both in the United States and abroad. On July 15, 1963, it was announced that the USAF will train German Air Force (GAF) pilots in F-104G jet fighters. The advanced training will increase the combat readiness of the GAF in support of NATO missions. A total of 48,007 missile and technical training courses and 23,079 other training courses given under grant aid have been completed both overseas and in the United States.

IX. Logistic Services

Logistic management techniques, founded on fast communications, computers, and rapid transport, are reducing maintenance and supply costs and increasing operational readiness rates. Since 1958, the value of the weapon systems inventory (aircraft, missiles, and communication and electronic equipment) has risen from \$23.6 billion to \$37 billion. However, the money spent each year on the purchase of spares for these systems declined from \$2 billion in 1958 to about \$770 million in 1964. At the same time, less than 5 percent of aircraft groundings, as contrasted with 13 percent in 1958, were due to parts shortages. In other words, while reducing its stocks of these expensive items, the Air Force through more efficient processing and shipping has provided them to the operating units when needed.

The computerized maintenance and supply data reporting system, while still far from complete, enabled the Air Force in 1964 to process and analyze about 50 million aircraft maintenance actions. The system both pinpointed problems and simplified the task of analyzing and solving them. It also pointed out instances where unnecessary time was being spent during scheduled maintenance inspections. As a result of these findings, inspection time on KC-135 jet tankers was cut from 9 to 2½ days and on B-52's from 11 to 3½ days. In effect, this added a wing of B-52's and a wing and one-half of KC-135's to the Nation's defense forces. In addition, it freed technicians for repairing many items which formerly had been sent to depots. This, in turn, reduced depot expenditures and cut down on the number of spare parts kept in depot pipelines.

Supply

In February 1964, the Secretary of Defense approved Air Force and DCA recommendations to expand the Automatic Digital Network (AUTODIN) serving as the Defense Department's primary logistic communication support network. AUTODIN handles 10 million messages a month. The 5 automatic electronic switching centers operating in the United States will be expanded to 19 at home and abroad. Four new centers in the United States, like the five already operational, will be leased. Ten oversea centers will be operated as Government-owned facilities. Installation of improved equipment will permit each

center to acquire, store, and transmit a far greater volume of data than was possible in the past.

An additional 17 bases joined the interim computerized base supply system during fiscal year 1964, raising the total to 102. These interim individual base systems, using equipment of varying size and age and performing under the auspices of the several commands, provide an excellent foundation for the standardized system scheduled to replace them.

To give direction and control to the standardized system, Headquarters, USAF, established a field extension of the Air Staff at Bolling AFB, Washington, D.C. Total cost of the equipment was estimated at \$37 million. The first of the new computers was put into test operation in the base supply facility at Andrews AFB, Md., in August 1964. After the test is completed and the computers accepted, the Air Force plans to convert 10 bases per month to the standardized system.

The gains registered in recent years by the bases operating under the interim base supply system have been impressive. With standard computers—and with the standardized and refined programs which the Bolling agency is developing—the bases should be able to achieve far greater reductions in supply stocks, parts inventory, and support personnel.

The Air Force completed the year-long Project MINT (Materiel and New Item Control Techniques) in September 1963. As new weapons, particularly missiles, came flooding into the USAF arsenal in large numbers in the late 1950's and early 1960's, the supply agencies found themselves acquiring repair parts and spares at a far faster rate than they could dispose of obsolete ones. The improvement of maintenance techniques complicated the problem by giving longer life to equipment which otherwise might have become outdated. One objective of the vast inventory review accomplished under MINT was to identify and eliminate items no longer used. An equally important objective was to collate items that were interchangeable or could be substituted for one another and retain only one of them. During the period of the MINT project, the Air Force examined technical data on 1.6 million line items, eliminated 418,701 of them, and marked another 68,000 for elimination after existing stocks were used up. While the Air Force terminated MINT as a special project, techniques developed during its operation were embodied in everyday USAF practices, with inventory review and control made an integral part of normal operating procedure. In July 1963, the Air Force line item inventory contained 1,866,837 items. By July 1964, it contained 1,715,060 items, the lowest in 5 years.

Air Force standardization actions, conducted in accordance with procedures set forth by Assistant Secretary of Defense (Installations

and Logistics) continued to reduce supply stocks. In the last two quarters of fiscal year 1964, 24,457 items were adjudged to be non-essential and were eliminated. The Air Force eliminated another 8,660 supply items because they duplicated the function of others.

At the same time that it worked to pare current inventories, the Air Force instituted measures to insure that only essential items would be added in the future. In cooperation with the other Services and DSA, the Air Force adopted "provisioning screening" in February 1964, submitting data to DSA's Logistics Services Center on items it intends to procure. The center screens the item against its central cataloging files. If another Service already has such an item, the possibility of the Air Force sharing in procurement or stocks is explored. In-house, the Air Force began a "no-data no-buy" policy that required AFLC to screen all requirements before purchase.

The Air Force received items worth more than \$2.7 billion (original cost) into its property disposal inventory during fiscal year 1964, and disposed of items worth approximately \$3.05 billion. This was only the third year since 1956 that the Air Force disposals exceeded generations, again attributable to Project REUSE accomplishments. The Air Force property disposal inventory decreased from about \$1.2 billion to \$859 million during the year. Much of the \$339 million decrease resulted from a large reduction of excess "on-hand" aircraft—from 1,750 to 1,082. The disposal rate of excess personal property—through withdrawals, reissue, reclamation, transfer to other Federal Government agencies, and donations—continued to improve. The rate stood at 57.5 percent in fiscal year 1964, as compared to 36 percent in 1959. Revenues received from sales of scrap and waste totaled \$9.6 million. Surplus property amounting to \$397 million (original cost) was sold for \$16 million, a 4 percent return.

Special attention was given to reusing property that became surplus in fiscal year 1964 as a result of base closures. Property valued at over \$5 million was reused during the year. In one case, the Air Force diverted \$1.5 million's worth of propellant loading tanks at a deactivated site to other USAF projects. In another instance, USAF officers removed \$1.2 million in fuel-handling pumps and meters from the Moroccan bases being deactivated for use at other Air Force bases.

Maintenance

Depot maintenance and overhaul during fiscal year 1964 amounted to \$686.6 million, a decline of 7 percent from the budget of \$736.6 million last year. Contractual maintenance, a principal part of this function, declined from \$328.4 million to \$308.7 million during this period. Missile and aircraft modification increased from \$766.6 mil-

lion to \$796.1 million, much of it accounted for by modification of the strategic bomber force to extend its operational usefulness.

The increasing amount of maintenance being performed at base level continued to reduce depot maintenance costs. In certain categories, the success of the program exceeded the Air Force's most optimistic estimates. On aircraft engines, for example, the Air Force now repairs and reinstalls 85 percent of all jet engines at base level compared with 57 percent 7 years ago. Several commands achieved a 95-percent base level installation on certain engines. The time between depot overhaul and inspection of engines was also being extended by replacing such items as compressor sections, turbine wheels, and hot section parts at the bases. The B-47 engine (J-47), for instance, underwent depot overhaul after about 125 flying hours in the early 1950's. By 1957, operating time between overhauls had been extended to 700 hours and under base level maintenance practices achieved by 1964 the engine averaged 2,000 hours before going to a depot.

Within the depots the policy of "repair rather than buy" fostered some innovations in repair techniques. Contract maintenance now repairs for \$20,000 a large FPS-24 search radar tube that the Air Force formerly replaced with a new one at a cost of \$51,500. Klystron tubes that cost \$5,900 to replace can now be repaired for \$986. Improved recapping techniques first developed for B-47 and KC-135 tires are now used on tires for most subsonic aircraft. These repairs saved many times their costs in new procurement.

Missiles have special maintenance requirements. The MINUTEMAN inertial guidance system runs constantly while the missile is on alert. To provide the necessary maintenance, the Air Force established a specialized repair facility at Newark Air Force Station, Ohio. At each missile support base a special shop has been built to calibrate precision instruments used in missile maintenance. With such "surgically clean" shops, technicians at Vandenberg AFB, Calif., for example, calibrated 2,500 items each month.

Transient aircraft maintenance costs were lowered during the year by reducing the number of men assigned to this duty. Studies indicated that 63 percent of all USAF bases received no more than one transient aircraft between midnight and 8 a.m., and 30 percent no more than one between 5 p.m. and midnight. Yet these bases kept crews on duty for round-the-clock transient maintenance. On April 1, 1964, the size of crews was cut back, enabling the Air Force to shift 363 military and 63 civilian spaces to other work.

The Air Force reactivated its Electronic Warfare Equipment Advisory Group (EWEAG) on September 24, 1963, to integrate its development, procurement, production, testing, support, maintenance, and employment of electronic warfare equipment. The group had

last met in May 1961. The increasing impact of electronic warfare systems on maintenance engineering and modification costs dictated that the group be reformed to coordinate these matters.

The USAF fiscal year 1964 cost reduction goal in the equipment maintenance category was \$98 million. By the end of the third quarter of the year, it had reported a savings of \$120.2 million and estimated that the full year's savings would be \$168 million.

Transportation

The Air Force continued to favor airlift for transportation of high cost supplies and spares wherever feasible. On a unit cost per pound, airlift is the most expensive means of transport, but the economics which it achieves in reduced procurement costs and stocks in the supply pipeline far outweigh its expense. In one category—aircraft engines—the Air Force has greatly reduced the number of spares in the pipeline by direct airlift from bases to repair depots. This alone has saved the Air Force \$7 billion in new procurement over the last decade. During fiscal year 1964, 54 percent of the total Air Force costs of \$181,209 for transporting cargo from depots to bases (second destination shipments) were for airlift, 30.7 percent for oceanlift, and 15.3 percent for surface movements.

In behalf of the Department of Defense, the Air Force requested the Civil Aeronautics Board to lower the international airlift minimum rates for contract civilian airlift. DoD traffic policy is placed with companies operating turbine-powered aircraft as a means of improving airlift readiness and at the same time achieving operating economies since they cost less to operate than piston-engine aircraft. The only carriers exempt from this policy and from the rate reductions are those operating in Alaska, between the United States and the Canal Zone, and between certain islands in the Pacific. For economic or operational reasons, piston-engine aircraft are better suited for these areas. Effective January 1, 1964, one-way passenger and convertible cargo rates remained the same—4.2 cents and 15.0 cents per statute mile, respectively. Round trip passenger-mile rates dropped from 2.75 cents to 2.55, cargo one-way ton-mile rates from 21.5 to 21.0, and cargo round trip ton-mile rates from 12.5 to 11.5. Cargo ton-mile rates were further reduced on July 1, 1964, one-way to 19.0 cents and round trip to 10.5 cents.

One result of the continuing effort to modernize LOGAIR, the domestic charter airlift, was to discontinue after July 1, 1964, the use of C-46's unless absolutely necessary. Minimum rates for the service remained the same. Plane-mile rates were \$1.485 for the DC-6 and \$1.49 for the Argosy. The minimum load for both remained 12.5 tons.

Available ton-mile rates were 11.88 cents for the DC-6 and 11.92 cents for the Argosy.

The MILSTAMP (Military Standard Transportation and Movement Procedures) program, a DoD project begun in fiscal year 1962, was put into operation in the spring of 1964. Under its provisions there are common standards and forms for documentation, shipment planning, and notification and reporting of freight movements, both domestic and overseas. Originally scheduled to start operating on July 1, 1963, the program was delayed by the Cuban crisis of late 1962. However, on October 1, 1963, the first phase of MILSTAMP became effective on material entering MATS, Military Sea Transportation Service (MSTS), LOGAIR, and other military terminals for transshipment. On April 1, 1964, the second phase—in-transit data reporting—was started. All other provisions of the program became effective on April 13, 1964. The data which are developed under MILSTAMP will be used to evaluate the efficiency of the logistic transport system.

During fiscal year 1964, most of the basic work to program logistics data into the reporting systems of the USAF Logistics Readiness Center (LRC) was completed. The Air Force had established the LRC during the Cuban crisis to centralize control over the pre-positioning of war materiel and retained it as a permanent adjunct of the USAF Command Post after the crisis. In case of new emergencies, its job will be to direct the swift relocation of Air Force war materiel to wherever needed.

Two more air bases were connected to commercial bulk aviation fuel pipelines, bringing the number receiving this service to 45. The Air Force granted approval to extend the service to another base, but difficulties in securing right-of-way delayed construction of the pipeline. Eleven other bases were being considered for the service. The private pipelines supplying the 45 bases saved the Air Force more than \$6 million a year in transportation, bookkeeping, and paper-handling costs. The companies also provided a reserve fuel storage of 2.5 million barrels for these bases at no cost to the Air Force.

X. Management

Air Force management during the year continued to emphasize the Secretary of Defense's 5-year cost reduction program. "Hard" and "cost avoidance" savings amounted to \$1.4 billion and \$0.8 billion respectively, for a total of \$2.2 billion. This compared with \$1.2 billion in fiscal year 1963.

A major source for these economies was the elimination of many cost-plus-fixed-fee contracts. By the end of June 1964, 15 Air Force commands no longer used them, having shifted to fixed-price or incentive contracts. More competitive contracting often lowered costs drastically for specific projects. For example, the nuclear detection satellites, when produced under an incentive contract, possessed superior performance characteristics and saved about \$26 million or about 32 percent of programmed cost. Studies showed that the Air Force could safely increase the storage life of MINUTEMAN solid-propellant motors from 3 to 4 years at an immediate saving of about \$25 million, while reducing motor procurement requirements in fiscal year 1965 by more than \$100 million. Suggestions from individual USAF employees have led to some impressive economies. One was instrumental in effecting a reduction of over 4,000 personnel at the plants of a USAF contractor, thus saving \$28 million; another proposed that excess B-52 engines be modified for KC-135 tanker aircraft at a saving of \$16 million in planned procurement orders.

The Air Force's increased combat effectiveness (ICE) program was also an important facet of the cost reduction drive. Known as Project ICE, it began shortly after President Johnson, in November 1963, asked the Service chiefs to seek new and better ways to obtain economy of operation. It required a detailed review of all Air Force missions and operations to determine their essentiality and the possibility of dollar and manpower savings. By the end of June 1964, well over 350 functions, organizations, and activities had been or were being examined. Project ICE and related actions contributed an estimated \$200 million to hard and cost avoidance savings during the year.

To improve the management of weapon and space development projects, the Air Force established in December 1962 the Program Evaluation Review Technique (PERT) orientation and training center in

Washington, D.C. The center conducts courses in industrial management techniques. During fiscal year 1964, the center trained 3,886 people.

In a related effort, the Air Force has developed an in-house cost analysis and estimating capability for weapon systems and program elements. A cost division was established within the Directorate of the Budget and a cost analysis course was begun at the Air Force Institute of Technology. Recent in-house cost studies have been made for OSD or the Air Staff on continental air defense, the F-111, the AMSA, and MMRBM alternatives.

Comptroller

Data Automation

The progressive automation of Air Force functions has contributed substantially to lower management and operating costs. To operate its complex military pay system more efficiently, the Air Force installed 172 small computers at 124 major bases.

The annual budgeting process has also been gradually automated. At both Headquarters, USAF, and in the field commands, officials have developed computer programs and distributed the necessary data to indicate total program costs in the 5-year force and financial structure. Cost estimate requirements and development of cost factors began on May 1, 1964, and data collection to feed the system will begin on July 1. The system will provide a complete tie-in between the program element and the appropriation budget.

The increased use of automation prompted Headquarters, USAF, to establish a central data automation design office and several regional automatic data processing survey offices. These offices, together with other organizational adjustments, require 263 new personnel spaces. As of June 30, 1964, 82 spaces had been authorized as the initial increment to permit the offices to begin functioning. In addition, the Air Force set up an orientation course in data automation for military and civilian executives.

Inspector General

Inspections

The Office of the Inspector General conducted 78 inspections during the year in procurement, support services, operational readiness, and industrial management. Operational inspections were primarily aimed at verifying the accuracy of command inspections of aircraft and ballistic missile units. Inspectors also made industrial management assistance surveys of selected concerns, including the Lockheed Missile and Space Co., the McDonnell Aircraft Corp., and the

Guided Missile Range Division of Pan-American World Airways, Inc. They also examined the effectiveness of Air Force support to NASA.

Other important inspections examined the development status of the MINUTEMAN I, TITAN II, and TITAN III, the integration of the F-4C fighter aircraft and other weapon systems into the USAF inventory, and the control and weapon handling procedures within USAFE, PACAF, and ADC. As in the past, efforts were made to discover and correct inefficient practices and to recommend alternate practices found successful elsewhere in the Air Force.

Safety

The USAF major aircraft accident rate dropped to an all-time low of 4.5 accidents per 100,000 flying hours compared with 5 for fiscal year 1963.

Major aircraft accidents declined from 343 the previous year to 300. Aircraft accidents causing fatalities also dropped from 127 the previous year to 111 in fiscal year 1964, but the number of fatalities rose from 293 in fiscal year 1963 to 315, principally as the result of the tragic loss of 78 lives in the crash of a C-135 in the Philippines.

Inspector General personnel continued to utilize the flight safety survey as an important tool in accident prevention. Surveys were conducted during the year at Headquarters, Special Air Warfare Center, Eglin AFB, Fla., at special air warfare advisory and training bases in southeast Asia, and at bases used for SWIFT STRIKE III. In all areas, some unsafe practices or conditions were uncovered and corrective actions recommended.

The difficulty of ejecting safely from jet aircraft at low altitude is a matter of concern to the Air Force. While only 17 percent of ejections occur below 1,000 feet, they produce 40 percent of the casualties. Unfavorable aircraft altitude and air speed are contributing factors. The Air Force is attempting to devise new escape equipment and better escape training for aircrews. Jet fighters are being retrofitted with the latest low-level ejection equipment, including rocket catapults and devices to separate the pilot from his seat, and jet bombers are being retrofitted with capsules. The ultimate objective is to achieve safe ejection from all combat aircraft under all emergency conditions. The Air Force has made available to NASA all ejection data to help resolve related problems involving escape from space capsules.

Six missile accidents and one missile incident were investigated during the year, and seven missile safety surveys and six operational readiness inspections were conducted. Safety surveys, visits, and operational reviews of nuclear weapon systems were carried out at 38 bases. Safety rules generally were found to be workable and effective. The

human reliability program functioned effectively. The Air Force prepared safety rules for 20 new weapon systems, recommended changes for 16, issued new regulations for 14, and amended existing regulations for 23.

A safety exercise at the missile powerplant at Sundance Air Force Station, Wyo., evaluated the ability of personnel to respond to a nuclear accident. The annual survey of this facility showed that management officials exercised businesslike control of all activities there. Safety surveys of the launchings of SNAP units from Vandenberg AFB and of agencies using radioisotopes revealed that all radioactive material and radiation-producing machines were adequately controlled. During the year, 247 officers graduated from the nuclear safety course at Lowry AFB, Colo.

During the year ground accidents totaled 11,951, a decline of 10 percent, and disabling injuries, 10,715, a decline of 7 percent. Total ground fatalities showed a slight reduction, 545 compared with 556 for the previous year. Automobile accidents caused 418 of these deaths, the same as in fiscal year 1963.

Security

Security measures to preclude compromise of vital U.S. defense information were strengthened, with special priority to surveillance and protection of missile sites and facilities. Electronic security equipment has its limitations. Consequently, the Air Force required more manpower for protective purposes than it had originally planned. The estimate of 650 air police for MINUTEMAN missile sites rose to 725.

Unreliable security equipment also caused a delay in making ATLAS and TITAN sites secure. The Air Force informed the equipment contractor that comprehensive reliability testing must precede production and installation. In June, the Air Force estimated that all security equipment for ATLAS and TITAN sites would be installed by October 1964.

Inspector General agencies completed 611,000 investigations, a decrease of 8.8 percent from the preceding year. Personnel security investigations accounted for 550,000; criminal and procurement fraud, 21,000; and counterintelligence, 40,000. By intensive effort, the Air Force reduced its investigative backlog from 67,000 cases at the beginning of the fiscal year to 40,000 at the end. The length of time required to conduct background investigations was also reduced, from an average of 100 days to 60.

Criminal investigations led to the recovery of \$900,000. A total of 4,789 disciplinary and procedural actions were taken, including courts-martial, 859; board actions, 926; reprimands, 540; Article 15's,

519; and discharges, 1,945 (of which 400 were honorable). Forfeitures totaled \$224,000.

Procurement investigations netted over \$180,000 and resulted in 522 disciplinary and procedural actions and \$20,000 in fines. Investigation of pay and allowance irregularities resulted in the recoupment of \$56,580, 31 courts-martial, and 97 other disciplinary actions including forfeitures of \$17,836 in pay.

As a result of its investigative activities, the Inspector General produced savings estimated at \$1.1 million during the year. Of this amount, \$720,000 were direct and \$387,000 cost avoidance savings. Worldwide safety and other inspection activities also produced savings and increased the efficiency of Air Force operations.

Administrative Management

The Air Force obtained greater postal economy by consolidating mailrooms at four air bases in four States and at Søndrestrøm AB, Greenland. This permitted the inactivation of 80 unit mailrooms at an annual saving of \$80,000. USAF postal inspectors obtained mail boxes for the consolidated mailrooms without cost to the Air Force.

With the approval of OSD and Congress, the Air Force will be the first Government agency to procure a new Lexicalgraphical Composer Printing (LGCP) system. The LGCP system is designed to provide high-speed electronic photographic typesetting and will be used to process printing requirements for tables of allowances, technical orders, and stock list catalogs from the data stored in computers at Wright-Patterson AFB, Ohio. The Air Force expects to have the LGCP system operational in 1967 and reduce by about 60 percent the 1.8 billion printed pages now required for these publications. An annual saving of \$2.7 million is anticipated.

Continued scrutiny of departmental printing requirements and the elimination of unnecessary items reduced USAF obligations for departmental printing to about \$13.6 million (excluding a 2.9-percent charge by the Government Printing Office), a sizable reduction from the \$15.6 million expended in the previous year.

XI. Budget

1964 Budget

The proposed Air Force budget for fiscal year 1964, as approved by the President, called for \$19.826 billion in new obligational authority, including \$648 million for military construction. The request was \$524 million below the amount appropriated for the previous fiscal year and reflected the termination of SKYBOLT development late in 1962 and the near completion of funding for ATLAS, TITAN I, and TITAN II. This allowed the Air Force to make considerable reductions in both the military construction and missile procurement accounts.

The Department of Defense appropriation bill passed by Congress in October 1963 gave the Air Force \$18.494 billion and authorized the transfer of \$55 million from working capital funds in lieu of appropriation. A separate bill passed in December 1963 provided \$488.4 million for military construction, increasing the Air Force budget to \$18.982 billion in new obligational authority. A supplementary military personnel (including AFRes and ANG) appropriation of \$429 million in June 1964 to cover an anticipated pay increase and other items not adequately funded raised the total new obligating authority for fiscal year 1964 to \$19.411 billion. This was \$939 million less than appropriations (including a \$92.2 million supplemental) for the previous year.

Excluding transfer funds, the major cost categories for the fiscal year 1964 appropriations, including the supplemental, were as follows: Operation and maintenance (including the ANG), \$4.578 billion; military personnel (including AFRes and ANG), \$4.485 billion; research, development, test, and evaluation, \$3.453 billion; aircraft procurement, \$3.386 billion; missile procurement, \$2.142 billion; other procurement, \$878 million; and military construction, \$488.4 million. In addition, \$257.4 million was allocated from the DoD family housing appropriation to support the Air Force family housing program for fiscal year 1964.

The following table summarizes the amounts made available by direct appropriations and by fund transfers:

AMOUNTS AVAILABLE FOR OBLIGATION BY THE AIR FORCE DURING
FISCAL YEAR 1964—AS OF JUNE 30, 1964

(In Millions of Dollars)¹

Department of Defense Appropriation Act, 1964.....	18,493.8
Military Construction Appropriation Act 1964.....	488.3
Deficiency Appropriation Act, 1964.....	428.5
Total new obligational authority enacted.....	19,410.6
Unobligated balance of prior-year program.....	3,058.1
Transfer to Emergency Fund, DoD, 1964, from:	
National Guard Personnel, AF.....	.4
Operation and Maintenance, ANG.....	2.6
Missile Procurement, AF.....	36.0
Transfer to Research, Development, Test and Evaluation, Defense Agencies, from:	
Research, Development, Test and Evaluation, AF.....	5.9
Transfer to Operation and Maintenance, Army, from:	
Operation and Maintenance, AF.....	3.2
Transfer to Operating Expenses, Public Building Services Administration, GSA, 1964, from:	
Operation and Maintenance, AF.....	1.0
Transfer to Operation and Maintenance, Defense Agencies, 1964, from:	
Operation and Maintenance, AF.....	15.2
Transfer from Operation and Maintenance, AF, to:	
Military Personnel, AF.....	2.0
Transfer to Military Personnel, AF, from:	
Air Force Stock Fund.....	25.0
Air Force Industrial Fund.....	10.0
Operation and Maintenance, AF.....	2.0
Defense Stock Fund.....	20.0
Transfer from Emergency Fund, DoD, 1964, to:	
Operation and Maintenance, AF.....	3.0
Research, Development, Test and Evaluation, AF.....	97.0
Anticipated Reimbursements.....	1,446.5
Total available for obligation during fiscal year 1964.....	24,005.8

Actual obligations and expenditures for fiscal year 1964 are summarized in the table following. The total of \$21,370 million for obligations compares with \$21,202 million for 1963, and \$21,000 million for 1962. The total of \$20,508.6 million for expenditures compares with \$20,641.6 million for 1963, and \$20,839.8 million for 1962.

¹ Represents nearest rounded figures.

USAF ACTUAL OBLIGATIONS AND NET EXPENDITURES
FOR FISCAL YEAR 1964 AS OF JUNE 30, 1964
(In Millions of Dollars) ¹

	Obligations	Net expenditures
Military Personnel.....	4, 453. 6	4, 435. 8
Reserve Personnel.....	57. 2	55. 4
National Guard Personnel.....	60. 5	58. 7
Operation and Maintenance.....	4, 745. 0	4, 472. 3
O&M, Alaska Communication System.....		. 9
O&M, Air National Guard.....	220. 3	222. 6
Discontinued Procurement Appropriations, prior years.....		23. 1
Preparation for Sale or Salvage of Military Property.....	(²)	(²)
Aircraft Procurement.....	4, 396. 6	3, 893. 9
Missile Procurement.....	2, 174. 8	2, 100. 6
Other Procurement.....	830. 1	964. 8
Research, Development, Test and Evaluation.....	3, 912. 1	3, 721. 6
Military Construction, AF.....	501. 4	535. 9
Military Construction, AF Reserve.....	4. 1	4. 0
Military Construction, Air National Guard.....	14. 7	14. 5
Miscellaneous.....		4. 6
Total.....	21, 370. 2	20, 508. 6

¹ Represents nearest rounded figures. Amounts will not necessarily add to total.

² Indicates an amount less than \$50,000.

HOW THE AIR FORCE DOLLAR WAS SPENT

	Percent
Aircraft, Missiles, and Related Equipment.....	34
Aircraft.....	(19)
Missiles.....	(10)
Other.....	(5)
Military Personnel ¹	22
Research, Development, Test and Evaluation.....	17
Civilian Personnel ²	11
Operation and Maintenance ¹	13
Military Construction ¹	3

¹ Includes Reserve and Air National Guard costs.

² Includes direct hire and contract personnel.

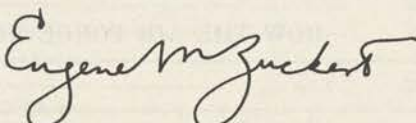
1965 Budget

For fiscal year 1965 the President requested \$19.185 billion in new obligating authority for the Air Force, including \$425 million for military construction. This was \$226 million less than appropriated for fiscal year 1964. The research, development, test, and evaluation

account showed the greatest reduction because of decreasing outlays for MINUTEMAN, TITAN II, TITAN III, and the B-70 programs. Missile procurement and other procurement again showed significant drops while the aircraft procurement account, after declining steadily for several years, was higher.

The Department of Defense appropriation bill passed by Congress early in August 1964 provided \$18.5 billion for the Air Force, not including military construction. The bill contained transfer authority of \$84.4 million from the Air Force and Defense Stock Fund accounts to the military personnel appropriation accounts as well as \$47 million more than requested for the advanced manned strategic aircraft program. Excluding transfer funds, the major cost categories for the fiscal year 1965 appropriation were as follows: Operation and maintenance (including ANG), \$4.804 billion; military personnel (including AFRes and ANG), \$4.512 billion; aircraft procurement, \$3.564 billion; research, development, test, and evaluation, \$3.112 billion; missile procurement, \$1.730 billion; and other procurement, \$779 million.

Congress late in August approved a fiscal year 1965 military construction appropriation (new obligational authority) of \$351.1 million, almost \$74 million less than requested. In addition, \$257.6 million was included in the DoD family housing appropriation to support the Air Force family housing program.



EUGENE M. ZUCKERT,
Secretary of the Air Force.

APPENDIX

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Note. Subtotals in these tables may not add to totals due to rounding.

Table 1

MAJOR FORCES BY DEPARTMENT

	June 30, 1961 (actual)	June 30, 1963 (actual)	June 30, 1964 (actual)	June 30, 1965 (estimated) ¹
DEPARTMENT OF DEFENSE				
Active Duty Personnel.....	2,483,771	2,699,677	2,687,409	2,656,008
Active Aircraft Inventory.....	31,262	30,781	30,109	29,560
DEPARTMENT OF ARMY				
Divisions.....	14	16	16	16
Regiments/RCTs.....	6	4	4	4
Armored Combat Commands.....	1			
Brigades.....	2	4	7	7
Battle Groups.....	8	6		
Special Forces Groups.....	3	6	7	7
Army Missile Commands.....	4	2	2	2
Surface-to-Surface Missile Battalions.....	42½	48½	38	38
Air Defense Missile Battalions.....	76¼	63¼	58¼	56¼
Active Duty Personnel.....	858,622	975,916	973,238	963,273
Active Aircraft Inventory.....	5,564	6,001	6,338	6,899
DEPARTMENT OF NAVY				
Commissioned Ships in Fleet.....	819	857	859	880
Warships.....	(375)	(383)	(388)	(406)
Other.....	(444)	(474)	(471)	(474)
Carrier Air Groups.....	17	17	17	17
Carrier Antisubmarine Air Groups.....	11	11	11	11
Patrol and Warning Squadrons.....	38	35	35	34
Marine Divisions.....	3	3	3	3
Marine Air Wings.....	3	3	3	3
Active Duty Personnel.....	803,998	854,330	857,373	864,184
Navy.....	(627,089)	(664,647)	(667,596)	(674,115)
Marine Corps.....	(176,909)	(189,683)	(189,777)	(190,069)
Active Aircraft Inventory.....	8,793	8,756	8,391	8,250
DEPARTMENT OF AIR FORCE				
USAF Combat Wings.....	88	86	83	78
Strategic Wings.....	(37)	(33)	(33)	(28)
Air Defense Wings.....	(19)	(18)	(14)	(13)
Tactical Wings (including airlift).....	(32)	(35)	(36)	(37)
USAF Combat Support Flying Squadrons.....	121	134	130	117
Active Duty Personnel.....	821,151	869,431	856,798	828,551
Active Aircraft Inventory.....	16,905	16,024	15,380	14,411

¹ As planned for fiscal year 1966 budget.

MAJOR FORCES BY MISSION

Table 2

	June 30, 1961 (actual)	June 30, 1963 (actual)	June 30, 1964 (actual)	June 30, 1965 (estimated) ¹
STRATEGIC RETALIATORY FORCES				
Intercontinental Ballistic Missiles				
MINUTEMAN Squadrons		2	12	16
TITAN Squadrons		7	12	6
ATLAS Squadrons	4	13	13	
POLARIS Submarines	5	12	21	29
Strategic Bombers				
B-52 Wings	13	14	14	14
B-58 Wings	1	2	2	2
B-47 Wings	20	13	10	5
CONTINENTAL AIR AND MISSILE DEFENSES				
Manned Fighter Interceptor Squadrons	42	42	40	39
Interceptor Missile (BOMARC) Squadrons	7	8	8	6
Army Air Defense Missile Battalions ²	49½	31½	26½	23½
GENERAL PURPOSE FORCES				
Army Divisions	³ 14	16	16	16
Army Surface-to-Surface Missile Battalions	42½	48½	38	38
Army Air Defense Missile Battalions	26¾	31¾	31¾	32¾
Army Special Forces Groups	3	6	7	7
Warships				
Attack Carriers	15	15	15	15
Antisub Warfare Carriers	9	9	9	9
Nuclear Attack Submarines	13	16	19	23
Other	328	326	322	329
Amphibious Assault Ships	110	132	133	135
Carrier Air Groups (Attack and Anti-submarine Warfare)	28	28	28	28
Marine Corps Divisions/Air Wings	3	3	3	3
USAF Tactical Forces Aircraft Squadrons	93	109	112	117
AIRLIFT AND SEALIFT FORCES				
Airlift Aircraft Squadrons				
C-130 through C-141	16	26	34	38
C-118 through C-124	35	31	27	19
Troop and Cargo Ships, and Tankers	99	101	99	99

¹ As planned for fiscal year 1966 budget.² Decrease reflects phaseout of NIKE-AJAX and transfer of NIKE-HERCULES battalions to Army National Guard.³ Includes three training divisions not ready for combat.

Table 3

FINANCIAL SUMMARY

(In Billions of Dollars)

	Fiscal year 1962		Fiscal year 1963	Fiscal year 1964	Fiscal year 1965 ³
	Original ¹	Final ²			
NEW OBLIGATIONAL AUTHORITY---	43.7	49.4	51.1	50.9	49.7
Financing Adjustments ⁴ -----	1.3	1.3	0.8	0.9	1.1
TOTAL OBLIGATIONAL AUTHORITY ⁵ -----	44.9	50.7	51.9	51.9	50.9
BY PROGRAM					
Strategic Offensive Forces-----	7.6	9.0	8.4	7.3	5.3
Continental Air and Missile Defense Forces-----	2.2	2.3	2.0	2.1	1.8
General Purpose Forces-----	14.5	17.4	17.6	17.7	18.1
Airlift/Sealift Forces-----	0.9	1.2	1.4	1.3	1.5
Reserve and Guard Forces-----	1.7	1.8	1.8	2.0	2.1
Research and Development-----	3.9	4.2	5.1	5.3	5.1
General Support-----	11.4	12.1	13.0	13.7	14.3
Retired Pay-----	0.9	0.9	1.0	1.2	1.4
Military Assistance-----	1.8	1.8	1.6	1.2	1.2
BY DEPARTMENT AND AGENCY					
Department of the Army-----	10.4	12.5	12.0	12.5	12.0
Department of the Navy-----	12.4	14.7	14.9	14.8	14.7
Department of the Air Force-----	18.5	19.7	20.6	20.3	19.4
Office of Civil Defense-----		0.3	0.1	0.1	0.1
Defense Agencies/Office of the Secretary of Defense ⁶ -----	0.4	0.3	0.9	1.1	1.2
Retired Pay-----	0.9	0.9	1.0	1.2	1.4
Defense Family Housing ⁷ -----	0.5	0.5	0.7	0.7	0.7
Military Assistance-----	1.8	1.8	1.6	1.2	1.2

¹ As proposed in budget estimates of Jan. 16, 1961.² Based on appropriation acts as approved by the Congress.³ As presented in budget estimates of Jan. 25, 1965.⁴ Consists of reimbursements, transfers, reprogramming, and other adjustments.⁵ Total obligational authority represents the total financial requirements for the program approved for initiation in a given fiscal year, regardless of the year in which the funds were authorized or appropriated. Excludes cost of nuclear warheads.⁶ Exclusive of "Retired Pay" and "Family Housing."⁷ Funds for this activity were appropriated to the military departments in fiscal year 1962.

Table 4

NEW OBLIGATIONAL AVAILABILITY FOR MILITARY FUNCTIONS FISCAL YEAR 1964

(In Millions of Dollars)

	Department of Defense	Army	Navy	Air Force	Defense-wide activities ¹
TOTAL	50, 243	12, 659	15, 019	19, 501	3, 063
MILITARY PERSONNEL	14, 204	4, 606	3, 828	4, 542	1, 228
Active Forces.....	12, 273	4, 147	3, 703	4, 423	-----
Reserve Forces.....	703	460	125	119	-----
Retired Pay.....	1, 228	-----	-----	-----	1, 228
OPERATION AND MAINTENANCE	11, 705	3, 534	3, 100	4, 557	513
PROCUREMENT	15, 645	2, 906	6, 326	6, 370	44
Aircraft.....	5, 640	458	1, 796	3, 386	-----
Missiles.....	3, 676	462	1, 108	2, 106	-----
Ships.....	2, 060	-----	2, 060	-----	-----
Ordnance, etc.....	2, 028	1, 307	478	242	1
Electronics and Communications.....	1, 353	357	499	485	12
Other Procurement.....	889	322	385	152	31
RDT&E	6, 984	1, 402	1, 561	3, 544	477
Military Sciences.....	986	207	178	126	475
Aircraft.....	614	75	213	326	-----
Missiles.....	2, 146	569	575	1, 002	-----
Ships.....	289	1	288	-----	-----
Astronautics.....	1, 491	19	40	1, 432	-----
Ordnance, etc.....	300	164	136	-----	-----
Other Equipment.....	636	295	61	280	-----
Program-wide Management.....	520	72	69	379	-----
Emergency Fund.....	2	-----	-----	-----	2
CIVIL DEFENSE	112	-----	-----	-----	112
CONSTRUCTION	949	211	205	488	46
Active Forces.....	913	201	199	468	46
Reserve Forces.....	36	10	6	20	-----
FAMILY HOUSING	644	-----	-----	-----	644

¹ Includes Office of the Secretary of Defense, Joint Chiefs of Staff, Defense agencies, Office of Civil Defense, etc.

Table 5

OBLIGATIONS FOR MILITARY FUNCTIONS FISCAL YEARS 1963-64

(In Millions of Dollars)

	Unobligated balance brought forward	New obligational availability	Reimbursements, recoveries, etc.	Total obligational availability	Obligations	Unobligated balance carried forward ¹
DEPARTMENT OF DEFENSE						
Fiscal Year 1963----	7, 120	50, 204	4, 267	61, 592	52, 292	9, 163
Fiscal Year 1964----	9, 163	50, 243	4, 606	64, 013	53, 979	9, 961
BY FUNCTIONAL TITLE						
<i>Military Personnel</i>						
Fiscal Year 1963----	(²)	13, 129	254	13, 383	13, 311	(²)
Fiscal Year 1964----	(²)	14, 204	258	14, 462	14, 436	-----
<i>Operation and Maintenance</i>						
Fiscal Year 1963----	75	11, 496	1, 444	13, 015	12, 884	101
Fiscal Year 1964----	101	11, 705	1, 683	13, 489	13, 403	49
<i>Procurement</i>						
Fiscal Year 1963----	5, 730	16, 667	1, 400	23, 796	16, 680	7, 093
Fiscal Year 1964----	7, 093	15, 645	1, 626	24, 365	16, 505	7, 860
<i>RDT&E</i>						
Fiscal Year 1963----	778	6, 993	506	8, 277	7, 317	955
Fiscal Year 1964----	955	6, 984	529	8, 468	7, 368	1, 099
<i>Civil Defense</i>						
Fiscal Year 1963----	2	126	(²)	128	110	18
Fiscal Year 1964----	18	112	(²)	130	113	16
<i>Construction</i>						
Fiscal Year 1963----	534	1, 204	552	2, 290	1, 420	870
Fiscal Year 1964----	870	949	498	2, 317	1, 520	798
<i>Family Housing</i>						
Fiscal Year 1963----	-----	590	112	702	570	125
Fiscal Year 1964----	125	644	11	780	634	138

See footnotes at end of table.

Table 5—Continued

**OBLIGATIONS FOR MILITARY FUNCTIONS
FISCAL YEARS 1963-64**

	Unobligated balance brought forward	New obligational availability	Reimbursements, recoveries, etc.	Total obligational availability	Obligations	Unobligated balance carried forward ¹
BY AGENCY						
<i>Army</i>						
Fiscal Year 1963----	1, 212	11, 955	2, 069	15, 236	13, 620	1, 556
Fiscal Year 1964----	1, 556	12, 659	2, 138	16, 353	13, 983	2, 362
<i>Navy</i>						
Fiscal Year 1963----	2, 998	15, 325	818	19, 141	14, 826	4, 264
Fiscal Year 1964----	4, 264	15, 019	764	20, 048	15, 362	4, 663
<i>Air Force</i>						
Fiscal Year 1963----	2, 814	20, 226	1, 220	24, 260	21, 202	3, 058
Fiscal Year 1964----	3, 058	19, 501	1, 446	24, 006	21, 370	2, 634
<i>OSD and Defense Agencies</i>						
Fiscal Year 1963----	94	2, 572	160	2, 826	2, 534	268
Fiscal Year 1964----	268	2, 939	257	3, 476	3, 151	285
<i>Office of Civil Defense</i>						
Fiscal Year 1963----	2	126	(²)	128	110	18
Fiscal Year 1964----	18	112	(²)	130	113	16

¹ Consists of preclosing balance minus expired funds.² Less than \$500,000.

Table 6

EXPENDITURES FOR MILITARY FUNCTIONS FISCAL YEARS 1963-64

(In Millions of Dollars)

	Unex- pended balance brought forward	New ex- penditure avail- ability	Total available for ex- penditure	Expendi- tures	Unex- pended balance carried forward ¹
DEPARTMENT OF DE- FENSE					
Fiscal Year 1963-----	28,697	49,794	78,491	48,252	30,019
Fiscal Year 1964-----	30,019	49,922	79,941	49,760	29,966
BY FUNCTIONAL TITLE					
<i>Military Personnel</i>					
Fiscal Year 1963-----	486	13,129	13,615	13,000	442
Fiscal Year 1964-----	442	14,204	14,646	14,195	354
<i>Operation and Mainte- nance</i>					
Fiscal Year 1963-----	2,041	11,548	13,590	11,845	1,742
Fiscal Year 1964-----	1,742	11,705	13,447	11,932	1,435
<i>Procurement</i>					
Fiscal Year 1963-----	19,785	16,614	36,400	16,660	19,705
Fiscal Year 1964-----	19,705	15,645	35,351	15,351	19,990
<i>RDT&E</i>					
Fiscal Year 1963-----	3,452	6,993	10,445	6,376	4,065
Fiscal Year 1964-----	4,065	6,984	11,049	7,021	4,025
<i>Civil Defense</i>					
Fiscal Year 1963-----	193	126	319	203	113
Fiscal Year 1964-----	113	112	224	107	112
<i>Construction</i>					
Fiscal Year 1963-----	1,343	1,192	2,535	1,144	1,392
Fiscal Year 1964-----	1,392	950	2,342	1,026	1,315
<i>Family Housing</i>					
Fiscal Year 1963-----		704	704	427	278
Fiscal Year 1964-----	278	644	921	580	327
<i>Revolving and Manage- ment Funds</i>					
Fiscal Year 1963-----	1,395	-512	883	² -1,401	2,283
Fiscal Year 1964-----	2,283	-321	1,961	² -452	2,406

See footnotes at end of table.

Table 6—Continued

**EXPENDITURES FOR MILITARY FUNCTIONS
FISCAL YEARS 1963-64**

	Unex- pended balance brought forward	New ex- penditure avail- ability	Total available for ex- penditure	Expendi- tures	Unex- pended balance carried forward ¹
BY AGENCY					
<i>Army</i>					
Fiscal Year 1963.....	5, 241	11, 751	16, 992	11, 499	5, 386
Fiscal Year 1964.....	5, 386	12, 563	17, 949	12, 050	5, 811
<i>Navy</i>					
Fiscal Year 1963.....	12, 477	15, 341	27, 817	14, 005	13, 771
Fiscal Year 1964.....	13, 771	14, 929	28, 700	14, 520	14, 143
<i>Air Force</i>					
Fiscal Year 1963.....	10, 278	20, 175	30, 453	20, 642	9, 764
Fiscal Year 1964.....	9, 764	19, 466	29, 230	20, 509	8, 688
<i>OSD and Defense Agencies</i>					
Fiscal Year 1963.....	507	2, 402	2, 909	1, 905	985
Fiscal Year 1964.....	985	2, 851	3, 836	2, 574	1, 210
<i>Office of Civil Defense</i>					
Fiscal Year 1963.....	194	126	320	203	114
Fiscal Year 1964.....	114	112	226	107	114

¹ Net balance after withdrawals and restorations of unexpended balances as provided in Public Law 798.

² Reimbursements exceeded expenditures.

Table 7

DEFENSE BUDGET
FISCAL YEAR 1965 ¹

(New Obligational Availability in Millions of Dollars)

	Budget estimates January 21, 1964	Appropriation acts ²
TOTAL, MILITARY FUNCTIONS-----	³ 49, 908	⁴ 48, 668
BY FUNCTIONAL TITLE		
Military Personnel-----	14, 797	14, 808
Operation and Maintenance-----	12, 396	12, 313
Procurement-----	13, 756	13, 422
RDT&E-----	6, 722	6, 449
Civil Defense-----	358	105
Military Construction-----	1, 168	940
Family Housing-----	711	631
BY AGENCY		
Army-----	12, 070	11, 767
Navy-----	14, 785	14, 577
Air Force-----	19, 259	18, 935
Defense Agencies-----	3, 436	3, 284
Civil Defense-----	358	105

¹ Excludes funds made available to the Department of Defense for the Military Assistance Program (\$1,055 million) and for Army civil works and civil functions (\$1,285 million).

² Included the Department of Defense Appropriation Act of August 19, 1964 (Public Law 88-446), the Independent Offices Appropriation Act of August 30, 1964 (Public Law 88-507), and the Military Construction Appropriation Act of September 2, 1964 (Public Law 88-576).

³ Excludes \$172 million for military pay increase under proposed legislation.

⁴ Includes direct appropriations of \$48,428 million and congressionally authorized transfers of \$240 million.

Table 8

REDUCTIONS IN WORKING CAPITAL FUNDS FISCAL YEARS 1953-64

(In Millions of Dollars)

	Transfers to other ac- counts in lieu of new ap- propriations ¹	Congressional rescissions	Total reductions
TOTAL, FISCAL YEARS 1953-64-----	3, 476. 8	3, 406. 0	6, 882. 8
STOCK FUNDS-----	3, 069. 8	3, 049. 0	6, 118. 8
Fiscal Year 1953-----			
1954-----		535. 0	535. 0
1955-----		550. 0	550. 0
1956-----		1, 454. 0	1, 454. 0
1957-----	² 437. 0	510. 0	947. 0
1958-----	³ 470. 0		470. 0
1959-----	³ 520. 0		520. 0
1960-----	³ 430. 0		430. 0
1961-----	³ 365. 5		365. 5
1962-----	³ 286. 0		286. 0
1963-----	³ 390. 0		390. 0
1964-----	³ 171. 3		171. 3
INDUSTRIAL FUNDS-----	407. 0	357. 0	764. 0
Fiscal Year 1953-----			
1954-----			
1955-----			
1956-----		195. 0	195. 0
1957-----		162. 0	162. 0
1958-----	³ 120. 0		120. 0
1959-----	³ 15. 0		15. 0
1960-----			
1961-----			
1962-----	³ 102. 0		102. 0
1963-----	⁴ 20. 0		20. 0
1964-----	³ 150. 0		150. 0

¹ Amounts actually transferred pursuant to authorization or direction of the Congress.² To finance military construction programs.³ To finance military personnel costs.⁴ To finance Navy shipbuilding costs.

Table 9

U.S. DEFENSE EXPENDITURES AND RECEIPTS ENTERING THE INTERNATIONAL BALANCE OF PAYMENTS

(In Millions of Dollars)

	Fiscal year 1961	Fiscal year 1962	Fiscal year 1963	Fiscal year 1964
DEPARTMENT OF DE- FENSE EXPENDITURES				
<i>Support of U.S. Forces</i> -----	2, 444. 9	2, 460. 6	2, 503. 6	2, 539. 7
Expenditures by Mil- itary and Civilian Personnel ¹ -----	781. 1	771. 5	802. 6	864. 2
Hire of Foreign Nationals-----	362. 2	394. 1	438. 1	423. 0
Procurement:				
Major Equipment-----	61. 0	66. 7	75. 8	91. 4
Construction-----	158. 0	121. 7	100. 9	80. 0
Petroleum Prod- ucts ² -----	257. 2	262. 5	268. 5	280. 6
Other Materials and Supplies ³ -----	304. 1	324. 1	281. 9	191. 9
Operation and Maintenance (Other) ⁴ -----	521. 3	520. 0	535. 8	417. 7
Other Payments ⁴ -----				190. 9
<i>Military Assistance</i> -----	310. 3	226. 7	317. 1	237. 8
Offshore Procurement--	130. 9	100. 8	118. 4	117. 3
NATO Infrastructure--	104. 6	35. 3	90. 7	61. 5
Other-----	74. 8	90. 6	108. 0	59. 0
<i>Net Change in Foreign Currency Holdings</i> -----	-2. 0	13. 3	-6. 3	-8. 0

See footnotes at end of table.

Table 9—Continued

**U.S. DEFENSE EXPENDITURES AND RECEIPTS ENTERING THE
INTERNATIONAL BALANCE OF PAYMENTS**

(In Millions of Dollars)

	Fiscal year 1961	Fiscal year 1962	Fiscal year 1963	Fiscal year 1964
OTHER AGENCIES' EXPENDITURES ⁵	343. 4	276. 0	248. 9	135. 8
TOTAL EXPENDITURES.....	3, 096. 6	2, 976. 6	3, 063. 3	2, 905. 3
RECEIPTS.....	-318. 9	-898. 6	-1, 334. 4	-1, 281. 3
Cash ⁶	-318. 9	-898. 6	-1, 334. 4	-1, 257. 8
Barter.....				23. 5
NET ADVERSE BALANCE....	2, 777. 7	2, 078. 0	1, 728. 9	1, 624. 0

¹ Includes expenditures for goods and services by nonappropriated fund activities.

² Beginning in fiscal year 1964, includes expenditures for petroleum procured through Operation and Maintenance accounts as well as through stock fund accounts.

³ Beginning in fiscal year 1964, includes primarily expenditures through Operation and Maintenance and stock fund accounts.

⁴ Beginning with fiscal year 1964, data previously reported as contractual services have been divided into two categories, i.e. "Operation and Maintenance (Other)," which includes all O&M payments not included elsewhere, and "Other Payments," which includes expenditures for retired pay, claims, research and development, industrial fund activities, etc.

⁵ Expenditures entering balance of international payments by the Atomic Energy Commission and other agencies included in the NATO definition of defense expenditures.

⁶ Includes only: (1) Sales of military items through Department of Defense; (2) reimbursement to United States for logistical support of United Nations forces and defense forces of other nations; (3) sales of services and excess personal property. Excludes estimates of receipts for military equipment procured through U.S. private sources, except when covered by government-to-government agreements.

Table 10

RESEARCH, DEVELOPMENT, TEST, AND EVALUATION PROGRAMS OBLIGATIONS

(In Millions of Dollars)

	Fiscal year 1963 actual	Fiscal year 1964 actual	Fiscal year 1965 estimated
TOTAL.....	7,369.8	7,348.4	7,072.6
RESEARCH, DEVELOPMENT, TEST, AND EVALUATION.....	6,886.8	6,872.9	6,600.0
Military Sciences.....	925.7	939.4	997.2
Aircraft and Related Equipment.....	724.1	993.1	1,148.0
Missiles and Related Equipment.....	2,525.4	2,141.2	1,791.5
Military Astronautics and Related Equipment.....	1,234.8	1,275.2	910.4
Ships, Small Craft, and Related Equip- ment.....	223.9	250.3	273.5
Ordnance, Combat Vehicles, and Re- lated Equipment.....	249.0	312.3	328.6
Other Equipment.....	513.7	518.5	586.7
Management and Support.....	490.2	442.9	445.8
Emergency Fund ¹			118.3
SUPPORTING ACTIVITIES.....	483.0	475.5	472.6
Military Personnel.....	238.8	263.0	277.5
Procurement.....	72.7	70.0	65.0
Operation and Maintenance.....	73.3	40.1	41.1
Civil Defense.....	11.0	11.8	12.4
Military Construction.....	87.2	90.6	76.6

¹ The emergency funds used during fiscal years 1963 and 1964 have been added to the appropriate subcategories.

Table 11
ACTIVE DUTY MILITARY PERSONNEL

	Department of Defense	Army	Navy	Marine Corps	Air Force
TOTAL					
June 30, 1963-----	2, 699, 677	975, 916	664, 647	189, 683	869, 431
June 30, 1964-----	2, 687, 409	973, 238	667, 596	189, 777	856, 798
OFFICERS					
June 30, 1963-----	334, 351	108, 302	75, 549	16, 737	133, 763
June 30, 1964-----	337, 502	110, 870	76, 400	16, 843	133, 389
<i>Regulars</i>					
June 30, 1963-----	160, 001	41, 575	48, 724	10, 479	59, 223
June 30, 1964-----	164, 049	41, 463	48, 931	10, 970	62, 685
<i>Reserves ¹</i>					
June 30, 1963-----	174, 350	66, 727	26, 825	6, 258	74, 540
June 30, 1964-----	173, 453	69, 407	27, 469	5, 873	70, 704
ENLISTED					
June 30, 1963-----	2, 354, 531	865, 768	583, 596	172, 541	732, 626
June 30, 1964-----	2, 338, 153	860, 514	584, 700	172, 567	720, 372
OFFICER CANDIDATES					
June 30, 1963-----	10, 795	1, 846	5, 502	405	3, 042
June 30, 1964-----	11, 754	1, 854	6, 496	367	3, 037

¹ Members of reserve components, including National Guard, plus a small number of officers without component in the Army of the United States or the Air Force of the United States.

Table 12

DEPLOYMENT OF MILITARY PERSONNEL

(Percentages Listed in Parentheses)

	Department of Defense	Army	Navy	Marine Corps	Air Force
TOTAL					
June 30, 1963	2, 699, 677 (100. 0)	975, 916 (100. 0)	664, 647 (100. 0)	189, 683 (100. 0)	869, 431 (100. 0)
June 30, 1964	2, 687, 409 (100. 0)	973, 238 (100. 0)	667, 596 (100. 0)	189, 777 (100. 0)	856, 798 (100. 0)
SHORE ACTIVITIES					
June 30, 1963	2, 310, 850 (85. 6)	975, 916 (100. 0)	283, 511 (42. 7)	181, 992 (95. 9)	869, 431 (100. 0)
June 30, 1964	2, 301, 254 (85. 6)	973, 238 (100. 0)	288, 048 (43. 1)	183, 170 (96. 5)	856, 798 (100. 0)
<i>Continental U.S.</i>					
June 30, 1963	1, 615, 325 (59. 8)	583, 981 (59. 8)	240, 845 (36. 2)	139, 906 (73. 8)	650, 593 (74. 8)
June 30, 1964	1, 611, 181 (59. 9)	581, 009 (59. 7)	243, 602 (36. 5)	140, 481 (74. 0)	646, 089 (75. 4)
<i>Outside Continental U.S.</i>					
June 30, 1963	695, 525 (25. 8)	391, 935 (40. 2)	42, 666 (6. 4)	42, 086 (22. 2)	218, 838 (25. 2)
June 30, 1964	690, 073 (25. 7)	392, 229 (40. 3)	44, 446 (6. 6)	42, 689 (22. 5)	210, 709 (24. 6)
AFLOAT AND MOBILE ACTIVITIES					
June 30, 1963	388, 827 (14. 4)	-----	381, 136 (57. 3)	7, 691 (4. 1)	-----
June 30, 1964	386, 155 (14. 4)	-----	379, 548 (56. 9)	6, 607 (3. 5)	-----

MILITARY PERSONNEL BY GRADE JUNE 30, 1964

(Percentages Listed in Parentheses)

Table 13

	Department of Defense	Army	Navy	Marine Corps	Air Force
TOTAL.....	2,687,409	973,238	667,596	189,777	856,798
OFFICERS.....	337,502	110,870	76,400	16,843	133,389
Percent of Total.....	(12.6)	(11.4)	(11.4)	(8.9)	(15.6)
Gen. of the Army—Fleet Admiral.....	3	2	1		
General — Admiral.....	38	14	9	1	14
Lt. General — Vice Admiral.....	115	41	32	5	37
Maj. Gen. } — Rear Admiral.....	1,138	201	250	23	163
Brig. Gen. }		249		31	221
Colonel — Captain.....	15,323	5,168	4,197	606	5,352
Lt. Colonel — Commander.....	36,347	12,386	8,022	1,402	14,537
Major — Lt. Commander.....	55,081	17,122	12,054	2,434	23,471
Captain — Lieutenant.....	105,884	30,063	21,370	3,776	50,685
1st Lieutenant — Lieutenant(JG).....	59,337	15,935	16,726	4,939	21,737
2nd Lieutenant — Ensign.....	47,864	19,459	11,902	2,102	14,401
Chief Warrant Officer W-4.....	2,879	1,152	791	83	853
Chief Warrant Officer W-3.....	5,269	2,703	574	113	1,879
Chief Warrant Officer W-2.....	5,418	4,265	472	642	39
Warrant Officer W-1.....	2,806	2,110		696	
ENLISTED ¹	2,338,153	860,514	584,700	172,567	720,372
Percent of Total.....	(87.0)	(88.4)	(87.6)	(90.9)	(84.1)
Pay Grade E-9.....	13,170	3,633	2,904	725	5,908
Pay Grade E-8.....	33,112	12,182	7,424	2,389	11,117
Pay Grade E-7.....	114,064	37,005	38,151	6,484	32,424
Pay Grade E-6.....	230,259	83,459	68,421	10,357	68,022
Pay Grade E-5.....	396,763	141,900	88,129	19,447	147,287
Pay Grade E-4.....	452,241	149,713	111,812	26,594	164,122
Pay Grade E-3.....	581,303	223,344	150,986	35,832	171,141
Pay Grade E-2.....	355,472	114,015	95,489	44,473	101,495
Pay Grade E-1.....	161,769	95,263	21,384	26,266	18,856
OFFICER CANDIDATES.....	11,754	1,854	6,496	367	3,037
Percent of Total.....	(0.4)	(0.2)	(1.0)	(0.2)	(0.3)

¹ Enlisted are shown by pay grade due to wide diversity of title. "Proficiency Pay" was being received by 197,975—pay grade E-9, 3,123; pay grade E-8, 7,411; pay grade E-7, 24,650; pay grade E-6, 52,190; pay grade E-5, 72,578; pay grade E-4, 34,578; and pay grade E-3, 3,445.

Table 14

ENLISTED PERSONNEL PROCUREMENT

	Department of Defense	Army	Navy	Marine Corps	Air Force
TOTAL					
Fiscal Year 1963---	665, 523	270, 298	168, 564	41, 578	185, 083
Fiscal Year 1964---	756, 528	361, 449	169, 207	52, 058	173, 814
<i>Inductions</i>					
Fiscal Year 1963---	74, 438	74, 387	-----	48	3
Fiscal Year 1964---	150, 723	150, 688	-----	35	-----
<i>First Enlistments</i>					
Fiscal Year 1963---	327, 694	111, 746	85, 265	28, 369	102, 314
Fiscal Year 1964---	345, 143	116, 202	95, 040	39, 065	94, 836
<i>Immediate Reenlistments</i>					
Fiscal Year 1963---	192, 359	68, 664	44, 819	10, 823	68, 053
Fiscal Year 1964---	206, 892	82, 074	37, 153	11, 035	76, 630
<i>Other Reenlistments</i>					
Fiscal Year 1963---	25, 846	14, 523	8, 060	702	2, 561
Fiscal Year 1964---	22, 163	11, 360	7, 748	936	2, 119
<i>Reserves to Active Duty</i> ¹					
Fiscal Year 1963---	45, 186	978	30, 420	1, 636	12, 152
Fiscal Year 1964---	31, 607	1, 125	29, 266	987	229

¹ Includes National Guard.

Table 15

REENLISTMENT RATES

(Percentage of Eligibles)

	Department of Defense	Army	Navy	Marine Corps	Air Force
REGULARS					
Fiscal Year 1963.....	53.1	51.5	47.4	35.4	66.3
Fiscal Year 1964.....	50.4	52.0	41.5	30.3	61.4
<i>First Term</i>					
Fiscal Year 1963.....	24.9	22.2	25.1	15.5	35.1
Fiscal Year 1964.....	25.2	27.9	22.5	14.4	29.5
<i>Career</i>					
Fiscal Year 1963.....	88.3	89.2	93.3	84.6	85.4
Fiscal Year 1964.....	87.5	84.4	90.1	85.7	89.9
INDUCTEES (Army)					
Fiscal Year 1963.....		11.2			
Fiscal Year 1964.....		3.6			
FIRST-TERM REGULARS BY OCCU- PATIONAL GROUPS					
<i>Ground Combat</i>					
Fiscal Year 1963.....	24.4	28.9		13.9	
Fiscal Year 1964.....	28.5	34.7		14.0	
<i>Electronics</i>					
Fiscal Year 1963.....	22.2	15.3	22.9	11.9	34.3
Fiscal Year 1964.....	23.6	21.2	22.6	12.3	31.1
<i>Other Technical</i>					
Fiscal Year 1963.....	25.9	18.8	29.9	19.9	33.0
Fiscal Year 1964.....	25.7	24.3	25.6	13.6	28.7
<i>Administrative and Clerical</i>					
Fiscal Year 1963.....	27.0	18.8	31.4	18.8	42.6
Fiscal Year 1964.....	27.1	24.9	26.2	17.2	34.5
<i>Mechanics and Repairmen</i>					
Fiscal Year 1963.....	24.7	19.3	24.5	22.3	36.0
Fiscal Year 1964.....	23.6	24.7	21.1	16.0	28.1
<i>Crafts</i>					
Fiscal Year 1963.....	24.9	17.4	22.9	14.0	33.3
Fiscal Year 1964.....	24.2	23.5	22.0	17.1	28.1
<i>Services</i>					
Fiscal Year 1963.....	29.1	27.9	54.4	16.3	28.0
Fiscal Year 1964.....	29.6	31.6	54.4	13.9	26.4
<i>Miscellaneous</i>					
Fiscal Year 1963.....	20.9	32.4	18.9	21.6	38.6
Fiscal Year 1964.....	15.1	30.0	14.7	12.1	13.8

Table 16

DEPENDENTS OF MILITARY PERSONNEL
MARCH 31, 1964

	Department of Defense	Army	Navy	Marine Corps	Air Force
TOTAL.....	3, 960, 686	1, 367, 748	777, 585	194, 675	1, 620, 678
Number Per Military Person.....	1. 48	1. 40	1. 19	1. 02	1. 88
TYPE OF DEPENDENT					
Wives.....	1, 340, 591	451, 727	281, 118	70, 285	537, 461
Children.....	2, 477, 212	823, 826	486, 885	123, 167	1, 043, 334
Parents.....	99, 913	65, 871	6, 413	1, 223	26, 406
Other ¹	42, 970	26, 324	3, 169	-----	13, 477
LOCATION OF DEPENDENT					
Continental U.S.	3, 356, 133	1, 107, 200	700, 953	180, 657	1, 367, 323
Alaska.....	38, 154	16, 088	1, 852	104	20, 110
Hawaii.....	68, 138	21, 664	21, 858	10, 402	14, 214
U.S. Territories.....	43, 416	19, 966	8, 868	486	14, 096
Foreign Countries.....	454, 845	202, 830	44, 054	3, 026	204, 935

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.

WOMEN MILITARY PERSONNEL

Table 17

	Department of Defense	Army	Navy	Marine Corps	Air Force
TOTAL					
June 30, 1963-----	30, 771	12, 144	8, 216	1, 698	8, 713
June 30, 1964-----	29, 795	11, 730	7, 741	1, 448	8, 876
OFFICERS					
June 30, 1963-----	10, 556	3, 852	2, 660	135	3, 909
June 30, 1964-----	10, 609	3, 772	2, 678	128	4, 031
<i>Regulars</i>					
June 30, 1963-----	3, 727	1, 400	1, 358	96	873
June 30, 1964-----	3, 644	1, 290	1, 275	85	994
<i>Reserves</i>					
June 30, 1963-----	6, 829	2, 452	1, 302	39	3, 036
June 30, 1964-----	6, 965	2, 482	1, 403	43	3, 037
ENLISTED					
June 30, 1963-----	20, 110	8, 292	5, 451	1, 563	4, 804
June 30, 1964-----	18, 986	7, 958	4, 863	1, 320	4, 845
OFFICER CANDIDATES					
June 30, 1963-----	105	-----	105	-----	-----
June 30, 1964-----	200	-----	200	-----	-----

Table 18

CIVILIAN PERSONNEL

	Department of Defense	Defense- wide activities	Army	Navy	Air Force
TOTAL					
June 30, 1963----	1, 213, 384	33, 123	484, 841	360, 050	335, 370
June 30, 1964----	1, 170, 066	37, 796	462, 818	347, 038	322, 414
DIRECT HIRE					
June 30, 1963----	1, 049, 765	33, 123	375, 690	343, 970	296, 982
June 30, 1964----	1, 029, 756	37, 796	369, 558	332, 678	289, 724
<i>Salaried</i>					
June 30, 1963----	527, 546	26, 426	206, 482	138, 636	156, 002
June 30, 1964----	536, 119	28, 760	211, 802	139, 495	156, 062
<i>Wage Board</i>					
June 30, 1963----	522, 219	6, 697	169, 208	205, 334	140, 980
June 30, 1964----	493, 637	9, 036	157, 756	193, 183	133, 662
INDIRECT HIRE					
June 30, 1963----	163, 619	-----	109, 151	16, 080	38, 388
June 30, 1964----	140, 310	-----	93, 260	14, 360	32, 690

Table 19

OSD-JCS PERSONNEL

	June 30, 1963			June 30, 1964		
	Total	Civilian	Military	Total	Civilian	Military
TOTAL.....	3,964	2,232	1,732	3,842	2,085	1,757
Intermittent Consultants.....	39	39	-----	21	21	-----
Summer Employees.....	117	117	-----	55	55	-----
TOTAL FULL-TIME PERSONNEL.....	3,808	2,076	1,732	3,766	2,009	1,757
OFFICE OF SECRETARY OF DEFENSE.....	2,247	1,673	574	2,196	1,612	584
Secretary and Deputy Secretary.....	15	10	5	14	9	5
Defense Research and Engineering.....	515	352	163	517	349	168
Administration.....	268	198	70	237	154	83
Comptroller.....	256	251	5	278	267	11
Installations and Logistics.....	261	250	11	269	247	22
International Security Affairs.....	344	234	110	319	218	101
Manpower.....	179	122	57	197	138	59
Public Affairs.....	149	84	65	141	81	60
General Counsel.....	71	68	3	54	53	1
Special Staff Assistants.....	189	104	85	170	96	74
JOINT CHIEFS OF STAFF ORGANIZATION.....	1,561	403	1,158	1,570	397	1,173
Office of the Chairman.....	25	14	11	29	14	15
Joint Staff.....	708	233	475	678	230	448
Other Joint Chiefs of Staff Activities.....	828	156	672	863	153	710

Table 20

OTHER DEFENSE ACTIVITIES PERSONNEL

	June 30, 1963			June 30, 1964		
	Total	Civilian	Military	Total	Civilian	Military
TOTAL-----	39, 645	30, 891	8, 754	44, 626	35, 711	8, 915
Defense Atomic Support Agency-----	7, 294	2, 006	5, 288	6, 935	1, 931	5, 004
Defense Communications Agency-----	1, 819	572	1, 247	2, 226	883	1, 343
Defense Intelligence Agency-----	2, 693	1, 617	1, 076	3, 593	2, 093	1, 500
Office of Civil Defense ¹ -----	1, 139	1, 133	6	-----	-----	-----
Defense Supply Agency-----	25, 970	25, 032	938	31, 141	30, 274	867
U.S. Court of Military Appeals-----	39	39	-----	40	40	-----
Armed Forces Information & Education-----	505	421	84	521	428	93
Interdepartmental Activities-----	53	12	41	41	8	33
International Military Activities-----	133	59	74	129	54	75

¹ Transferred to Department of the Army on Apr. 1, 1964.

Table 21

RESERVE PERSONNEL

JUNE 30, 1964

	Total	Officers	Enlisted ¹
DEPARTMENT OF DEFENSE-----	2, 781, 067	798, 797	1, 982, 270
<i>Department of the Army</i> -----	1, 590, 368	345, 630	1, 244, 738
Army National Guard-----	390, 610	36, 582	354, 028
Army Reserve-----	1, 199, 758	309, 048	890, 710
<i>Department of the Navy</i> -----	697, 587	224, 515	473, 072
Naval Reserve-----	554, 242	198, 308	355, 934
Marine Corps Reserve-----	143, 345	26, 207	117, 138
<i>Department of the Air Force</i> -----	493, 112	228, 652	264, 460
Air National Guard-----	73, 578	10, 176	63, 402
Air Force Reserve-----	419, 534	218, 476	201, 058
ON ACTIVE DUTY ² -----	230, 351	172, 388	57, 963
<i>Department of the Army</i> -----	69, 519	68, 536	983
Army National Guard-----	1, 543	1, 524	19
Army Reserve-----	67, 976	67, 012	964
<i>Department of the Navy</i> -----	90, 135	33, 342	56, 793
Naval Reserve-----	82, 791	27, 469	55, 322
Marine Corps Reserve-----	7, 344	5, 873	1, 471
<i>Department of the Air Force</i> -----	70, 697	70, 510	187
Air National Guard-----	361	333	28
Air Force Reserve-----	70, 336	70, 177	159
NOT ON ACTIVE DUTY-----	2, 550, 716	626, 409	1, 924, 307
<i>Department of the Army</i> -----	1, 520, 849	277, 094	1, 243, 755
Army National Guard-----	389, 067	35, 058	354, 009
Army Reserve-----	1, 131, 782	242, 036	889, 746
<i>Department of the Navy</i> -----	607, 452	191, 173	416, 279
Naval Reserve-----	471, 451	170, 839	300, 612
Marine Corps Reserve-----	136, 001	20, 334	115, 667
<i>Department of the Air Force</i> -----	422, 415	158, 142	264, 273
Air National Guard-----	73, 217	9, 843	63, 374
Air Force Reserve-----	349, 198	148, 299	200, 899
COAST GUARD RESERVE-----	31, 244	5, 948	25, 296
On Active Duty-----	777	623	154
Not on Active Duty-----	30, 467	5, 325	25, 142

¹ Includes officer candidates.² On continuous or extended active duty, and included in count of military personnel on active duty. Excludes reservists undergoing 2-week annual, 6-month basic, etc., reserve training.

Table 22

RESERVE PERSONNEL NOT ON ACTIVE DUTY

	Total	Ready Reserve	Standby Reserve	Retired Reserve
DEPARTMENT OF DEFENSE				
June 30, 1963.....	2, 435, 532	1, 692, 172	508, 216	235, 144
June 30, 1964.....	2, 550, 716	1, 799, 142	482, 476	269, 098
DEPARTMENT OF THE ARMY				
June 30, 1963.....	1, 460, 851	1, 035, 098	293, 283	132, 470
June 30, 1964.....	1, 520, 849	1, 111, 077	255, 592	154, 180
<i>Army National Guard</i>				
June 30, 1963.....	368, 017	368, 017	-----	-----
June 30, 1964.....	389, 067	389, 067	-----	-----
<i>Army Reserve</i>				
June 30, 1963.....	1, 092, 834	667, 081	293, 283	132, 470
June 30, 1964.....	1, 131, 782	722, 010	255, 592	154, 180
DEPARTMENT OF THE NAVY				
June 30, 1963.....	581, 048	414, 367	98, 059	68, 622
June 30, 1964.....	607, 452	437, 392	96, 981	73, 079
<i>Naval Reserve</i>				
June 30, 1963.....	446, 712	303, 476	82, 792	60, 444
June 30, 1964.....	471, 451	333, 689	73, 390	64, 372
<i>Marine Corps Reserve</i>				
June 30, 1963.....	134, 336	110, 891	15, 267	8, 178
June 30, 1964.....	136, 001	103, 703	23, 591	8, 707
DEPARTMENT OF THE AIR FORCE				
June 30, 1963.....	393, 633	242, 707	116, 874	34, 052
June 30, 1964.....	422, 415	250, 673	129, 903	41, 839
<i>Air National Guard</i>				
June 30, 1963.....	74, 325	74, 325	-----	-----
June 30, 1964.....	73, 217	73, 217	-----	-----
<i>Air Force Reserve</i>				
June 30, 1963.....	319, 308	168, 382	116, 874	34, 052
June 30, 1964.....	349, 198	177, 456	129, 903	41, 839
COAST GUARD RESERVE				
June 30, 1963.....	29, 059	25, 621	2, 862	576
June 30, 1964.....	30, 467	27, 129	2, 667	671

RESERVE PERSONNEL IN PAID STATUS

Table 23

	Total in paid status	Paid drill training			Paid active duty training only
		Total	Drill-pay status	Active duty basic training	
DEPARTMENT OF DEFENSE					
June 30, 1963-----	964, 361	896, 499	843, 060	53, 439	67, 862
June 30, 1964-----	1, 047, 542	953, 256	871, 384	81, 872	94, 286
DEPARTMENT OF THE ARMY					
June 30, 1963-----	644, 896	597, 699	555, 088	42, 611	47, 197
June 30, 1964-----	727, 484	650, 070	578, 748	71, 322	77, 414
<i>Army National Guard</i>					
June 30, 1963-----	360, 714	360, 714	332, 153	28, 561	-----
June 30, 1964-----	381, 546	381, 546	335, 678	45, 868	-----
<i>Army Reserve</i>					
June 30, 1963-----	284, 182	236, 985	222, 935	14, 050	47, 197
June 30, 1964-----	345, 938	268, 524	243, 070	25, 454	77, 414
DEPARTMENT OF THE NAVY					
June 30, 1963-----	177, 474	165, 868	161, 566	4, 302	11, 606
June 30, 1964-----	179, 572	169, 137	164, 604	4, 533	10, 435
<i>Naval Reserve</i>					
June 30, 1963-----	129, 372	119, 611	119, 029	582	9, 761
June 30, 1964-----	131, 645	123, 277	122, 652	625	8, 368
<i>Marine Corps Reserve</i>					
June 30, 1963-----	48, 102	46, 257	42, 537	3, 720	1, 845
June 30, 1964-----	47, 927	45, 860	41, 952	3, 908	2, 067
DEPARTMENT OF THE AIR FORCE					
June 30, 1963-----	141, 991	132, 932	126, 406	6, 526	9, 059
June 30, 1964-----	140, 486	134, 049	128, 032	6, 017	6, 437
<i>Air National Guard</i>					
June 30, 1963-----	74, 325	74, 325	70, 399	3, 926	-----
June 30, 1964-----	73, 217	73, 217	68, 963	4, 254	-----
<i>Air Force Reserve</i>					
June 30, 1963-----	67, 666	58, 607	56, 007	2, 600	9, 059
June 30, 1964-----	67, 269	60, 832	59, 069	1, 763	6, 437
COAST GUARD RESERVE					
June 30, 1963-----	18, 919	17, 454	16, 277	1, 177	1, 465
June 30, 1964-----	20, 269	17, 973	16, 620	1, 353	2, 296

Table 24

RESERVE ACTIVE DUTY BASIC TRAINING PROGRAMS ¹

	Active duty training status	Fiscal year 1963	Fiscal year 1964	Cumulative August 10, 1955, through June 30, 1964
DEPARTMENT OF DEFENSE				
<i>Officers</i> —Total.....	Entered.....	19	30	36,061
	Completed..	8	31	31,786
Army Reserve.....	Entered.....	19	30	35,761
	Completed..	8	31	31,511
Air Force Reserve.....	Entered.....			300
	Completed..			275
<i>Enlisted</i> —Total.....	Entered.....	107,039	145,667	910,612
	Completed..	111,006	110,209	780,350
Army National Guard.....	Entered.....	51,086	78,482	423,909
	Completed..	57,013	57,516	355,075
Army Reserve.....	Entered.....	33,301	43,590	320,903
	Completed..	34,506	30,545	280,632
Naval Reserve.....	Entered.....	1,315	1,257	6,581
	Completed..	1,496	1,193	5,723
Marine Corps Reserve.....	Entered.....	8,828	10,407	65,883
	Completed..	8,968	8,977	53,911
Air National Guard.....	Entered.....	8,794	8,301	66,898
	Completed..	6,044	7,585	60,799
Air Force Reserve.....	Entered.....	3,715	3,630	26,438
	Completed..	2,979	4,393	24,210
COAST GUARD RESERVE				
<i>Enlisted</i> —Total.....	Entered.....	2,180	2,617	18,876
	Completed..	2,117	2,313	16,411

¹ Three- to six-month active duty reserve training, including Air National Guard 8-week basic training, under provisions of Section 262 of the Armed Forces Reserve Act of 1952, as amended.

Table 25

MEDICAL CARE IN DEFENSE FACILITIES

	Department of Defense	Army	Navy	Air Force
HOSPITAL ADMISSIONS—ALL PERSONNEL				
Fiscal Year 1963..	1, 154, 421	450, 419	297, 512	406, 490
Fiscal Year 1964..	1, 139, 929	455, 045	290, 202	394, 682
<i>Active Duty Personnel</i>				
Fiscal Year 1963..	491, 733	183, 726	154, 235	153, 772
Fiscal Year 1964..	469, 147	180, 388	143, 811	144, 948
<i>Dependents and Others</i>				
Fiscal Year 1963..	662, 688	266, 693	143, 277	252, 718
Fiscal Year 1964..	670, 782	274, 657	146, 391	249, 734
OUTPATIENT VISITS—ALL PERSONNEL				
Fiscal Year 1963..	45, 269, 604	17, 067, 923	12, 808, 016	15, 393, 665
Fiscal Year 1964..	46, 129, 377	17, 127, 444	13, 194, 858	15, 807, 075
<i>Active Duty Personnel</i>				
Fiscal Year 1963..	20, 546, 281	7, 734, 053	6, 994, 518	5, 817, 710
Fiscal Year 1964..	20, 436, 023	7, 432, 926	7, 110, 474	5, 892, 623
<i>Dependents and Others</i>				
Fiscal Year 1963..	24, 723, 323	9, 333, 870	5, 813, 498	9, 575, 955
Fiscal Year 1964..	25, 693, 354	9, 694, 518	6, 084, 384	9, 914, 452

Table 26

DEPENDENTS MEDICARE PROGRAM ¹

	Department of Defense	Army	Navy	Air Force
PHYSICIANS' CLAIMS PAID				
<i>Number</i>				
Fiscal Year 1963..	387, 179	107, 037	152, 950	127, 192
Fiscal Year 1964..	376, 983	95, 561	155, 045	126, 377
<i>Amount (In Dollars)</i>				
Fiscal Year 1963..	29, 784, 394	8, 400, 789	11, 683, 992	9, 699, 613
Fiscal Year 1964..	29, 216, 489	7, 460, 191	11, 934, 700	9, 821, 598
CIVILIAN HOSPITAL CLAIMS PAID				
<i>Number</i>				
Fiscal Year 1963..	268, 995	80, 998	101, 286	86, 711
Fiscal Year 1964..	264, 412	74, 527	104, 009	85, 876
<i>Amount (In Dollars)</i>				
Fiscal Year 1963..	41, 158, 390	12, 158, 789	15, 982, 875	13, 016, 726
Fiscal Year 1964..	42, 808, 337	11, 716, 416	17, 357, 864	13, 734, 057

¹ As of Feb. 3, 1965. Due to time lag in billings, the above data cannot be considered complete.

COST REDUCTION PROGRAM

Table 27

(In Millions of Dollars)

	Estimated savings to be realized in: ¹				
	FY 1963	FY 1964	FY 1965	FY 1966	FY 1968
TOTAL PROGRAM.....	1,386	2,831	² 2,461	4,055	4,826
BUYING ONLY WHAT WE NEED.....	860	1,521	1,168	1,973	2,001
Refining Requirements Calculations					
Major Items.....	90	487	373	747	-----
Initial Spares.....	163	218	134	184	-----
Secondary Items.....	481	643	607	799	-----
Technical Manuals.....		10		8	-----
Production Base.....	35	14	19		-----
Technical Data.....		2	4	2	-----
Increased Use of Inventory					
Equipment and Supplies.....		57	15	75	-----
Production Equipment.....	1				-----
Contractor Inventory.....	18	14	1	3	-----
Value Engineering.....	72	76	15	83	-----
Item Reduction.....				72	-----
BUYING AT LOWEST SOUND PRICE.....	237	553	652	1,015	1,114
Shift to Competitive Procurement.....	237	448	216	414	-----
Shift from Cost-Plus-Fixed-Fee.....		100	436	599	-----
Breakout.....		5		2	-----
REDUCING OPERATING COSTS.....	289	757	641	1,067	1,711
Terminations.....	123	334	359	551	-----
Consolidations and Standardizations					
DSA ³	31	42	53	57	-----
Departmental.....		95	20	95	-----
Increased Efficiency					
DCA and DC System.....	80	131	49	129	-----
Traffic Management.....	24	7	12	35	-----
Equipment Maintenance.....		65	109	108	-----
Noncombat Vehicles.....	2	18	12	21	-----
Reduced Contract Technicians.....		20	9	27	-----
Military Housing.....	6	13	8	14	-----
Real Property.....	23	25	9	27	-----
Packaging.....		7	1	3	-----

¹ Includes one-time savings not expected to recur in future years.² Amount reflected in budget for fiscal year 1965 as presented to the Congress in January 1964; actual accomplishment is now expected to exceed this earlier estimate.³ Excludes DSA inventory drawdown of \$38 million in fiscal year 1962; \$262 million in fiscal year 1963; \$161 million in fiscal year 1964; \$111 million in fiscal year 1965, and \$131 million in fiscal year 1966, a total of \$703 million.

Table 28

PROPERTY HOLDINGS

(Acquisition Cost in Billions of Dollars)

	Department of Defense	Army	Navy	Air Force	Defense agencies
ALL TYPES					
June 30, 1963.....	171.4	35.7	65.2	67.7	2.7
June 30, 1964.....	173.5	37.1	67.4	66.0	3.0
PERSONAL PROPERTY					
June 30, 1963.....	132.6	24.8	54.0	51.1	2.7
June 30, 1964.....	134.9	26.0	56.7	49.1	3.0
<i>Materiel in Use</i>					
June 30, 1963.....	77.4	7.9	¹ 35.8	33.7	(²)
June 30, 1964.....	81.3	9.2	¹ 38.3	33.8	(²)
<i>In Supply System</i>					
June 30, 1963.....	40.2	12.3	13.8	11.6	2.5
June 30, 1964.....	38.9	11.9	13.4	11.2	2.3
<i>Plant Equipment</i>					
June 30, 1963.....	8.7	3.5	3.2	1.9	0.1
June 30, 1964.....	9.8	3.8	3.2	2.2	0.6
<i>Government-Provided Material</i> ³					
June 30, 1963.....	2.7	NA	NA	2.7	(²)
June 30, 1964.....	1.7	0.5	0.1	1.1	(²)
<i>Industrial Funds</i>					
June 30, 1963.....	0.2	(²)	0.2	(²)	(²)
June 30, 1964.....	0.2	(²)	0.2	(²)	(²)
<i>Excess and Surplus</i>					
June 30, 1964.....	3.4	1.1	1.0	1.2	(²)
June 30, 1964.....	3.0	0.6	1.5	0.8	0.1
REAL PROPERTY					
June 30, 1963.....	36.6	10.7	10.1	15.7	-----
June 30, 1964.....	36.7	10.8	10.1	15.8	-----
CONSTRUCTION IN PROGRESS					
June 30, 1963.....	2.2	0.2	1.1	0.9	-----
June 30, 1964.....	1.8	0.3	0.5	1.0	-----

¹ Includes \$2.2 billion for June 30, 1963, and the same amount for June 30, 1964, of expenditures for work in place on vessels under construction or conversion.

² Less than \$50 million.

³ Reporting procedures instituted during fiscal year 1964. Data for 1963 not available (NA) for the Departments of the Army and the Navy. Air Force data for 1964 under new reporting procedures not comparable with data for 1963.

CONTRACT AWARDS BY PROGRAM

Table 29

(Net in Millions of Dollars)

	Fiscal year 1963		Fiscal year 1964	
	Amount	Percent	Amount	Percent
TOTAL.....	29, 379	100. 0	28, 796	100. 0
MAJOR HARD GOODS.....	19, 602	66. 7	18, 408	63. 9
Aircraft.....	5, 582	19. 0	6, 223	21. 6
Missile and Space Systems.....	6, 863	23. 4	5, 871	20. 4
Ships.....	1, 750	5. 9	1, 541	5. 4
Tank-Automotive.....	1, 046	3. 6	787	2. 7
Weapons.....	220	0. 7	214	0. 7
Ammunition.....	899	3. 1	676	2. 3
Electronics-Communications.....	3, 242	11. 0	3, 096	10. 8
SERVICES.....	2, 103	7. 2	2, 523	8. 8
ALL OTHER.....	7, 674	26. 1	7, 865	27. 3
Subsistence.....	650	2. 2	640	2. 2
Textiles and Clothing.....	268	0. 9	275	0. 9
Fuels and Lubricants.....	1, 236	4. 2	1, 147	4. 0
Miscellaneous Hard Goods.....	1, 219	4. 1	1, 109	3. 9
Construction.....	1, 287	4. 4	1, 563	5. 4
Actions of less than \$10,000.....	3, 014	10. 3	3, 131	10. 9

Table 30

CONTRACT AWARDS BY TYPE OF CONTRACTOR

(Net in Millions of Dollars)

	Department of Defense	Army	Navy	Air Force	Defense agencies
TOTAL					
Fiscal Year 1963.....	29, 379	6, 365	8, 235	11, 919	2, 960
Fiscal Year 1964.....	28, 796	6, 240	8, 995	10, 546	3, 015
INTRAGOVERNMENTAL					
Fiscal Year 1963.....	347	78	102	145	22
Fiscal Year 1964.....	562	151	166	211	33
WORK OUTSIDE U.S.					
Fiscal Year 1963.....	1, 271	520	152	269	330
Fiscal Year 1964.....	1, 326	567	206	229	324
EDUCATIONAL AND NON-PROFIT INSTITUTIONS					
Fiscal Year 1963.....	618	86	177	316	39
Fiscal Year 1964.....	688	105	175	341	67
BUSINESS FIRMS FOR WORK IN U.S. ¹					
Fiscal Year 1963.....	27, 144	5, 681	7, 804	11, 189	2, 470
Fiscal Year 1964.....	26, 221	5, 418	8, 447	9, 766	2, 591
<i>Small Business Firms ¹</i>					
Fiscal Year 1963.....	4, 301	1, 181	1, 193	978	949
Fiscal Year 1964.....	4, 519	1, 272	1, 287	939	1, 021
<i>Small Business Percentage ¹</i>					
Fiscal Year 1963.....	15. 8	20. 8	15. 3	8. 7	38. 4
Fiscal Year 1964.....	17. 2	23. 5	15. 2	9. 6	39. 4

¹ For military functions only. Data for military and civilian functions combined is as follows:

	FY 1963	FY 1964
Awards to Business Firms for Work in U.S.....	\$27, 793	\$26, 920
Small Business Firms.....	\$4, 597	\$4, 842
Small Business Percentage.....	16. 5	18. 0

Table 31

CONTRACT AWARDS BY PRICING PROVISIONS
(Net in Millions of Dollars)

	Fiscal year 1963		Fiscal year 1964	
	Amount	Percent	Amount	Percent
TOTAL.....	29,379	-----	28,796	-----
Intragovernmental Orders ¹	347	-----	562	-----
Actions less than \$10,000 ²	2,808	-----	2,907	-----
TOTAL MINUS SUBTOTALS.....	26,225	100.0	25,328	100.0
FIXED PRICE.....	17,013	64.9	18,029	71.2
Firm.....	10,886	41.5	11,730	46.3
Redeterminable.....	981	3.7	612	2.4
Incentive.....	4,137	15.8	4,685	18.5
Escalation.....	1,007	3.9	1,001	4.0
COST REIMBURSEMENT.....	9,212	35.1	7,299	28.8
No Fee.....	621	2.4	582	2.3
Fixed Fee.....	5,439	20.7	3,035	12.0
Incentive Fee.....	3,062	11.7	3,580	14.1
Time and Materials.....	64	0.2	70	0.3
Labor-Hour.....	25	0.1	31	0.1

¹ Pricing provisions not applicable.

² Data on pricing provisions are not obtained for actions of less than \$10,000.

Table 32

CONTRACT AWARDS BY COMPETITIVE STATUS

(Net in Millions of Dollars)

	Fiscal year 1963		Fiscal year 1964	
	Amount	Percent	Amount	Percent
TOTAL.....	29,379	-----	28,796	-----
Intragovernmental Orders ¹	347	-----	562	-----
TOTAL MINUS SUBTOTAL.....	29,032	100.0	28,235	100.0
PRICE COMPETITION.....	10,763	37.1	11,031	39.1
Formally Advertised.....	3,678	12.7	4,072	14.4
Restricted to Small Business and Labor Surplus Areas.....	1,382	4.8	1,539	5.5
Open Market Purchase of \$2,500 or less within U.S. ²	1,280	4.4	1,338	4.7
Other Price Competition ³	4,423	15.2	4,084	14.5
OTHER THAN PRICE COMPETITION.....	18,269	62.9	17,203	60.9
Design or Technical Competition.....	1,092	3.7	1,681	6.0
Follow-on Contracts after Price or Design Competition.....	9,494	32.7	8,876	31.4
One-Source Solicitation.....	7,683	26.5	6,646	23.5

¹ Competitive status not applicable.² Price competition required on actions of \$250 or more and assumed for actions below \$250.³ Contracts awarded through negotiation after requesting proposals from two or more suppliers.

Table 33

DEFENSE-WIDE SUPPLY

	Line items centrally managed	Net inventory investment (\$ millions)	Annual sales (\$ millions)	Annual obligations (\$ millions)
DSA SUPPLY CENTERS				
June 30, 1963-----	1, 029, 000	2, 412. 2	1, 639. 0	1, 376. 8
June 30, 1964-----	1, 328, 000	2, 231. 9	1, 738. 2	1, 577. 8
<i>Automotive Supplies</i>				
June 30, 1963-----	103, 000	88. 0	9. 5	7. 6
June 30, 1964 ¹ -----				
<i>Clothing and Textiles</i>				
June 30, 1963-----	23, 000	1, 037. 6	357. 8	217. 7
June 30, 1964-----	22, 700	842. 3	376. 9	246. 7
<i>Construction Supplies</i>				
June 30, 1963-----	122, 000	109. 1	30. 5	45. 7
June 30, 1964 ¹ -----	263, 300	223. 6	104. 8	115. 7
<i>Electronic Supplies²</i>				
June 30, 1963-----	389, 000	412. 8	57. 0	40. 0
June 30, 1964-----	507, 700	419. 3	112. 8	112. 2
<i>Fuel³</i>				
June 30, 1963-----	1, 000	9. 3	17. 2	⁴ 15. 5
June 30, 1964-----	1, 600	27. 7	34. 1	⁴ 34. 8
<i>General Supplies</i>				
June 30, 1963-----	45, 000	146. 6	119. 0	105. 5
June 30, 1964-----	87, 300	126. 9	105. 4	100. 3
<i>Industrial Supplies</i>				
June 30, 1963-----	338, 000	306. 7	107. 9	85. 1
June 30, 1964-----	433, 600	301. 2	102. 8	84. 5
<i>Medical Supplies</i>				
June 30, 1963-----	9, 000	207. 3	111. 8	69. 6
June 30, 1964-----	10, 900	178. 3	97. 3	82. 9
<i>Subsistence</i>				
June 30, 1963-----	1, 000	94. 8	828. 3	790. 1
June 30, 1964-----	900	112. 6	804. 1	800. 7

¹ The Defense Automotive Supply Center (DASC) was disestablished on Jan. 1, 1964. Its responsibilities were transferred partly to Army and partly to the Defense Construction Supply Center (DCSC). Fiscal year 1964 totals shown for DCSC include transferred automotive supplies as well as transactions at DASC prior to disestablishment.

² Partially operational during fiscal year 1963; became fully operational on Apr. 1, 1964.

³ The Defense Fuel Supply Center (DFSC) differs from the other centers in that the military Services retain ownership of their wholesale fuel (petroleum) stocks except for packaged petroleum products. DFSC does, however, procure petroleum products, bulk as well as packaged, for the military Services.

⁴ Procurement awards by DFSC for petroleum totaled \$1,182 million in fiscal year 1963, and \$1,119 million in fiscal year 1964.

Table 34

CONTRACT AWARDS BY REGION AND STATE ¹

	Fiscal year 1963		Fiscal year 1964	
	Millions of dollars	Percent of U.S.	Millions of dollars	Percent of U.S.
NEW ENGLAND.....	2, 277	9. 1	2, 307	9. 5
Maine.....	58	0. 2	32	0. 1
New Hampshire.....	51	0. 2	65	0. 3
Vermont.....	12	0. 1	14	0. 1
Massachusetts.....	1, 060	4. 2	1, 032	4. 2
Rhode Island.....	47	0. 2	38	0. 2
Connecticut.....	1, 048	4. 2	1, 126	4. 6
MIDDLE ATLANTIC.....	4, 639	18. 4	4, 297	17. 6
New York.....	2, 500	9. 9	2, 496	10. 2
New Jersey.....	1, 252	5. 0	918	3. 8
Pennsylvania.....	887	3. 5	883	3. 6
SOUTH ATLANTIC.....	2, 862	11. 3	3, 207	13. 1
Delaware.....	47	0. 2	30	0. 1
Maryland.....	606	2. 4	548	2. 3
District of Columbia.....	238	0. 9	223	0. 9
Virginia.....	485	1. 9	691	2. 8
West Virginia.....	162	0. 7	87	0. 4
North Carolina.....	259	1. 0	274	1. 1
South Carolina.....	58	0. 2	52	0. 2
Georgia.....	423	1. 7	520	2. 1
Florida.....	583	2. 3	783	3. 2
SOUTH CENTRAL.....	2, 169	8. 7	2, 209	9. 0
Kentucky.....	56	0. 2	40	0. 2
Tennessee.....	183	0. 7	194	0. 8
Alabama.....	195	0. 8	191	0. 8
Mississippi.....	186	0. 7	156	0. 6
Arkansas.....	39	0. 2	30	0. 1
Louisiana.....	195	0. 8	181	0. 7
Oklahoma.....	111	0. 5	122	0. 5
Texas.....	1, 203	4. 8	1, 294	5. 3

See footnotes at end of table.

Table 34—Continued

CONTRACT AWARDS BY REGION AND STATE ¹

	Fiscal year 1963		Fiscal year 1964	
	Millions of dollars	Percent of U.S.	Millions of dollars	Percent of U.S.
EAST NORTH CENTRAL.....	3, 171	12. 5	2, 765	11. 3
Ohio.....	1, 346	5. 3	1, 029	4. 2
Indiana.....	487	1. 9	538	2. 2
Illinois.....	486	1. 9	429	1. 8
Michigan.....	633	2. 5	591	2. 4
Wisconsin.....	219	0. 9	177	0. 7
WEST NORTH CENTRAL.....	1, 601	6. 3	2, 209	9. 0
Minnesota.....	274	1. 1	218	0. 9
Iowa.....	130	0. 5	103	0. 4
Missouri.....	686	2. 7	1, 349	5. 5
North Dakota.....	65	0. 3	192	0. 8
South Dakota.....	81	0. 3	23	0. 1
Nebraska.....	34	0. 1	34	0. 1
Kansas.....	332	1. 3	289	1. 2
MOUNTAIN.....	1, 445	5. 7	1, 055	4. 3
Montana.....	79	0. 3	16	0. 1
Idaho.....	9	(²)	8	(²)
Wyoming.....	125	0. 5	49	0. 2
Colorado.....	444	1. 8	390	1. 6
New Mexico.....	62	0. 2	71	0. 3
Arizona.....	286	1. 1	174	0. 7
Utah.....	428	1. 7	340	1. 4
Nevada.....	13	0. 1	6	(²)
PACIFIC.....	6, 919	27. 4	6, 215	25. 6
Washington.....	1, 042	4. 1	1, 086	4. 5
Oregon.....	42	0. 2	29	0. 1
California.....	5, 836	23. 1	5, 101	21. 0
ALASKA and HAWAII.....	149	0. 6	154	0. 6
Alaska.....	103	0. 4	102	0. 4
Hawaii.....	45	0. 2	52	0. 2

¹ Includes supply, RDT&E, services, construction, and facility prime contract awards of \$10,000 or more within the United States, totaling \$25,233 million during fiscal year 1963 and \$24,417 million during fiscal year 1964.

² Less than 0.05 percent.

Table 35

DEFENSE-WIDE TRANSPORTATION SERVICES

	Military Air Transport Service ¹	Military Sea Transportation Service ²	Defense Traffic Management Service ³
PASSENGERS CARRIED			
Fiscal Year 1963-----	1, 360, 000	412, 000	4, 260, 000
Fiscal Year 1964-----	1, 311, 000	435, 000	4, 521, 000
CARGO CARRIED (In Short Tons)			
Fiscal Year 1963-----	184, 000	25, 613, 000	22, 904, 000
Fiscal Year 1964-----	197, 000	26, 236, 000	23, 116, 000
<i>Dry Cargo Tonnage</i>			
Fiscal Year 1963-----	184, 000	⁴ 6, 608, 000	9, 268, 000
Fiscal Year 1964-----	197, 000	⁴ 7, 066, 000	8, 952, 000
<i>Petroleum Tonnage</i>			
Fiscal Year 1963-----		⁵ 19, 005, 000	13, 636, 000
Fiscal Year 1964-----		⁵ 19, 170, 000	14, 164, 000
EXPENSES (In Millions of Dollars)			
Fiscal Year 1963-----	412	444	⁶ 598
Fiscal Year 1964-----	385	455	⁶ 592
<i>Payments for Commercial Services</i>			
Fiscal Year 1963-----	212	341	590
Fiscal Year 1964-----	192	345	584

¹ Responsible to the Single Manager for Airlift Service, the Secretary of the Air Force.

² Responsible to the Single Manager for Ocean Transportation, the Secretary of the Navy.

³ Responsible to the Director, Defense Supply Agency. Cargo tonnage and expenses totals exclude amounts for uncreated household goods moved on government bills of lading to overseas destinations from the continental United States—137,300 tons at a cost of \$98 million during fiscal year 1963 and 133,300 tons at a cost of \$90 million during fiscal year 1964.

⁴ Reported by MSTs in measurement tons—12,555,000 in 1963 and 13,426,000 in 1964—and converted to short tons on an estimated ratio of 1.9 to 1.

⁵ Reported by MSTs in long tons—16,969,000 in 1963 and 17,116,000 in 1964—and converted to short tons on a ratio of 1 to 1.12.

⁶ Includes payments made by the military Services to commercial carriers for transportation and the administrative costs of DTMS.

Table 36

FEDERAL CATALOG SYSTEM

	Fiscal year 1963		Fiscal year 1964	
FEDERAL CATALOG				
Number of Items at Beginning of Year	4, 159, 519		4, 222, 524	
Number of Items Added	1 689, 652		481, 556	
Number of Items Deleted	626, 647		413, 517	
Net Increase	1 63, 005		68, 039	
Number of Items at End of Year	4, 222, 524		4, 290, 563	
Department of Defense Items	3, 942, 218		3, 950, 651	
Other Agency Items	280, 306		339, 912	
	June 30, 1963		June 30, 1964	
	Number	Percent	Number	Percent
INTER-SERVICE USE				
Army				
Items in Use	1, 081, 828		1, 105, 439	
Items Also Used by Other Services	378, 231	35. 0	345, 855	31. 3
Navy				
Items in Use	1, 367, 067		1, 306, 287	
Items Also Used by Other Services	347, 758	25. 4	278, 872	21. 3
Marine Corps				
Items in Use	274, 909		260, 180	
Items Also Used by Other Services	182, 073	66. 2	168, 867	64. 9
Air Force				
Items in Use	1, 866, 785		1, 713, 246	
Items Also Used by Other Services	387, 246	20. 7	338, 970	19. 8

¹ Includes 45,859 items added to total through correction and improvement of reporting procedures.

Table 37

MAJOR STORAGE FACILITIES

(In Millions of Square Feet)

	Fiscal year 1963	Fiscal year 1964
COVERED SPACE ¹		
Beginning of Fiscal Year.....	344.3	338.3
Net Reduction.....	-6.0	-13.6
End of Fiscal Year.....	338.3	324.7
OCCUPIED OPEN SPACE ²		
Beginning of Fiscal Year.....	103.7	95.9
Net Reduction.....	-7.8	-3.0
End of Fiscal Year.....	95.9	92.9
CROSS-SERVICING OF COVERED SPACE ¹	27.0	24.0
Among Defense Agencies.....	19.8	17.2
National Stockpile.....	6.6	6.1
Other Government Agencies.....	0.6	0.7
CROSS-SERVICING OF OCCUPIED OPEN SPACE ²	21.2	23.5
Among Defense Agencies.....	1.6	5.1
National Stockpile.....	19.1	17.7
Other Government Agencies.....	0.5	0.7

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.

MATERIEL REUTILIZATION AND DISPOSAL

Table 38

(In Millions of Dollars)

	Fiscal year 1963	Fiscal year 1964
GROSS REUTILIZATION AND DISPOSALS-----	5, 098	6, 894
REUTILIZATION WITHIN DEPARTMENT OF DEFENSE-----	1, 157	1, 325
Wholesale Inter-Service Supply Support-----	420	396
Intra-Service ¹ -----	626	² 769
Inter-Service-----	111	160
OTHER REUTILIZATION AND DISPOSALS-----	3, 941	5, 569
Military Assistance Program-----	11	4
Reutilization by Other Federal Agencies-----	177	190
Donations-----	233	273
Sold as Usable Property-----	892	980
Designated for Sale as Scrap-----	2, 538	3, 818
Other Dispositions ³ -----	16	187
Destroyed or Abandoned-----	74	117
CASH PROCEEDS REALIZED-----	110	111

¹ Excludes intra-Service transfers of property by property officers.² Includes special conversions of major end items, valued at \$66 million.³ Fiscal year 1964 data include disposition of surplus combatant ships with an acquisition value of \$170 million. Fiscal year 1963 data exclude such dispositions, which totaled \$193 million in acquisition costs.

Table 39

REAL PROPERTY HOLDINGS

	Department of Defense	Army	Navy	Air Force
ACQUISITION COST (In Millions of Dollars)				
June 30, 1963.....	36, 565	10, 742	10, 095	15, 727
June 30, 1964.....	36, 735	10, 812	10, 093	15, 829
<i>United States</i>				
June 30, 1963.....	30, 625	9, 716	8, 488	12, 421
June 30, 1964.....	31, 287	9, 750	8, 582	12, 955
<i>U.S. Possessions</i>				
June 30, 1963.....	1, 247	144	771	333
June 30, 1964.....	1, 125	138	652	335
<i>Foreign Countries</i>				
June 30, 1963.....	4, 692	882	837	2, 973
June 30, 1964.....	4, 322	923	860	2, 539
ACREAGE (In Millions of Acres)				
June 30, 1963.....	30. 2	12. 1	5. 4	12. 6
June 30, 1964.....	31. 8	15. 0	5. 1	11. 7
By Location				
<i>United States</i>				
June 30, 1963.....	26. 8	11. 4	4. 9	10. 4
June 30, 1964.....	28. 2	14. 0	4. 6	9. 6
<i>U.S. Possessions</i>				
June 30, 1963.....	0. 2	0. 1	0. 1	(¹)
June 30, 1964.....	0. 2	0. 1	0. 1	(¹)
<i>Foreign Countries</i>				
June 30, 1963.....	3. 2	0. 6	0. 4	2. 2
June 30, 1964.....	3. 4	0. 9	0. 4	2. 1
By Type of Control				
<i>Owned Outright</i>				
June 30, 1963.....	6. 9	3. 9	1. 5	1. 5
June 30, 1964.....	7. 2	4. 1	1. 4	1. 7
<i>Public Domain and Public Lands</i>				
June 30, 1963.....	17. 0	6. 7	2. 3	8. 0
June 30, 1964.....	16. 7	7. 4	2. 2	7. 1
<i>Leased, Easements, etc.</i>				
June 30, 1963.....	3. 2	0. 9	1. 3	1. 0
June 30, 1964.....	4. 5	2. 6	1. 1	0. 8
<i>Foreign Rights</i>				
June 30, 1963.....	3. 1	0. 6	0. 4	2. 1
June 30, 1964.....	3. 3	0. 9	0. 4	2. 0

¹ Air Force controlled only 40,553 acres in U.S. possessions on June 30, 1963, and 40,589 acres on June 30, 1964.

FAMILY HOUSING

Table 40

	June 30, 1963	June 30, 1964
TOTAL UNITS--MILITARY OWNED AND CONTROLLED.....	377, 331	378, 926
<i>Adequate</i>	334, 898	340, 483
Capehart.....	111, 540	114, 630
Wherry (Acquired).....	71, 187	74, 190
Leased.....	6, 282	4, 567
Surplus Commodity ¹	9, 403	8, 890
Other Public Quarters.....	123, 161	129, 268
Wherry (privately owned).....	8, 420	5, 124
Rental Guaranty.....	4, 905	3, 814
<i>Inadequate</i>	42, 433	38, 443
UNITS UNDER CONSTRUCTION.....	8, 844	10, 129
Appropriated Funds.....	5, 587	9, 557
Capehart.....	3, 257	164
Surplus Commodity ¹		408

¹ Housing constructed overseas primarily with funds derived from sale of surplus agricultural commodities.

Table 41

MILITARY ASSISTANCE, 1950-64

(In Millions of Dollars)

	Appropriations	Transfers, reimbursements, and rescissions	Available for obligation	Obligations and reservations	Expenditures
TOTAL, 1950-64 ¹ ----	33,902.8	-1,254.5	32,648.2	32,643.8	30,592.7
Fiscal Year 1950-----	1,314.0	0.1	1,314.1	1,101.0	51.7
1951-----	5,222.5	0.9	5,223.4	4,676.9	934.2
1952-----	5,744.0	-476.4	5,267.6	5,591.2	2,385.9
1953-----	4,219.8	-237.9	3,981.9	2,512.1	3,953.1
1954-----	3,230.0	-329.6	2,900.4	2,383.7	3,629.5
1955-----	1,252.7	-478.1	774.6	3,163.2	2,297.3
1956-----	1,022.2	-11.9	1,010.3	848.7	2,620.1
1957-----	2,017.5	-9.7	2,007.8	1,664.5	2,356.3
1958-----	1,340.0	-29.0	1,311.0	1,828.4	2,189.8
1959-----	1,515.0	27.8	1,542.8	1,512.2	2,368.1
1960-----	1,300.0	57.2	1,357.2	1,358.4	1,635.4
1961-----	1,800.0	-6.0	1,794.0	1,786.9	1,466.2
1962-----	1,600.0	-8.4	1,591.5	1,585.4	1,404.6
1963-----	1,325.0	79.2	1,404.2	1,442.7	1,767.2
1964-----	1,000.0	167.3	1,167.3	1,188.6	1,533.4

¹Includes "Common Use Item" appropriation administered by the Agency for International Development.

Table 42

MILITARY ASSISTANCE OBLIGATIONS AND EXPENDITURES

(In Millions of Dollars)

	Obligations/Reservations		Expenditures	
	FY 1964	FY 1950-64	FY 1964	FY 1950-64
TOTAL ¹	1, 188. 6	32, 643. 8	1, 533. 4	30, 592. 7
BY BUDGET ACTIVITY				
Equipment and Supplies.....	732. 0	25, 456. 4	987. 1	23, 906. 2
Shipping and Related Charges.....	72. 7	1, 661. 0	81. 3	1, 652. 9
Training.....	79. 6	1, 006. 1	86. 9	967. 9
Infrastructure Construction.....	29. 2	959. 6	61. 8	855. 5
Other Military Construction.....	27. 7	487. 6	45. 8	424. 1
Weapons Production Program.....	6. 1	367. 6	72. 5	336. 7
Research and Development.....	-2. 3	246. 4	8. 7	234. 0
Administration.....	23. 7	396. 1	24. 3	389. 0
Int'l. Military Headquarters.....	15. 4	99. 6	15. 2	89. 7
Credit Financing.....	135. 8	518. 0	83. 6	312. 1
Other Services.....	68. 8	1, 445. 5	66. 3	1, 424. 7
BY AGENCY				
Army.....	536. 9	15, 916. 1	620. 9	15, 146. 5
Navy.....	168. 4	3, 852. 7	202. 4	3, 412. 5
Air Force.....	399. 8	10, 284. 2	612. 6	9, 611. 8
OSD.....	74. 9	1, 425. 2	85. 8	1, 261. 8
Other Agencies.....	8. 5	1, 165. 5	11. 7	1, 160. 1

¹ Includes "Common Use Item" appropriation administered by the Agency for International Development.

Table 43

MILITARY ASSISTANCE DELIVERIES

(In Millions of Dollars)

	Fiscal year 1963	Fiscal year 1964	Fiscal years 1950-64
DELIVERIES UNDER GRANT AID ¹	1, 765. 1	1, 414. 7	29, 388. 2
FORWARD DEFENSE.....	555. 4	475. 3	7, 964. 6
China, Republic of.....	76. 3	128. 1	2, 079. 5
Greece.....	68. 2	83. 2	1, 121. 2
Iran.....	66. 0	27. 3	579. 2
Korea.....	160. 4	124. 4	1, 821. 9
Philippines.....	23. 7	10. 7	278. 5
Turkey.....	160. 8	101. 6	2, 084. 3
ALLIANCE FOR PROGRESS SECURITY.....	49. 7	51. 2	419. 5
Argentina.....	1. 0	1. 5	4. 3
Bolivia.....	2. 4	3. 2	8. 6
Brazil.....	10. 0	9. 1	159. 7
Chile.....	8. 0	7. 8	59. 8
Colombia.....	8. 3	6. 2	45. 6
Costa Rica.....	0. 6	0. 5	1. 3
Dominican Republic.....	1. 9	1. 5	9. 7
Ecuador.....	2. 6	2. 6	24. 8
El Salvador.....	1. 0	0. 9	2. 6
Guatemala.....	2. 6	1. 4	6. 7
Honduras.....	(²)	0. 4	3. 0
Mexico.....	0. 2	0. 3	0. 9
Nicaragua.....	1. 6	1. 2	5. 7
Panama.....	0. 7	0. 1	1. 2
Paraguay.....	0. 5	1. 2	2. 1
Peru.....	5. 2	10. 0	51. 1
Uruguay.....	2. 1	1. 8	29. 3
Venezuela.....	1. 0	1. 5	3. 1
MILITARY BASE.....	46. 5	37. 4	834. 3
Ethiopia.....	10. 9	10. 3	72. 6
Libya.....	0. 4	1. 5	5. 9
Portugal.....	8. 7	5. 5	299. 4
Spain.....	26. 5	20. 1	456. 3
GRANT AID PHASEOUT.....	195. 9	179. 0	14, 318. 2
Belgium.....	7. 3	39. 6	1, 229. 2
Cambodia.....	9. 9	3. 6	86. 8
Cameroon.....	(²)	-----	0. 2
Cuba.....	-----	-----	10. 6

See footnotes at end of table.

Table 43—Continued

MILITARY ASSISTANCE DELIVERIES

(In Millions of Dollars)

	Fiscal year 1963	Fiscal year 1964	Fiscal years 1950-64
Dahomey.....	(²)	-----	0.1
Denmark.....	13.0	12.1	542.3
France.....	8.0	5.2	4,149.7
Germany, Fed. Republic of.....	0.4	0.3	900.7
Ghana.....	(²)	(²)	(²)
Haiti.....	0.2	-----	3.2
Indochina.....	-----	-----	709.6
Italy.....	55.9	40.0	2,187.5
Indonesia.....	13.9	7.2	66.0
Ivory Coast.....	(²)	-----	0.1
Jamaica.....	(²)	0.2	0.2
Japan.....	33.9	18.6	790.4
Luxembourg.....	(²)	(²)	8.2
Netherlands.....	18.9	10.7	1,164.3
Niger.....	(²)	-----	0.1
Norway.....	22.9	41.1	740.9
Upper Volta.....	(²)	-----	0.1
United Kingdom.....	11.6	0.3	1,034.3
Yugoslavia.....	-----	-----	693.9
FREE WORLD ORIENTATION.....	22.8	25.9	157.5
Afghanistan.....	0.7	0.5	2.8
Congo (Leopoldville).....	0.1	5.0	5.1
Iraq.....	(²)	0.1	46.2
Jordan.....	2.5	8.1	28.7
Lebanon.....	0.1	0.1	8.5
Liberia.....	1.2	0.7	2.7
Mali.....	0.1	0.2	1.1
Morocco.....	6.1	6.0	16.1
Nigeria.....	(²)	0.2	0.2
Saudi Arabia.....	4.7	1.1	29.9
Senegal.....	1.6	0.5	2.2
Syria.....	-----	(²)	(²)
Tunisia.....	5.7	3.5	14.2
WORLDWIDE AND REGIONAL PRO- GRAMS ³	894.7	646.0	5,694.2

¹ Includes only grant-aid deliveries chargeable to Military Assistance Program appropriations. Additional military materiel and services valued at \$83.1 million were delivered during fiscal year 1964 under the credit assistance provisions of the Foreign Assistance Act, for a total of \$312.1 million in credit assistance since 1950. Furthermore, military weapons, equipment, and supplies excess to U.S. needs and valued at acquisition costs of \$124.6 million were delivered to grant-aid countries during fiscal year 1964 without charge to MAP appropriations except for rehabilitation and transportation costs, bringing total deliveries of excess stocks to \$2,593.5 million since 1950.

² Less than \$50,000.

³ Includes totals for countries which must remain classified because of intergovernmental agreements or because of their sensitive nature.

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