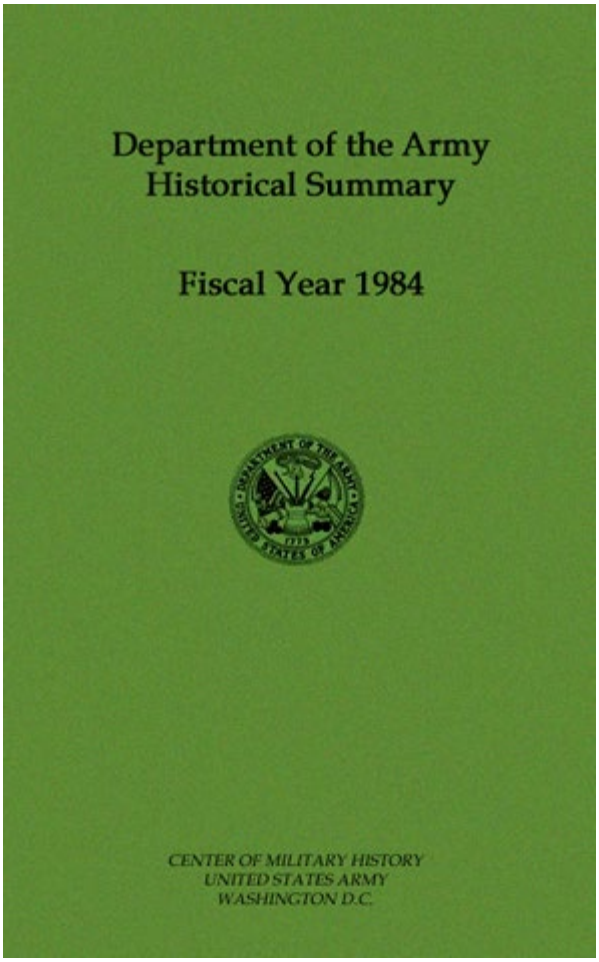

Department of the Army Historical Summary

Fiscal Year 1984

Compiled by

Dwight D. Oland

Edited by

Cheryl Morai-Young

CENTER OF MILITARY HISTORY
UNITED STATES ARMY

WASHINGTON, D.C., 1995

The Library of Congress has cataloged
this serial publication as follows:

Library of Congress Catalog Card 75-09647561

ISSN 0092-097880

CMH Pub 101-16

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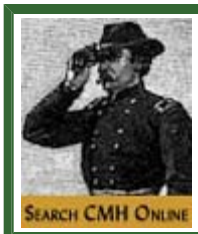

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Introduction

Tomorrow is never the time to start your preparation. The safety of this Nation in the atomic age cannot be built on good intentions and the decision to prepare when the time comes.

General Dwight D. Eisenhower

Fiscal year (FY) 1984 was a year of transition for the U.S. Army as it prepared to meet its varied worldwide obligations and missions. The implementation of force structures and development of weapon systems to complement the requirements of the AirLand Battle doctrine, as espoused in FM 100-5, was a central theme during the year. The Army recognized that the mid- to high-intensity conflict posed the greatest risk to the national security of the United States and, therefore, designed and trained forces to fight in accordance with the new AirLand Battle concepts of FM 100-5.

Several factors, however, compromised the full implementation of FM 100-5. The Army was aware that it lacked forces capable of rapid deployment to locations of low intensity conflict. Emphasis on much-needed modernization of heavy forces had left the Army with few units to deploy by airlift to meet the rapid deployment mission. Therefore, Army planners created the light division, lean in personnel and equipment, to employ best the scarce airlift capability, yet to retain the flexibility and combat power to accomplish its mission. Here too the Army made concessions as it balanced combat effectiveness against mission, airlift capacity, and doctrine.

A self-imposed military personnel ceiling of nearly 780,000 soldiers forced the Army to adjust to meet the goals of both FM 100-5 doctrine and the formation of light infantry divisions. Army planners solved this dilemma partially by reducing the size of heavy divisions, converting existing infantry divisions into light units, and using the resulting personnel savings to create new light divisions. These actions, started or continued in FY 84, would reach fruition in several years.

Meanwhile, the Army was still within the initial stages of its heavy force modernization program. Each new weapon system necessitated the Army's flexible adaptation because each system, in

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turn, imposed new demands on sustainment, mobility, personal training, and doctrine. Often newer systems did not completely replace older weapons. The two had to exist side by side until the Army fielded new ones in their entirety, which marked a transition in materiel, training, and doctrine. Although the light forces could immediately take advantage of part of this modernization program, the majority of the new weapon systems were designed for a tank-versus-tank confrontation in Central Europe. The momentum of this so-called heavy modernization program could not be redirected easily because it underpinned central pillars of Army combat doctrine. Thus, the Army had to reevaluate its ongoing modernization program and simultaneously address the recognized needs of light forces. This process inaugurated another transitional period with adjustments to the twin demands of force modernization and rapid deployment.

The light force requirements included new doctrine, a different training program, lightweight yet powerful weaponry, and a distinct force structure, all designed to provide units with enhanced flexibility. The High Technology Light Division at Fort Lewis, Washington, field-tested various combinations of doctrine, weapons, and force structures for firepower, battlefield mobility, effectiveness, and deployment capability to determine the one best suited to the emerging light forces. Furthermore, the Army reemphasized the utility of the Special Operations Forces (SOF),

increasing its capability and force structure to enhance effectiveness in unconventional warfare and thereby supplement the light forces in low-intensity conflicts.

Entering FY 84, the Army worked to resolve two major problems that hindered the combat capability of heavy and light forces lift and sustainment. The Air Force and Navy did not have the transportation resources to deploy the Army's forces in a timely manner either by air or sea. Once Army troops arrived in the area of conflict, sustainment requirements like food, fuel, ammunition, replacement personnel, and spare parts placed another heavy burden upon the already overextended U.S. lift capacities. Attempting to solve these problems, Army planners and logisticians pre-positioned POMCUS (pre-positioned materiel configured to unit sets) stores and war reserve stockpiles in Europe and deployed units in likely regions of conflict to reduce the lift requirements and improve the sustainment capabilities of Army forces in wartime. These actions altered the Army's force balance, funding allocations, force structure, logistics, and doctrine and allowed the Army to employ finite resources to meet its worldwide missions and obligations.

The balance between deployed forces and continental United States (CONUS)-based forces was one of several force structure issues drawing Army attention. Planners considered heavy-versus-light forces, combat-versus-support forces, and active-versus-reserve units in planning the most effective Army structure. As Lt. Gen. Fred K. Mahaffey, Deputy Chief of Staff for Operations and Plans (DCSOPS), noted in October 1984, "This concept of proper *force balance* does not imply equal parts, but rather the achievement of optimal ratios between the various components of balance necessary to meet our strategic requirements." (Army, Oct 84) During FY 84, planners continued to study the proper force balance, a task that covered rapidly changing facets of the Total Army occasioned by revised doctrine, force structure, equipment, training, funding, and missions. The steadily increasing quantitative and qualitative improvement in the Warsaw Pact armies naturally affected the determination of U.S. Army force balance.

The Army transformed its training program to emphasize a "train as you expect to fight" philosophy; it modernized the program to produce highly skilled soldiers to compensate for the numerical manpower superiority of Soviet backed forces. The Army underlined support for this program by seeking and recruiting high-quality personnel and retaining skilled soldiers. Dispatching reserve units to the National Training Center (NTC) and emphasizing realistic combined arms training improved greatly the capability and effectiveness of those units. After successfully demonstrating its value in enhancing unit morale and reducing personnel turbulence, the New Manning System expanded the number of COHORT (Cohesion, Operational Readiness, and Training) and American Regimental System units.

In 1979 the Army National Guard -(ARNG) and the U.S. Army Reserve (USAR), hampered by personnel shortages and insufficient quantities of modern first line equipment, did not attain prescribed readiness objectives. Since that time, the Guard and reserve forces have enhanced greatly their ability to support the Total Army and meet readiness goals. The roundout and CAPSTONE programs further integrated reserve units with active organizations, and Army policies reinforced this association by training both components together and equipping them with compatible, if not the same, equipment. The "first to go, first to equip" policy, in particular, demonstrated the Army's determination to forge a total force and to recognize that without the reserve forces it lacked the man power and equipment to fulfill missions. Here too, the transition to a more effective Total Army forced adjustments with far-reaching

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ramifications for the ongoing force modernization, force structure, and doctrine aspects of Army planning and operations.

As General Mahaffey stated, "The Total Army's challenge, then, in a world of increasingly constrained resources and unconstrained requirements, is to create a properly structured, superbly trained and well-equipped Total Army of balanced forces, capable of responding across the entire spectrum of conflict." (Army, Oct 84) The following chapters demonstrate how the Army successfully worked to meet this challenge during fiscal year 1984.

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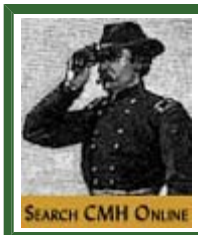

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Force Development

After a post Vietnam period of intense analysis, discussion, and debate, the Army changed the operations doctrine as expressed in FM 100-5. Among the reasons for the Army's shift in operational emphasis were the rapid technological changes in weapon firepower and mobility as well as a growing disparity between the strength of allied and Soviet bloc conventional forces. The original doctrinal revisions, first published in 1976, were revised again in 1982. Because the 1976 version was a radical change from previous operations doctrine, it remained the subject of intense debate within and outside the Army. In fact, the 1982 revision represented a departure from the 1976 version in several major aspects. However, all doctrine is dynamic and the 1982 version is not yet final as current discussion and debate prove. FM 100-5 is the capstone Army manual and directly or indirectly affects every aspect of Army force structure and operations.

The doctrine stated that the Army might face two different combat environments in the future. The first was a "sophisticated battlefield with an existing infrastructure of communications, air defense, logistics facilities, and ports," such as found in a European type of theater of operations. The other would be an arena where the Army would either have "to create an infrastructure or . . . fight without one," for example in Southwest Asia or sub-Saharan Africa. The opponents could range from well-armed insurgents or terrorists to mechanized and armored units with the most advanced weaponry. Army doctrine also warned that future conflict would likely be intense, expensive, and very lethal; the use of nuclear and chemical weapons was not ruled out.

FM 100-5 postulated that the Army faced four challenges:

1. A battlefield of non-linear maneuver will replace the traditional battlefield of clearly demarcated front lines. This means that the Army must conduct deep strikes against the enemy while it is engaged simultaneously in rear area combat. The Army must conduct command and control countermeasures, operate on low levels of logistical support, survive

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against highly lethal weapons systems, perhaps fight outnumbered, and perhaps under the threat of use of nuclear or chemical weapons. These new demands of the modern battlefield clearly required a reexamination of Army doctrine.
2. The new demands of combat impose higher standards on leaders. Leadership and unit cohesion will play vital roles in motivating troops to fight resolutely even though they may find themselves temporarily encircled or outnumbered. The highly fluid battlefield requires commanders at all levels to display "skill, imagination, and flexibility" to the fullest extent possible.
3. Personnel and unit readiness is a necessity since future conflicts will offer little time for leisurely deployment. Such readiness, however, is of little value "without logistical readiness-the availability and proper functioning of materiel, resources, and systems to maintain and sustain operations on a fluid, destructive, and resource-hungry battlefield."
4. Therefore, the fourth challenge, training, ties all of the above factors together. For if the officers and men are not professionally and mentally prepared for battle, then the battle is lost. However, training is envisioned as more than individual preparation. It includes the training of units both individually and in combined arms exercises.

Army doctrine defined maneuver and firepower as "inseparable and complementary elements of combat." Although one element may be emphasized more than the other, depending on the combat solution, "the coordinated use of both characterizes all operations." Today, fire support units must be as maneuverable as the combat units they support.

Since the Army doctrine was the blueprint for future combat operations, four major areas of Army planning were directly interrelated: force development, sustainment, mobilization, and training. All are intrinsically related although treated separately in this chapter.

Force Development

Army planners and programmers used the five-volume Force Modernization Master Plan (FMMP, DA Pam 5-26) as a roadmap for the modernization of systems and operations during the 1980s and 1990s. This will guide Army staffers in improving and easing the transition of Army forces into the Army of Excellence configuration. The Deputy Chief of Staff for Operations and Plans pub-

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lished the latest FMMP on 1 August 1984, which included the planned transition of units for the coming decades.

After determining the ideal size of the Division 86 force structure, Army planners discovered that although each component's raison d'etre was sound, resources were inadequate to support the proposed force structure. A change in Army leadership also brought a new appreciation of the potential of light forces and an accompanying call for more light infantry divisions. Nevertheless, the Army could organize no new divisions, either heavy or light, if the existing Division 86 structure lacked resources. Therefore, Headquarters, Department of the Army (HQDA), tasked the Training and Doctrine Command (TRADOC) to study the problem and design a new combat-effective, responsive, and balanced total force within the guidelines of current Army resources. TRADOC, however, received several limitations for the study from HQDA. These included keeping the force structure within programmed Army end strength of 780,800 personnel; determining whether the Army could be manned at Authorized Level of Organization (ALO) 2; designing a light division structure capable of fighting a low intensity conflict; reducing the resources of heavy divisions; and moving division assets to corps level. Several issues discussed at the Army Commander's Conference in August 1983 were also included as restrictions: to simplify units' missions, to increase deployment ability, and to enhance some units' ALO structure. The resulting TRADOC study, "Army of Excellence (AOE)," proposed a force structure that met HQDA's guidance, which was gradually being implemented. The Army's 17th and 18th Infantry Divisions will be activated in 1985 with two active light infantry brigades and one reserve component light infantry brigade. Following that, the 7th Infantry Division and 25th Infantry Division will be reconfigured as new light infantry divisions. Furthermore, the Army will reactivate the 29th Infantry Division, an Army National Guard unit, in the same light structure. The Army reduced simultaneously the assets of the heavy division to ten maneuver battalions. All units considered better employed elsewhere were assigned to Echelons Above Division (EAD). Work also progressed on providing the light infantry division with additional corps augmentation and support units.

Certain analysts considered the Army of Excellence to be inappropriate for an Army in the middle of a massive modernization program. They questioned the rationale for the new light infantry division as well as the change in Division 86 configuration and movement of assets to EAD level on a reduced scale. Although many planners considered

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these moves doctrinally acceptable, critics wondered if the changes, in effect, traded combat effectiveness for an expanded structure.

The reorganization of the 82d Airborne and 101st Airborne (Air Assault) Divisions emphasized their combat capability and streamlined their structures. The new light infantry division design proposed under the AOE study was modified to meet the divisions' special requirements. The changes in force structure also had to incorporate the improved modern equipment being introduced to the force to support the AirLand Battle doctrine. Other improvements included better strategic and local mobility, additional communications equipment, additional antitank firepower, and a lower leader-to-led ratio. As with the heavy divisions, the Army assigned corps-level units to support the divisions. These support units included a parachute rigging unit, a light armored battalion, and several truck companies. Upon conversion to the new force structure each streamlined division will have 20 percent fewer troops. The 101st will convert during FY 86 and the 82d the following year.

TRADOC also studied the Echelons Above Corps (EAC) structure and doctrine as did the Combined Arms Center at

Fort Leavenworth, Kansas. One of the products was FC 100-16-1 Theater Army, Army Group, and Field Army Operations, a circular which, with FM 100-16, discussed combat support and combat service support operations and doctrine at the EAC level. The relevant parts of both manuals were being combined into a revised FM 100-16 at the end of FY 84. The Combined Arms Center reviewed EAC force structure with respect to recent changes in Army doctrine as expressed in the AOE study. The center's analysts expected this study to continue through 1985 and planned to match the EAC force structure to the current doctrine.

The 9th Infantry Division High Technology Test Bed at Fort Lewis, Washington, was redesignated the Army Development and Employment Agency (ADEA) and kept the same mission of quickly identifying, testing, and recommending to the Department of the Army operational concepts, doctrine, organization, materiel requirements, technology, and training developments, which improve the light infantry division's combat power, development capability, mobilization ability, and sustainment. The 9th Infantry Division will remain as the High Technology Light Division. This term itself was changed to High Technology Motorized Division to differentiate it from the new design light infantry division and to focus on the different equipment and operational doctrine of a motorized division.

The motorized division was organized to fulfill requirements not met by heavy, airborne, air assault, or light divisions. Thus, the mo-

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torized division has the strategic mobility of an air assault division and the ground antiarmor capability of a heavy division. Although organized to engage in mid- to high-intensity conflicts with Soviet type opposition, the 9th Infantry Division also remained available for deployment worldwide, not only to areas where its superior ground tactical mobility was best employed. The Army might assign the 9th to a corps or joint task force where it would fight in conjunction with other types of divisions. The 9th's force structure configuration was designed to expand lodgments made by other units.

The structure of the 9th Infantry Division, however, centered around several essential weapon systems, such as the fast attack vehicle (FAV) and armored gun system (AGS). Currently, these items remain below authorized levels. Nonetheless, the division was combat ready in its existing force structure configuration for immediate deployment. It will operate under this new design in FY 87 and will be converted completely to a motorized division in FY 92 with full operational capability soon thereafter.

Besides its role as a motorized division in the Army's force structure, the 9th Infantry Division will retain its test bed role to examine and to test new concepts and technological advances for the Army. The results should indicate which ideas and technologies will be of use to other Army units. Another of the Army's goals with the motorized infantry division was to reduce division personnel to roughly 13,400 by FY90, keeping within DOD manpower guidelines.

The Army continued to increase the role of National Guard and Army Reserve components in the Total Army concept. The Army provided these forces additional units, appropriations, modern equipment, and more responsible missions. Furthermore, Army staffers monitored closely the reserve components to create a well-balanced and equipped force. This resulting mixture was not a permanent figure or fixed percentage but fluctuated with the Army's perception of its doctrine, missions, and costs. Thus, DOD planners expected that the Selected Reserve strength will be higher than that of the Active Army by 1988. However, for such forces to be valuable they must be properly equipped. Consequently, the Army expended tight budget dollars to provide new equipment for the reserve units. The Army also added one new National Guard division (35th Infantry Division) in FY 84 and expected to add another in FY 85. These were the first additional National Guard divisions in forty years. The Army will augment the Army Reserve with 165 new units over the next five years. The Army also retained the current reserve component percentages of Total Army strength in combat support and combat service support (approximately 67 percent), division

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combat increments (roughly 40 percent), and maneuver battalions (50 percent). Unit equipment upgrading was on

schedule-those deploying first were modernized first.

AirLand Battle doctrine, as the name implies, involves air assets. Thus the Army and Air Force having agreed already in 1983 that FM 100-5 would be used for joint tactical training and field exercises, expanded the manual's role in joint planning of future force development and operational concepts. Both air and ground arms agreed that it was important to use combined air and ground power in a complementary manner to support the theater commander's objectives.

On 22 May 1984, Army Chief of Staff General John A. Wickham, Jr., and Air Force Chief of Staff General Charles A. Gabriel signed a Memorandum of Agreement identifying thirty-one initiatives for development by the Army and Air Force. Titled the "U.S. Army-U.S. Air Force Joint Force Development Process (JFDP)," it was commonly referred to as "The 31 Initiatives." (See *Appendix A.)* In this agreement, the chiefs perceived the thirty-one initiatives as the initial step in a long-term, dynamic process to institutionalize jointness.

These thirty-one initiatives had a far-reaching impact by consolidating and eliminating programs as well as clarifying roles and missions. The initiatives deleted several programs, such as the Air Force Comfy Challenge electronic combat system. The Army Mohawk Joint Surveillance and Target Attack Radar System was incorporated into the Air Force C-18 system. A study was mandated of potential modifications of traditional roles and missions, including the Army's assuming rotary wing lift support for special operations forces and the Air Force's undertaking responsibility for area surface-to-air missile defense. The initiatives required greater joint war-fighting concepts and capabilities. These included an assessment of how to counter jointly the heliborne assault threat and tactical missile systems as well as how to improve identification-friend-or-foe systems. Moreover, the initiatives looked at long-term requirements and concepts coordination in new aircraft starts, tactical reconnaissance systems, and intratheater airlift. The thirty-first initiative, the Program Objective Memorandum (POM) priority list, was the most crucial, since it attempted to make the JFDP permanent by formalizing cross-service participation in the POM development process. All of the initiatives required the service staffs and unified, specified, and major commands to coordinate in new areas that, ultimately, would provide the necessary catalyst to institutionalize jointness.

To infuse jointness throughout the two services, Generals Wickham and Gabriel directed the Army DCSOPS and the Air

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Force DCSOPS to implement the agreement. As a result, they disbanded the original study group and in June 1984, created a permanent office, the joint Assessment and Initiatives Office, to assume the study group's responsibilities and tasked the service proponents to participate.

While FM 100-5 was being reviewed as current doctrine, TRADOC was working on its successor, Army 21, which forecast the years 2000-2015 and the AirLand Battle concept in the twenty-first century. TRADOC examined future concepts to prepare, through doctrinal development, forces design, and resource planning, for the future Army and its combat role. Army 21, an evolutionary concept, will cover areas not previously emphasized. The Army fully expects that technological advances will alter the shape of Army 21.

The Army force structure established light divisions to counter low-intensity threats to United States interests. These divisions were to be highly mobile strategically and were to have more than one-third of personnel in combat arms specialties. Army planners envisioned using light divisions to secure airheads for follow-on heavier units as well as for operations in restricted terrain during high-intensity conflicts.

The present commitment was to convert or to activate five light infantry divisions by FY 89; the timetable was:

1. 7th-Fort Ord. Complete conversion in FY 85.
2. 25th-Hawaii. Begin and complete conversion in FY 86.
3. 10th Mountain Division-Fort Drum. Activate over period of FY 85-89 with part of one brigade and its support temporarily at Fort Benning.
4. 6th-Alaska. Activate from FY 86-87.

5. 29th-ARNG, Maryland and Virginia. Activate from FY 86-87.

The 10th Mountain Division represented the only new activation. The Army will create other light divisions from existing units, except for the 6th, which will incorporate the 172d Infantry Brigade.

Since 1981 and the continuing spiral of terrorism, the Special Operations Forces (SOF) of the United States have received increased attention and support from the President and Congress. As a demonstration of increased legislative interest, the Readiness Subcommittee of the House Armed Services Committee established a new panel to oversee improvements in Special Operations Forces. Furthermore, the Army implemented the 1984 SOF Master Plan during the year. The plan reviewed force structure requirements and assets, then recommended ways to correct deficiencies during the years 1986-1990.

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The Chiefs of Staff of the Army and Air Force agreed that all SOF rotary wing support would be provided from Army assets. An Army Air Force Working Group was laying the groundwork for the transfer of Air Force rotary wing assets to the Army at the end of FY84. However, the Deputy Secretary of Defense had not given final approval to implement the decision and the House Armed Services Readiness Subcommittee opposed this decision based upon testimony and information provided to the special SOF panel.

A fourth active component special forces group was activated in September 1984. Other activations included a Ranger regimental headquarters, 75th Infantry Regiment (Ranger, on 1 July 1984 and the 3d Ranger Battalion on 1 October 1984) . Furthermore, the Army planned to activate Special Operations Communications Support Elements (SOCSE) in FY 86 and to increase their strength in FY 88. These SOCSE's provided additional resources to establish, maintain, and operate Command, Control, and Communications (C 3) systems among theater, special operations, Army SOF subordinate, and other commands as needed. The SOCSEs will operate C 3 missions simultaneously in two theaters.

An austere Special Operations Support Element (SOSE) was under development to provide support to SOF units for short, low visibility operations. The SOSE included support unavailable elsewhere within the theater. It will be able to support two theaters simultaneously. An FY 86 activation is planned.

TRADOC analyzed a combat service support concept for the 1st Special Operations Command (SOCOM) to determine whether support services should be provided by units integral to 1st SOCOM or by augmentation with selected active and/or reserve units. TRADOC also reviewed a combat arms reorganization plan that would allow the Army to satisfy all unified and specified commands' requirements without increasing space requirements. Moreover, a reorganization of the 4th Psychological Operations Group was investigated.

As a part of the Army's planned expansion to a 28-division force structure, it activated the 35th (Santa Fe) Infantry Division (Mechanized) in 1984. Identified by the National Guard Bureau in 1983 as the ninth National Guard division, the 35th Infantry Division (Mechanized) comprised the 67th Infantry Brigade of Nebraska, the 69th Infantry Brigade of Kansas, and the 149th Armored Brigade of Kentucky. Prior to their consolidation into the 35th Infantry Division these units existed as separate brigades. Other units from Colorado, Kansas, Kentucky, Missouri, and Nebraska, both in existence and newly organized, will fill out the 35th Division's remaining organization. At the end of FY 84, the division's tenth maneuver battalion and

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air defense battalions were unidentified. The division headquarters is located at Fort Leavenworth, Kansas, and the National Guard plans to have the division completely organized by FY 89.

One of the major components of the AirLand Battle doctrine was the ability to deploy rapidly personnel and materiel for both strategic and tactical purposes. The glaring absence of such capability, both in sealift and airlift, became a major issue during congressional hearings and interservice studies. As one commentator noted, no matter how excellent the

quality and quantity of the people and equipment, if they cannot be moved to where they are needed, they are worth nothing. The Congressionally Mandated Mobility Study (CMMS) of 1981 established a 66 million-ton-miles-per-day (MTM/D) goal for strategic airlift and 100,000 short-tons-per-day goal for sealift to meet projected 1986 defense requirements for four scenarios. The goals represented the minimum capabilities based upon probable available fiscal assets and, in fact, did not meet the operational lift needs for any of the projected scenarios. Furthermore, less developed areas of the world, particularly Southwest Asia, remained unsuitable for air lift. These potential trouble spots, as well as other likely flash points for the outbreak of low intensity conflict, necessitated dependence upon an augmented sealift capability.

Under the congressional requirement, the Military Airlift Command was to have the capability to move 60 tactical fighter squadrons, 1 Marine amphibious brigade, and 6 Army divisions to the Middle East within ten days. To accomplish this ambitious goal, the Air Force planned to add 50 C-5Bs, 44 KC-10s and 3 of the new C-19s to its fleet. These aircraft and the Civil Reserve Air Fleet (CRAF) modification program will ease the airlift problem, but a projected 17.5 MTM/D shortfall still existed for FY 89. This, in turn, meant that insufficient airlift was available to move three Army divisions to the Middle East within the ten-day limit established by the CMMS.

General Mahaffey, then Assistant Deputy Chief of Staff for Operations and Plans, testified before the Senate Armed Services Committee's Subcommittee on Sea-power and Force Projection in March 1984. He stated that "Airlift is the cornerstone of force projection during the early days of deployment." (*Armed Forces Journal [AFJ]*, July 1984) Another complicating factor was the Army's plan to increase the amount of outsized equipment that only new C-5Bs could carry. A possible solution lay in the C-17, which had the capability to carry outsized equipment and use forward area airfields. Even with congressional funding, the G-17 would not be available for seven years. The CRAF program, in which civilian airlines provided planes to supplement military airlift capability, also faced problems from eco-

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nomic dislocation in the commercial airline industry. In fact, projected cargo capacity will probably drop over the next several years.

These problems were concerned primarily with strategic airlift. At that time, no tactical airlift or sealift requirements were established. On 22 May, the Chiefs of Staff of the Army and Air Force agreed to establish an office to determine tactical airlift requirements. The Senate Armed Services Committee told the Department of Defense (DOD) on 31 May to provide a report on tactical airlift requirements by March of the following year.

The Navy's Military Sealift Command also fell short of meeting sealift needs for both the Army and Marine Corps. Although the CMMS requirements ordinarily would have been met, an OSD-conducted study showed that, based upon a worst-case scenario in FY 88 (rather than FY 86), the Navy would have a 9 percent shortfall of lift. A later review of the study by the Maritime Administration showed that the shortfall would be in the 20-25 percent range because the American Merchant Marine's sealift capacity was falling, not remaining constant as planners had postulated. Furthermore, the Navy had a shortage of roll-on/roll-off ships, essential for rapid deployment of Army materiel as well as ships able to steam faster than eighteen knots. A shortage of break bulk ships also loomed on the horizon as more and more shippers converted to containerization.

The Navy pursued programs to increase its sealift capabilities. The Near-Term Pre-positioning Force consisted of thirteen ships (break bulk, lighter aboard ship, roll-on/roll-off [RO/RO], and tanker) stationed in the Indian Ocean to shorten the response time of Army forces by having the units' materiel already in the region, awaiting the arrival of troops. The Fast Logistics Ships program increased Army surge capability by converting T-AKR container ships to an RO/RO configuration. These boats traveled faster than eighteen knots and could deliver an Army heavy division to the Persian Gulf region in 14 to 16 days. At the end of FY 84, Military Sealift Command had contracts on 8 RO/RO ships (also known as SL-7s) or roughly 45 percent of all RO/RO flying U.S. flags. The Navy received four SL-7s during the fiscal year. Berthed on the East Coast, they will be able to put to sea within four days.

Composed of 288 ships, the National Defense Reserve Fleet contained the military's troopships and needed a minimum of 90-120 days to begin operations. Part of this fleet, the Ready Reserve force, was upgraded from 34 ships, available in

FY 84, to 77 by 1988. Response time was established at 5 to 10 days, meeting the troops as they arrived at embarkation ports. The Navy requested $31 million for purchasing 19 vessels in FY 85.

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Besides converting container ships to an RO/RO configuration, the Army and Navy worked together to adapt the converted vessels to carry outsized Army equipment that was too large for containerization. Two programs, flatrack and seashed, were used to modify these vessels. Flatracks were posts and decks that could be arranged either vertically or horizontally to make space for bulky items. Seasheds could change a single container cell into three contiguous cells with temporary decks for storing heavy lift equipment. All of the services looked at airlift and sealift mobility with renewed interest, and future plans and budgets included an increased emphasis on the ability to deploy the land force wherever it may be needed.

Maj. Gen. Bobby J. Maddox, first Chief of the Army Aviation Branch, stated in Army (March 1984) that "Army aviation will play a key role in any future AirLand Battle because of the unique maneuver capability and firepower it possesses and the added dimension its systems bring to the battlefield. Army aviation offers a significant potential for substituting technology for manpower to neutralize or defeat any adversary's tactical war-making machinery." The AirLand Battle concept outlined in FM 100-5 as operational doctrine reemphasized the Army's concerns for close air support. Almost all phases of the AirLand Battle doctrine demanded the participation of U.S. Army helicopter assets. The Army's aviation assets, however, were divided between several arms for support. Consequently, on 12 April 1983, the Secretary of the Army recognized aviation's role as a combat arm and approved formation of an Aviation Branch. The Army Chief of Staff concurred with the Secretary's decision, and on 6 June ordered studies conducted for the establishment of an Aviation Branch and its role and missions. The Aviation Branch spent FY 84 formulating doctrine and operational plans as well as identifying the assets, force structures, personnel, and training requirements for the new branch.

The Army expected its aviation resources to destroy enemy armor and mechanized infantry either directly with TOW missiles or indirectly with laser target identification. This action would delay enemy advances, which, in turn would allow allied forces to seize the initiative. The Army Attack Helicopter Battalion was the most maneuverable and deadly unit that a division commander could use. Additional Army aviation assets provided air assault capability, reconnaissance, communications, command, and control assets to commanders; supplied special electronic mission aircraft (SEMA); inserted and extracted SOF personnel; and evacuated the wounded.

The United States Army Aviation Center (USAAVNC), Fort Rucker, Alabama, worked on planning the force structure to con-

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duct all these functions. Their complex task of fielding a new branch and separate combat arm was complicated by the concurrent change from Army 86 to an AOE force structure. Army aviation had a key role on any future battlefield and aviation doctrine within the capstone of FM 100-5. It influenced the Army's ability to conduct the operational requirements identified therein. New aviation weapon systems already fielded, in production, or in planning stages included the UH-60A Black Hawk, the AH-64 Apache, the Army helicopter improvement program (AHIP), the CH-47D Chinook, the light helicopter program (LHX), SEMA, and the heavy lift helicopter program. The Army made preliminary recommendations of aviation force structure and operational doctrine for all levels (division, corps, and echelons above corps [EAC]). Army aviation planners and analysts emphasized the combined arms concept that Army ground and air units employed in Vietnam. This integration of ground and air assets was vital to the accomplishments of AirLand Battle operational goals.

The role and missions of Army aviation will change significantly by the end of this century if the Army implements current plans and is able to maintain the present rate of progress. By 2000, the Army will reduce its rotary wing fleet from twenty-two types of helicopters to seven. A new generation of light helicopters designed for scout, attack, utility,

and observation roles was under development, and the Army considered a new heavy lift helicopter. A tilt rotor aircraft may also be introduced to assume rotary-wing operations. The Army may adapt helicopters to carry air-to-air missiles, such as the Stinger, for a defensive air-to-air capability although some aviators sought them to use offensively against enemy aircraft. Special electronic mission aircraft (SEMA) will play a more important role in the next decade in target designation, reconnaissance, and electronic warfare.

An Army study group worked on Army Airborne Intelligence 2000, a study on the use of SEMA. The Army focused attention on both manned and remotely piloted aircraft and linked these with requirements for intelligence gathering and electronic warfare to determine the best aerial platform for a particular mission. These will not be limited to Army platforms but will look at all applicable Air Force vehicles as well. The Army study will be combined with the Air Force's "Theater Intelligence Reconnaissance and Surveillance" study in FY 85 as the services cooperate to identify common aerial reconnaissance platforms for joint Combat Electronic Warfare Intelligence (CEWI) activities.

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The Army also planned to expand the aviation flying-hour program from 124,000 hours (18.4 hours/aircraft/month for 560 aircraft) to 134,233 hours (more than 19.5 hours/aircraft/month for 600 aircraft) in FY 85. Aviation training would increase from 15.6 hours to 16.8 hours/aviator/month. As the new Apache helicopter was fielded, the Army increased night training and planned for further increases in FY 85. General Robert W. Sennewald, Commanding General of Forces Command, U.S. Army (FORSCOM), announced that all AH-64 Apache attack helicopter training would be consolidated at Fort Hood, Texas, by mid-1985.

Sustainment

With a suitable and properly equipped force structure, and the capability to deliver these forces where required, a significant determinent of success is the ability to sustain the force-the ability to supply the force with the ammunition, spare parts, petroleum, oils, and lubricants (POL), and water required to accomplish the mission. Dr. Lawrence J. Korb, Assistant Secretary of Defense for Manpower, Reserve Affairs, and Logistics, voiced concern over what he termed the services' "dangerously low sustainability posture." He blamed this deficiency on defense budget cutbacks following the Vietnam War; the lack of "glamor" of this type of materiel compared to new or modernized weapon systems; and the popular notion that American industry would be able to mobilize quickly for wartime production in a national emergency. *(Defense* 84, January) Others also identified the increasing technological complexity and cost of new weapon systems as factors that extended production time and contributed to the shortage of sustainment items. Each weapon system requires an adequate supply of spare parts, ammunition, POL, and other items necessary to make that system continue to function effectively on the battlefield. Like sealift and airlift, sustainment items do not have as high a priority as weapon systems, and both are overlooked and underfunded. Suddenly, the Army has weapons and a force structure, but no way to deliver them to a theater or to sustain them once they arrive.

Commanders of unified and specified commands placed "near-term improvement in materiel sustainability" as their most important priority. They saw that the current military forces lacked an adequate capability to sustain the force and probably would suffer from this condition for several more years, despite Army awareness and attention to the problem. Army planners recognized that a bal-

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ance between weapon system production and modernization and the acquisition of sustainment items was needed.

Although the Department of Defense Guidance for Fiscal Years 1983-1987 listed sustainment as a high priority, progress in meeting near- and mid-term goals was slow. The reason was that sustainment money was programmed to the outyears of fiscal years 1986-1988 both in the 1983-1987 and 1984-1988 Guidance. Dr. Korb observed that these increases were removed from the budget as each outyear turned into a budget year. Army funding for fiscal years 1985-1989 did not meet the Department of Defense Guidance for sustainment by fiscal year 1988. Furthermore, proposed cumulative funding through FY 88 fell short of requirements by $2.5 billion. This remained a difficult problem. An

examination of the Army's ammunition and tracked vehicles (tanks and armored personnel carriers) programs illustrates the problem. The ammunition program placed increased procurement funding in the outyears while the tracked vehicles program budgeted less procurement funding. However, as the outyears approached actual budget years, the program's share of funding reversed.

The Army used its funds for sustainment in the most economical manner and improved sustainment, though much remained to be accomplished.

The War Reserve program improved sustainment, strategic mobility, and support of contingency operations. War reserves assumed a particularly vital role in combat operations of the type described in FM 100-5. These intense and highly lethal scenarios will place a heavy burden on the intheater pre-positioned war reserve materiel stocks, which will be the only materiel immediately available for commanders to use to sustain their forces' fighting ability. War reserve stocks included all replacement items, ammunition (including missiles), equipment, and POL procured during peacetime and used to replace combat wear and losses until the Communications Zone can forward supplies from a mobilized CONUS industrial base.

The intheater pre-positioned war reserve materiel was located as near the planned area of use as possible in order to conserve the time needed to resupply units. During FY 84, the Army stored materiel in Hawaii, Panama, Alaska, Japan, Korea, and the North Atlantic Treaty Organization (NATO) alliance countries. Pre-positioning these stocks overseas was vital since the Army's strategic lift capacity remained limited, and the planned mobilization of the national industrial base was expected to require time. The Office of the Deputy Chief of Staff for Logistics (ODCSLOG) planners considered pre-positioned stocks as adequate if they could sustain

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the operations of all forward-deployed and reinforcing U.S. units until CONUS resupply was established on a normal basis. A safety factor, taking into account underestimation of consumption and/or delays in the establishment of resupply from the United States, was inherent in the stockage levels. The FY 84 levels of war reserve stocks were so low that the industrial resources would need an eight- to ten-month lead time to replace combat losses and use.

Some war reserve stocks were positioned within the United States to meet other Army requirements. These CONUS war stockpiles, for example, served as backup for certain materiel pre-positioned overseas and would be a source of equipment for a worldwide contingency force (such as the Army's Rapid Development Force units). In addition, the Army earmarked materiel for upgrading reserve units to a war footing.

Other war reserves were available for purposes other than sustainment. Pre-positioning of materiel configured to unit sets (POMCUS), and non-POMCUS for special contingencies, contained stocks for the initial supply of arriving units or materiel in excess of unit authorization for special contingencies in CONUS, the Pacific, and especially Europe.

Each year, members of the Army's major commands meet with ODCSLOG personnel to identify problems, discuss solutions, and plan for actions to resolve war reserve issues. The Army held four of these war reserve conferences during the year.

The War Reserve Automated Process (WRAP) was a standard automated system that determined wholesale and retail secondary item war reserve requirements and prepared the funding and programming reports required under the Army's current policies and guidance. The reports produced by WRAP serve as the official documentation justifying the secondary item war reserve budgets and programs. In FY 84, the Army developed, tested, and sent WRAP to all Headquarters, Army Materiel Command, major subordinate commands (MSCs). At the end of FY 84, it was operational at the wholesale level and will be deployed and operational at the retail level by the end of August 1985.

POMCUS stocks are war reserves stored in Luxembourg, the Netherlands, Belgium, and Germany for the use of specified CONUS-based units, which will deploy to NATO shortly after mobilization. Since POMCUS are complete equipment authorizations for the deploying units, the units' personnel can be airlifted to Europe without their accompanying equipment. This conserves valuable space and allows the maximum number of personnel to be

airlifted, given current strategic airlift and sealift capability shortages compared-to the Army's requirements.

The Army kept POMCUS stocks in operating condition by storing them either inside specially constructed facilities or in the open, as appropriate. Specialists maintained the equipment under a cyclic set program in which all unit sets not stored in humidity-controlled buildings were inspected and repaired every two years with the remainder maintained on a four-year cycle. Significantly, REFORGER units used POMCUS stocks, and all equipment employed during REFORGER exercises was cleaned, inspected, repaired, and returned to storage after the completion of the exercise.

The Army continued filling POMCUS stocks during FY 84. Congress included funds in the FY 84 defense appropriations bill for Division Sets 5 and 6, to be located in Belgium and the Netherlands. The bill also required that the levels of active component stockage not fall below 70 percent and reserve component stockage below 50 percent. However, since the construction of facilities necessary to store these division sets remained unfinished, the Army shipped no equipment during FY 84.

ODCSLOG personnel responded to the twin concerns of the Vice Chief of Staff of the Army over the state of POMCUS readiness and the lack of an accurate gauge to measure the progress of stocking the POMCUS. ODCSLOG determined that the Vice Chief of Staff concerns were justified and proposed corrections, namely to articulate the total POMCUS requirement and use the POMCUS Authorization Document (PAD) to identify which units the Army could add to POMCUS each fiscal year as additional storage facilities became available.

The Army maintained small elements from the 7th Support Command and the 54th Area Support Group in Rheinsberg, Germany, to implement POMCUS. Army planners also worked to obtain congressional approval to acquire permanent facilities for these two units and to improve community support at the remote sites in northwestern Germany where they were stationed.

Although the Army's operational doctrine matured and modernized equipment entered the force, the Class IX Management System to support these initiatives has remained unchanged since 1970. General Richard H. Thompson and Lt. Col. Robert P Stisitis pointed out in Army *Logistician* (Nov/Dec 84) that the current prescribed load lists (PLLs) and authorized stockage lists (ASLs) were outmoded, overstocked, and only partially supported combat readiness. ODCSLOG decided to make doctrinal and managerial changes to upgrade the system provided to combat, combat sup-

port, and combat service support units. Several initiatives in the modernization of the Class IX Management policy balanced the forward-positioned stocks with those stockpiles depending upon delivery through the transportation and distribution system and, thereby, improved the system's responsiveness to units and guaranteed that materiel readiness would be sustained during combat. In FY 84, the Army attempted to guarantee- 85 percent stockage of a unit's items. The new policy, under study, recommended stocking only those items essential to fulfill immediate requirements. *(See Charts 1 and 2.)*

CHART 1 - TODAY'S CLASS IX ASL "SUPERMARKET"
(Heavy Division)

Stocks to meet the need for any part for any equipment.

- Quantity-10,500 line items.
- Weight-2,500,000 pounds.
- Volume-124,000 cubic feet.

Source: Army Logistician.

CHART 2 - TOMORROW'S CLASS IX ASL "CONVENIENCE STORE"
(Heavy Division)

Focuses on readiness of key critical combat weapon systems.

- Quantity-7,000 to 7,500 line items.
- Weight-1,500,000 pounds.
- Volume-76,000 cubic feet.

Source: Army Logistician.

A major part of the PLL/ASL problem was the expansion of the support list allowance card (SLAG) brought about by the influx of new equipment into the force. Spare parts for new equipment created an additional burden on the unit's time, space, personnel, and mobility because they coexisted with stockage of parts for older equipment. Furthermore, the technological sophistication of new weapon systems usually increased the number of spare parts a unit must maintain to keep "down-time" to a minimum.

ODCSLOG planners worked to reduce stockage list allowances of new equipment and to develop a system to identify and remove

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from the PLL and ASL parts for equipment no longer used. In the future, the PLL/ASL will stock, as nondemand-supported provisioning items, only high-mortality parts essential for the equipment in operation and parts necessary to satisfy safety and legal requirements. The implementation of the new criteria could reduce requirements for parts by 90 percent. These interim criteria will be replaced by a standard Total Army mandatory parts list (MPL) based upon an empirical validation. Other items essential to the combat readiness of equipment, but not included under these criteria, will be stored at corps or installation level, thereby maintaining readiness but alleviating storage problems for the forward supporting and supported units. Fringe requisitioning at the depot level will make nonessential items available at the depot level. AMC planners worked on developing a program to update wholesale data bases, which should improve the management of stocks at all levels and enhance combat readiness.

The second part of the new supply policy used the standard combat PLL and ASL program to develop an MPL. At the direction of the Chief of Staff of the Army, ODCSLOG investigated the problem of a sufficient breadth (number of lines stocked) and depth (number of items for each line) in the Total Army PLLs and ASLs to maintain critical equipment during combat. Aided by simulations, ODCSLOG planners determined the operational availability of equipment required for combat operations, a departure from the previously used peacetime demand-oriented system to project wartime requirements.

AMC tested a high-priority delivery system in the United States Army, Europe (USAREUR), to fulfill not-mission-capable supply requirements for specified end items. Using commercial delivery services, this Rapid II system reduced the order shipping time to 90 hours-CONUS to Europe.

As the Army fields an increasing number of modern weapon systems employing modules, the emphasis of ASL management will change from parts to be discarded to those that can be repaired. The Army made an important policy change last year when it gave major commands the responsibility to manage reparable parts. Logisticians at the end of FY 84 worked to develop a synchronized supply, maintenance, and distribution system to improve reparable management while keeping costs and stockage low.

ODCSLOG improved the supply policy and distribution system by developing two new microcomputer systems. The

Unit Level Logistics System (ULLS) began as the tactical organizational paperless service support system, a SMART (Supply and Maintenance

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Assessment and Review Team) program initiative in the 24th Infantry Division. It automated almost all of the PLL transactions, decreased the PLL workload, and increased transaction accuracy at the unit level. The Standard Army Retail Supply System (SARSS) will be fielded in forward support battalions to receive and process ULLS data, generate stock issue and inventory management data, and prepare transactions for Direct Support Unit Standard Supply System processing. All of these transactions were designed to decrease response time to meet lower level units' high-priority needs.

The Army Logistics Center, after reexamining recent technological advances and the threat to the rear area divisional support area, reappraised its centralized materiel management policy. Planners believed that daily logistical functions were more likely to survive hostile action if they dispersed among the division's direct support units. The 9th Infantry Division (Motorized) served as a test bed for decentralizing daily logistical functions management. The 9th provided a demanding test for the new system because the division was configured for rapid deployment. Its maneuver units were highly mobile because of organic ground and air transportation assets. The Army designed proposed doctrinal changes in supply policy to provide a logistics system that could support rapidly moving combat elements similar to the 9th Infantry Division.

The Army logistical organization, at the end of FY 84, followed several principles while developing a supply policy to meet FM 100-5 doctrinal requirements. For example, logisticians identified the challenges of force modernization and made progress in meeting them. Planners recognized also that they must strike a balance between the level of stockage and the level of usage to keep PLLs and ASLs more mobile and less expensive. The distribution system was the vital key to the timely and adequate resupply of combat units.

In 1980 the Secretary of Defense designated the Army the DOD Executive Agent for land-based water resources. Since then the Army has worked on developing, coordinating, and implementing a totally integrated tactical water support system. Primarily, ODCSLOG, as the Army's water resources proponent, focused its attention on the needs of the United States Central Command (USCENTCOM) because operations in that area of the world would occur in an arid environment with high ambient temperatures and few sources of fresh water. ODCSLOG used a systems approach to determine water support requirements for such functions as detection, production, treatment, distribution, storage, and cooling. The Army transferred the responsibility for all of

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these functions, except for detection and production, from engineer elements to combat service support units.

A two-part program was used to satisfy CENTCOM water requirements. The first, completed by the end of the FY 82 funded delivery period, fulfilled the minimum essential needs of the near-term force. Redesignated petroleum, engineer, and transportation units used commercially obtained equipment to establish and operate the System. The second involved the creation of a comprehensive tactical water support capability for the expanded force by the close of the FY 87 funded delivery period. ODCSLOG programmed the necessary materiel and force structure requirements to meet the deadline.

ODCSLOG successfully demonstrated a 300,000-gallon-per-day, barge-mounted, reverse osmosis water purification unit during the Joint Logistics Over the Shore Exercise II. The Army will deploy the water purification unit in CENTCOM. It also pre-positioned more equipment for water units in CENTCOM's Near-term Prepositioning Force (NTPF). In addition, the National Training Center started unit water training.

The Army was responsible for the inland distribution of bulk Petroleum, Oils, and Lubricants to all services in both developed and undeveloped theaters. Its mission was to maintain a flow of fuels and lubricants from a combination of

offshore tankers and pier-side discharge systems through a network of onshore storage and distribution systems to the user. This mission was critical for force readiness and sustainment. Requirements steadily increased during the year.

In response to growing requirements, the Army established a General Officers Steering Committee and an Action Officers Workshop to study POL Logistics-Over-the-Shore (LOTS) and inland distribution capabilities. Both groups emphasized the need to modernize the petroleum systems within the Army Facilities Component System; to revise the 1978 "Petroleum Distribution in a Theater of Operations" study; to modify the Army Concept of Operations to include the increased use of tactical pipeline; and to work on inland distribution plans.

The Action Officers Workshop completed the evaluation of aluminum instead of steel piping and the use of new quick lock couplings rather than steel bolted couplings in POL tactical pipelines. In January 1984, the Army accepted the aluminum pipe and the quick lock couplings, both commercially available equipment, as Class IX items in the Army Facilities Component System and included the equipment in an Inland Petroleum Distribution System (IPDS) design. ODCSLOG saw the benefits of the new equipment and realized that the movement of large volumes of POL through pipelines was

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the most efficient and least labor-intensive method. Therefore, it programmed a larger use of tactical pipeline to offset the Transportation Medium Truck Company (POL) force structure shortfalls. Initial procurement began in FY 84.

Last year, the 5,000-gallon collapsible fabric POL storage tank was the largest in the Army's inventory. This year, the Army started procurement of the Bulk Fuel Tank Assembly (EFTA), a 5,000-barrel (210,000-gallon) collapsible storage tank. It was used successfully during the joint Logistics Over the Shore Exercise II.

An Army/Navy OPDS (Offshore Petroleum Discharge System) Steering Group was established in FY 84 to prepare joint OPDS policy, procedure, acquisition, and compatibility. The group will have a Common Offload and Discharge Memorandum of Agreement ready for Chiefs of Staff signature next year. This agreement will clarify each service's responsibilities. The OPDS is scheduled for demonstration testing in FY 85.

The Petroleum Distribution System, Korea (PDSK), handled the general support POL mission. ODCSLOG changed its Table of Distribution and Allowances (TDA) organization to that of a Table of Organization and Equipment unit providing an in-place cadre to support a rapid increase of personnel and mission during wartime. The PDSK became the 2d Petroleum Group, Korea, in September 1984 and required neither additional personnel for its peacetime mission nor increases in the manpower ceiling of the Eighth U.S. Army.

The Army could not sustain its forward-deployed and deploying forces because of inadequate air and sealift capability and a shortage of war reserves. Planners, however, implemented several actions to improve sustainment. One major sustainment program, Host Nation Support (HNS), used allied assets to fulfill part of the U.S. Army's combat support and combat service support requirements and to attain the Army's force structure objectives. Since the NATO area was vital to U.S. interests (the majority of troops were deployed there), most HNS was also found in Europe.

The United States and the Federal Republic of Germany (FRG) signed a Wartime Host Nation Support (WHNS) Agreement on 15 April 1982. According to this agreement, West Germany will supply wartime essential services from its civil sector and perform service support functions for U.S. forces from a newly created 50,000-man reserve. The United States agreed to provide a ten-division force by D-day. At the end of FY 84, the two countries were developing the Civilian Support Technical Agreement to identify the civilian support the FRG will make available during war and the Military Technical Agreement to specify reservists' support. The former is planned for com-

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pletion in FY 86 and the latter by the end of FY 85. On 21 January 1983, West Germany and the United States signed the Reinforcement Exercise Technical Agreement, which established German support for U.S. peacetime exercises such

as REFORGER. The two countries, this year; agreed on the single source of equipment issue, the allocation of funds, and the approval of HNS as a part of the NATO infrastructure, which established guidelines for future activations.

Bilateral agreements with NATO allies assure HNS for vital U.S. lines of communication. Belgium, Luxembourg, the Netherlands, the United Kingdom, Germany, Norway, Denmark, Canada, and Italy have signed general (government to government) agreements and technical (host nation ministry of defense and Headquarters, United States European Command) agreements. Furthermore, Belgium, the Netherlands, and Luxembourg signed joint Logistical Support Plans (JLSP), and negotiations were under way with Norway, Italy, and Denmark. Negotiations for JLSP have not yet been started with Spain, Portugal, and Greece while awaiting State Department approval. The United States European Command established Logistical Coordination Cells (LCC) to act as in-country agents to develop JLSP They were essential for the continued rapid delineation and agreement on the detailed support to be given to U.S. forces. The LCCs will also develop joint Implementation Plans to provide operational plan-level detail.

The HNS policy for Southwest Asia was in the initial negotiation stage with U.S. allies in that region. Discussions covered the development of possible contingency support for U.S. forces by these countries.

The Combined Defense Improvements Projects (CDIP) program, which handled HNS in Korea, continued its successful operation. During FY 84, Japan provided support to the United States through base rentals and by assumption of construction costs.

The Western Command (WESTCOM) continued to work on the Friendly/Allied Nation Support (FANS) program, which determined and cataloged other Pacific countries' ability to provide the U.S. with supply and service support.

Mobilization

A suitable force structure, a flexible imaginative doctrine, and a sustainment capability all depend upon the mobilization of national reserves to support deployed forces with reinforcing units, replacement personnel, and replenishment supplies. Mobilization brings the required resources to the necessary state of readiness or

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to production. This task is accomplished by expanding existing facilities and establishing training bases to process untrained civilians; bringing reserve component personnel onto extended active duty; preparing CONUS transportation systems to move men and materiel; and converting factories to the production of war materiel. Mobilization of the Total Army implies that the Army will complete these actions effectively and quickly.

An initial mobilization action occurs when the President of the United States calls up reserve units to active duty. In that situation, current Army doctrine states that approximately 20 percent of Army Reserve elements will deploy overseas within 30 days after mobilization, 64 percent within 60 days, and almost all within 90 days. These units, however, represent only those designated for outside continental United States (OCONUS) deployment.

In FY 84, the Army added full-time reserve staff to vital active commands and posts to assist in mobilization planning. In addition, the Army continued to add reserve management information systems to the Continental Army Management Information System (CAMIS)-the primary Army Reserve and National Guard information system. Selected reserve centers and National Guard armories already using CAMIS will be joined by more than 5,000 subscribers by October 1986.

Since the Corps of Engineers was responsible for several of the mobilization actions mentioned above, it provided the United States with a strong reserve for engineering services and construction management through its civil works and military programs. The Corps' peacetime construction force (two-thirds involved in civil works) formed the backbone of the mobilization preparedness program. This program expanded during the year. Engineers in cooperation with Major Army Command staffs identified specific construction projects required for personnel mobilization. Furthermore, the civilian personnel of the engineer districts worked with Army installation planners to prepare mobilization master plans and Installation Support Books that established the necessary actions to satisfy personnel mobilization requirements.

Most engineer districts and divisions established plans to support the Army's mobilization bases and to augment their staffs to meet personnel mobilization surges. The Chief of Engineers created a program of direct and general support districts to integrate the newly transferred civil works personnel into the military construction program. Direct support districts (fourteen districts handling peacetime military construction) supported installation commanders and facilities engineers in the United States. Since mobiliza-

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tion demands could overwhelm these districts, general support districts (twenty-two civil works districts with no peacetime military construction) will provide reserve support.

The Installation Support Book (ISB) program, which provided essential information to district support and general support staffs for designing and building mobilization facilities, expanded during FY 84. The Corps of Engineers provided funds for adding 30 ISBs to the 101 installations, 55 reserve component mobilization stations, and 46 Development and Readiness Command production base facilities already in the program.

The Corps' mobilization preparedness level continued to decline because of reductions in its civil works manpower and the amount of design and construction work it authorized and performed. The augmentation of the military construction program suffered as a result. However, the Corps' emergency operations centers for floods, hurricanes, and other disasters did prepare Corps personnel to operate under extreme conditions that were similar in certain respects to those found during mobilization.

The Corps established the Corps of Engineers Corrective Action Program (CECAP) to provide an automated inventory of mobilization issues raised by OCONUS and CONUS districts and divisions. CECAP also identified a responsible proponent to resolve each issue and to monitor progress on the issue until its resolution. While contending with the same mobilization problems of CONUS, OCONUS districts and divisions faced several additional unresolved issues such as wartime construction requirements, resource management, and command relationships.

TRADOC completed the Training Base Capacity Study II and forwarded it to HQDA. The exhaustive study reviewed the equipment requirement to support the training base after full mobilization. The study group estimated equipment costs to meet present mobilization requirements at nearly $3.8 billion. Based on the TRADOC study, HQDA planners wrote a Program-Development Increment Package to alleviate some of the shortages in future POM cycles. Planners also used the study to examine the stated requirements for accuracy. It will be updated annually to monitor changing equipment requirements.

The Corps of Engineers prepared a proposal to amend Title 10, United States Code (USC) 2808, and sent it to the Office of Management and Budget (OMB) in January 1984. The proposal allowed a presidential determination of "imminent threat" to trigger mobilization (training base) construction using previously appropriated MILCON funds. Title 10, USC 2808, required that mo-

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bilization construction start after a public declaration of national emergency or war. The FY 85.military authorization bill, forwarded to Congress on 3 February 1984, included the proposal. The final bill, signed by President Ronald Reagan on 20 August, did not contain it. The defeat of the Corps' proposal led to reassessing the timing and direction of the long-term effort to possess needed mobilization authority and to obtain relief from unreasonable statutory constraints.

Industrial mobilization complements personnel mobilization. The industrial base provides the equipment and materiel to support and sustain the forces engaged in combat, combat support, and combat service support. The Department of Defense continued to emphasize initial combat capability over industrial preparedness. This directly affected the Army because of low equipment and materiel stockpiles. Serious deficiencies still existed between the time required to mobilize the production capacity of U.S. industry and the time to meet ongoing combat demands. Several studies and

reports (Ichord hearings, General Accounting Office reports) called attention to the defects of DOD's "short war" planning philosophy. These deficiencies in industrial preparedness were readily apparent in MOBEX 78 and MOBEX 80.

Dr. Korb stated that the United States had neglected industrial mobilization since World War Il but in the past several years had emphasized industrial preparedness in several ways. The President established the Emergency Mobilization Preparedness Board in 1982. In 1984, DOD and White House planners worked on emergency legislation that the President could use in a national emergency to remove impediments, such as long production lead times, to quickly meet mobilization requirements. During FY 84, the Army stockpiled critical components for systems with long lead times to shorten weapon systems production time upon mobilization.

The Secretary of the Army noted in the October 1984 Association of the United States Army *Green Book* that the Army was "not satisfied with our present ability to mobilize quickly." He stressed several areas that needed improvement: "getting more manpower with required skills, raising the readiness levels of reserve components combat service support units, improving the capability of continental U.S. installations to handle deploying units and upgrading our command and control structure to ensure the timely movement of critical resources." He stated that the Army was working on improving these areas. While some progress had been made, the Secretary acknowledged that much more needed to be done.

Training

Following the publication of the operational doctrine in FM 100-5, the Army changed its training programs to complement the offensive emphasis of the revised manual. The philosophy to train as the Army fought permeated all levels of the Army organization as trainers incorporated this concept into all elements of the training program. These included individual, unit, and combined arms activities; institutional instruction; and training support. The demands occasioned by FM 100-5 doctrine required a level of training and proficiency far greater than that of our potential adversaries. American soldiers must often fight outnumbered in both personnel and equipment, as well as at the end of extended supply lines. The Army's primary training mission, in support of the Army of Excellence, was to turn newly inducted civilians into disciplined and skilled soldiers; to provide a cadre of highly capable noncommissioned officer trainers; and to improve the officer corps' capabilities. A new force structure placed further demands on training requirements as did fielding new or modernized weapon systems and adding new training courses. The Army responded by increasing instructor personnel authorization by 600 spaces, despite overall limited resources.

The soldier's most important peacetime activity is to train and prepare for war. Such training is vital for a force that fights according to a doctrine calling for rapid deployment of operational forces into a highly confusing, violent, and lethal theater of operations. All members of the Total Army need to understand and be trained under the principles of FM 100-5 so that they can fight and win the battle in such an environment.

The thirteen-week Infantry One-Station Unit Training (OSUT) program at the Infantry Training Center, Fort Benning, Georgia, took civilians and turned them into well-trained infantrymen. Those who will use Bradley fighting vehicles received additional training during a three-week, add-on course designed to familiarize them with the new equipment. The OSUT course emphasized tactical realism, reinforcement of mastered subjects in subsequent lessons, and after-action reviews. These actions improved the soldier's tactical and technical proficiency. In FY 84, the OSUT proved successful as evidenced by soldiers scoring an average of 268 out of 300 points on the demanding final Advanced Physical Readiness Test (APRT) and 92.4 percent on the Performance-oriented Infantry Qualification Test (POIQT) containing thirty-two Skill Level I tasks.

Initial Entry Training provided soldiers with a foundation of basic skills. Upon completion of basic training, the soldiers were

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well motivated and well disciplined, but still needed further training on Skill Level I subjects. After arrival at their assigned units, they received additional training to sharpen their skills, to learn new and more advanced tasks, and to become team members.

A unit's efficiency and effectiveness depends upon its members' confidence in each other and in their leaders. Consequently, the Army worked to ensure that all leaders were tactically and technically competent to instill confidence in their subordinates. The Army also recognized that future conflicts, described in FM 100-5, would be highly lethal, demanding proficient leadership to conserve unit fighting strength on the complex modern battlefield. Therefore, it not only provided training for the soldiers' current assignments, but also trained them for more responsible future assignments.

The Army also expanded and established several programs for the professional development of career soldiers. For example, funding was provided to begin an FY 87 expansion in the number of senior NCOs engaged in training. The First Sergeant's Course will be expanded to 1,010 students per year, while the Sergeant Major Academy will train an additional 128 sergeants annually. The Army, after analyzing the NCO ranks, identified a shortage of Skill Level 2/3 technical training for combat support/combat service support soldiers. In response, Army trainers began primary and basic technical courses to improve the technical competency of E-5 and Er6 NCOs and make them fully qualified in their respective military occupational specialties (MOS). By FY 86, the Army will have 157 such courses in operation.

The emphasis in FM 100-5 on maneuver warfare demanded unit cohesion, small unit leadership, and independent operations. Leadership qualities of competence, toughness, resourcefulness, and flexibility were necessary to take full advantage of the latest doctrine. Thus the length of most officer basic courses increased from four to five weeks to offer more field training in tactical, maintenance, physical, and leadership skills. Trainers added a seven-day Tactical Leadership Course (TLC) to the Infantry Officers Basic Course to improve newly commissioned second lieutenants' tactical and leadership skills. Following TLC, the officers went through a light infantry field training exercise (FTX) and a mechanized infantry FTX. The Army incorporated the twenty drills of the TLC into the light infantry unit training program and may use them for active and reserve component field units as well.

Moreover, the appearance of a new three-tier training plan for warrant officers revised and expanded existing courses. Under the new program all newly appointed warrant officers will attend a six-

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week, entry-level leadership course, and later during their career take an advanced course with selected officers attending a senior-level course. The new policy's mandatory entry-level training will improve the officer's ability to handle responsibility.

The conversion and establishment of divisions into the light infantry configuration and the restructuring of the 9th Infantry Division (Motorized) prompted the Army to explore the units' training programs as they experimented with new operational concepts. This was especially true of the units found in the light infantry force.

The Infantry School established a light infantry training program to improve light infantry skills during OSUT; to conduct special light infantry training at Fort Benning for unit leaders; and to increase gradually the percentage of Ranger-trained leaders in the light infantry divisions. The key battalion leaders will be Ranger-trained, and all infantry platoons will have some Ranger-trained personnel. The light infantry training program comprised three courses: the Light Leader Course, the Light Fighter Course, and the Light Infantry OSUT COHORT

Ranger-qualified senior NCOs conducted the four-week Light Leader Course at the Ranger School, Fort Benning. The course trained battalion sets of unit leaders (team leader to company commander) to become better trainers themselves by improving their proficiency in leadership abilities and soldier skills. The first class commenced in August, and a new Light Leader Course was planned for FY 86.

All light divisions conducted a Light Fighter Course that concentrated on squad and platoon training. The course lasted

four weeks for infantry companies and one week for noncombat units. The 7th Infantry Division began training in the fall with the two-phase course. All soldiers who passed Phase I training were certified as light infantrymen and were sent to Phase II. In this phase, the light leader graduates trained their units in various tactical skills, which included rappelling from helicopters, traveling on snowshoes and skis, setting up hasty ambushes, and performing reconnaissances.

The proposed fifteen-week Light Infantry OSUT COHORT Course will employ a battalion of the 7th Infantry Division as a test unit during FY 85. After careful analysis of the results achieved in this battalion's training cycle, the Army will determine whether to continue the course.

The Ranger School, currently limited to a nine-week Ranger training program, will expand in FY 87 to support the Army's emphasis on increasing light infantry training requirements. The school's priorities were to soldiers assigned to Ranger battalions and

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light infantry units as well as to all Infantry Branch lieutenants. The goal was to increase the number of hardened, combat oriented, tactically skilled leaders to light infantry divisions. The expansion will also support the larger SOF force structure, which added a Ranger battalion and Ranger regiment.

This training program supported the Army's goal of rapidly establishing a high-quality light infantry force. The Army will monitor and study the training process and the results. TRADOC will evaluate the organizational concept and performance of the light infantry division in terms of the new units' ability to meet the rigorous light infantry standards and the Infantry School's ability to support the training program during the transition of Division 86 units into light infantry units. However, light infantry was not the only unit training in progress.

Each unit, whether using a single weapon system or providing a support function, must be proficient in its specialty. Using the Army Training and Evaluation Program (ARTEP), units established programs for individual and collective training in critical battle tasks. The Army revised its ARTEPs during the year, especially through the use of expanded training and evaluation outlines. Using these, commanders determined training performance and planned to correct deficiencies.

Individual and unit training formed the basis for the Army's readiness, while the training of the battalion task force inculcated principles of combined arms warfare in units. Furthermore, FM 100-5 identified the battalion as the basic combat unit. Thus the combined arms task force concept integrated various complementary weapon systems with a greater level of combat support and combat service support. One significant problem associated with battalion task force-size training was a lack of space to exercise full capability. The battalion's new weapon systems extended the range and scope of live-fire exercises beyond all but a few military reservations.

One Army response was the establishment of the National Training Center (NTC) at Fort Irwin, California. According to Maj. Gen. Frederic J. Brown, Commanding General, U.S. Army Armor Center, starting full-scale operation in 1982, "the tough, realistic, force-on-force training with MILES as the NTC is the best combined arms training, short of actual combat, that has ever been conducted in the U.S. Army" (Armor, Nov/Dec 84) The NTC's large maneuver area, skilled opposing force, live fire, multiple integrated laser engagement system (MILES), and standardized evaluation combined to offer an unparalled training operation. Operations group observer-controllers, through computer-aided standardized evaluations, pro-

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vided thorough after-action reviews to each unit following the two-week-long training mission. MILES provided timely and accurate determinations of individual and vehicle hits and near-misses that allowed, in turn, simulation of realistic force-on-force combat with realistic weapons simulation and casualty determination.

The NTC also improved the proficiency of unit leaders as they rotated through the center as well as enlisted personnel who had the opportunity to use skills learned at their home station. The units that trained at the NTC also incorporated "lessons learned" into their home station training programs. Thus NTC influence extended far beyond the two-week course and spread throughout the Army, thereby improving readiness.

In FY 84, the NTC first witnessed a unit (2d Brigade, 2d Armored Division) equipped with Ml Abrams tanks and M2 Bradley fighting vehicles training at the center. These new weapons improved the brigade's ability to maneuver more rapidly across rough terrain. Simultaneously, while on the move, the improved technology increased their ability to hit targets accurately. Thermal sights enhanced the crew's target acquisition when operating under conditions of reduced visibility. FY 84 also witnessed the first National Guard battalions using the NTC. These were the 2d,Battalion, 136th Infantry (Mechanized), from Minnesota and the 1st Battalion, 108th Armor, from Georgia.

Army personnel and units engaged in numerous exercises during the fiscal year. Most occurred at the units' home stations with the aim to familiarize personnel with small unit tactics. Each exercise, whether CPX (command post exercise), FIX (field training exercise), STX (situational training exercise), or CALFEX (combined arms live-fire exercise), was an essential block of the foundation for larger combined arms training such as that conducted at the NTC. Moreover, leaders received training in FCXs (fire coordination exercises), LCXs (logistics coordination exercises), and MCXs (movement coordination exercises).

Each year the Army participates in two major Joint Chiefs of Staff (JCS)-sponsored and -conducted command post exercises selected from four possible scenarios: mobilization, general war/nuclear crisis, NATO reinforcement, and regional exercise. In FY 84, the CPXs were NIGHT TRAIN 84 and PRESSURE POINT 84. NIGHT TRAIN 84, a nine-lay CPX conducted in two phases between 5 and 13 April 1984, focused on survivability, continuity of operations, and reconstitution following a nuclear strike against the United States. HQDA established eight exercise objectives to evaluate Army command and control, decision making, residual capabilities, military assistance to civil authorities, and

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capability to support reconstitution efforts during a nuclear crisis. This marked the first time in an extended interval that the Army examined its ability to transfer command and control functions to alternate locations. The Federal Emergency Management Agency (FEMA) directed the participation of several federal civil agencies in NIGHT TRAIN 84 under its own exercise title of Readiness Exercise (REX) 84 BRAVO. The participants identified several deficiencies during the exercise, but in general found improved results compared to the previous nuclear CPX. However, the Army contended that the design of the previous three nuclear CPXs made it very difficult, if not impossible, to assess the progress and trends of correcting past deficiencies.

The other major JCS-sponsored and -directed command post exercise was PRESSURE POINT 84, which evaluated crisis management procedures and the operational and logistical aspects of sustainment in a major conflict. The federal civil and military agencies of both the United States and the Republic of Korea (ROK) participated in the two-phase exercise from 17 October to 22 November 1983. Unlike the most recent comparable *exercise, POTENT* PUNCH 81, which evaluated plans and operations during the initial stages of a conflict in Korea, PRESSURE POINT 84 concentrated mainly, but not exclusively, on sustainment of forces during a crisis. The Army found this emphasis useful, because it could evaluate sustainment capabilities in greater depth than before and it could better articulate the severity of shortfalls in materiel and other critical areas of sustainment. The exercise scenario portrayed an escalation of worldwide tensions that led to several regional conflicts, including the outbreak of a conventional war on the Korean peninsula. The participants had already faced many of the crisis management, mobilization, and deployment problems of PRESSURE POINT 84 during POTENT PUNCH 81. However, this CPX examined these issues in greater detail in the new context of sustainment.

Any Army after-action assessment of PRESSURE POINT 84 noted a continuing shortage of ammunition stocks, several major equipment items, and combat arms replacements that severely limited the Army's ability to sustain combat operations. Although of less importance, limitations placed upon the Army by chronic deficiencies in medical, engineer, and transportation support capabilities appeared. Conversely, significant improvement in planning and operational

procedures, including, with certain reservations, the procedures for supply support to the Republic of Korea, demonstrated the advantages accrued from "lessons learned" in previous exercises.

The Army also conducted several large-scale *exercises to* test combat readiness. Logistical planners held LOGEX 84, a CPX war

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game, at Fort Pickett, Virginia, from 8 through 20 July 1984, to train participants in the command and staff procedures of joint operations within a NATO AirLand Battle scenario. Furthermore, LOGEX 84 demonstrated the interaction between combat, combat support, and combat service support units, operations, and missions. The exercise provided rewards for proper planning and execution and exacted penalties for violations of doctrine or sound practice. This demonstrated the effects of the participants' decisions on combat operations. In addition, trainers taught current doctrine, as found in FM 100-5, and introduced emerging concepts. Early deploying reserve components received training in their wartime mission, in addition to meeting and working with members of other units and services they would deal with in wartime.

Participants included members of 11 Active Army, 38 Army National Guard, and 48 Army Reserve units from CONUS and USAREUR, as well as active and reserve component personnel from the U.S. Navy, U.S. Air Force, and U.S. Marine Corps. Personnel of military organizations from nine allied nations represented those countries' logistical support activities to make LOGEX 84 as realistic as possible. The training covered policies and procedures for operations in the theater environment, necessary operations to support the AirLand Battle, and appropriate responses to Soviet/Warsaw Pact operational concepts and tactics. The trainers used microcomputer technology to generate and transfer to player units a significant amount of real-time scenario information.

The Army also increased its participation in several more highly visible, large-scale, complex joint and combined exercises from 28 in FY 83 to 31 in FY 84. These exercises, particularly the OCONUS ones, improved the Army's ability in combined combat operations with allied forces, projected its operational capability, tested joint and strategic mobility, and trained Total Army personnel to work in the joint arena with members of other U.S. services. Two of the most ambitious and well-known exercises were REFORGER and TEAM SPIRIT.

REFORGER (Return of Forces to Germany) involved the deployment of U.S. units from all three services and their reserve components to Germany for training with NATO units. They performed all operations under simulated wartime conditions designed to test the U.S. military's ability to deploy rapidly and operate in Europe. REFORGER also demonstrated both our military credibility and our commitment to our allies within NATO. The Army deployed 16,966 soldiers from elements of the 5th Infantry Division (Mechanized); 1st Brigade, 2d Armored Division; 224th Engineer Battalion; 2d Battalion, 75th Rangers; and other active and reserve com-

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bat, combat support, and combat service support units. Once in Europe, the NATO allies and U.S. forces conducted a series of exercises called AUTUMN FORGE that stressed the solidarity of the Allied Command and tested host nations' capabilities to mobilize and commit their forces for the defense of Western Europe.

Over 200,000 ROK and U.S. personnel in three corps elements and nine divisions participated in TEAM SPIRIT 84, which was held in Korea during the spring of 1984. A further four divisional headquarters simulated second and third echelon activities. This year marked I Corps' (Fort Lewis, Washington) first participation in TEAM SPIRIT. Other American units involved included a headquarters and brigade task force from the 2d Infantry Division (stationed in ROK), a brigade headquarters and battalion task force from the 7th Infantry Division, a headquarters and brigade from the 25th Infantry Division, and 2d Engineer Group. Beyond active forces, the Koreans activated two reserve divisions for the exercise. The exercise planners emphasized interoperability by interchanging units from one organization to another. Thus, divisions included ROK and U.S. Army elements and later ROK and U.S. Marine units.

The newly created combined aviation force (CAF) participated for the first time in TEAM SPIRIT 84. Composed of the 17th Aviation Group (Combat) and ROK aviation units, the CAF offered ground commanders maximum use of scarce aviation assets and provided tactical air mobility. Exercises begun in September 1983 identified deficiencies in the areas of air mobility, attack, air assault, and observation. The 17th Aviation Group, for instance, had an assault helicopter battalion and a medium transport helicopter battalion, but lacked attack, scout, and observation helicopters. Conversely, ROK aviation units had attack and air assault helicopters but no medium lift aircraft. Additional C 3 systems and logistical strengths and weaknesses also affected the allies' air support role. U.S. and ROK assets were combined into the CAF, thereby employing the available assets of each army to best complement the aviation role. The CAF used 15 Black Hawks, 27 Hueys, 31 Chinooks, and 24 500-MDs (ROK Army's attack/scout helicopters) to provide exercise forces with agility, depth, initiative, and synchronization.

Central America became even more turbulent as Marxist guerrilla operations spread farther and grew more violent in the region. The President of the United States continued to demonstrate his commitment to U.S. allies in Latin America by conducting joint and combined exercises there. These exercises assisted host nations in enhancing the readiness and capability of their military forces and demonstrated American willingness to support our al-

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lies against aggression, to provide a local military presence, and to offer American units the opportunity to conduct joint exercises involving all services and their components. Honduras was the major theater of operations for these exercises. The U.S. Army played a major role in a regular series of training operations.

The two largest exercises were AHUAS TARA II and GRANADERO I. United States Readiness Command and FORSCOM provided joint operations command support as well as the Army forces employed. Experienced in operating joint exercises, USREDCOM established a joint Task Force (JTF) headquarters to plan for AHUAS TARA II. After the exercise began, JTF II, under the command of United States Southern Command, controlled the units and operations. During the course of the exercise, 5 August 1983 to 8 February 1984, the commander of JTF II directed units from all services as well as several Honduran Army units. The 43d Support Group, Fort Carson, Colorado, provided logistical and administrative support while the 41st Combat Support Hospital, Fort Sam Houston, Texas, supplied medical support. The hospital personnel also engaged in humanitarian projects in the Honduran countryside. The 3d Battalion, 319th Field Artillery, Fort Campbell, Kentucky, worked with two Honduran Army mortar battalions that were converting to 105-mm. towed howitzer battalions. Meanwhile, the 7th Special Forces Group assisted Honduran infantry battalions in counterinsurgency and antitank exercises. To support the wide-range exercise, the 46th Engineer Battalion, Forts Rucker and McClellan, Alabama, built one airfield, upgraded another, and instructed Honduran forces in anti-armor defenses. The U.S. Marines, in addition to assisting a Honduran battalion in amphibious operations, also directed a combined Honduran Army and U.S. Army-Navy-Marine maritime interdiction training exercise. Army forces, working in challenging and difficult conditions, often had to construct new base camps for operations. However, Army personnel still found time for humanitarian projects, which included medical treatment for Honduran citizens, veterinary care for their animals, assistance to orphanages, and distribution of clothing received from several American military installations.

Based on the results of AHUAS TARA II, Secretary of Defense Caspar W Weinberger ordered the Commander in Chief of SOUTHCOM to continue the American operations through June 1984. The Commander in Chief redesignated JTF II as JTF "Alpha" and assigned it the operational responsibility for command and control, support functions, communications, and security of heavy equipment in the follow-up exercise, GRANADERO I.

Conducted during May and June 1984, GRANADERO I resembled AHUAS TARA II because it was a combined and joint exercise. The 864th Engineer Battalion, Fort Lewis, Washington, arrived a month before the start of the exercise and built two airfields capable of handling C-130 aircraft. On 23 May, JTF 7 arrived to commence the exercise with the 227th Assault Helicopter Battalion, Fort Hood, Texas; the 47th Field Hospital, Fort Sill, Oklahoma; several teams of the

7th Special Forces Group, Fort Bragg, North Carolina; the 169th Tactical Air Support Squadron (TASS), Peoria, Illinois; a USAFRED (U.S. Air Force Forces, Readiness Command) unit; and several logistical and communications units. El Salvador sent an infantry battalion, while Honduras provided an infantry and an airborne battalion. Panama assigned an observer team to the exercise. The units spent a week engaged in combined operations and a second week performing a multinational airborne/air assault at Jamastran near Honduras' southern border with Nicaragua. As during AHUAS TARA II, Army personnel performed humanitarian acts to assist the local inhabitants, including medical and veterinary care as well as an airlift of food and medical supplies for Indian refugees.

New weapon systems, a new force structure, and a changing operational doctrine necessitated increased training for Army personnel. The Army also faced training restrictions imposed by scarce resources, which reduced the amount of available fuel and ammunition. In addition, most of the available maneuver areas were too small to handle the increased ranges of weapons and vehicles. Since new weapon systems, such as the Ml, M2, and M3, introduced more capabilities and ways of employment than their predecessors, personnel required a concomitant increase in training on these systems. Budgetary constraints implied either a reduction of the amount of training time or of the size of the force to receive training. Rather than choose a reduction, Army leadership decided to increase the use of training devices and simulations, thereby conducting necessary training in the most economical manner.

Training devices served as training enhancers and resource conservers. One of the most important of these devices was MILES, which used lasers to simulate realistic combat exercises. Fully fielded in the active component, funding for MILES was begun in the reserve components. The Army also introduced MILES equipment for Ml, M2, and M3 vehicles, thus completing the system for major Army close combat vehicles.

Other major advances in training equipment were in the area of simulators and computer-assisted simulations. The Army's use of simulators for missile and artillery firing practice represented an

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inexpensive yet efficient means to train gunners while conserving extremely costly ammunition. Combined with unit training devices, this equipment achieved a substantial savings of Class II, V, and IX materiel. However, these savings were not sufficient, so TRADOC and AMC designed more advanced simulators to conserve more materiel and enhance training.

The unit conduct-of-fire trainer (UCOFT), a computer simulator, will assist tank and infantry fighting vehicle crews in meeting gunnery table proficiency. UCOFT successfully completed validation and verification testing during the year. Fielding will begin in March 1985. Army planners expected UCOFT to pay for itself, on mileage savings alone, within 7.6 years. However, since UCOFT significantly reduced ammunition requirements programmed for training, the payback period, if ammunition savings are included, will be shortened to three years. Army trainers expected UCOFT to save each tank battalion $473,000 for 105-mm. shells and $1,295,000 for 120-mm. shells. The entire field force could be equipped with UCOFT devices for the cost of several M1 tanks.

The Army Armor Center, in conjunction with AMC and TRADOC, also worked on other training simulators for the armor force. Trainers designed the videodisc gunnery simulator (VIGS) to substitute for the first two gunnery tables and provide a foundation for UCOFT and PCMT (platoon combat mission trainer) training. The PCMT, another computer-assisted system, reproduced the combined arms environment through the generation of digital images to depict the external environment as viewed from inside an armor vehicle. The software allowed platoons, while in the simulator room, to perform maneuver missions, solve field problems, and handle free play. USAARMC expected that it would be available by FY 85 and would substantially reduce training costs within the armor force.

Work also progressed on the Army training battle simulation system (ARTBASS), an automated interactive battle simulation for commanders and staffs of maneuver battalions. ARTBASS was the beginning of a conversion from manual to computer-assisted war gaming. The eventual goal is an automated or computer-driven system. By the 1990s FORSCOM wanted to have a complete set of automated battle simulations to train combat, combat support, and combat service support personnel from platoon level to echelons above corps. In FY 85, FORSCOM will distribute ARTBASS to the first maneuver battalions.

The cost of firing a live TOW missile (about $10,000) and a Hellfire missile ($40,000) made extensive firing prohibitively expensive. Nevertheless, Army aviators had to maintain their target acquisition proficiency, and simulators provided the means. Army aviators also

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increased their flying proficiency by using flight training simulators. The Apache helicopter program was the first in which Army planners concurrently funded a simulator along with a helicopter. Since flying the Apache was 10-15 times more expensive than flying in the simulator, the Army expected substantial cost savings. FORSCOM also worked on the design of the ACATT (aviation combined team training) computer simulator, which aviation battalions should receive in FY 86 or FY 87.

The Army also was involved in simulators and simulations on a joint services level. USREDCOM worked on a joint theater-level simulation (JTLS), which will offer air, land, and sea battle simulation. The Army planned on placing JTLS at USREDCOM, the Army War College, and the Army Concepts Analysis Agency in early FY 85. The USREDCOM also continued the development of the joint Exercise Control System UECS), a computer-aided system for automating the operation of command and staff training exercises. It will be field tested during BOLD VENTURE 85, a USREDCOM CPX conducted at Fort Lewis, Washington.

The Air Force, under Project Warrior, established the Warrior Preparation Center at Ramstein Air Force Base, Germany, to train Air Force and Army commanders and staffs in combined force employment in NATO. The Warrior Preparation Center taught Warsaw Pact threat status and countermeasures, as well as performed battle simulation. The center proved to be a valuable tool for Air Force and Army staffs to use to sharpen their command and control skills.

Congress, through the efforts of the House Armed Services Committee, had encouraged the joint services to coordinate their training research and development work in 1978. The committee then reemphasized its guidance in 1980, and DOD established the joint Service Research and Development Program. The Navy started manpower and personnel elements for the program and the Army followed suit in FY 84, appropriating $6 million for training and technology projects. The Training Activities Subcommittee of the Office of the Secretary of Defense Steering Committee on Training and Training Technology oversaw the program. The subcommittee, composed of military and civilian members of the four services, reviewed potential projects and selected four or five a year for funding.

The perennial debate over officer training versus officer education continued during the year. While acknowledging that unit-level tactical training remained vital, most commentators favored more education in war fighting and principles of wax at higher level military schools such as the U.S. Army Command and General Staff

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College (USACGSC). The CGSC's curriculum, a two-year course in 1929, was shortened to one year after World War II and later reduced to ten months. The emphasis on tactical and operational lessons of warfare was further abbreviated to allow more time to study the complex Cold War arena; to maintain units at a high level of readiness; to develop new officer skills; and better to use constrained resources. Tactical and operational lessons were shortened from a total of 665 hours in 1951 to approximately 170 hours in 1984. The CGSC, in FY 84, increased tactics lessons in the electives program and included three one-week-long, college-wide exercises to remedy the drift away from the study of the lessons of warfare. The current conduct of war under FM 100-5 and its increased use of technologically sophisticated weaponry and highly mobile forces increased the amount of tactical and operational material, that the tactics section of the CGSC curriculum had to cover.

CGSC consequently added an eleven-month Advanced Military Studies Program to provide an in-depth study of the science and art of war at the tactical and operational levels (division and corps). In FY 84, the pilot stage of the program had a small, high-quality faculty capable of teaching as many as ninety-six CGSC graduates annually. The students will receive instruction in all aspects of G1, G2, G3, and G4 operations as well as a study of ranges of possible conflicts

from terrorism to nuclear war. The new course emphasized thinking based on the study of military theory and application, both historical and contemporary, to allow officers to arrive at creative yet practical solutions to operational problems. According to Colonel Huba Wass de Czege (*Military Review,* Jun 84) , the Advanced Military Studies Program was the Army's "long-term investment in future capability."

Army Chief of Staff General Bernard W. Rogers in 1977 ordered a study to be made of officer training and education requirements through the 1990s. The Review of Education and Training for Officers (RETO) study group completed its analysis of requirements from pre-commissioning through general officer levels the following year. The study group made several recommendations such as expanding officer basic courses and changing advanced courses into functional courses dedicated to specific duty positions. Another recommendation was the establishment of a course to teach staff skills. The RETO study group based this recommendation upon several findings. First, the selection rate of officers for CGSC was below 50 percent of total eligible officers, which meant that the majority of Army officers received their last formal education at the officers advanced course. Second, CGSC

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graduates were not assigned to tactical-level staff positions, thereby depriving tactical units of trained and qualified staff officers. However, the complexity of modern warfare placed a premium on staff skills at these lower echelons.

Initially, the Army planned the proposed staff officer course as an alternative program of instruction (POI) for those officers not chosen for the CGSC course. After exploring this proposal, the Army found that all Army officers required non-branch specific instruction in staff skills beyond the officers advanced course level. Therefore, this alternative POI proposal was dropped, and a working group was formed at Fort Leavenworth in 1979 to design a new POI and program of implementation for a Combined Arms and Services Staff School (CAS3). According to Lt. Col. Karl Farris, CAS3 was "to provide Active and Reserve component officers the instruction necessary to serve as staff officers with Army field units." *(Military Review,* Apr 84) The school's instruction had to meet three objectives: "to teach what staffs are by defining and tracing the development of staff roles; to teach what staffs do by presenting instruction on common and collective staff procedures and skills; and to teach how staffs operate." The goals of CAS3 were derived from these objectives and were prominently displayed in each classroom:

1. Improve the ability to analyze and solve military problems.
2. Improve the ability to interact and coordinate as a member of a staff.
3. Improve communication skills.
4. Improve one's understanding of Army organization, operations, and procedures.

The Army, following another RETO study group recommendation concerning the POI, set up a two-phase CAS^3. The first, or non-resident, phase contained fifteen self-paced modules, which all officers completed at their home stations. After passing the open book examination, they were eligible for the resident, or second, phase. The first phase provided a common background in communicative arts; historical development of staffs, staff skills, roles, and relation ships; decision-making process; quantitative skills; personnel and administration operations; basic principles of logistics; training management; staff leadership; budget; reserve components and mobilization; tactics; threat forces; and organization of Army divisions.

Phase II, a nine-week resident course held at Fort Leavenworth, used small group seminars to improve upon the skills learned in Phase I. The student body was divided into twelve-person groups, each led by a lieutenant colonel battalion commander. The students

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rotated through various staff positions within the fictitious 52d Infantry Division (Mechanized), a roundout unit based at Fort Riley, Kansas. The instruction focused on six broad, problem-solving exercises in staff techniques, training management, budget, mobilization, preparation for combat operations, and a command post exercise. By the end of the

course, each student had worked extensively on solving over sixty complex individual and group problems.

The pilot program began in April 1981 with 117 officers from all Army branches as well as the National Guard and Army Reserve. CASs conducted two validation and verification courses the following year. Based on these courses, the Army made adjustments to the program and began regular classes.

The Extension Training Management Division at Fort Leavenworth sent Phase I packets to all Officer Personnel Management Directorate (OPMD)-managed officers after they completed the officers advanced course. The officer's period of eligibility for the resident phase began with successful completion of Phase I and lasted through the officer's ninth year of service.

All OPMD-managed officers, starting with year group 1977, had to attend CAS3. For those in earlier year groups, the Military Personnel Center (MILPERCEN) made the selection. However, CAS3 must expand its facilities before full implementation can begin. In the summer of 1983, the CGSC started an expansion of its facilities to handle the instructional load of CAS3. With completion scheduled for the fall of 1985, CAS 3 will begin educating 4,500 captains per year.

At the end of FY 84, the instructors, students, and Army educators were satisfied with the results of CAS3. The junior officers received broad training applicable to all of their duty positions and, upon graduation, had a common understanding of staff procedures, which would be valuable on the modern battlefield. Overall, CAS3 met, and in some cases exceeded, its instructional goals. The small-group, staff-leader method of instruction in conjunction with peer interaction and the exercise method of instruction contributed to this result.

The Army, in an attempt to increase the mid-level officer schooling program's cost effectiveness, required that all officers attending advanced schools and certain special programs add an extra one- to three-year service obligation to their careers upon graduation. The new regulations took effect during the summer and fall of 1984. Officers attending an advanced course that began on or after 1 October 1984 would incur a one-year obligation. Legal officers attending the judge Advocate General's Graduate Course were required to serve two additional years. Starting 1 July 1984, officers

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selected as astronaut candidates had a three-year service obligation added to their careers after they left the space program.

The Army continued to expand modernization training initiatives during FY 84, particularly in four areas. The first area was the development of an automated and viable data base to support Army Modernization Training (AMT). The Assistant Secretary of the Army for Financial Management approved the Mission Elements Need Statement (MENS) and the Project Managers (PM) Charter during FY 84. This data base combined all modernization training information into one system so that AMT managers will be better able to implement AMT.

Second, HQDA established a New Equipment Training (NET) Manager's Workshop to provide NET managers with information on the AMT process. It also provided new equipment trainers with a method to bring problems to the attention of both the training community and Army leadership for resolution.

The Consolidated Training Support Work Group (CTSWG) process was the third area receiving attention. It was an ad hoc forum for the major players in the New Equipment and Doctrine and Tactics Training activities that review consolidated training plans to resolve problems therein. Formerly there were eight CTSWGs, one conducted by each materiel developer every six months. The Army reduced that number to two held every six months, known as CTSWG East, which met at Fort Monmouth, New Jersey; and CTSWG West, which met at St. Louis, Missouri, in the spring of 1984, and at Detroit, Michigan, in the fall of 1984. The fourth area of improvement provided initiatives for training reserve components. Active reserve component representatives developed several realistic and supportable training plans, which emphasized the reserve components' unique training requirements.

The Standards in Training Commission (STRAC) worked on determining the amount of training ammunition required

by individuals, crews, and units of the Total Army to attain and sustain weapons proficiency. The commission considered aids, devices, simulators, simulations, and sub-caliber firing in developing qualification training strategies for thirty-eight systems. STRAC drafted DA Circular 350-XX, which documented the type of attainment and sustainment event; integration of training devices and simulators; standard training strategy; frequency of repetition; and training ammunition requirements to attain and keep the four established separate training readiness conditions. After being reviewed Army-wide, the draft was revised as DA Circular 350-84-2, Standards in Weapons Training, for FY 85 publication.

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The Army Study Program

The Army Study Program denotes a collection of analytical activities sponsored and carried out by HQDA agencies and major commands to provide quality information to help senior Army leaders make sound decisions. During FY 84, a new initiative, the Issue Assessment Process (IAP), ensured that the Army's analysis community studied the most important problems. Started in the fall of 1983, UP quickly reached the stage where its products influenced the analytical program of the Arroyo Center, the Army's policy and analytic organization. The Chief of Staff also decided during the fiscal year to move the Arroyo Center from the jet Propulsion Laboratory of the California Institute of Technology to the Rand Corporation.

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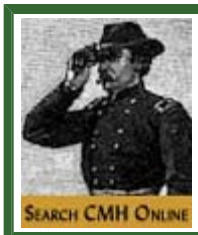

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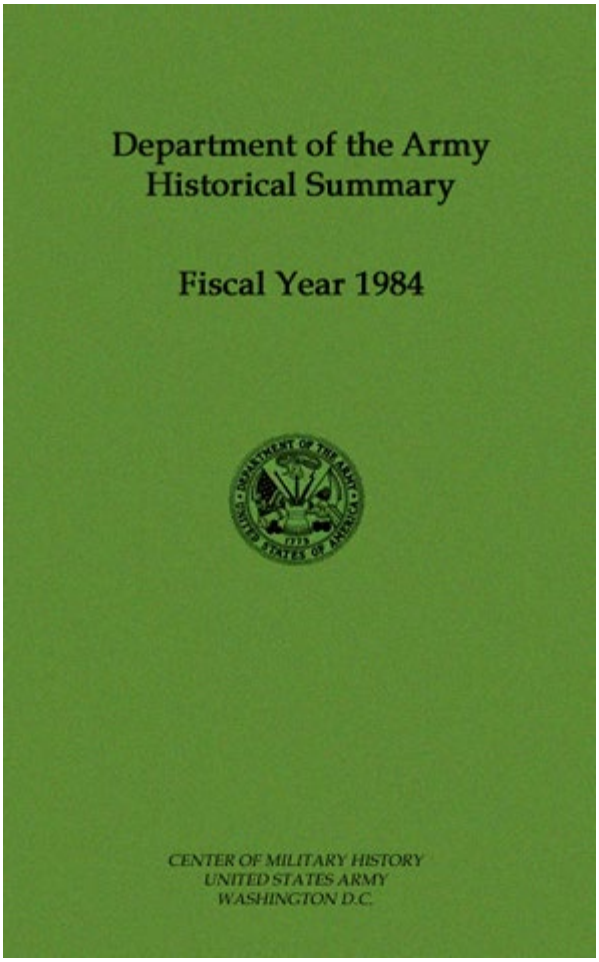

Department of the Army Historical Summary

Fiscal Year 1984

Compiled by

Dwight D. Oland

Edited by

Cheryl Morai-Young

CENTER OF MILITARY HISTORY
UNITED STATES ARMY

WASHINGTON, D.C., 1995

The Library of Congress has cataloged
this serial publication as follows:

Library of Congress Catalog Card 75-09647561

ISSN 0092-097880

CMH Pub 101-16

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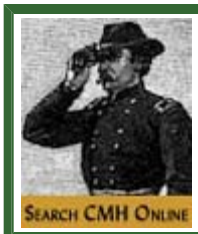

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Last updated 8 March 2004

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Operational Forces

By necessity, the Army plans its force structure concomitantly with sustainment, mobilization, and training adjuncts. It must maintain current operational forces at a level that enables units to carry out the doctrine expounded in FM 100-5. This is accomplished by activating, inactivating, or realigning active Army units; readjusting the size and composition of the force structure; refining contingency plans; and maintaining personnel, unit, and materiel readiness. Underpinning these efforts are deployed forces around the world that serve as deterrents to enemy aggression and as a demonstration of American capability and credibility to defend our allies. Other areas of concern to the operational forces are chemical and nuclear activities and support to the civilian sector of our society.

Organization and Readiness

Fiscal year 1984 marked a shift in the composition of the United States Army force structure. The Army refined many of the 16 active and 10 reserve component division designs through the Army of Excellence design initiatives to accommodate force structure needs within a constrained active Army end strength. These initiatives helped to develop a light division tailored for the low-intensity threat that the Army forecast into the twenty-first century, while retaining the capability to fight on the mid- to high-intensity battlefield when properly augmented. Light divisions, through their relative improvement in deployment, permit the timely application of combat power to stabilize or neutralize the situation at minimal force levels. In addition to the light infantry division, the Army of Excellence placed increased emphasis on providing the corps commanders with the means to conduct the AirLand Battle. This included shifting artillery, intelligence, and combat aviation assets from the division to the corps. The Army of Excellence recognized the efficiencies that could be gained from new and emerging technologies.

The Grenada rescue mission reemphasized the Army's need for a force capable of successfully handling similar low intensity operations because of the increasing frequency of these situations. Concomi-

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tantly, Army leaders viewed units designed exclusively for mechanized and armor combat against Warsaw Pact armies as too rigid and too large to be transported quickly to the European theater in case of a NATO emergency. Therefore, the Army began refining force structure to reflect the current philosophy of employing lighter units to engage in counterterrorist and other low intensity actions.

The Army planned to activate the 10th Infantry Division (Light) in early 1984, with the 6th Infantry Division (Light) being activated in 1986. Meanwhile, the 7th Infantry Division (Light) continued its conversion into a light division. In addition, ten heavy divisions were being converted into the lighter Army of Excellence force structure organization. The 2d Armored Division finished its reorganization during the year, and the remainder of the heavy divisions, excluding certain aviation units, will complete reorganization by the end of fiscal year 1985. Secretary of the Army John O. Marsh, Jr., also announced the future activation of a seventeenth active Army division but did not specify a tentative date or a possible location.

Because of a renewed emphasis on low-intensity conflict, the Army expanded the Special Operations Forces (SOF). The Army activated Headquarters, 75th Ranger Regiment, in July and followed this action with the establishment of a third Ranger battalion at Fort Benning in October. Fort Lewis witnessed the activation of a fourth Special Forces group, the 1st Special Forces Group, in September. The Special Forces Group (SFG) headquarters and two battalions will be stationed at Fort Lewis, while a third will be stationed on Okinawa.

The establishment of the Fourth U.S. Army on 1 October 1984 at Fort Sheridan, Illinois, increased the number of CONUS armies to five. This ended a two-year program upgrading Army Reserve and National Guard units and improving supervisory channels.

The Army, confronted with strategic, operational, and tactical obligations at a time of manpower ceilings and scarcer resources, responded with modification to the composition and organization of its force structure to create an Army capable of meeting increasingly complex present and future responsibilities. General Mahaffey, DCSOPS, stated in "Structuring Force to Need" (Army, Oct 84) that "our national security policy, supporting military strategy, and the characteristics of those regions of vital interest to the United States collectively demand forces with greater balance, flexibility and deployability than those we currently possess." A balanced force covers four areas: forward-deployed and CONUS-based forces, active Army and reserve components, heavy and light units (types of forces), and

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combat-versus-support forces (so called tooth-to-tail ratio). The balance is not designed for numerical equality of units in each respective area, but for a proper ratio that satisfactorily meets the varied strategic and operational requirements facing the Army. As a consequence, the Army changed its conflict model from a simplified and utilitarian one, as seen in *Figure 1,* to a more complex but more realistic model as shown in *Figure 2.*

FIGURE 1 - SIMPLIFIED CONFLICT MODEL

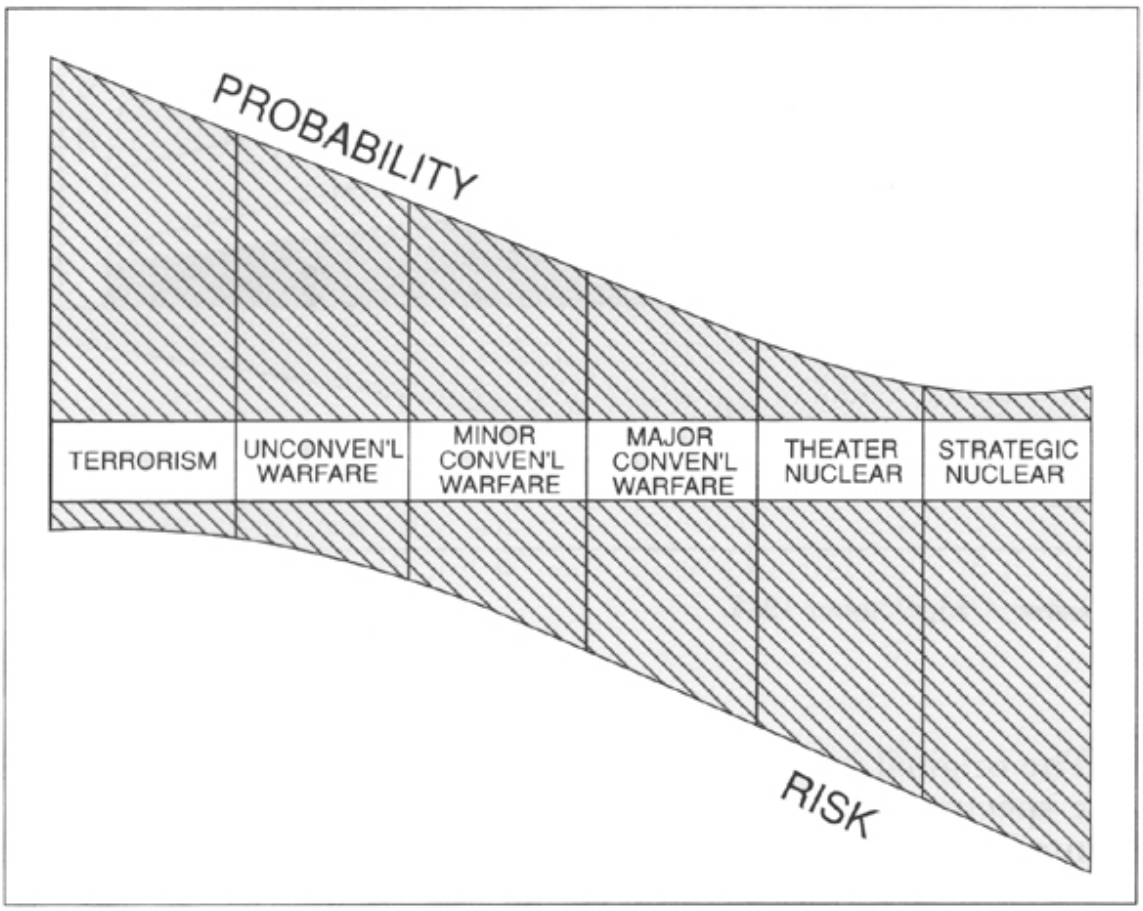

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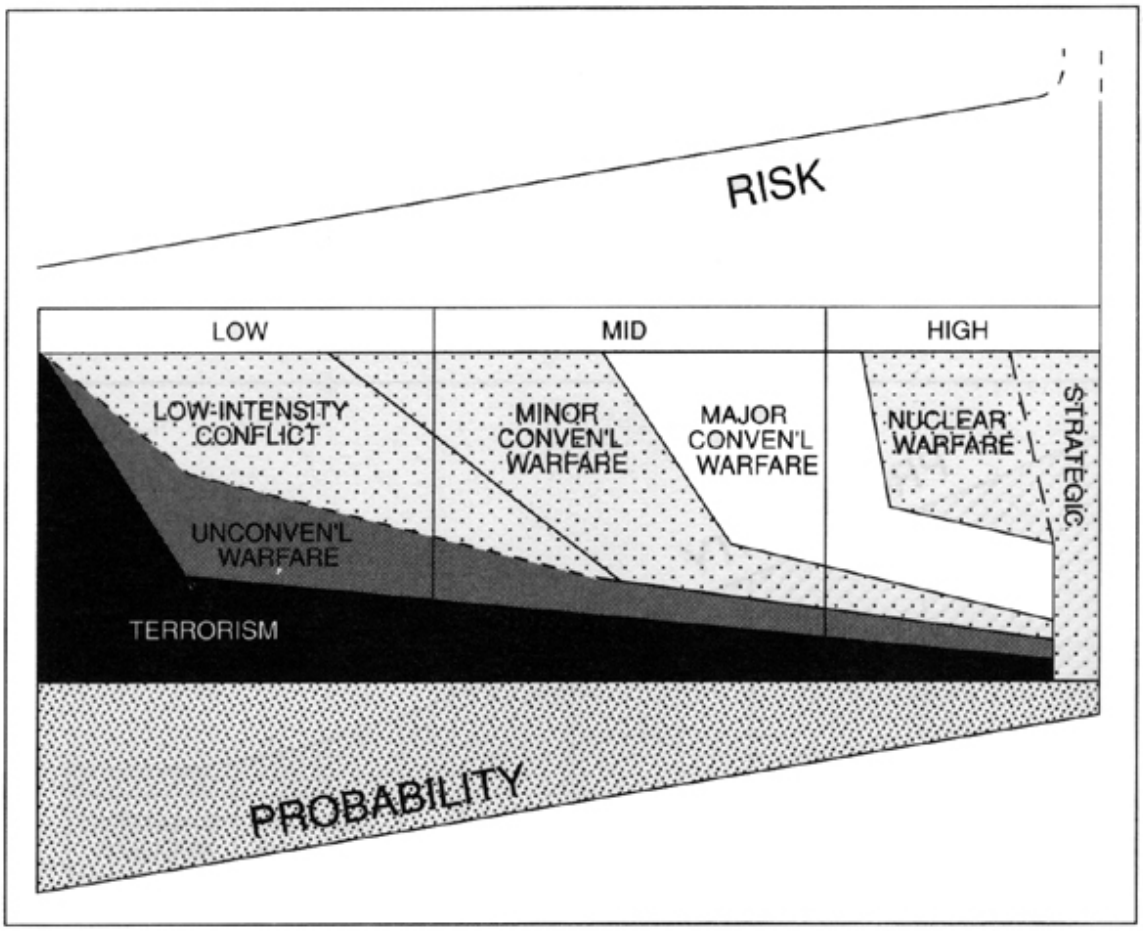
FIGURE 2 - REALISTIC CONFLICT MODEL



Source: Army, October 1984.

The original model reflected a linear view of conflict with discrete spectrums of non-overlapping forms of warfare. The Army oriented its force structure and balance toward the conventional warfare sector, particularly with regard to the major threat, i.e., Soviet aggression in NATO. Thus Army forces became heavier in personnel, materiel, and weapon systems to meet treaty commitments in Europe.

The newer model demonstrated the potential overlap of all elements of the conflict spectrum, that, in turn, could conceivably lead to a minor terrorist incident escalating to nuclear war. Such a possibility led Army planners to conclude that the strategic nuclear deterrent concept remained valid. Moreover, a conventional war in Europe might escalate into a nuclear exchange, a threat that decreased the probability of major conventional warfare there. A third observation was that with few exceptions-such as the Iran-Iraq War, the Israeli Arab Wars, and the Korean War-low-intensity

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warfare has characterized military operations since World War Il. Army leadership determined that the force structure needed to be rebalanced to meet requirements of the low to mid-intensity conflicts, including terrorist activities prevalent today, yet still maintain sufficient mechanized and armored forces to deter aggression in Europe, Southeast Asia, and Southwest Asia.

Equipment heavy forces are difficult to deploy in a timely manner from CONUS. Shortages of strategic air and sealift are factors in strategic forward deployment, either to deter aggression or to slow any initial enemy assault until CONUS-based reinforcements can be lifted to the threatened area. The Army increased the number of fight forces in the United States to provide rapidly deployable units either to support heavy units in Europe and Korea; to respond to aggression anywhere in the world, particularly in Southwest Asia; or to engage in short missions such as the rescue of students and protection of democracy in Grenada. Restructuring occurred without benefit of increased manpower ceilings and under intense congressional scrutiny.

Nevertheless, the Army chose to concentrate on the heavy-versus-light unit balance and began to implement a light division force structure. Active duty personnel ceiling strengths meant that the manning for new, light divisions and manpower to operate the newly fielded advanced weapon systems had to come from existing Army personnel resources. The Chief of Staff established a constant end strength of 780,000 for the active Army and mandated future increases in personnel for reserve components. This far-reaching decision necessitated a change in the organization of Division 86 units as well as the formation of light divisions to achieve the proper balance in the force structure for current operational capability.

During FY 84, the Army underwent a transition to balance the restructuring of the light forces against the modernization of heavy forces, while simultaneously maintaining their combat readiness. The formation of, or conversion to, light divisions was planned to minimize disruption to the ongoing improvement of the heavy divisions. The Army's goal was to field leaner and stronger divisions in a more mobile force.

Premised on the new AirLand Battle doctrine and integrating the lessons learned from field exercises in Honduras, the Army acted to improve and augment Special Operations Forces to fulfill important missions such as security assistance support, psychological warfare, intelligence, civic action, mobility, medical assistance, communications, and construction capabilities. Light divisions also had missions in the low- to mid-intensity levels of conflicts, so the

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Army planned to complement the SOF improvements with light division development to increase combat capabilities. Along with slimming down heavy divisions, these actions with the SOF and light divisions demonstrated the Army's determination to enhance overall readiness to meet a variety of contingency operations.

In past wars the U.S. Army had time to mobilize forces gradually and to prepare for combat operations. Current simulations demonstrated that the Army would not enjoy the same grace period in a future war and would depend heavily on the peacetime readiness of units to deploy for combat as a major ingredient for success. Therefore, the Army chose a fully manned and trained combat force organized to handle a variety of contingencies worldwide, equipped with modern weapon systems properly maintained, and sustained by adequate materiel stocks and support facilities. Significant increases in defense expenditures during the last three years did improve dramatically the Army's level of readiness, but congressional decisions concerning resource constraints meant the Army judiciously and economically would have to balance the various elements of readiness (such as personnel, training, force structure, equipment, modernization, sustainment, and strategic mobility) to extract full value for each dollar spent.

Improved personnel readiness and increased personnel quality characterized the Army during the year. Gains in the number of high test-score recruits and the percentage of recruits with high school diplomas were especially noteworthy. Enlistment bonuses, the Army College Fund, and increased recruiting resources and expertise were instrumental in these gains. Higher levels of training along with lower levels of indiscipline further demonstrated personnel quality and stability. The New Manning System exerted a positive effect on cohesion and stability at the unit level during the year. Reserve component personnel readiness also improved during the period because of better recruiting procedures, improved incentives for reservists, and increased full-time, active duty manning.

The Army's individual and unit training programs during the year enhanced training readiness. New exercise ranges for the Abrams tank and Bradley fighting vehicle appeared in the United States and overseas as part of the FY84 funding for the $109 million range modernization program, nearly four times the comparable figure for 1982. Exercises by operational units at the NTC increased, allowing more objective assessments of unit training readiness concomitantly with improvement of unit leader proficiency and cohesion. Fiscal year 1984 also witnessed 962 reserve component units receiving overseas deployment training-quadrupling

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the FY 81 level. This underlined the Army's increased reliance on reserve components in the Total Army concept. Army trainers promulgated the Standards in Training Commission (STRAC) strategies to establish minimum essential levels of live training ammunition required to attain and sustain specified levels of individual, crew, and unit weapons proficiency

for the Total Army. The concepts, including training aids, simulations, and subcaliber firing devices, provided substantial savings in the cost of training and significant improvements in training readiness.

Equipment modernization programs begun in earlier fiscal years continued apace, and more technologically sophisticated, state of the art weapon systems and equipment entered the force. By the end of FY 84, 20 tank battalions had received the Ml tank; 6 mechanized infantry battalions had been equipped with the Bradley fighting vehicle system (BFVS); 3 multiple launch rocket system (MLRS) batteries were deployed; and 22 UH-60 Black Hawk helicopter companies were fielded. These were the major new weapons systems. Numerous other new or upgraded systems were added to the Army inventory to improve combat capabilities and readiness. Paradoxically, modernization temporarily degrades readiness because new weapon systems must have a break-in period to identify potential problems and to train personnel in the operation and maintenance of the modern equipment. Spare parts for the new items are usually in short supply compared with established systems. However, readiness does increase as personnel become more proficient in using and caring for these systems.

Of all elements constituting readiness, sustainment is the most apparent as an indicator of preparedness. The layman understands that, lacking sufficient levels of ammunition, fuel, spare parts, and other materiel, an army will grind to a halt in combat. According to Ambassador Robert W. Komer in an article in the *Armed Forces Journal International* (Dec 84), PRESSURE POINT 84, a JCS-sponsored and directed exercise, demonstrated that United States forces had sufficient materiel and ammunition stockpiled to fight one major war, in this case, Korea, for a limited time. The issue of DOD sustainment readiness remained highly controversial throughout the year as Congress, the press, the services, and commentators widely debated, analyzed, and discussed the Army's level of preparedness. Sustainment readiness costs a large amount of money to maintain reserve stocks. The Department of Defense mandated that the Army maintain a 60-day reserve of munitions. However, Dr. Richard Delauer, Under Secretary of Defense for Research and Engineering (USDRE), stated that the emphasis on the newer, increased autho-

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rized levels of ammunition stocks shortchanged other vital items of supply. As an example, he observed that if the Army met the 60-day goal it would still have "only two days of hospitals" *(AFJ,* Dec 84) . He noted further that if the requirement was reduced to a 55-day level, the Army would have $7 billion available for other purposes. To meet DOD-ordered stockpile requirements and to keep production facilities operating, the Army continued to purchase older munitions at several times the unit cost of newer, more effective ammunition, which could be manufactured on a large scale in the following year.

Another important issue was unit readiness. A unit that met the old 1979 standard 30-day level, heretofore classified as combat ready, suddenly fell to a marginally ready classification in 1984. At a 6 March press conference, General John W. Vessey, Chairman of the Joint Chiefs of Staff, acknowledged that American forces in Europe had "43 days ammunition on the ground." *(AFJ,* Apr 84) Although various news accounts reported that many combat units lagged behind 1979 standards even after significant defense spending, it must be noted that many of these units were affected by the radical change in criteria used to measure readiness. General Vessey, in reply, stated that the increase in ammunition stockpiles was one indication that "by any common sense measure that American people can understand, the force is far readier that it was three years ago." *(AFJ,* Apr 84) He also pointed out that spending on munitions had tripled since 1980, increasing both Army and Air Force inventories by close to 20 percent. However, the Army still had significant shortfalls of secondary war reserve items, such as reparable components and consumable spare parts. Certain analysts, both within and outside DOD, blamed the shortfalls of pre-positioned stocks for rapid deployment forces, another sustainment readiness category, on congressional parsimony.

The Surveys and Investigations Staff of the House Appropriations Committee issued a report in 1983 decrying the UH-60 Black Hawk spare parts problems and alleging it had seriously impaired mission readiness. Mr. Joseph P. Cribbins, chief of the Army's Aviation Logistics Office, countered that aircraft readiness was at its highest level since the Vietnam War and that spare parts shortages for the UH-60 existed only during the early phases of fielding the new weapon. During FY 84, the helicopter had the highest peacetime readiness rates ever attained. The flying hour program will reach its plateau in 1988 and spare parts to support that level of operation are stated to be available in 1986.

In Europe, one problem with sustainment readiness concerned the preparedness of our NATO allies. Although U.S. forces do have

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sufficient stockpiles to sustain a high-intensity, conventional European war, our allies lack this capability, thereby downgrading overall NATO combat preparedness. NATO allies' infrastructure spending on forward-storage sites for ground forces munitions has also been minimal. These two developments led Senator Sam Nunn (D-Ga.) to offer an amendment to withdraw American troops if our NATO allies did not increase war stocks and NATO infrastructure spending.

Overall, though, the Army made substantial improvements in sustainment readiness through additional funding for POMCUS, war reserve stocks, and depot maintenance. The improved stock levels of POMCUS materiel and equipment, for example, contributed to the general heightened preparedness by reducing wartime airlift requirements and deployment times.

Army planners expanded the role of reserve components in Total Army readiness by increasing National Guard and Army Reserve readiness. The Army issued over $400 million of new equipment to reserve and Guard units in FY 84 and committed over $1.4 billion worth for issue in FY 85. More demanding missions for reserve units meant a closer alignment with active component units through the CAPSTONE program. CAPSTONE placed increased priority on reserve forces' readiness to improve Total Army readiness by increasing the number of combat ready forces available to meet worldwide requirements and contingencies.

Critics observed that not all Army units needed to be at a high state of readiness, because many could not be deployed for weeks due to a shortage of airlift and sealift capability. Reserve units expected to be deployed quickly under the CAPSTONE program found this particularly true. Ambassador Komer, a former Under Secretary of Defense for Policy, pointed out that in FY 84 the United States had more active forces within CONUS than could be deployed in time for effective deterrence or defense in many areas of possible conflict. Although the Reagan administration did increase spending to acquire more strategic lift, even this procurement will still fall short of estimated minimum requirements for 1990. General improvements in overall Army readiness were degraded by an inability to deploy rapidly these improved forces as needed to meet contingencies.

Nowhere was this problem more acute than in Southwest Asia, where a lack of forward basing further complicated matters. A major cause of this significant strategic disadvantage was the reluctance of Persian Gulf governments to allow the United States to build permanent facilities and pre-position materiel and equipment. Another significant factor was low congressional funding for

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the construction of forward bases, even in areas where the host country agreed. Again, ground forces stood ready but could not effectively respond to contingencies for lack of strategic mobility and, in this case, forward basing.

Initiatives or completion of several programs improved readiness management. One Army initiative was the development, after two years of work, of a method to measure changes in unit war-fighting capability over time. Called Measuring Improved Capability of Army Forces (MICAF), the system revealed that the Army's twenty-four divisions increased their war-fighting capability by 18 percent from FY 80 to FY 84 and by 6 percent in FY 84 alone. The Army also started an "ERG-A Fix" project, which identified units rated C-4 for equipment on hand and listed the minimum resources needed to raise the rating to C-3. The Army initiated several other readiness management projects during the fiscal year, including the Master Priority Integration (MPI) system, and the Logistics Readiness Rating Report (LR^3). Although General Vessey stated that he was "never satisfied or comfortable" with the Army's readiness and that "we [the Army] are not inhibited by lack of room for improvement" (*AFJ*, Apr 84), he believed that the Army was a stronger and better equipped force in FY84 than at any other time in recent history. It also continued to work out solutions for improvements, such as spare parts and strategic mobility, that degraded the general combat readiness level of the Army's operational forces.

The Army Overseas

The major tenet of United States post World War II strategy was the deterrence of war. The military services played a major role in this by confronting would-be aggressors with a three-pronged threat: first, that the defenses would stop the aggressor; second, that hostilities could escalate in ways contrary to the aggressor's assumptions; and third, that the United States would retaliate against, and cause substantial damage to, the aggressor's national interests. The United States, with vital interests, commitments, and obligations in Western Europe, Southwest Asia, and East Asia, maintained large numbers of forward-deployed forces in these regions to support America's deterrence defense strategy. Indeed, forward basing has been a touch stone of our national defense policy since 1945. The Army's major role in these joint forward deployments was to provide a timely response and forward barrier to prevent the loss of territory that would be difficult to recover once lost to aggressors. During FY 84, 43 percent of the Army's active components were deployed overseas.

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The United States also had alliances with various nations worldwide, but especially within the areas identified above, to preserve peace and freedom. Our allies' contributions did, to an extent, reduce the size of the American military and fiscal contribution overseas. Conversely, combined operations increased the need for training in interoperability, providing security assistance, and sharing technological advances. Alliances were vital because the United States and its allies, individually, could not match the quantitative superiority of the Soviet Union and its allies.

USAREUR

The NATO Alliance, a keystone of United States foreign policy, remained the principal arena for the Army's operational planning. FM 100-5, the embodiment of AirLand Battle doctrine, was principally written for combat operations within the NATO theater against Warsaw Pact aggression. The United States not only saw NATO as a primary security concern, but also as an area sharing its political, moral, and social values and ideals. To deter Warsaw Pact aggression and to protect these vital U.S. interests, the NATO Alliance fielded about 750,000 personnel stationed in Germany, including more than 200,000 soldiers of the U.S. Army.

The United States Army, Europe (USAREUR), had peacetime control over all American ground elements in central Europe, including the Berlin Brigade and the U.S. Army Southern European Task Force (SETAF), an airborne infantry battalion located in Italy, which is a part of the Allied Command Europe Mobile Force. USAREUR was responsible for manning, equipping, and training Army units under its control. During a crisis or war, the combat elements would be transferred to NATO command. However, USAREUR would continue its logistical and administrative support to these units.

During peacetime, Central (European) Army Group (CENTAG) acted as an international planning staff with no combat forces under its control. It developed and tested plans and procedures for the command and control of combat forces within the CENTAG area of responsibility. The arrangement differed markedly from past wars, when the United States and allies determined command and control responsibilities and procedures after the onset of war. The current arrangements capitalized on lessons learned from the past to improve interoperability and accelerate the transition from a peacetime to a wartime footing. This was especially critical given the potential speed and violence of a Warsaw Pact strike. CENTAG demonstrated through several tests and exercises that its plans and procedures were workable.

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USAREUR forces within the Federal Republic of Germany totaled two corps-each composed of one armored division, one mechanized infantry division, and one armored regiment. Other maneuver units were three separate mechanized infantry brigades (one being disbanded), a separate field artillery brigade equipped with Pershing surface-to-surface missiles, and an air defense command. The Berlin Brigade and the SETAF airborne infantry battalion rounded out the combat forces. The 200,000-plus U.S. soldiers garrisoned in West Germany made the United States the second largest force following that of the Federal Republic of Germany's *Bundeswehr.*

By all measurements, the units in USAREUR attained their highest level of readiness since the United States withdrawal from Vietnam in 1972. Over the past several years improvements were noticeable in more frequent and more realistic training; heightened unit cohesion through the introduction of the New Manning System; and fielding of new or upgraded

weapons systems. Equipment readiness, while showing improvement, continued to be a problem area as shortages of spare parts and qualified maintenance personnel existed. Nevertheless, the land forces under USAREUR control modernized their equipment and increased their level of combat readiness.

One aspect of USAREUR modernization was the wholesale replacement of armor assets as the Ml Abrams main battle tank as well as the Bradley M2 infantry and M3 cavalry fighting vehicles (CFVs) entered the force. The latter will give the United States a mobile, combined arms capability similar to that enjoyed by the *Bundeswehr* and Warsaw Pact armies. In addition, the introduction of the TOW-II significantly improved the antitank guided missile inventory. The MLRS (multiple launch rocket system) also appeared in U.S. units during the year, which greatly enhanced USAREUR's artillery firepower.

The NATO Alliance lacks enough deployed standing forces to defeat outright foreign aggression. The United States must, for instance, rely on a massive air and sealift of active and reserve units to reinforce Central Europe. The Supreme Allied Commander, Europe, Rapid Deployment Plan committed the U.S. to provide a ground force of 10 divisions within 10 days of mobilization. Four of these divisions were already in Germany, meaning that 6 must deploy from CONUS. In supporting this commitment, the United States Army stationed certain units in CONUS and stored their equipment and materiel in POMCUS sets in Europe. Four sets were already in place in Germany and two others, in the Benelux coun-

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tries, were being filled. With one other site in North European Army Group, these two Benelux POMCUS sets support U.S. III Corps reinforcing units, while the remainder are dedicated to CENTAG reinforcements. NATO countries test this rapid deployment and use of POMCUS sets through several mobilization, deployment, and field training exercises annually. REFORGER and accompanying exercises were the major tests of the Army's plans and procedures.

The United States recognized that its strategic lift was insufficient to transport 10 divisions within 10 days. Five NATO allies (the Federal Republic of Germany, the United Kingdom, the Netherlands, Belgium, and Luxembourg) were asked for logistical support in time of crisis. These allies agreed and produced bilateral agreements with the United States. The Federal Republic of Germany and the United States signed a Wartime Host-Nation Support (WHNS) Agreement in April 1982 that served as a model for future WRNS agreements such as the one signed by the Federal Republic of Germany and the United Kingdom in December 1983.

NATO was the primary focus of U.S. foreign and defense policies. This emphasis elevated certain aspects of our military relationship with our NATO allies into highly controversial issues. Such strategic topics as the TRIAD (strategic nuclear, theater nuclear, and conventional forces) defense strategy, flexible response, forward defense, burden sharing, and force goals were usually guaranteed to produce emotional responses. The past several years saw the dramatic rise of antinuclear advocates who, while primarily opposed to the commercial use of nuclear power, were also vocal against the nuclear arsenal. Representation on these groups was multinational, including those NATO countries committed to a defense of Central Europe, and complicated defense planning as they injected populist issues and political rhetoric into the equation.

The public debate on the risks of using nuclear weapons, sparked by these advocates, led NATO planners to reexamine methods for reducing NATO's dependence upon these weapons for defense and deterrence and for strengthening the conventional sector of NATO's defense to raise the nuclear threshold and reduce the likelihood of a nuclear exchange. However, this reassessment did not constitute an elimination of a reliance on tactical nuclear weapons to deter aggression.

The United States strategy of deterrence, based originally on U.S. nuclear superiority and subsequently on nuclear parity, was one ingredient that maintained peace in Europe for forty years. With the fielding of tactical nuclear weapons, the Army adopted a flexible response concept for defense, which allowed for three re-

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sponses to enemy aggression: direct defense, deliberate escalation, and general nuclear response. An important aspect of NATO's flexible response strategy was the inherent option to escalate to first use of nuclear weapons if the first option failed. The point at which nuclear weapons are first used is the nuclear threshold.

The lynchpin of deterrence remained a nuclear arsenal that confronted the potential aggressor with unacceptable losses that negated any potential aggressor gains or might escalate to a full-scale nuclear exchange. Several high-ranking officers, including Lt. Gen. James. E Hollingsworth and General Bernard W Rogers, analyzed flexible response and found that the Army's position had eroded over the past twenty years. "To achieve credible deterrence," stated General Rogers, Supreme Allied Commander, Europe (SACEUR), "flexible response must be supported by adequate military capability for each leg of the triad forces it requires: . . . But today we find NATO's deterrence jeopardized because it has been surpassed by the Warsaw Pact in all three categories." *(Defense* 84, June)

During FY 84, according to General Rogers, the United States and the United Kingdom worked at improving the deterrent value of their strategic nuclear forces, the first part of the TRIAD defense strategy. While NATO also planned to deploy various intermediate-range nuclear missiles on the European continent to counter the Soviet buildup, concurrently NATO ministers conducted arms reduction talks with the Soviets aimed at redressing the balance of nuclear weapons. The allied ground-based inventory included 18 French surface-to-surface missiles and the 57 United States ground-launched cruise missiles (GLOM) and Pershing II missiles being fielded. The main targets for these weapons were the Soviet military forces in and beyond the Western Military Districts, which would reinforce first echelon units engaged in an offensive against NATO forces. Defense analysts believed that the threat of first-use nuclear weapons option would deter aggression by presenting incalculable risks to the aggressor. Until recently, NATO let the Warsaw Pact in the number of short-range nuclear warheads and delivery systems that made up the second part of NATO's TRIAD defense strategy. While the Soviets had several weapon systems that could use artillery nuclear warheads, they did not deploy them into forward areas of Eastern Europe. However, since 1975, the Soviets have deployed five new systems there. In FY 84, the Warsaw Pact fielded at least as many tactical nuclear-capable artillery tubes as the NATO forces. The Soviets also had a considerable advantage in missile-delivered warheads. On 3 July 1983, the cancellation by the U.S. Senate of the W-82 nuclear warhead for the U.S. 155-mm. howitzer

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complicated the tactical nuclear equation. This artillery round was designed to modernize the United States tactical nuclear forces, and its abrogation indicated to NATO and Warsaw Pact ministers as well as military planners that Congress was moving away from a dependence upon nuclear forces for European deterrence. The October 1983 Montebello conference of NATO's Nuclear Planning Group of ministers called for a unilateral withdrawal of 1,400 nuclear weapons, mostly short-range systems, from the NATO inventory. This position also suggested a shift from a dependence upon nuclear deterrence to one based upon conventional forces without nuclear weapons as a possible threat.

President Reagan, among others, believed that U.S. and NATO conventional forces in Europe had to be modernized as well as increased in size and capability, but did not believe that conventional forces alone could completely replace the nuclear deterrent. In a 12 September 1984 letter to Congress, the President wrote that NATO had to "continue to maintain a credible nuclear deterrent." *(Department of State Bulletin,* Nov 84)

Recently, defense analysts have debated, discussed, and critiqued the effectiveness and capability of our conventional forces in Europe, in particular, and NATO's conventional force structure, in general, based upon concerns over these forces' ability to fulfill their missions under the flexible response and forward defense plans. Both proponents and critics of current force structure strength and organization compared NATO's resources and abilities against those of the Warsaw Pact. While the number of divisions and manpower strengths served as focal points, at least one analyst noted that although these figures remained fairly constant over the last several decades they concealed the massive increase in new equipment and consequent modernization of the Warsaw Pact ground forces.

General Rogers asserted that the Warsaw Pact was eliminating most of its deficiencies, especially in the field of logistics. The Warsaw Pact's level of sustainment was sufficient to maintain 90 divisions in combat operations for more than 60 days. NATO could not match Warsaw Pact forces on a one-to-one basis, but analysts and planners believed that allied technological superiority served as a force multiplier and evened the odds. Others, less sanguine, emphasized the massive increase in technologically sophisticated weaponry and equipment of Warsaw Pact forces to highlight their contention that the technological edge was thinner than previously thought.

General Rogers, SACEUR, repeatedly requested a bolstering of his conventional forces. He called on the U.S. Congress to

strengthen the Army's forces as a model and incentive to our allies to do likewise

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and to provide an additional deterrence based upon conventional forces. General Rogers pointed out that conventional forces needed to be "strong enough to give us high confidence that we can preserve the integrity of the Allied Command Europe's conventional defense by enough for NATO to make an orderly and deliberate consideration of escalatory responses to try to convince the aggressor to cease his attack." *(Defense* 84, June) The road to a credible conventional deterrence remained extremely long and difficult. A major recurring problem was sustainment. NATO lacked adequate manpower, war reserve materiel, and ammunition to maintain its combat power for a protracted length of time.

With the introduction of units employing new, advanced weapon systems needed to modernize the Army's conventional forces in Europe-to enhance the conventional deterrence-the personnel strength of USAREUR increased, since no personnel reductions were planned for other units. However, congressionally mandated manpower ceilings for European troop strength resulted in compromises. An initial decision was the deactivation of the 4th Brigade, 4th Infantry Division (Mechanized). Other units were considered for dual basing, which meant several units would be returned to the United States for stationing, while their associated equipment and materiel would remain in Europe. Though the stockage level of war reserve materiel increased during the year, it fell far short of meeting sustainment goals. The POMCUS equipment and materiel stockage rate proceeded slowly.

The U.S. Army also faced deficiencies in the detection of, protection from, and means to deter the use of chemical weapons, an area in which the Warsaw Pact forces enjoyed a distinct superiority. Although several NATO countries had acceptable defensive chemical capability, none equaled the wide range and capability possessed by the Warsaw Pact ground forces. Meanwhile, Congress, regarding the U.S. chemical weapon stockpile as sufficient, was reluctant to provide funds for improving or increasing the American offensive capability in such weapons. The stockpiled chemical weapons were nearing obsolescence because of deterioration in both the warhead and propellant.

General Rogers also identified other problem areas within Allied Command, Europe. These included intelligence operations, logistics systems, air defense, command and control, and the number of reserves available for mobilization. He had two main areas of concern. His first was to bring the forces already committed to NATO up to peacetime standards in equipment, sustainment, manning, training, and reinforcement capabilities. Second, he wanted to ac-

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celerate the modernization of those forces to maintain NATO's vital technological superiority over Warsaw Pact forces.

Congress, as well as the news media, used figures such as those in *Table 1* to criticize NATO allies for failing to pay their own way while enjoying U.S. protection. Proposals for the reduction of American troop strength in Europe if the allies did not substantially increase defense spending to the 3 percent level were heard in Congress. Senator Nunn proposed an amendment to the FY 85 defense authorization bill in June that would reduce the present 326,000 total DOD troop strength by 90,000 if the allies did not increase defense spending. The Senate, after a close vote (55-41) , tabled the amendment. Nunn's amendment very specifically called for improvements in NATO's conventional forces to improve their level of effectiveness above that of a "tripwire". If this was not done, the United States would decrease its ground forces to a "tripwire" level also. According to Nunn this meant bringing home 90,000 soldiers. To stop such a huge withdrawal of U.S. forces the NATO allies have to complete certain programs, which Nunn estimated would cost $6 billion over five years, to increase their ammunition stockpiles to the level announced as official NATO policy. The infrastructure program was highly successful during FY 84 as it handled very specific items, such as fixed installations or facilities needed for developing and using combat forces, and received improved funding from our NATO allies.

TABLE 1 - PERCENT CHANGES IN NATO SPENDING IN CONSTANT PRICES, 1971-1982

Country	1971-78	1977-78	1978-79	1979-80	1980-81	1981-82
Belgium	4.75	6.7	4.5	2.2	2.0	0.2

Canada	2.72	-0.2	0.9	-0.9	5.1	3.0
Denmark	2.80	3.1	0.2	0.2	0.7	0.1
France	3.17	4.9	3.0	2.5	3.9	3.5
Great Britain	1.62	-0.3	3.9	3.0	2.7	2.1
Greece	5.49	-3.2	0.5	-2.9	-8.8	5.6
Italy	3.08	3.2	0.8	2.6	4.9	-1.2
Luxembourg	6.28	7.9	1.4	3.5	16.3	7.1
Netherlands	3.28	-5.3	3.5	3.9	-1.5	2.3
Non-U.S. NATO	-	2.1	2.7	2.2	2.6	2.2
Norway	2.99	7.7	2.8	1.9	1.8	2.5
Portugal	-6.01	1.7	12.3	2.9	10.1	2.8
Turkey	7.80	0.0	2.1	2.6	2.0	3.1
United States	-2.69	1.5	3.2	3.4	4.9	5.4
West Germany	2.91	3.0	2.0	1.8	1.9	1.9

Source: James R. Golden, "NATO Burden Sharing: Risks and Opportunities," *The* Wash*ington* Papers/96, Volume X, 1983, p. 51.

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The United States and its NATO allies continued, during FY 84, to demonstrate a commitment to a strong deterrence and common defense. This was done in spite of criticism of their defense strategy (flexible response and deep strike based upon AirLand Battle); of the strength and capability of their conventional forces; and of perceived inequities in sharing the cost of their defense. While the forces were not as large as in the past, their capability had increased considerably over the past four years. However, with the economic problems then prevalent and predicted, that capability would increase slowly during the next several years. During the year NATO members worked diligently to solve the problems of interoperability and standardization of forces, weapons, and materiel. The U.S. Army considered the cooperative development of several weapon systems with European companies, and joint deployment of weapons systems such as MLRS were completed. However, Warsaw Pact capabilities also continued to increase. At the end of FY 84, Congress, the Army and its sister services, the news media, and other defense and foreign affairs specialists still debated, discussed, and offered plans to reverse the decline.

USCENTCOM

Post World War II Southwest Asia has been racked by conflicts and crises, and recent events-such as the Iran-Iraq war, internecine fighting in Lebanon, ongoing tensions between Israel and its neighbors, the Soviet invasion of Afghanistan, and the rise of radical Islamic fundamentalist groups within several Arab countries-demonstrated a continuation of such trends. As one commentator remarked, "Today the region displays a wide and uneven range of economic and social development. It is marked by great ethnic, religious, and political diversity, reflecting its extraordinary history and capable of producing tensions which often result in armed conflict." (AFJ, Oct 84)

United States interests in Southwest Asia fell into three categories. The first was oil. Although the United States sharply reduced its dependence upon Arabian oil, our allies still depended on resources from this region. Second, the region's central location bridging Europe and Asia demanded that the United States extend its influence there to counter possible Soviet plans to expand. Finally, the United States continued to support the state of Israel and desired to ease or solve Arab-Israeli problems.

The United States had vital interests in Southwest Asia. Regional political stability as well as countering an increasingly more visible

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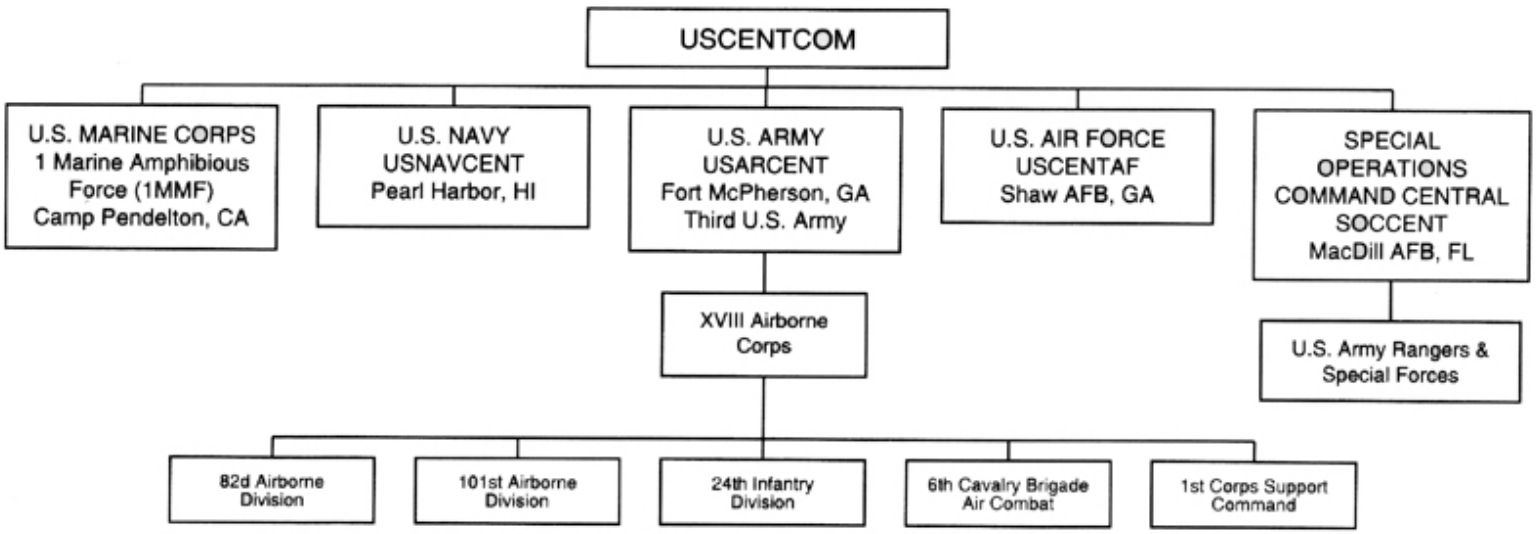
Soviet influence were basic strategic goals. The downfall of the Shah of Iran and the Soviet invasion of Afghanistan, both in 1979, forced the United States and its allies to conclude that they lacked the military capability, either in place or rapidly available, to achieve either goal. Therefore, President Jimmy Cater, in March 1980, established the Rapid Deployment Joint Task- Force (RDJTF) to provide an immediately available capability to confront elements promoting instability. Interservice rivalries and assignment to a region already divided between two major commands (European and Pacific) plagued the RDJTF. To solve these problems and to improve the American military capability in Southwest Asia, President Reagan established the United States Central Command (USCENTCOM) on I January 1983 with its headquarters at MacDill Air Force Base, Florida. USCENTCOM assumed responsibility for an area encompassing Southwest Asia, and including Egypt, Ethiopia, Somali, Kenya, Sudan, Iran, Afghanistan, and Pakistan. USCENTCOM's mission was based upon American interests in the region and assumptions planners made concerning events likely to occur or to continue in Southwest Asia. The primary mission was to deter any type of overt hostilities, to include a nuclear conflict or general warfare with the Soviet Union as well as any regional conflict. USCENTCOM also had the responsibility to protect the region's sources of oil and access to these resources, to confront and oppose the expansion of Soviet influence in the region, and to provide security for those nations in the region friendly to the United States. Furthermore, USCENTCOM worked to increase the area's economic development and its political stability. The primary mission was deterrence, which it sustained with political support, economic aid, combined exercises, security assistance, and training programs. If such assistance failed, then USCENTCOM, with JCS approval, could provide military support items, including advisers, tankers, reconnaissance planes, supplies, and equipment. If the President determined that this assistance too was unable to deter aggression, he could order USCENTCOM combat units into the region.

The combat and support elements of USCENTCOM were divided among the United States Army, Navy, Air Force, Marine Corps, and Special Operations Command, Central. *(See Chart 3.) U.S.* Army Rangers and Special Forces were included in the latter while all remaining U.S. Army forces were under the control of USARCENT (United States Army Forces, CENTCOM). USARCENT, under the command of the Third U.S. Army commander at Fort McPherson, Georgia, planned and controlled all operations of U.S. Army units assigned to the USCENTCOM theater. Army units assigned to the

CHART 3 - USCENTCOM ORGANIZATION



USCENTCOM were stationed in CONUS, except for a small forward headquarters element established in December 1983 and collocated afloat with the Middle East Force in the Persian Gulf and elements assigned to the Multinational Force and Observers (MFO) stationed in the Sinai Peninsula.

USCENTCOM's deterrent value rested on basing rights in the region. With all Southwest Asian countries extremely reluctant to allow basing within their territory and with all USCENTCOM forces, except a minuscule number of troops, located in CONUS the problem was apparent. Furthermore, the United States lacked sufficient air and sealift to transport the CONUS-based units and their equipment as well as simultaneously to move sustainment materiel to the region.

The Soviet military capability in the region included approximately thirty Army divisions stationed along the USSR's southern border and in Afghanistan. Except for the forces in Afghanistan and the nine divisions along the Soviet-Iran border, most Soviet forces were at peacetime TOE. They still enjoyed the main advantage of proximity to the heart of USCENTCOM's area of responsibility when compared to the extended 7,000-nautical-mile line of communication for American troops who would be airlifted to the region. Shipping, if available, did not reduce these staggering distances because the water route via the Suez Canal was 8,000 nautical miles, while that around the Cape of Good Hope was 12,000 nautical miles.

As the Soviet forces battle-tested their combined arms capabilities and operational doctrine in Afghanistan, USCENTCOM's Army units were just beginning to exercise and field-test AirLand Battle doctrine, as promulgated in FM 100-5. Soviet forces also possessed an advanced offensive and defensive chemical warfare capability, which was tested in most, if not all, Soviet field exercises and possibly employed operationally in Afghanistan. In contrast, the United States forces in USCENTCOM possessed no offensive and little defensive chemical capability. USCENTCOM, of course, was unable to match the Soviets' level of force-basing in the region.

Lt. Gen. Robert C. Kingston, well aware of the military threat posed by Soviet actions and troop positions in Southwest Asia, pointed out that the psychological threat of these forces and activities was often more important than actual threat of use or use of terrorism, especially when combined with Soviet-sponsored terrorism against countries friendly to the United States.

USCENTCOM forces, while forming the bulwark of security and United States strategy in Southwest Asia, received support from the military forces of the region's states. As part of its mission to improve

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the defensive military stature of Southwest Asia, USCENTCOM worked to modernize and increase the size and capability of the military forces of those countries friendly to the United States through security assistance programs and training exercises such as BRIGHT STAR. U.S. Army units and the Army Corps of Engineers were heavily involved in both of these areas.

The Department of Defense planned to increase substantially the rapidly deployable forces available to its unified commands, including USCENTCOM. (See *Table 2.)* However, the expansion of available personnel from 222,000 to 440,000 would not raise the overall strength level of United States ground forces, establish additional units, or separate units from their present parent commands. The last stipulation had the potential to be especially troublesome for units committed to meet both NATO and USCENTCOM contingencies if crises or conflicts erupted simultaneously in both areas. Planners, at the close of FY 84, worked on solutions to this problem. *Table 3* shows the anticipated increased funding for rapid deployment capabilities worldwide with USCENTCOM allocated a substantial portion.

The United States, through FY84, constructed or budgeted for support facilities worth over $1.1 billion in the region. *Table 4* shows a breakdown of DOD construction funding for the rapid deployment infrastructure, which improved existing host nation facilities so that United States forces could be supported during a conflict or crisis. When the military construction program ends, it will provide storage areas for pre-positioned equipment, thus saving valuable air and sealift capacity. It also will allow support forces, especially engineer construction units, to be deployed later than planned, allowing for a faster response by combat units. Finally, it will enhance deterrence by demonstrating American commitment to our friends and allies in the region.

General Kingston, Commander in Chief, USCENTCOM, noted that his command was the only one of the unified commands with out headquarters located within the area of responsibility. This condition was a definite handicap to a timely response to conflict or crisis in the region. Kingston observed other significant and worrisome differences among his command, the European Command, and the Pacific Command. While the latter two had large force structures stationed

within them, USCENTCOM had virtually none. The other commands also possessed established C 3 systems and substantial logistical networks, which USCENTCOM lacked. Finally, Kingston's command had no host nation support agreements or long-term alliances with states within his area of responsibility, as did the European and Pacific Commands.

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TABLE 2 - PLANNED U.S. RAPIDLY DEPLOYABLE FORCES

	Fiscal Year 1984	Fiscal Year 1989
Navy:		
Aircraft carrier battle groups	3	3
Amphibious ready group1	1	1
Air Force:		
Tactical fighter wings 2	7	10
Ground Forces:		
Marine amphibious forces 3	1	2
Army combat divisions 4	3⅓	5
Total personnel	222,000	440,000

1 Typically consists of three to five amphibious ships including an amphibious assault ship.
2 Each consists of approximately 72 aircraft.
3 Each consists of a ground combat division, a tactical fighter wing, and sustaining support.
4 Each division consists of 16,000 to 18,000 soldiers.

Source: International Security Yearbook 1983/84, edited by Barry M. Blechman and Edward N. Luttwak, Georgetown University Center for Strategic and International Studies (New York: St. Martin's Press, 1984), p. 153.

TABLE 3 - RAPID DEPLOYMENT-RELATED PROGRAM COSTS
(In millions)

	Fiscal Years					
	1984	1985	1986	1987	1988	1984-88
SWA-specific	$622	$805	$893	$1,204	$852	$4,376
Other	1,618	1,479	1,580	1,717	2,783	9,177
Total	2,240	2,284	2,473	2,921	3,635	13,553

TABLE 4 - MILITARY CONSTRUCTION FUNDING FOR RAPID DEPLOYMENT-RELATED FACILITIES 1
(In millions)

Location	Fiscal Years 1980-1983 Appropriated
Egypt (Ras Banas)	$91

Oman	224
Kenya	58
Somalia	54
Diego Garcia	435
Azores(Lajes)	67
Other locations	-
Total	929

1 Does not include planning and design costs.

The picture was not, however, bleak when one compares the progress made over the course of four years. The formation of USCENTCOM provided the region's leadership with one major command to coordinate defense affairs and established a unified command to simplify the command and control procedures. The RDJTF and USCENTCOM worked diligently to improve the joint operations within the region by conducting major field exercises (e.g., BRIGHT STAR), which enhanced the general level of readiness. In addition, materiel was pre-positioned onboard ships in the region and overall air and sealift capabilities were improved.

USCENTCOM's commitment to protecting the security and stability of the region further enhanced the defense capabilities and cooperation between America's allies and nations friendly to America. Although USCENTCOM, at the end of FY 84, still faced many challenges, General Kingston believed that his command had the means to affect favorably the outcome of a regional crisis.

The Multinational Force and Observers

The Multinational Force and Observers (MFO), established on 2 August 1981 to supervise the implementation of the peace treaty between Egypt and Israel, did not, because of Soviet opposition, function as a part of the United Nations peacekeeping mission.

Composed of personnel from several different countries *(see Table 5),* the MFO's sole mission was to observe Egyptian and Israeli operations in the Sinai and to report any violations of the peace treaty to representatives of both nations. The MFO's area of operations was limited to Zone C and the international boundary. *(See Map 1.)* Members manned checkpoints and observation points and carried out reconnaissance patrols.

TABLE 5 - PERSONNEL STRENGTHS OF THE MFO

Australia	109
Colombia	502
United Kingdom	36
Fiji	500
France	35
Italy	88
Netherlands	102
New Zealand	35
Norway	4
Uruguay	75
United States	1,110
Total	2,596

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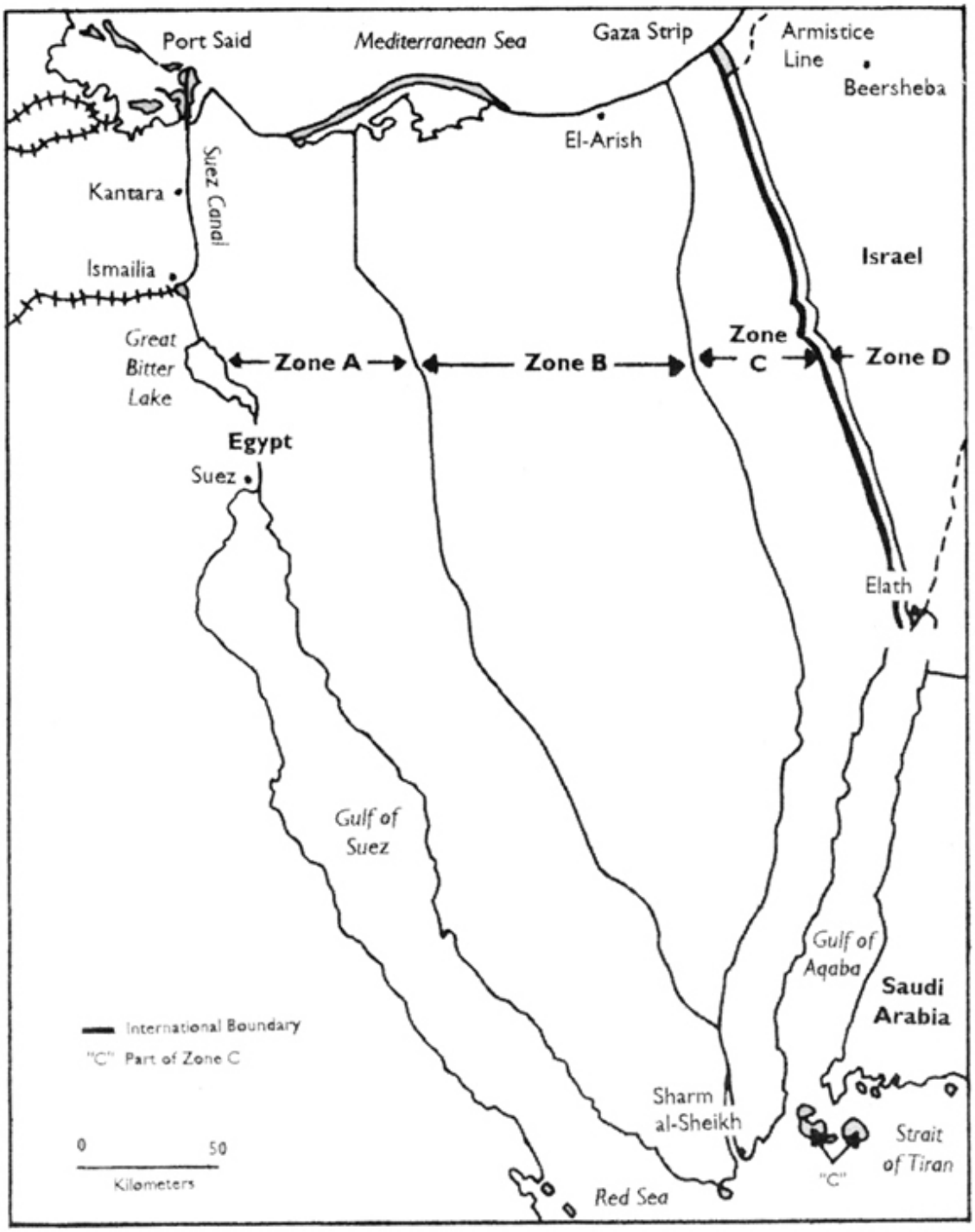
MAP 1 - LIMITED-FORCE ZONES PROVIDED BY ISRAELI-EGYPTIAN PEACE TREATY



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The United States contributed an infantry battalion (rotated semiannually between the 82d Airborne and 101st Airmobile Divisions), a logistic support unit, and a 34-man civilian observer unit to MFO. The Army battalion operated in the southern portion of Zone C. The logistic support unit, a combat service support element with 340 people assigned from numerous CONUS supply units, performed various logistical operations: 1) transporting cargo from ports to units; 2)

running depots for all supply classes; 3) operating fuel points, a movement control center, medical dispensaries, and an Army post office and finance office for United States personnel; 4) hauling water and fuel; 5) supplying maintenance services; and 6) providing for the disposal of explosive ordnance. The Army, during this period, converted assignments to the logistics support unit from a TDY to a Permanent Change of Station status to provide needed continuity.

The U.S. Army forces in Sinai acted as a peacekeeping force whose political presence was more significant than its potential military effectiveness. These lightly armed units, the largest USCENTCOM force in-place, although providing valuable services to peace in the region and maintaining an American military presence, were not intended to serve as a bulwark against conflict or crisis in Southwest Asia.

PACOM

PACOM, the Pacific Command, was responsible for an area of strategic significance not only to the United States but also to our NATO allies for several reasons. The Pacific rimland nations were an economic colossus that generated one-sixth of the total world trade and one-third of America's total trade. In fact, the trade between Asian/Pacific nations and the United States was larger than trade with Western Europe. European trade was also expanding rapidly in the region. While the protection of sea lanes of communication was important to the United States, maintenance of these LOCs was vital to our European allies, who depended upon raw materiels and finished goods imported from the PACOM region. Conversely our Asian/Pacific allies like Japan and Korea, as well as other Asian nations friendly to the U.S., depended upon Middle East oil transported over lengthy and vulnerable sea lanes. To support regional stability, the United States and its allies, both European and Asian, had an essential interest in supporting the independence of the region's countries, protecting their economic infrastructure, and keeping the sea lanes open to international commerce. In this basically maritime region, the U.S. Army had an active and important role. El-

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ements of the seven largest armies of the world (People's Republic of China, USSR, Socialist Republic of Vietnam, India, United States, North Korea, and Republic of Korea) met in the PACOM area of responsibility, providing opportunities for local conflict or crisis which might potentially escalate into a war with United States and USSR involvement. During FY 84, the regional instability exemplified by the Socialist Republic of Vietnam's military operations in Cambodia was echoed by Communist insurgency in the Philippines, tension between the People's Republic of China and its southern and northern neighbors, and the continuing saber-rattling of the North Koreans.

For United States forces in PACOM, especially for those belonging to the Army, the area's immensity, over one-half of the earth's surface, was the significant planning factor. It was true that most of the area is ocean and thus of greater concern to the U.S. Navy. Deployment planners, however, faced great challenges in projecting power in the form of U.S. Army operations, because there were few personnel, little equipment, scarce materiel, and slender support assets located within the region close to possible areas of crisis or conflict. Therefore, the distances dictated a lift capability far in excess of that required to project similar-size forces in the same period of time to Europe. This was particularly true for transporting forces from one side of PACOM to the other. A C-141 transport plane required 24 hours to fly from California to Diego Garcia in the Indian Ocean. Sealift by even the fastest ships took over 3 weeks to steam the same distance. This is an extreme example, but many forces would travel this route if they were needed in USCENTCOM. Although the distance and time for deployment to East Asia were shorter than to Southwest Asia, they still presented difficult obstacles in terms of distance to a timely and meaningful response by the United States to a crisis in that region.

Within this vast region, PACOM's primary area of concern is Northeast Asia, an area of political tensions, unresolved conflicts, tenuous diplomatic and military relationships, and propinquity to Soviet military strength. According to James A. Kelly, Deputy Assistant Secretary of Defense (East Asia and Pacific Affairs) "the dramatic increase of Soviet offensive power in Asia and in the Pacific and Indian Oceans is the most far-reaching military development of recent years. This assessment is valid despite America's preoccupation with Europe and the Middle East and despite the attention paid to the balance of strategic forces and the strategic uses of outer space." For the first time, wrote Kelly, "Soviet military forces in the Pacific . . . pose a significant direct threat to United States military forces, territory, and lines of communications." *(Defense* 84, January)

Soviet strategic, naval, and air forces posed a direct threat to PACOM nations as well as to the vital sea lanes upon which they and their trade partners depended. The Soviet military not only based their forces in PACOM's central area of concern, but also had access to two excellent ports in the Socialist Republic of Vietnam.

The United States forces in PACOM act primarily as a counterfoil to the expansion of Soviet influence, a bulwark against the Soviet military threat and intimidation, and a stabilizing influence for the region's multitudinous tensions. Currently, the United States has stopped the withdrawal of forces in overall PACOM force structure and increased the readiness, sustainment, and equipment modernization of U.S. units forward deployed in the region. While the United States recently raised funding for sustaining PACOM forces and enhancing their readiness, the force at that time was inadequate to fulfill its numerous missions without reinforcement from CONUS-based forces.

Almost all of U.S. Army forces in PACOM were dedicated to deterring aggression, mainly from the threat of North Korea. This mission has existed since the beginning of the Korean War. Most U.S. Army troops in PACOM were stationed in the Republic of Korea with close support from limited backup forces in Japan.

North Korea had the world's sixth largest army, but ranked only fortieth in population. In FY 84, the North Koreans outnumbered ROK/U.S. forces by more than 2 to 1 in armor and artillery, close to 4 to 1 in ships, and 2 to 1 in combat aircraft with almost one-half this military power located within 50 miles of the Demilitarized Zone (DMZ). This quantitative advantage offset somewhat their qualitative disadvantage.

The U.S. 2d Infantry Division added vital infantry, armor, and artillery assets to Republic of Korea forces. Its deployment along the DMZ assured direct United States involvement if the North Koreans attacked across the zone. America nuclear capability added a deterrent factor that North Korea and the Soviet Union must consider. With combat operations under the control of the ROK-U.S. Combined Forces Command (CFC), United States participation was further assured. The Eighth Army would provide combat and combat service support as well as handle reinforcements to Korea before assignment to the CFC.

The 2d Division entered the final planning stages for converting mechanized and armor battalions into the Division 86 organization. In June 1984, the general support artillery battalion received a multiple-launch rocket battery. During the year, the division's armor forces traded in M48A5 tanks for newer M60A3s.

In addition over 180 new systems were added or programmed for the next several years. These included AH-1S TOW Cobra helicopters, M198 155-mm. towed howitzers (2d Division was the first overseas unit to receive these), and TACFIRE (Tactical Fire Control System). Furthermore, the division improved intelligence capabilities and enhanced range of command and control communications systems. Eventually all tactical communications equipment used by Republic of Korea and United States units will be compatible. The division also received manpower authorization increases to improve supervisory and "hard-skill" capabilities.

The Army increased funding to meet long-standing construction requirements and started a ten-year program to build, renovate, or upgrade facilities, some of which were built during the Korean War. Construction and modernization of barracks, dining halls, welfare and recreation facilities, and work areas will begin with field units. The Republic of Korea contributed to this program by building leased family housing and reducing the cost of electricity for United States dependents living off post.

One of the more significant actions taken during the fiscal year within Eighth Army to increase allied capabilities was the formation of the combined aviation force (CAF). Starting in September 1983, the 17th Aviation Group (Combat) conducted several airmobile and combat air assaults with aviation units of the Republic of Korea Army to develop procedures for a combined aviation force. Several factors pointed logically to the benefits to be gained from merging United States and Republic of Korea aviation resources. The 17th Aviation Group had a medium transport helicopter battalion with CH-47s and an assault helicopter battalion containing UH-60s and UH-1Hs. However, it lacked scout and observation helicopters as well as attack aircraft. The ROK Army maintained a substantial air assault and attack inventory,

but required the lift capability of the CH-47 and UH-60. In addition, an examination of command, control, and communications (C3) as well as logistics assets found corresponding disparities that could be combined for greater effectiveness and efficiency. Another factor was the length of time it would take for aviation assets outside Korea to be deployed. During TEAM SPIRIT 84, the CAP successfully demonstrated its combined operational value to combined ROK-U.S. combat operations.

Although the Eighth Army made many improvements in readiness, sustainment, and combat capabilities, it still faced several problems. Although most experts on the Eighth Army agreed that modernization of the Army force stationed there was essential, they also emphasized that substantial shortages existed in stocks of am-

munition, war reserve materiel, and POL. Specifically, they noted that antitank and field artillery ammunition was far short of that needed to meet forward-defense requirements. They also pointed out that current lift capability was inadequate to deliver necessary sustainment items before they would be exhausted during a North Korean attack. The combat service support units within Eighth Army were sufficient to meet peacetime demands but needed force structure augmentation to handle their wartime assignments.

The 25th Infantry Division, stationed in Hawaii, continued its role as the Pacific Ground Force Reserve. The Army approved pre-positioned war reserve materiel stocks for the division during FY 84. This resource will significantly improve the division's readiness capability.

SOUTHCOM

The United States countered the expansion of Soviet military forces and Soviet-supported governments in the Southern Command's (SOUTHCOM) area with a combination of military assistance and operational military forces. The U.S. Army played a major role in American policy in this region. The longest and largest role was as a planner and participant in several large-scale, multinational combined exercises in Honduras during the fiscal year. In addition, Special Forces advisers trained troops from El Salvador both in country and in Honduras.

In the midst of Honduran exercises AHUAB *True I* and AHUAS *True II,* American forces, predominantly U.S. Army units, executed an airborne/air assault operation against the island of Grenada on 25 October 1983. President Reagan ordered U.S. troops into combat in response to an "urgent, formal request from . . . the Organization of Eastern Caribbean States (OECS) to assist in a joint effort to restore order and democracy on the island of Grenada." *(Department of State Bulletin,* Dec 83) He ordered elements of the 1st and 2d Battalions of the 75th Infantry Regiment (Ranger) and 82d Airborne Division "to protect innocent lives, including up to a thousand Americans .... to forestall further chaos . . . and to assist in the restoration of conditions of law and order and of governmental institutions." By the end of hostilities on 2 November, U.S. forces had safely evacuated 662 Americans and 92 foreign nationals, had restored order, and had begun the restoration of democratic institutions on the island. Indicative of the resistance are the statistics that United States personnel killed 24 Cuban and 45 Grenadian soldiers, wounded 29 Cuban and 337 Grenadian troops, and captured another 600 Cubans. American forces suffered 19 killed and 113

wounded in action. After 2 November all Army units, except a support element made up of XVIII Airborne Corps troops, returned to the United States. Those remaining behind maintained law and order until the reestablishment of local government authority. A more detailed account is included in *Appendix B.*

Nuclear, Biological, and Chemical Matters

Chemical, biological, or nuclear weapons use in warfare is considered unthinkable and abhorrent. Yet various belligerents have used all three types in the past, either as a limited means to an end or as a war-winning weapon. Because of the widespread use of chemical weapons in World War I and the limited use of biological and nuclear weapons in World War II, the United States must face the prospect that the next war may witness the reappearance of these weapons. The U.S.

Army is the service responsible for most of the nuclear, biological, and chemical (NBC) research and remains the one most likely to become the major target of these weapons. Based upon its extensive work in NBC areas, the Army remained the executive agent for the programs designed for military use. Thus U.S. Army goals were to deter offensive use by aggressors, to protect personnel and equipment, and to enhance retaliatory capability. Most of the Army's actions were directed at the battlefield threat posed by the Soviet Union and its Warsaw Pact allies.

The Soviets possessed an effective and efficient delivery system for chemical munitions deployed in-depth over a wide area of the battlefield. This capability was supported by the world's best trained chemical warfare force of between 50,000 and 120,000 troops. The Soviets had an extensive chemical research and development program, much of which appeared to be dedicated to offensive operations, as well as a large production base.

The United States decision unilaterally to cease production of chemical weapons in 1969 meant that the chemical warfare program deteriorated. The research, development, and acquisition base; the managerial expertise; and the training and doctrinal capability declined to an unacceptable level. In addition, the chemical ordnance manufactured before the end of production suffered from deterioration of the chemical agent, obsolescence of warheads, and lack of suitable delivery vehicles. During FY 84, the United States was in the midst of reversing this trend. General Wickham, Chief of Staff of the Army, during testimony on FY 85 DOD appropriations before the subcommittee on the Department of Defense, House Appropriations Committee, called chemical warfare the

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Army's Achilles heel. He stated further that 70 to 90 percent of the country's chemical stockpile was "militarily useless" and that the United States needed "to move with alacrity in building a capability for retaliation so that we can deter chemical warfare."

The U.S. Army had a major role in improving those areas of the chemical warfare program that had deteriorated during the 1970s. Dr. Bill Richardson, Deputy Director of the U.S. Army Chemical Research and Development (R&D) Center, stated that "the biggest short-term challenge we face is fielding equipment as quickly as possible." *([ARDA] Army Research Development, and Acquisition,* Mar/Apr 84.) With the Soviet use of chemical weapons in Southeast Asia and Afghanistan, the Army became aware of an increased chemical warfare threat and increased requested funding for technological work and production of binary weapons. Congress authorized the FY 84 program, but did not fund it and placed restrictions on the chemical program. One restriction eliminated additional United States stockpiling by requiring one currently serviceable shell destroyed for each new binary round manufactured. Furthermore, limitations allowed construction of production facilities and manufacture of weapons components but delayed final assembly of munitions until October 1985. The FY 85 Authorization Act asked funding for the same amount of retaliatory weapons as did the FY 84 Authorization Act but in a different manner. The U.S. Army requested only sufficient funds to begin production in the indefinite future. The authorization did not ask for all of the facilities, every component, or final assembly assets. Thus, Congress retained the prerogative to authorize and appropriate additional resources to obtain complete chemical munitions.

Another component of the U.S. Army's chemical program was the demilitarization of its unitary chemical munitions to eliminate those undeliverable, obsolete, and hazardous munitions in the Army's inventory. The Army's demilitarization program, made difficult by the combination of explosives, toxic chemicals, and contaminated components in one weapon, proved to be successful and safe. Since 1972 , the demilitarization program has rendered over 7,000 tons of chemical agents ineffective. At present, the Army plans to destroy all BZ , an obsolete incapacitating agent, all faulty chemical projectiles, and all rockets.

The 1984 defense appropriation bill required the Army to apprise Congress of its chemical defense readiness in Europe and measures needed to correct deficiencies (Senate Report 98-292, pp. 160-61) . The DCSOPS submitted a classified report assessing overall readiness and delineating equipment needs. The report

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stated that while the Army had ameliorated its chemical defense posture, particularly for its European forces, a need existed to improve equipment, training, doctrine, and chemical force structure. Army leaders called also for a modernization of

American chemical weapons for a viable deterrence.

The U.S. Army continued to improve NBC force design and supplement force structure to enhance its nuclear, biological, and chemical defense capability. Army planners augmented the NBC force structure with new chemical units and additional chemical specialists to provide field commanders smoke, NBC reconnaissance, and decontamination support as well as to strengthen NBC defense training. During FY 84, the Army introduced these Army 86 NBC enhancements into the Army of Excellence study. Plans were made to convert the heavy division chemical company into the new Division 86 configuration during FY 85. Meanwhile, the Army activated a decontamination team in Germany and increased the total number of active duty NBC specialists from 7,500 in FY 83 to 8,600 in FY 84.

The U.S. Army allocated $56 million in the FY 84 Operations and Maintenance, Army, program for procuring stock fund chemical defense equipment, such as NBC protective clothing, chemical agent detector kits, personal decontamination kits, and training aids, to improve training and readiness. In 1983, the Army adopted the battle dress overgarment (BDO), which combined camouflage with increased chemical protection, as the standard chemical protective overgarment. U.S. Army forces in Europe received their initial readiness issue of two sets of BDOs per soldier during FY 84.

Using $54 million of Other Procurement, Army, funds, the Army purchased NBC protective masks (M17A2 field, M24 aviator, M25 tanker), M17 lightweight decontamination systems (LDS), and modular collective protection for vehicles, shelters, and vans. The M17 LDS, designed to decontaminate vehicles and equipment rapidly with hot water applied at a high pressure, gave light division battalions and NBC companies an NBC decontamination capability. Simultaneously, the Army terminated the XM16 jet exhaust decon system UEDS) Research, Development, Test, and Evaluation program and redirected its efforts towards a more compact, less logistically burdensome system.

Faced with a highly probable use of chemical agents, the U.S. Army needed equipment to detect and identify these agents quickly. The Chemical R & D Center served as the proponent for detection equipment. The center replaced the M8 Chemical Agent Detector, which had a one- to two-minute response time, with the

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significantly improved M8Al detector with a response time of three to five seconds.

The use of smoke on the battlefield is a well-known tactic. Researchers continued engineering development efforts on the XM76 infrared screening smoke grenade for use in armored vehicle smoke grenade launchers and the XM819 smoke screening cartridge to be fired from the 18-mm. United Kingdom mortar now being fielded by the U.S. Army. In January 1984, the Army conducted SMOKE WEEK VI, an exercise designed to evaluate the performance of new smoke materiel under snow and cold conditions.

Modernization of the Army's chemical munitions in FY 84 continued. The President's FY 84 Budget Request asked funding for future items whose manufacture necessitated planning and constructing facilities now to prepare for binary munition (155-mm. GB-2 artillery and BIGEYE VX bomb) production. The President, however, did not seek actual production authority, and Congress rejected the FY84 chemical modernization program. Nevertheless, the Army reorganized the binary program during the remainder of FY 84 to offset this delay and to prepare for the FY 85 budget request to Congress.

A deficiency of suitable short-range artillery projectiles meant that planners considered the 155-mm. and 8-inch nerve agent shells as the only possibly useful munitions. More than 50 percent of these contained the XV persistent agent, which tactically did not meet the doctrine espoused in FM 100-5, because self-made chemical barriers would block maneuver elements and retard the tempo of friendly operations. The new, higher powered charges used in the Army's modernized howitzers also adversely affected the chemical shell's range, thus degrading capability. In addition, these artillery shells were produced between 1955 and 1968 and filled with chemical agents manufactured even earlier. Deterioration of such shells was a major concern. Scientists believed that severe agent decomposition might make these weapons useless by 1990. The Army requested funding to replace component parts of obsolete munitions for the M687 155-mm. GB-2 binary artillery shell, which had a greater range and was less volatile during its active life span.

Congress and those states affected by the Army's chemical demilitarization program displayed heightened interest in the

subject during FY 84. Of the many chemical materiel disposal projects, the M55 rocket disposal program was the most controversial. As the Army chose not to dispose of its M23 XV mines, the nearly 496,000 M55 rockets were the only munitions to be destroyed. In January 1984, the Army filed a notice of intent to write an environmental

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impact statement concerning the disposal of the rockets at three sites. The following month, public affairs officers held meetings at the three locations to brief the public about the program and to elicit public comments on significant environmental issues. Public reaction to onsite disposal was adverse in Kentucky. The citizens demanded that the Army consider moving the munitions to another site for destruction. Concomitantly, the Under Secretary of the Army doubted that the program was urgent and asked for information on the rocket's condition. Given the public response and the Under Secretary of the Army's reconsiderations, Army planners revised the M55 rocket disposal schedule to reconsider alternatives and produce a comprehensive destruction program.

The Army Agent Orange Task Force and the Army Nuclear Test Personnel Review were administratively consolidated into the joint Services Environmental Support Group (ESG) on 25 January 1984. The group reported directly to the Deputy Adjutant General (DAG).

As the Executive Agent for the Department of Defense Chemical Warfare/Chemical-Biological Defense (CW/CBD) research, development, and acquisition (RDA) program, the Army initiated and directed the publication of a joint Service Agreement USA) governing the program. Department assistant secretaries signed the JSA on 5 July 1984, with publication of the first joint RDA plan scheduled for July 1985. The agreement attempted to ensure service coordination of their respective CW/CBD programs to fulfill, with available resources, high-priority requirements and DOD goals.

In 1979, NATO ministers decided to deploy ground-launched cruise and Pershing II missiles while simultaneously conducting arms control negotiations with the Soviets. With the failure to achieve an intermediate-range nuclear arms agreement and in response to a continuing buildup of the Soviet SS-20 nuclear capability, NATO Alliance members, per their 1979 decision, deployed the first Pershing II battery in December 1983. During FY 84, Pershing II deployments progressed at the pace set by NATO representatives and will continue through 1987 at a steady rate. The Pershing II offered increased range, better accuracy, faster response time, and improved survival over the Pershing la, which it will replace. Meanwhile, the United States supported nuclear armed Nike Hercules missiles located in five NATO countries and will continue to do so until the non-nuclear armed Patriot missile or other agreed-upon substitutes replace the Nike Hercules. The United States will inactivate its Nike Hercules units in FY 85.

In October 1983, the high-level group agreed to the Montebello Decision to reduce the European nuclear stockpile and mod-

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ernize remaining systems. It specifically called for a dual capability replacement for the Lance missile system and modernized artillery-fired atomic projectiles. In November 1983, Congress, via the 1984 DOD appropriations bill, imposed restrictions on the development of nuclear options for the joint Tactical Missile System, which became the Army Tactical Missile System, and delayed study and development of the Lance's replacement.

Congress mandated that the Peacekeeper missile system initial operating capability date would be 31 December 1986. To meet this date, the Air Force established a need-date of 31 March 1986 for finishing the construction of the Reentry System Assembly, Surveillance, and Inspection Facility, the single most critical element of construction in the system's deployment. In November 1983, the Director of Engineering and Construction, Corps of Engineers, asked the Assistant Secretary of Defense (Manpower, Reserve Affairs, and Logistics) to authorize a cost plus-feed-fee contract for the construction of the facility at the Francis E. Warren Air Force Base in Wyoming. Approval of this contract for $20 million would speed up construction by allowing it to begin concurrently with design.

Congress, after initially opposing the contract, approved it in early June 1984 and the Corps' Omaha District awarded a contract to TYGER Construction Company, Spartansburg, South Carolina, for a total of $9,116,000 ($8,656,000 cost

portion, $460,000 fixed fee). However, FY 84 appropriations totaled only $4 million, making the remainder of the funds dependent upon the FY85 military construction authorization and appropriation bills. Groundbreaking was on 10 July 1984. Peacekeeper deployment also required restrictive and cable easements near the Warren Air Force Base, and the Omaha District prepared cost estimates for the acquisition of fifty sites.

The 1984 DOD Authorization Conference Report terminated development of the improved W82 155-mm. nuclear shell. Although Congress reversed this decision by reauthorizing W82 production in the 1985 DOD Authorization Act, it imposed restrictions that limited the number of W'79 8-inch projectiles and W82 warheads to 925, eliminated production of enhanced radiation warheads after 19 October 1984, and limited Department of Energy spending on manufacturing both weapons to $1.1 billion after enactment of the legislation (19 October 1984) .

The identification of personnel records of civilians placed in the nuclear personnel reliability program (PRP) was another area in which the Army identified a need to change record-keeping procedures. The Army's DA Form 3180 (Personnel Screening and Evalua-

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tion Record) certified civilians in both the nuclear and chemical personnel reliability programs. The form, however, was a temporary document not permanently maintained in the official personnel folder (OPF). Consequently, if a civilian was disqualified from the personnel reliability program, no permanent record would be retained. Conceivably, a civilian might be disqualified, fired, and then later rehired and found suitable for the personnel reliability program without the knowledge of the disqualifying or current certifying official. The Office of the Deputy Chief of Staff for Operations and Plans asked the Office of Personnel Management to make the DA Form 3180 a permanent part of the employee's OPF

Consolidation of the evaluation and recommendation of nuclear weapon systems safety rules in the Office of the Deputy Chief of Staff occurred with the transfer of the Nuclear Weapons Systems Safety Committee from the Deputy Chief of Staff for Research, Development, and Acquisition. Army nuclear safety planners changed several significant nuclear arms safety rules during the fiscal year. While the 8-inch projectile safety rules were changed to restrict the movement of the M422 round to the firing site in an assembled configuration, members of the DCSOPS Surety Division prepared a product improvement program to remove the restriction. The Army also completed a deliberate unauthorized launch analysis of the Pershing II missile system to conform the Army's standards of safety analysis to those of the other services.

During the fiscal year, the Army maintained its well-established theater nuclear safety, security, and survival management organization and strove for further refinement. For example, ODCSOPS emphasized nuclear arms survival, identified areas of possible improvements, and established several working groups to deal with these concerns. The Combined Arms Combat Developments Activity developed a Nonstrategic Nuclear Forces Safety, Security, and Survivability (NSNFS3) Action Plan and at several meetings NSNFSs project officer groups discussed an improved upload system, secure and safe containers, and advanced storage concepts. Moreover, the Army published and distributed AR 11-20, *Army Nonstrategic Nuclear Force Survivability, Security, and Safety Program,* to establish its policy for operation of the NSNFS3 program.

The Department of Defense established the nuclear accident and incident response and assistance (NAIRA) program to minimize loss of life, personal injury, hazardous effects, and destruction of property caused by the handling or mishandling of nuclear weapons and materiel. Another goal of the program was to recover and secure lost or stolen nuclear weapons or materiel. DOD as-

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signed responsibility for accident/incident command and control to the service operating the installation where the accident occurred or to the service maintaining weapons custody at the time of the accident. The Army Materiel Command, in turn, supplied the Army NAIRA forces for CONUS while the Commanders in Chief developed and coordinated their own response units in OCONUS. Fortunately, no accidents or significant incidents marked the fiscal year.

The Assistant to the Secretary of Defense (Atomic Energy) established a ten-year nuclear weapons accident exercise program in 1981, with an annual command post exercise (PREMIER TASK) and a biennial field training exercise

(NUWAX). To date, all exercises have been conducted within CONUS. The proponency rotates among the Army, Navy, Air Force, and Department of Energy. The 1984 exercise, conducted 9-11 May, simulated a nuclear accident at a Department of Energy facility in Texas and provided a unique opportunity to investigate and enhance the operations and cooperation between a Department of Energy facility and federal, state, and local agencies. During the exercise, the Army responded to simulated requests for transport and radiological control, as well as explosive ordnance disposal and security forces. Following this exercise, the various services and agencies that participated began planning for the first OCONUS exercise scheduled for FY 85.

The Defense Nuclear Agency (DNA) published a new *Nuclear Weapons Accident Response Procedures* manual (DNA Manual 5100.1) and distributed it to the services. Besides providing information to those military units tasked to respond to nuclear accidents, it summarized procedural guidance, technical information, and DOD responsibilities of the on-scene commander and staff. The manual, forwarded through MACOMs to key nuclear accident response assistance units, did not dictate actions to be taken, but served as a useful and informative planning tool.

United States forces completed the second and final phase of the Force-on-Force program in September 1984. The program determined the capability of security forces to prevent entry or access by terrorists to nuclear weapons facilities and recommended changes in doctrine and training to ensure security. The Army sent videotapes and written reports containing these recommendations to the other services and MACOMs. Department of the Army and the United States European Command applied the program's lessons learned at various training and storage sites that might be potential targets of terrorists. Several significant initiatives resulted. First, a Supreme Headquarters, Allied Powers Europe-controlled multinational team would execute annual force training and assess operations at all Al-

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lied Command, Europe, sites. A United States team, which previously conducted annual storage site vulnerability assessments at all United States-secured sites in U.S. Army, Europe, may expand its operations to allied secured sites. The Army also incorporated lessons learned into the programs of instruction for the nuclear security courses and planned to disseminate them widely throughout the Army.

The United States Army, Europe, started installing the Weapons Access Delay System in FY84. The system employed a series of delay components emplaced within or on nuclear weapons storage magazines to impede access to and removal of nuclear weapons by unauthorized personnel. Although the system's initial role was the protection of portable weapons, its role was extended to the protection of all nuclear weapons stored in nuclear storage magazines. Conceivably, components could be employed in any structure regardless of contents. Installation will begin in CONUS depots in August 1985 with completion slated for FY 88.

In April 1984, the Director of the Nuclear and Chemical Directorate (now Space and Special Weapons Directorate) ODCSOPS, ordered that semiannual nuclear surety reports be prepared for the Deputy. The first report, for the period 1 January to 30 June 1984, discussed the status of the overall Army nuclear surety program. Subsequent reports included the chemical surety program as well. The reports examined operations and aspects of the surety program's operations that assured the safety, security, and reliability of the nuclear and chemical stockpiles.

During FY 84, the United States Army Nuclear and Chemical Agency conducted nuclear visits to OCONUS headquarters and CONUS installations assigned nuclear missions. Likewise, agency teams made chemical surety visits to one OCONUS chemical command and four CONUS facilities that stored chemical materiel. As a result of these assistance visits, several system-wide problems were identified and corrective action was initiated. The agency also coded the Modified Tables of Organization and Equipment of nuclear-capable units to identify correctly all nuclear duty position requirements. By changing the definitions of limited and exclusion areas within chemical storage sites, the agency substantially reduced the worldwide number of chemical personnel reliability program duty positions. Furthermore, the agency expanded the surety visit program by adding reserve component nuclear-capable headquarters and those active component headquarters (CONUS armies, readiness group, etc.) that offer training support to those reserve component units. This action finally provided all Army nuclear-capable units with the same level of surety support and assistance.

The U.S. Army took another major step forward in FY 84 when it published three new regulations mandating survivability of critical equipment on the NBC battlefield. Although a nuclear survivability program has existed since 1977, the Army established an NBC contamination survivability program to enhance its NBC posture.

Military Support to Civilian Authorities

Historically the Army performs duties not commonly considered "military" in nature. These assist mainly the civilian sector and usually are low profiled, though providing a vital service. The Army, for instance, supported the XXIII Olympiad, the National Narcotics Border Interdiction System (NNBIS), the Emergency Animal Disease Eradication Program, the Shelter for the Homeless Program, the United States Secret Service, and the Military Assistance to Safety and Traffic Program.

The United States hosted the XXIII Olympiad during July 1984 in Los Angeles. Past terrorist acts at the games, combined with the worldwide terrorist threat, led planners to expect that this Olympiad would be targeted. However, thorough planning and coordination prevented any terrorist incidents. The Department of Defense played a key role in this planning and provided strong support to many law enforcement agencies both during the games and three years prior to the games.

The Secretary of Defense designated the Department of the Army his Executive Agent to provide DOD support to Olympic security. Congress appropriated $50 million for this support. The Director of Military Support (DOMS), as Action Agent, had responsibility for the support mission. To accomplish this, he established a small, multi-service Olympic Support Task Force at the Pentagon and a Forward Military Support Element in Los Angeles. The task force's peak strength was 101 personnel from all services.

The major DOD support effort assisted local and state law enforcement agencies to provide adequate security. Assistance included communications equipment, which provided the diverse law enforcement agencies with an integrated secure communications network; an intrusion detection system for the Olympic villages; explosive ordnance detection and disposal personnel and equipment; more than 80 fixed- and rotary-wing aircraft with crews and support personnel; over 90 vehicles; and small arms with ammunition. The Department of Defense also assigned personnel to work with law enforcement personnel in operations, bombs management, intelligence, and air traffic control centers.

Personnel and installations of all of the services provided the requested equipment, which involved the entire DOD logistical system from individual depots and posts to the Defense Logistics Agency. The Department of Defense supplied more than 400 different types of items, such as 91 vehicles, 360 weapons, ammunition, generators, flak jackets, night vision devices, lighting systems, and binoculars. The Forward Military Support Element assembled, issued, recovered, and returned approximately 30,000 pieces of equipment. Within six weeks of the end of the games, this element, having accomplished its mission, was reduced to minimum strength.

The military forces also prepared contingency plans for a rapid response if the law enforcement agencies were unable to handle emergencies such as terrorist acts, civil disturbances, improvised nuclear devices, and natural disasters. The Department of Defense trained thousands of personnel for possible deployment. Naturally, units of the California National Guard and the 7th Infantry Division formed the first echelon of response. DOD, however, also tasked other units located throughout the United States for security duty.

The United States Army and the Department of Defense could be proud of their accomplishments at the Olympiad. With their personnel and materiel assistance, the various law enforcement agencies made the games safe and successful. DOD contributions were also economically effective as the total direct expenditures were less than $32 million of the appropriated $50 million.

Fiscal year 1984 marked the first full year of the Army's participation in the National Narcotics Border Interdiction System. A combination of personnel from Department of Defense departments and federal agencies chaired by the Vice President of the United States and operated by his Chief of Staff, the NNBIS's major mission was stopping the flow of drugs into the United States. Army liaison personnel were assigned to the six regional NNBIS centers (New York, Chicago, El Paso, New

Orleans, Long Beach, and Miami) to assist the NNBIS staff in coordinating Army support. They also visited all border state National Guard headquarters, Army Reserve centers, and active Army posts to brief the respective commanders and their staffs on the functions of NNBIS.

The Army provided most of its support by lending equipment such as fixed- and rotary-wing aircraft, vehicles, and weapons. Daily the Army supplied federal and state law enforcement agencies with individual and unit materiel, including protective vests, night vision goggles, military weapons, and vehicles, It also coordinated with the Marine Corps to lend ground sensors from both services to the Drug Enforcement Administration (DEA). Furthermore,

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the Army authorized local installation commanders to lend military materiel to both federal and nonfederal agencies for up to six months as long as these loans did not impede military operations.

During FY 84, the number of Army National Guard units combining aerial observation missions as a part of active duty training increased from 4 in 1983 to 14 in 1984. A North Carolina National Guard unit involved in this program uncovered a plot of 4,715 marijuana plants with a street value of $4.7million.

The U.S. Army Intelligence Center and School, Fort Huachuca, Arizona, developed Operation GROUNDHOG as an end-of-course comprehensive test for ground surveillance radar operators. Operation GROUNDHOG was a one-week field exercise that gave the students experience in a real-world, high-stress training environment along the United States-Mexico border near Yuma, Arizona. The Border Patrol and the United States Customs Service supported the operation, and field commanders reported higher quality performance in those soldiers who took the course.

The U.S. Army Intelligence Center and School also oversaw Operation HAWKEYE that modified certain flight paths in the OV-ID Mohawk flight training program to conduct aerial observation missions along the United States-Mexico border between Douglas and Nogales, Arizona. In FY84, the school flew 59 HAWKEYE missions and trained 81 students (44 camera/sensor operators and 37 OV-1 pilots). Based on the information obtained from a comparative analysis of the imagery, the Customs Bureau selected 243 photographs.

The U.S. Army John E Kennedy Special Warfare Center, Fort Bragg, North Carolina, established the Advanced Land Reconnaissance Course to fulfill a mission requirement for Ranger and Special Forces units. The eight week course concluded with a two-week field training exercise during which student teams infiltrate a remote geographic area undetected, establish a "hide position," remain hidden for eleven days while gathering and reporting information regularly, and exfiltrate on receipt of orders. The first field training exercise occurred along the south Louisiana coastline. Although primarily a military training operation, the exercise also served to check on illegal activities within the area. Team information did not result in any seizures of illegal drugs, but overall training was highly successful. The various military departments, U.S. Customs Service (Marine and Aviation Divisions), U.S. Coast Guard, Gulf Region NNBIS, Drug Enforcement Administration, and other federal agencies coordinated the exercise.

The U.S. Army assisted the U.S. Department of Agriculture (USDA) from November 1983 through October 1984 in stopping an outbreak of Avian influenza, which affected poultry in Pennsylvania,

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New Jersey, Maryland, and Virginia. The Department of Agriculture estimated that potential damage could reach $9.6 billion. Fort Dix, New Jersey, a base support installation for the USDA task force, provided military assistance in the form of administrative equipment, radios, vehicles, and sprayers. Forty-two Army veterinarians, including those from reserve components, from duty stations across the country, served 30 or more days on temporary duty in the region. In addition, 97 Army support personnel served the effort. Afterward, the Deputy Assistant Secretary of Defense approved the awarding of the Humanitarian Service Medal to the participating military personnel.

The Army continued its Shelter for the Homeless Program during FY 84 with the establishment in July of a task force headed by the Assistant Secretary of the Army (Installations and Logistics) to coordinate the Army's support for the

program. In June 1984, the Army leased two buildings and two acres of land at the Camp Parks Reserve Center, California, for two years and provided $400,000 for restoration. Likewise, in September the Army leased a building to the city of Philadelphia and supplied $500,000 for renovation.

The Army provided bomb search assistance to the U.S. Secret Service for those persons authorized Secret Service protection. Bomb experts performed 2,306 searches both overseas and in CONUS during the fiscal year. The other major area of support provided was transportation assistance.

President Reagan declared 13 emergencies and disasters during FY 84 but none required active Army support. However, the Military Assistance to Safety and Traffic Program continued to furnish emergency medical evacuation services to selected civilians who suffered from severe trauma or disease. Thirty-one Army units responded to 1,919 missions, evacuated 2,083 patients, and logged 4,354 flight hours.

Fiscal year 1984 was busy for the United States Army in many areas. It pursued previous initiatives to reorganize Army resources more effectively and efficiently. The Army's role as peacekeeper and preserver of freedom was tested operationally in Grenada, and its deterrent role was performed in Europe, Southwest Asia, and Northeast Asia. While the thought of chemical, biological, and nuclear war is abhorrent, Army planners and scientists worked diligently to provide the country with safe, reliable, and modern chemical, biological, and radiological weapons to deter their use by any aggressor. Finally, the Army demonstrated its humanitarian side-a side often ignored by critics of military expenditures. Overall, the active Army continued to modernize while simultaneously performing its multitudinous assignments.

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Reserve Forces

During the past year the Army National Guard and Army Reserve increased the importance and size of their contribution to the Total Army. Reserve units provided more than 50 percent of the active Army's initial combat logistical support, nine of the Army's projected twenty-five combat divisions, and a substantial portion of its infantry battalions, field artillery battalions, armored cavalry regiments, and aviation units. Approximately 46 percent of combat support and 70 percent of combat service support currently were provided by National Guard and Reserve units. Army planners will increase combat support by the reserve forces to 50 percent in the near future. *(See Chart 4.)* This substantial contribution remained a focal point of the debate among analysts over the organization, policy, and effectiveness of the total force.

While most commentators agreed, in theory, that the Total Army design was the best method of matching American military manpower requirement with finite fiscal resources, they disagreed over the total force's ability to adequately meet global and territorial defense commitments. Critics asserted that since reserve components trained for limited periods of time, used equipment often inferior to or incompatible with active Army units, experienced difficulty in rapidly mobilizing, and had little or no dedicated air and sealift capability to move them simultaneously with active forces, they could not be effectively or efficiently interchanged with active Army units. On the other hand, proponents insisted that the Army had made significant progress and was continuing to upgrade reserve forces to meet national commitments.

Army planners realized that the active Army could not meet major contingencies without reserve support and consequently, since 1980, have enhanced the reserve components' capabilities, missions, and readiness. Drill strength increased from 562,000 to more than 670,000, with full-time manning increasing over 35 percent. In FY 84 the reserve components received more than $900 million in new equipment and will receive $1.4 billion in FY 85 to modernize their aging equipment. In addition, planners diligently coordinated active Army and reserve units' training, war planning,

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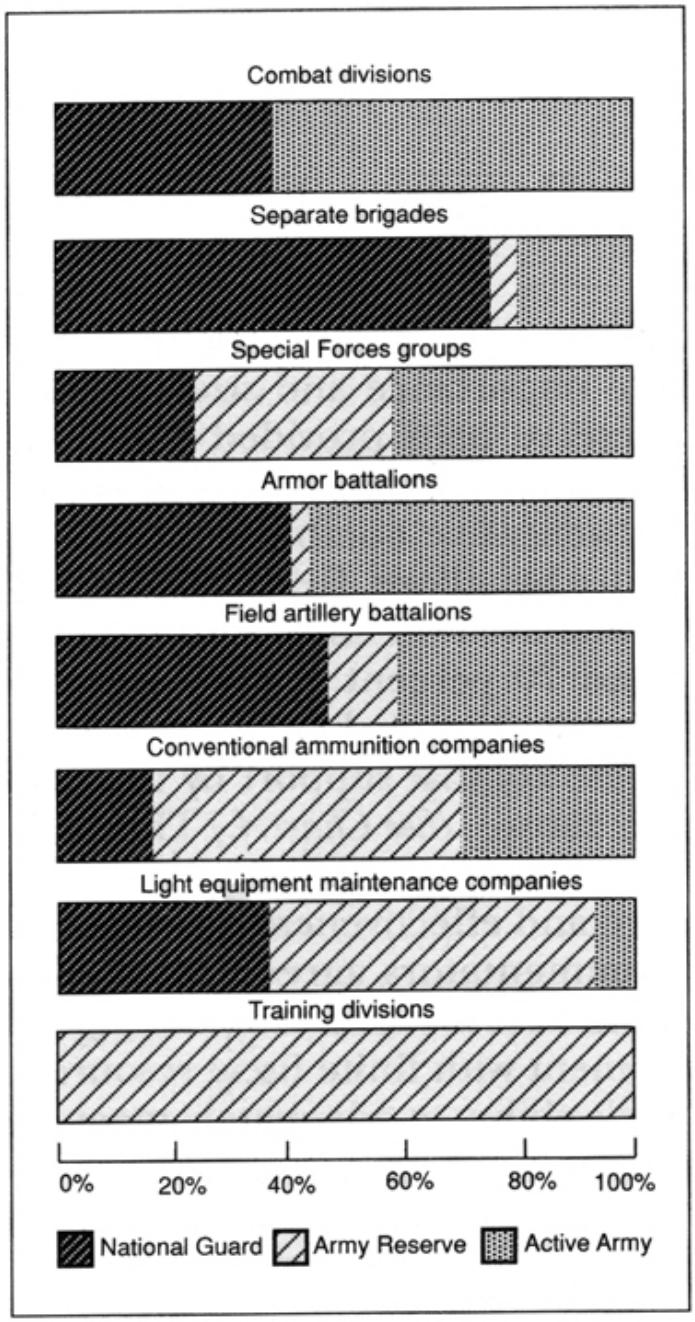
CHART 4 - PROPORTION OF ARMY RESERVE COMPONENTS IN TOTAL ARMY FORCES



Source: Reserve Forces Policy Board, Readiness Assessment of the Reserve Components, Fiscal Year 1982, Office of the Secretary of Defense, Washington, D.C., December 1982.

and exercises as the components worked together to strengthen cohesion for the Total Army.

During FY84, the Secretary of the Army and the Army Chief of Staff reaffirmed their commitments to expand the role of the reserve components in the Total Army. In his keynote speech at the annual meeting of the Association of the United States Army (AUSA) Secretary of the Army Marsh termed the increasing pre-

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mium placed on the National Guard and the U.S. Army Reserve "probably the most profound change in the Army that has occurred over the last ten years."

Force Structure

The Army substantially strengthened the National Guard force structure in FY 84. On 25 August 1984, Headquarters and Headquarters Company, 35th (Santa Fe) Infantry Division (Mechanized) was reactivated and reorganized at Fort Leavenworth, Kansas, after Army planners, in the FY 83 Army plan, identified the need for an additional heavy division. With the tradition of the 35th's outstanding World War 11 combat record to draw on, the division's major units were the 67th Infantry Brigade from Nebraska, the 69th Infantry Brigade from Kansas, and the 149th Armored Brigade from Kentucky. Existing nondivisional units will be converted and new elements established in Colorado, Kansas, Kentucky, Missouri, and Nebraska to fill out the division.

On 6 June 1984, at the D-day Commemoration in Washington, D.C., the Secretary of Defense announced that the 29th (Blue and Gray) Infantry Division (Light) would be activated in FY 86 to form the tenth National Guard division. Forty years earlier the 29th Division had stormed OMAHA Beach and gone on to distinguish itself in combat operations in northwest Europe. With initial establishment of headquarters at Fort Belvoir, Virginia, in October 1984, the 29th Division will eventually be composed of the 58th Infantry Brigade of Maryland and the 116th Infantry Brigade of Virginia.

The National Guard organized the 5th Battalion, 200th Air Defense Artillery (Roland), in New Mexico, making it the first all-weather air defense unit in the Total Army. Another unique unit, the 3d Battalion, 172d Infantry (Mountain), Vermont ARNG, was also organized with an authorized strength of 785. Furthermore, the National Guard Mountain School in Vermont trained its first class, and the Army increased the MTOE mountain infantry company enlisted strength from level three to level two. The National Guard also established two health professional detachments, one in Tennessee and the other in Connecticut. These units allowed health professionals to maintain their civilian practices with minimum disruption, while placing them in a military organization that can provide a trained and operating medical asset during mobilization.

The 155th Armored Brigade of Mississippi and the 3d Battalion, 141st Infantry, of Texas assumed roundout missions with the 1st Cavalry Division. These two actions increased the number of

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brigades in roundout missions to five and battalions to seven. The National Guard reorganized the 256th Infantry Brigade, Louisiana ARNG, under a J-edition TOE to improve its capability as a roundout unit to the 5th Infantry Division. Likewise, the 2d Battalion, 136th Infantry, of Minnesota and the 3d Battalion, 141st Infantry, were reorganized for better roundout alignment with their respective active Army parent divisions. Two support hospitals were converted into evacuation hospitals and three combat support hospitals were reorganized into Mobile Army Surgical Hospitals.

The National Guard Bureau continued plans for the reorganization of eight state-operated training sites that doubled as mobilization bases. Such actions allow an efficient transition from peacetime to mobilization missions. The installation support unit established at each site during peacetime will manage training activities as well as plan for possible mobilization and deployment. The bureau also developed, validated, and submitted to Forces Command six mobilization Tables of Distribution and Allowances for State Area Commands (STARC). The bureau received twenty other mobilization TDAs for coordination and documentation during the year.

During FY 84, the National Guard Bureau successfully met the challenges posed by Army of Excellence initiatives and Army-directed force structure restrictions. The bureau remained within the dictated force structure constraints. It retained all existing units not scheduled for conversion and restructured those units that analysis classified as unnecessary. Unfortunately, the multiplicity of far-reaching actions produced serious shortfalls in authorized spaces.

As of 30 September 1984 the Army National Guard had the following major components. *(See Table 6.)*

TABLE 6 - ARMY NATIONAL GUARD MAJOR COMPONENTS

5 Infantry Divisions
1 Infantry Division (Mechanized)
2 Armored Divisions
1 Division Headquarters
10 Infantry Brigades (Separate)
8 Infantry Brigades (Mechanized) (Separate)
4 Armored Brigades (Separate)
4 Armored Cavalry Regiments
2 Special Forces Groups
1 Infantry Group (Arctic Region)

132 Separate Combat and Combat Support Battalions
18 Hospitals
760 Separate Companies and Detachments
289 Headquarters [1]

TABLE 6 - ARMY NATIONAL GUARD MAJOR COMPONENTS - Continued

		MTOE	TFS
71	GO[2]	17	54
61	O6[3]	59	2
157	O5[4]	157	0

1 Includes brigade and group headquarters for the various branches of the Armed Forces.
2 Separate general officer headquarters.
3 Separate O6 headquarters.
4 Separate O5 headquarters.

As of 30 September 1984, the National Guard possessed the following percentages of various combat units of all Army forces. *(See Table 7.)*

TABLE *7* - ARMY NATIONAL GUARD COMBAT UNIT PERCENTAGES

36% of combat divisions
68% of separate brigades
29% of special forces groups
64% of infantry battalions [1]
100% of infantry battalions (TLAT) [2]
48% of infantry battalions (mechanized) [1]
100% of infantry groups (scout)
43% of armored battalions [1]
57% of armored cavalry regiments
50% of field artillery battalions
30% of aviation units

1 Includes organic and separate battalions.
2 Infantry battalions that fire the TOW antitank missile.

The Army Reserve made 215 unit changes to its force structure during FY 84: 59 activations, 14 inactivations, 101 reorganizations, and 41 authorized level of organization changes. *(See Table 8.)*

TABLE 8 - ARMY RESERVE FORGE STRUCTURE CHANGES

Significant Activations:	1 Training Brigade
	1 Medical Brigade
	2 MASHs
	1 Chemical Battalion
	1 Signal Battalion
	1 Chemical Company
	1 Military Police Company
	1 Maintenance Company

1 Transportation Company
6 Quartermaster Teams (water purification)

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TABLE 8 - ARMY RESERVE FORCE STRUCTURE CHANGES - Continued

Significant Inactivations:	2 Chemical Detachments (decon)
	6 Engineer Detachments (water purification)
	6 Military Police Platoons (hospital security)
Significant Reorganization:	6 Station Hospitals (300 beds)
	5 Medical Detachments (vet suc small)
	4 Medical Detachments (vet suc large)
	5 Ordnance Groups Ammo (DS/GS)
	7 Ordnance HHC Battalions Ammo (DS/GS)
	2 Ordnance Companies Ammo
	5 Signal Companies
	8 Military Police HHD Battalions
	1 Military Police HHC Brigade
	25 Military Police Detachments
	4 Maintenance Companies
	1 Transportation HHC Brigade
	7 Transportation Companies

The Army Reserve, per its projection in early FY 84, completed the transfer of the water purification mission from the Corps of Engineers to the Quartermaster Corps. It planned to increase the number and capability of roundout units in FY 85 as well as pursue an ambitious plan to add over 150 new support and service units (including chemical, maintenance, medical, and transportation) to its force structure over the next five years.

FORSCOM also activated the Fourth Army to reorganize and expand the Army's command and control capability in the mid-western United States. The Fourth Army directed reserve units stationed in Illinois, Indiana, Iowa, Michigan, Minnesota, Ohio, and Wisconsin. This activation and the reorganization of the Fifth and Sixth U.S. Armies will complete the reserve's revision of stateside command and control structure by January 1985. With these and other changes major reserve commanders will assume increased responsibility for the training and mobilization of their forces.

The Army Reserve, like the National Guard, provided a substantial portion of the Total Army's assets. This is depicted in *Table 9.*

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TABLE 9 - RESERVE UNITS AS PERCENT OF TOTAL ARMY UNIT STRUCTURE
(Fiscal Year 1984)[1]

Type of Unit	Percent of Army Structure
Training division	100
Training brigades	100
Military intelligence (strategic research and analysis)	100
Civil preparedness support detachments	100
Army Reserve schools	100
Maneuver area commands	100
Maneuver training commands	100
Railway units	100

Judge advocate general detachments	98
Civil affairs units	97
Psychological operations units	89
Smoke generator companies	78
Quartermaster petroleum, oil, and lubricant supply companies	67
Army hospitals	65
Terminal service/transfer companies	61
Services and supply capability	59
Pathfinder units	55
Conventional ammunition companies	51
Chemical decontamination companies/detachments	46
Quartermaster petroleum, oil, and lubricant operating companies	45
Watercraft units	44
Army medical units (other) [2]	41
Combat support aviation companies	38
QM engineer water supply, well drilling, purification units	36
Major logistical units [3]	31
Truck companies	30
Nondivisional bridge companies	29
Combat engineer battalions	24
Maintenance companies (direct support, general support, nondivisional)	24
Special forces groups	22
Separate combat brigades	13
Field artillery brigades, headquarters detachments	9
Field artillery battalions [2]	9
Infantry battalions [2]	8
Mechanized infantry battalions [2]	2
Armor battalions [2]	2

1 Current structure as of January 1984.
2 Includes organic and separate elements.
3 Theater army area command/corps support command headquarters company and material management center.

Strength and Personnel Management

Table 10 shows the breakdown of reserve component strength.

Army National Guard

The Army National Guard (ARNG) was one of three reserve components to reach or surpass Department of Defense-established end strength goals. Starting the fiscal year with an assigned strength of 417,791 (41,678 officers and 376,113 enlisted personnel), recruiting difficulties dropped strength to a low for the year of 413,499 in January 1984. Consequently the Guard launched a major recruiting effort that brought the end strength up to 434,702 (41,847 officers and 392,855 enlisted personnel) by the end of FY 84. Representing 100.3 percent of authorization, this was the highest strength ever attained by the Guard and surpassed its previous

record set in FY 57. Average strength for the year was an unprecedented 416,521 and the net gain of 16,911 accessions represented a nearly 200 percent increase over FY 83. A major reason for the Guard's success was an aggressive recruiting program, established by the Chief of the National Guard Bureau and the Director and Deputy Director of the Army National Guard. The ARNG implemented weekly strength initiatives and emphasized strength objectives along with recommended actions in letters to the respective adjutants general. Other initiatives were developed to reduce non-ETS losses, to increase prior service enlisted accessions by 1,000 per month, and to raise career reenlistments by 15 percent.

At the beginning of the fiscal year, minority strength represented 26.6 percent of the total ARNG assigned strength. This declined to 26.4 percent by the close of the fiscal year. The 3,957 minority commissioned/warrant officers and 110,893 minority enlisted personnel present at the end of the fiscal year included a net gain of 7,751. The black officer strength remained at 4.5 percent of total officer strength, while the black enlisted strength increased to 18.5 percent of total enlisted strength. There were 1,883 black officers and 72,752 black enlisted personnel at the end of FY 84, an overall increase of 5,865. These figures represented 17.2 percent of total assigned strength.

The number of female personnel increased slightly during the fiscal year due to the significant number of women who had been serving in units later reclassified as male only. The loss of spaces in combat support units available to females impaired recruiting efforts and female strength decreased slightly to 5.2 percent of overall assigned

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strength. This figure represented 2,073 commissioned/warrant officers and 20,465 enlisted personnel at the close of the fiscal year.

The inactive National Guard included 9,037 individuals (581 commissioned/warrant officers and 8,456 enlisted personnel) at the end of FY 84. They remained attached to their parent units for administrative accounting and were available for deployment when their parent units mobilized.

Enlisted personnel increased by 85,540 or 77.8 percent of the programmed objective. Prior service enlistments totaled 39,371 (78.7 percent of objective) and non-prior service enlistments were 46,169 (77.0 percent of objective). Of the total enlisted gains, 54 percent were non-prior service and 46 percent were prior service.

The quality of new recruits remained high and continued to be a major goal of the ARNG. The board surpassed the minimum recruiting standard for non-prior service high school graduates of 65 percent, which the Army established as the Total Army goal for FY 84. The percentage of high-school graduates and seniors peaked at 71.6 percent at the end of the third quarter and averaged 68.8 percent for the year. Although the Department of the Army and Congress established a ceiling of 20 percent for Test Score Category IV (scoring below the thirtieth percentile on the Armed Services Vocational Aptitude Battery [ASVAB]) for the fiscal year, the ARNG continued its ceiling of 12 percent. Enlistment percentages in this category reached 8.5 percent-an increase over FY 83, but less than the 11.8 percent attained in FY 82. By the end of FY 84 only 6.9 percent of non-prior service enlistments fell into this category.

The ARNG, recognizing the necessity to control personnel losses, enhanced its retention program and reduced losses to a six-year low. Enlisted losses stayed below the programmed objective with an ETS loss rate of 4.8 percent, a non-ETS loss rate of 14.9 percent, and a total loss rate of 19.5 percent. The Guard added 67 Retention NCOs to the Full-Time Attrition/Retention Force to assist commanders in improving reenlistment rates. The first term extension rate was 56.6 percent; the career rate was 68 percent; and the year's total retention rate was 65.7 percent.

The Guard began a new program, the ARNG Family Program, in conjunction with the Year of the Army Family to support both mobilization readiness and to retain Guard personnel by assuring family support programs. The program received positive support from the field.

The commissioned and warrant officer strength totaled 41,847 for the fiscal year, representing 97.3 percent of the programmed objective of 43,000. Accessions from the Reserve Officers' Training

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TABLE 10 - ARMY RESERVE COMPONENT PERSONNEL STRENGTHS
(End of Year/Month-in thousands)

Strengths	**FY 84**

	FY 84														
	FY82[1]	FY83[1]	Oct [1]	Nov [1]	Dec [1]	Jan [1]	Feb [1]	Mar [1]	Apr [1]	May [1]	Jun [1]	Jul [2]	Aug [2]	Sep [2]	Column FY 85 Pres. Budget Program [3]
	Actual														
Selected Reserve Paid Strength															
Officer															
ARNG	40	42	42	41	41	41	41	41	41	41	41	41	42	42	43
USAR	41	42	42	43	42	42	42	42	42	42	42	42	43	44	44
Total	81	84	84	84	83	83	83	83	83	83	83	84	84	86	87
Enlisted															
ARNG	367	375	373	372	372	372	373	374	375	376	375	375	377	392	390
USAR	208	216	214	216	216	214	216	216	217	217	217	216	216	220	223
Total	575	591	588	588	588	586	588	590	592	593	591	591	593	612	613
Aggregate	656	675	672	672	671	669	672	673	674	676	674	674	678	698	700
Individual Mobilization Augmentees (USAR only) [4]															
Officer	7.4	7.5	7.6	7.6	7.6	7.6	7.6	7.7	7.7	7.7	7.9	8.1	8.3	8.6	8.7
Enlisted	0.4	0.6	0.6	0.6	0.7	0.7	0.8	0.9	1.2	1.4	1.5	1.7	2.1	2.3	2.0
Aggregate	7.8	8.1	8.2	8.2	8.3	8.4	8.4	8.5	8.9	9.1	9.4	9.8	10.4	10.8	10.7

	Strengths														
	FY 84														
	FY82[1]	FY83[1]	Oct [1]	Nov [1]	Dec [1]	Jan [1]	Feb [1]	Mar [1]	Apr [1]	May [1]	Jun [1]	Jul [2]	Aug [2]	Sep [2]	FY 84 Column FY 85 Pres. Budget Program [3]
	Actual														
Individual Ready Reserve/Inactive National Guard															
Officer															
USAR	45	45	45	44	44	44	44	44	43	43	43	43	42	42	42
ARNG	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	1.0
Enlisted															
USAR	174	201	206	207	208	210	213	216	217	218	221	225	233	235	213
ARNG	10.3	9.5	9.6	9.5	9.6	9.5	9.4	9.4	9.4	9.4	9.4	9.4	9.1	9.1	9.0
Aggregate	230	256	261	261	263	264	267	270	271	271	275	278	285	286	265
Standby Reserve															
Officer	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Enlisted	0.2	0.1	0.1	0.1	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	0.1
Aggregate	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3
Total	894	940	942	941	943	942	947	952	954	956	959	963	973	995	976

1 Source: DD-M-(M) 1147 and 1148. History (Official).
2 Unofficial-Preliminary.
3 FY 85 President's Budget-Preliminary (Submit).
4 FY 82 reflects transfer of IMAs to Selected Reserve.
NOTE: Columns may not add due to rounding.

*Less than 50.

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Corps (ROTC) reached 1,621 or 41.4 percent of total commissioned officer accessions. The Guard expected a rise of over 50 percent in the percentage of these accessions by FY 90, thereby making ROTC the largest single source for ARNG lieutenants. The State Officer Candidate Schools (SOCS) provided 1,236 accessions for 31.6 percent of commissioned accessions. The Guard believed that this percentage will decline to 23 percent in the future as a result of Army imposed SOCS accession constraints. The Guard will still use this source to provide enlisted personnel a method for achieving promotion, to supply officers to geographically remote areas of the United States, and to fulfill officer requirements for a possible mobilization.

Minority commissioned/warrant officer strength increased by 918 officers during the fiscal year and the 3,495 commissioned and 462 warrant officers represented 9.5 percent of the officer strength. The 1,883 black officers (1,737 commissioned, 146 warrant officers) made up 4.5 percent of the total officer strength. Female officer strength (1,946 commissioned and 126 warrant officers) totaled 5 percent of the officer force.

Although the Guard gained in overall basic branch officers strength, significant personnel shortages remained, particularly in specialties such as doctors, nurses, and chaplains. The Guard initiated intensive recruiting efforts in FY 84 to reduce these shortages.

The Guard's Officers Strength and Personnel Management programs redoubled their efforts to attain the professionally and educationally qualified leadership necessary for the Guard to fulfill its peace and wartime missions in the national security structure. Two significant actions were civilian education assistance programs and final coordination of the Reserve Officers Personnel Management Act (ROPMA). The latter will align reserve component officer management policies with those already in effect in the Regular Army.

The Army Vice Chief of Staff extended the Army's Continuing Education System to the reserve components to enable Guard officers to attain their mandatory educational requirements. Exact details and administration of the program remained unresolved. The Assistance for Military Professional Development program provided additional financial assistance to selected ARNG officers and SOCS candidates to assist them in achieving the increased educational requirements. This program provided as much as 75 percent of tuition as well as those laboratory fees for consumable materials used during classroom instruction and listed by the school at registration. At present the program parallels and later will amalgamate

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with the Continuing Education System. Publication of the details of these two programs will appear in a circular in FY 85.

The ARNG established several civilian educational requirements for commissioned officers to increase the percentage of officers possessing baccalaureate or higher degrees above the current 53 percent. First, all commissioned officers must finish at least two years of college or equivalent by 1 October 1989. Second, all SOCS graduates must complete two years of college before appointment, beginning in 1989. Third, all officers appointed after 30 September 1983 must possess a baccalaureate degree prior to promotion to major. The ARNG established a warrant officer educational goal of an associate degree. During FY 84, 45 percent of the Guard's warrant officers met or surpassed this goal.

The Guard implemented its version of the Standard Installation/ Division Personnel Support Systems (SIDPERS) on 1 November 1984. SIDPERS-ARNG paralleled the active Army system and used Department of Defense standard data elements. It operated at the state level using changes supplied by unit or higher headquarters. With the introduction of more advanced equipment into both the active Army and ARNG SIDPERS, the Guard expected to receive computer assistance at battalion and unit level through the Tactical Army Combat Service Support Computer System.

Army Reserve

The Army Reserve increased by 8,874 to reach a total strength of 275,062 personnel at the end of the fiscal year. Although an improvement over past fiscal years, this figure was still nearly 12,600 below authorized strength or about 36,000 short of anticipated wartime requirements. All three categories of the Selected Reserve increased in strength with Individual Mobilization Augmentees (IMAs) rising by 25.1 percent to 10,847. Active Guard and Reserve programs expanded to 8,822 full-time reservists, and the troop program units added 4,362 personnel, which raised the trained in-unit strength to 80.5 percent of the wartime requirement. Approximately 30,000 of the troops carried on the rolls were undergoing training and were not suitable for

deployment in case of mobilization. To counter this deficiency in deployable strength the Army Reserve established an "individual account" that will permit recruitment of as many as 10 percent more personnel than authorized. The reserve attributed much of the increase in strength to recruiting incentive programs that attracted over 15,000 high-quality soldiers for high-priority units as well as those recruits with com-

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bat arms, military police, and medical skills. In addition, more than 78 percent of the reserve's non-prior service enlistees graduated from high school, well above the congressionally and DA mandated requirement.

Within the Total Army context the reserve supplies most of the post mobilization medical force, so the reserve emphasized the recruitment and retention of medical personnel during the fiscal year. The medical professional strength continued its significant growth from the previous year with physician strength at 62 percent, up from under 30 percent four years ago. The nurse strength reached 79 percent, an improvement from the 50 percent level of five years ago.

Female strength increased during the year and passed the 42,000 mark, an increase of 80 percent over the past five years. Women served in 87 percent of the units, in 80 percent of the enlisted skills, and in 95 percent of the officer skills. Minorities made up 13 percent of the officer strength and 34 percent of the enlisted strength.

The Army Reserve, in the past, always had fewer personnel serving in a full-time active duty capacity than other reserve components. In 1982, only 4 percent of its personnel were in this category. Noting a direct relationship between a unit's readiness and the number of full-time personnel, the reserve plans gradually to increase full-time strength to 10 percent of its force by the end of FY 89.

The Army established the U.S. Army Reserve Personnel Center (ARPERCEN) from elements of the U.S. Army Reserve Components Personnel and Administration Center (RCPAC). Collocated with RCPAC in St. Louis, Missouri, ARPERCEN will provide centralized command and control of Army Reserve, Individual Ready Reserve, and Standby Reserve, as well as provide for the personnel management of Individual Mobilization Augmentees and Active Guard and Reserve (AGR) personnel.

Equipment and Maintenance

A significant problem facing the reserve components during fiscal year 1984 was the shortage of equipment, primarily that comparable to or the same as active Army equipment. Although the reserve components made improvements, much remained undone.

Army National Guard

During FY 84, the Army's massive modernization program caused a slight decrease in readiness when units converted to the J-

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series of Modified Tables of Organization and Equipment (MTOE). This meant a state of unreadiness existed because AR 220-1, Unit Status Reporting, required that equipment readiness be based upon MTOE full wartime requirement. This unreadiness status affected reserve components more than active Army units since the former lacked many types of equipment. Headquarters, Department of the Army, eliminated this disparity from the Unit Reporting System by implementing an Instant Unreadiness Policy, which listed modernization items and related equipment as unreportable until fielded; gave the Chief of the National Guard the authority to declare certain materiel as unreportable under Unit Status Reporting for specified periods of time; and coordinated MTOE effective dates with the availability of resources. The Guard's Logistics Division published its first list of exempt items for unit status reporting in December 1983.

The ARNG also started the Redistribution From Army Materiel (REDFRAM) program to reduce equipment shortages. Under this program, the Guard identified and transferred equipment from low-priority, late-deploying units to higher priority units, thereby substantially improving the combat readiness of these earlier deploying units.

The Army National Guard filled the equipment needs of its units by using the Reserve Component Resource Priority List (RCRPL), which had eleven priority categories based upon Rapid Deployment Force-A (this is the highest level of readiness), NATO, and non-NATO war plan requirements. The Department of the Army ordered all Total Army components to use only the Department of the Army Master Priority List (DAMPL) as the guide. That list arranged units in an order of priority based upon

arrival dates across all the war plans to which the units were assigned. The DAMPL program became effective 1 October 1984.

The ARNG planned on receiving 245 different items of equipment from the Army modernization information memorandum during FY 84. The scale of this modernization highlighted the capability of the Guard to handle the latest technology, and demonstrated an Army commitment to supply ARNG units with modern equipment to support their peacetime training and wartime missions. Further testimony to this commitment was the Army's decision to provide ARNG roundout units with the same equipment as the active parent units. Since 1982, the Army has issued Ml tanks, M60A3 tanks, Bradley fighting vehicles, and improved TOW antitank missiles to roundout units.

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Equipment issued to National Guard units through normal supply channels in FY 83 was almost $100 million over the FY 82 level of $271 million. The ARNG accepted $611 million of equipment in FY 84, which included M939-series five-ton trucks, Ml tanks, M60A3 tanks, commercial utility cargo trucks, M198 howitzers, and TACFIRE computers. Fiscal year 1984 appropriations committed almost $1 billion for the procurement of ARNG equipment. Initial significant deliveries of this materiel will begin in fiscal years 1986 and 1987. Congress also provided dedicated funding to procure additional equipment such as five-ton trucks, armored personnel carriers, and tactical communications equipment. The Guard used nearby 50 percent of its dedicated funding from fiscal years 1983 and 1984 to improve communications at the division and corps level.

Although the organizational clothing and equipment improved, major challenges remained. Although Congress increased the operation and maintenance, ARNG (Operations and Maintenance, National Guard), budget request so that the Guard could increase procurement of chemical defense equipment, camouflage modules, cold weather clothing and equipment, tool and test sets, OMNG-funded medical equipment, and fire direction sets, the funding fell short of requirements and shortages of chemical defense equipment continued to plague the training and mobilization missions during FY 84.

Army Reserve

Like their counterparts in the Army National Guard, Army Reserve units did not meet prescribed readiness objectives because of a lack of sufficient modern, first line equipment. Serious shortages included heavy engineer, electronic, data processing, cryptologic, and communications equipment. The Army did apportion equipment on a first to fight, first to be equipped basis. Also, for the fourth consecutive year, Congress added funds to the Office of the Secretary of Defense budget earmarked for the sole use of the Army Reserve. The reserve used the extra $15 million granted in FY 84 to purchase communications and electronics equipment, as well as the means to transport and operate it.

Table 11 shows the status of reserve equipment as of 30 September 1984:

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TABLE 11 - STATUS OF EQUIPMENT

	Value (In billions)	On Hand (Percent)
Requirements (Mobilization)	$6.7	52
Authorization	4.7	74
On-Hand Assets	3.4	
Mobilization Equipment Shortfall	3.3	
Peacetime Equipment Shortfall	1.3	

The Army Reserve received $150 million worth of major items of equipment during FY 84, more than double the $72 million of the previous fiscal year.

During FY 84, reserve units received four UH-60A Black Hawk helicopters to qualify mechanics and other maintenance personnel for repairing and maintaining the newest Army helicopter. In addition, the 101st Airmobile Division and the Army Reserve agreed that the 101st would exchange an aircraft requiring maintenance for a fully operational one from USAR stocks. This procedure enabled the reserve aircraft maintenance unit to perform a mission that met the wartime requirement, yet did not degrade either unit's readiness status. Reservists also had the satisfaction of seeing their work tested and the aircraft returned to the operational inventory because of their efforts. This idea was effective and adaptable to other equipment as well.

The Chief of Staff of the Army Award for Maintenance Excellence and the Chief, Army Reserve, Award for Excellence in Maintenance recognize those units that have the best maintenance program during the fiscal year and earn the highest score in areas such as training, innovation, readiness, management, and cost savings. The FY 84 winners were:

(a) Light Category:
Winner: 391st Engineer Company (Water Supply) Kalispell, Montana
Runner-up: 971st Medical Company (Clearing) Wichita, Kansas

(b) Intermediate Category:
Winner: 1011th Supply & Service Company (DS) Independence, Kansas

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Runner-up: 163d Ordnance Company (Ammo) (DS/GS) (Conv) Santa Ana, California

(c) Heavy Category:
Winner: D Company, 411th Engineer Battalion Dydasco (USARC), Guam
Runner-up: HHC, 321st Engineer Battalion (CBT) Boise, Idaho

Facilities and Construction

Reserve components require an infrastructure including offices, armories, logistical facilities, warehouses, and training areas to conduct their peacetime training for wartime missions. Such facilities require funding to buy, build, operate, and maintain.

Army National Guard

The National Guard received $67.6 million in new obligational authority for facilities and construction during FY 84. Nevertheless, a construction backlog of $825 million remained at the end of the fiscal year. One of the Guard's new management initiatives, stable annual investment for the renewal of systems, called for the assignment of priorities during budget cycles to emphasize facilities replacement projects. The Guard set a 2 percent replacement rate for all categories of facilities as its goal. The Guard awarded contracts for 98 major prior year and FY 84 projects worth $82 million and 141 minor projects totaling $14.8 million.

To meet the shortage of storage space required for the equipment and supplies of units scheduled for early deployment, the ARNG continued construction of new warehouses. Several units must deploy rapidly, so they cannot draw mobilization materiel from the normal supply system; they must maintain this mobilization materiel in warehouses close to the unit's station. This complication and the assignment of more early deployment missions to Guard units presented the Guard with a requirement for additional storage facilities.

Over the past several years, the backlog of maintenance and repair grew constantly. However, the Guard planned to reduce this to the congressionally mandated containment level of $15.2 million during fiscal year 1988 by requesting funds specifically for this in the FY 85 budget request, as well as by using the outyears program.

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Army Reserve

The Army Reserve started construction of eight new replacement reserve centers and a maintenance facility, as well as modernizing and expanding ten existing centers. One of these projects gained national attention as several reserve medical units transferred from a run-down urban reserve center into a rehabilitated suburban school. The Kansas City government and the reserve derived mutual benefits from the trade. The municipal government received prime downtown development property, while the reserve quickly and inexpensively acquired a new center. In FY 85, the reserve planned to build 6 new centers and 2 field training ranges, as well as to expand 24 reserve centers.

Training and Readiness

A peacetime army must train for its wartime missions. The reserve components, meeting sixteen hours each month and two consecutive weeks during the year, have special challenges to achieve their readiness for wartime operations compared to active

Army units. However, the Army staff, as well as the National Guard and Army Reserve leadership, worked diligently to increase the reserve components readiness posture through a well-planned training program to put the limited time available to best use.

Army National Guard

The National Guard Bureau established the ARNG Readiness Council in April 1984 as a quarterly forum to identify problems and recommend possible solutions. The Director, ARNG, chaired the council, which was composed of National Guard Bureau Army Directorate division chiefs and two selected state readiness officers from each CONUS Army area. The inaugural meeting was held in October 1984.

During the past several years, the Guard increased its training level to meet readiness goals for units as well as individuals. Beyond this effort, guardsmen concentrated on realistic training in a field environment duplicating combat conditions, command levels, and weapons availability insofar as possible. Therefore, the ARNG increased the level of unit training, including combined arms training at the National Training Center. Although the NTC offered the most realistic combined arms training, the Director of the Army National Guard, Maj. Gen. Herbert R. Temple, Jr., called

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for the development of "local combined arms training areas to enhance this vital training element."

ARNG units participating in exercises received requisite training in combined arms operations and the implementation of mobilization plans usually unavailable in their annual training programs. The Army selected Guard units for training on the basis of their CAPSTONE alignment contingency mission. National Guard units took advantage of overseas deployment training to plan and exercise in their assigned contingency area with their wartime command unit. Beginning with 6 ARNG units in 1976, the program expanded to a scheduled 483 units and units cells in FY 85, serving in Europe, Korea, Panama, and Japan.

The National Guard Bureau designed a training strategy to prepare combat-ready components during peacetime. It used time, fuel, and ammunition to their fullest extent, while reducing wear and tear on equipment to the lowest possible level. The Guard used this strategy to employ more effectively its limited resources, thereby increasing unit readiness. The strategy, composed of three levels, coordinated training for units up to battalion level. The first level, for units up to platoon size, consisted of training devices used at the armory/garrison training area. The next step involved the construction, where necessary, of local training areas to train units through company level in combined arms live fire or MILES exercises. The final level consists of annual battalion and task force maneuvers, as well as combined arms live fire exercises conducted at major training areas.

The eastern ARNG aviation training site provided aircraft and tactical skill qualification training to 467 ARNG aviators during its first year of operation. The Guard also held four classes on Aviation Mishap Prevention and Orientation during the fiscal year. In addition, the ARNG implemented a new program standardizing the aircrew training requirements of units with similar missions within the total force. The Guard also started a program that standardized individual aviation training within the states.

Army Reserve

Army Reserve units and individuals underwent the same types of training as did those in the Army National Guard. CAPSTONE allowed units to concentrate their training on wartime missions. Emphasis was on readiness, as the 358th Civil Affairs Brigade (Norristown, Pennsylvania) demonstrated during Operation URGENT FURY The brigade and its CAPSTONE link, Headquarters, Com-

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mander in Chief, Atlantic Command, worked together before, during, and following the Grenda operation. Prior association ensured that Headquarters, Atlantic Command, knew the unit to tap for civil affairs support on short notice. The first members of the brigade arrived on the island within three days of the call-up. However, the 358th Civil Affairs Brigade had exceeded CAPSTONE requirements before the Grenada operation. Besides exchanging standing operating procedures and making staff visits, the brigade assigned an officer to the command headquarters on a planning tour. Both organizations were familiar with each other and had strong personal ties in addition to the usual detailed and formal CAPSTONE relationships. Thus, the two organizations worked well together during Operation URGENT FURY.

The Army Reserve, like the National Guard, also employed Overseas Deployment Training to provide its units more realistic training. During FY 84 more than 485 units and unit cells deployed to overseas areas where they would most likely operate during

wartime. In all, 6,707 reserve personnel participated in this program and the reserves planned to increase participation in FY 85. The reserves also supported growth in Overseas Deployment Training for SOUTHCOM and the Pacific. While most of the fourteen major exercises in which reserve and active Army units participated occurred in the United States, several were held overseas. These included REFORGER and WINTEX in Europe, YAMA SAKURA in Japan, and TEAM SPIRIT in Korea. Reserve units currently in the CAPSTONE program will increase their level of participation by close to 10 percent annually.

The Army Reserve initiated its Prior Service program in FY 84 to enhance unit readiness by decreasing the number of prior-service unqualified personnel in the assigned duty military occupational specialty (MOS). These prior-service trainees used unfilled TRADOC advanced individual training class seats, thus more efficiently taking advantage of training resources. Although the reserve allocated funding for 3,000 prior-service soldiers, only 1,436 actually took part during FY 84.

The Army Reserve recognized that its active duty reservists needed more training in their MOS and received additional funds in FY 84 for this. Moreover, the USAR asked for an increase in its FY 85 budget to accelerate this program.

The reserves emphasized physical fitness training, as did the other components of the Total Army. However, complete implementation of the reserve program awaited legislation that would resolve the insurance compensation and coverage problems with over-40 reservists. The reserve lacked medical and disability cover-

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age for those personnel who possessed cardiovascular ailments that were discovered or aggravated during active duty physical training. Additionally, the units needed more medical screening personnel and equipment to identify these at-risk, over-40 personnel prior to their suffering injury and death.

Indicative of the high proficiency level of reservists was their showing at various competitions. The United States three-man teams finished 5th, 6th, 8th, 12th, 13th, and 15th at the 37th Annual Interallied Confederation of Reserve Officers (CIOR) Congress and military competitions held in Rome, Italy, from 20 to 28 July 1984. The U.S. novice team placed first in the novice categories while tying for first in overall marksmanship. The United States over-35 team finished second in its competition, while the United States captured first place in the first aid category. Thirtynine NATO-CIOR member nation teams participated, representing Belgium, Canada, Denmark, France, Germany, Italy, Norway, the Netherlands, the United Kingdom, and the United States. The following individuals turned in outstanding performances:

1. Maj. Jon Nealon-1st in pistol
2. 2d Lt. Larry Braaten-3d in pistol
3. Capt. Lyle Nelson-1st in submachine gun (tie)
4. Capt. Daniel Walker-3d in submachine gun (tie)

The USAR Shooting Team won the National .22-Caliber Pistol Team Championship and the National Infantry Rifle Team Championship at the United States International Shooting Championships. Out of 28 first places, the team won 12 as well as 30 of the 78 first, second, and third place medals. In addition, this event was used to select the United States Shooting Team, and seven reservists made the 22-member team. In the Olympics, reservists earned three of the six medals taken by the United States in marksmanship:

1. Capt. Edward Etzel-Gold Medal, English Matches
2. Sgt. Ruby Fox-Silver Medal, Ladies Sport Pistol
3. Capt. Wanda Jewell-Bronze medal, Ladies Standard Rifle

Support to Civil Authorities

The public's contact with the reserve components differs from that of the active Army because the citizens often see the Guard and Army Reserve reserve in local settings assisting the civil authorities during natural disasters and civil disturbances. Further-

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more, most members of the reserve components are local friends and neighbors seen daily out of uniform.

Army National Guard

Guardsmen responded to 391 call-ups in 49 states and territories, with 10,821 personnel working 107,550 man-days. Natural disasters accounted for 129 call-ups: 48 floods, 39 snow/ice storms, 22 tornadoes, 18 forest/range fires, 1 volcanic eruption, and 1 earthquake. Other emergencies included 93 medical evacuations, 62 search and rescue operations, 20 water hauls to areas affected by contamination, drought, or water systems under repair, 4 chemical spills/chemical fires, 3 power outages, and 72 miscellaneous missions.

The Guard also sent 501 personnel to assist civil authorities in eight civil disturbances in four states. These disturbances included civilian response to unpopular judicial decisions, as well as actions by dissatisfied copper mine workers and misconduct of a motorcycle gang. ARNG also planned and prepared for possible antinuclear demonstrations against several Army installations. Guardsmen also developed plans to maintain mail service in the event of a postal workers strike.

Almost 1,000 guardsmen from California and its neighboring states provided aviation and logistics aid to local authorities supporting the XXIII Olympiad in Los Angeles, California, in July and August.

Army Reserve

Army Reserve units, as well as individuals, responded to calls for assistance from civil authorities. Two representative cases involved water contamination in western Pennsylvania and an Avian flu epidemic on the East Coast.

Reserve water purification units provided potable water to the residents of McKeesport, Pennsylvania, in the late winter of 1984 when viral contaminants in the city's water supply made more than 300 people ill. The engineer units used this operation as a unit training exercise and remained on duty, under Department of the Army authority, until state agencies could assume the role.

During the year, an outbreak of Avian influenza on the East Coast threatened to destroy the region's chicken and turkey industry. Twelve reserve veterinarians volunteered their services to Army and civilian agencies to fight the epidemic. Their hard work was a significant factor in the eventual containment of the Avian influenza outbreak.

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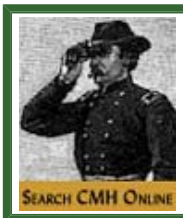

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Research, Development, and Acquisition

The Army's extensive modernization program reaped the benefit of the research and development of the 1970s and produced equipment in the procurement stage at economically efficient production rates. Even as Army modernization gained momentum, Army planners understood that the Soviet Union not only outnumbered American forces in personnel and equipment, but also was rapidly overcoming the technological advantages of U.S. weapon systems. In short, the USSR was producing sophisticated quality weapons in quantity. This development, coupled with the Army doctrine espoused in FM 100-5 that emphasized the critical need to win a Central European engagement against heavy Soviet forces, determined that the modernization program would continue to concentrate on developing and upgrading weapon systems for Division 86 units. The likelihood of becoming involved in low intensity conflicts required the Army to have a quick response capability, but the lack of strategic lift capability hindered rapid deployment of ground troops. Strategic lift was insufficient for even the "lightest of the light," the 82d Airborne Division, to deploy rapidly enough to meet its requirements. In response, Army planners designed the light division to fit into the current lift capability and to fulfill the low-intensity conflict role. The modernization program, however, remained focused on the doctrinal concept of Central European warfare. While the Army steadily increased development of new materiel or upgrading and converting of older models for the use of light divisions, it maintained emphasis on heavy force modernization during FY 84. This chapter discusses the major actions and weapon systems in the Army's research, development, and acquisition program as the Army leadership balanced NATO responsibilities against the light division initiative.

Budget

The Army based its initial approved RDTE program on the President's budget as adjusted by Congress up to 30 September 1983. In addition to amounts withheld in anticipation of congres-

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sional action, other deferrals totaled $493.2 million and included $61.5 million for TRACE (total risk assessing cost estimates), $109.1 million for new starts, $310.5 million based on Under Secretary of Defense for Research and Engineering (USDRE) Format Is, and $12.1 million for other individual programs. The USDRE also withheld funds for Patriot, the antitactical missile, 155-mm. howitzer improvements, the Army joint surveillance/target attack radar system, division air defense command and control, and joint tactical communications. Besides deferring funds, the USDRE identified twenty-six specific program elements as being of "USDRE interest"-funds for these programs could not be shifted without prior written approval from OUSDRE.

During the first quarter of FY 84, the Army funded programs under a Continuing Resolution Authority, which was adequate to support all released programs. The Army's RDTE appropriation, finally enacted on 8 December 1983, was $4.199 billion ($593 million short of the requested $4.792 billion). The following major congressional reductions, eliminations, and increases were contained within the appropriations bill. *(See Table 12.)*

TABLE 12 - REDUCTIONS
(In millions)

Program	Amount
Technology Base	$72
BMD Systems Technology	206
Terminally Guided Projectile	16
Advanced Software Technology	18
Antitactical Missile	16

Medical/Chemical Programs	21
Military Computer Family	21
Advanced Field Artillery Tactical Data System	10
155-mm. Howitzer Improvements	37
Eliminations	
Artificial Intelligence/Robotics	$8
Industrial Base/Vaccine and Drugs	34
Joint Service Vertical Lift Aircraft	36
Advanced Rocket Control System	31
Light Armored Vehicle	3
Meteorological Equipment Development	3
Education and Training	12
Automatic Test Support System	12
TRADOC Studies and Analysis	2
Installation Audiovisual	6

TABLE 12 - REDUCTIONS-Continued
(In millions)

Program	**Amount**
Increases	
REMBASS Improvement	$5
Fighting Vehicle Systems	20
Liquid Propellant Guns/Ammunition	4
Joint Tactical Communications	25
Manufacturing Methods and Technology	74

In addition to congressionally approved reprogramming of $74 million, the Army reprogrammed $111.5 million in 170 program elements. As a result, the FY 84 program, by 30 September 1984, was $4.273 billion with obligations of $3.756 billion and outlays of $2.113 billion. The FY83 carryover equaled $266.7 million while $3.9 million of direct funds lapsed at the end of FY 84. Besides direct appropriated funds, the RDTE program contained $935.1 million in reimbursable obligations ($178.1 million FY 83 funds and $757.0 million in FY 84 funds) including orders received from other DOD agencies, non-DOD agencies, and nonfederal sources.

The Army procurement appropriation's FY 84 obligation plan totaled $19.427 billion ($17.737 billion for direct Army procurement and $1.690 billion for reimbursable customer sales) and included all obligations from funds appropriated in FY 82, FY 83, and FY 84 dedicated to the FY 84 program. Actual obligations incurred during FY 84 equaled $17.837 billion ($16.323 billion for direct Army procurement and $1.064 billion for reimbursable customer sales). The lapse of funds for the expiring FY 82 program year was $122.5 million of direct funds, which included approximately $87 million for contingency liabilities, totaled $105.9 million, and of reimbursable funds, which was due to the Army supplying materials from stock that did not require replacement, equaled $16.6 million.

The Army procurement portion of the FY 85 budget request was $21.060 billion, an increase of $3.768 billion over actual FY 84 appropriations. This additional funding will maintain multiyear programs and economic production rates for several selected weapon systems. The requested funding for FY 85 will sustain ammunition reserves, modernize major end items, continue procurement of tactical wheeled vehicles, and improve fielded systems.

The FY 85 aircraft procurement budget submission included $1.290 billion to purchase major end items such as 144 AH-64 Apache attack helicopters as well as long lead time engines and avionics equipment. The Army helicopter improvement program

(AHIP) also received $217.3 million. The missile procurement appropriation enabled the Army to buy 585 Patriot missiles and 50,472 rockets for the multiple launch rocket system. The Army earmarked the weapons and tracked combat vehicles appropriation request for improving combat power by purchasing new items and modifying existing systems. The appropriation for ammunition procurement included $2.192 billion for buying ammunition and $302 million for ammunition production base support. The other procurement category contained $1.536 billion for tactical and support vehicles, $2.927 billion for communications and electronics equipment, and $1.599 billion for other support equipment.

Science and Technology

The Army Science Board, in a 1981 assessment of AirLand Battle 2000, now known as Army 21, concluded that to execute that doctrine the Army had to concentrate on those technologies in which the United States had a strong superiority over Warsaw Pact nations. Based upon this assessment and other recommendations, the Army, in its 1983 long-range research, development, and acquisition plans, divided these "high-leverage" technologies into five "new technology thrusts." The thrusts did not cover all areas of research and development nor will they replace efforts in such areas as mobility, maintainability, reliability, and survivability as well as general battlefield effectiveness.

The first thrust, Very Intelligent Surveillance and Target Acquisition (VISTA), will use advanced electronic sensors, decentralized data processors, and a combat information center to provide ground commanders near real time intelligence on enemy operations. Closely related to VISTA was the second initiative, Distributed Command, Control, Communications, and Intelligence (DC 31) . It will enhance communications and the distribution of information to all levels of command under adverse conditions.

The third direction was self-contained munitions that could, after launch, seek out and select a target, then guide a warhead to it without assistance such as laser designation-the so-called fire-and-forget weapons. These munitions will employ the latest advances in fiber optics, electro-optics, infrared, and radar techniques and will include improvements in fuses, warheads, and delivery systems.

Biotechnology was another area and involved creating new treatment and protective measures for infectious diseases, wounds and injuries, and chemical/biological warfare agents. The Medical and Chemical Research and Development Commands will direct the de-

velopment of vaccines, antidotes, and diagnostic agents, as well as chemical and biological warfare detection and identification systems.

The increased use of technologically sophisticated equipment, especially that planned for the future, demanded soldiers who were capable of operating it. This fifth concern is applicable to all initiatives. The Army aimed to simplify teaching a soldier to maintain and operate these complex weapon systems.

These five arenas focused Army research and development efforts into long-term modernization goals. The Army's thirty-four laboratories continued their cooperation with defense contractors and academia to attain these goals. The initiatives received first funding in FY 84. In addition, the AMC established the New Thrust/Demonstration Management Office to coordinate its efforts with those of TRADOC and to plan for the first major field experiment using thrust technologies. This demonstration (DEMO 86/8'7) will be held in the last quarter of FY 86 with FORSCOM providing support and will bring together the new technologies as well as new operational concepts in a combined arms exercise. Every few years, the Army will conduct similar demonstrations to check the progress toward AirLand Battle 2000 and the evolving Army 21. Those technologies that show promise or prove their capability will be incorporated into the new doctrine.

The Advanced Concepts and Technology Committee initiated six new Programs in FY 84 that will continue through FY 86:

1. Bell Aerospace Army flight test of ring fin concept
2. University of Maryland-Method for curing rubber in tank track pads
3. Goodyear-lightweight (less than 50 lbs.) synthetic aperture radar
4. GT Devices-plasma mass accelerator
5. Auburn University Electrical discharge chemical/biological filter
6. Dyna East-Self-forging fragment weapon

Seventeen projects continued from previous fiscal years. The most important of these were the following:

1. Aerojet-Rocket assisted kinetic energy round
2. Bell Lab-Integrated tank fire control concept
3. Hughes Aircraft -Artificial intelligence tactical vehicle control
4. U.S. Army Armament Research and Development Center-Autoloading system for tanks and artillery

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Furthermore, several programs previously supported by the committee received increased visibility in FY 84:

1. Stabilization system for mast-mount sight on the OH-58D
2. Large caliber liquid propellant gun
3. Ada, the DOD higher order computer language

The Corps of Engineers continued its military engineering research and development program through FY 84. At Fort McClellan, Alabama, the Waterways Experiment Station (WES) began developing a biological monitoring system to determine the environmental impact of smoke generation training. WES also started field and laboratory investigations to create new technologies in assessing toxic waste sites for the U.S. Army Toxic and Hazardous Materials Agency. Moreover, WES studied the Corps' forestry and related natural resource management practices to determine its environmental impact. During May 1984 the WES Structure Laboratory conducted two tests of the WES-designed antitank ditch formed by liquid explosives. These demonstrations, plus a second series in July, showed that all the techniques worked well and the U.S. Army Engineer School advocated their rapid development, adoption, and fielding.

The Construction Engineering Research Laboratory (CERL) worked with the Defense Nuclear Agency (DNA) to test the properties of high-strength, high-ductility steel plates and welds for the Silo Hardening Program. CERL also field-tested lightweight rails under mobilization loads for the Railroad Maintenance Management System, FORSCOM. As a part of the Winter Battlefield Obscuration Program, Cold Regions Research and Engineering Laboratory (CRREL) received approval to study the turbulent and radiative surface heat fluxes and the resulting effects on the atmospheric surface layer over the St. Lawrence Island Polynya.

The Engineer Topographic Laboratory (ETL) submitted preliminary documentation to the Cannon Artillery Weapon System project manager's office for the Modular Azimuth and Positioning System (MAPS), which will provide accurate location information for several Army sensor and weapon systems. ETL scientists cooperated with researchers at the U.S. Army Signal Warfare Laboratory to determine how to use artificial intelligence to integrate terrain data with electronic warfare sensors reports. If successful, the resulting system would improve battlefield management and intelligence preparation on the battlefield. The ETL-developed Digital Elevation Data Dubbing Facility, a van-mounted computer system

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that provides digital elevating data for FIREFINDER units, became operational during FY 84. The system's data will improve the speed and accuracy with which the counterartillery radar system can locate enemy gun positions.

The Corps of Engineers also performed military engineering research and development for the Air Force and Navy. For the Air Force, WES conducted dynamic testing on reinforced concrete slabs to determine load distribution, spall phenomena (the breaking or chipping of pieces from slab surfaces), strain rate effects, and casing effects of sealed charges. The Air Force also asked WES to establish criteria for the design, construction, and maintenance of pavement and other transportation-related facilities at Tyndall Air Force Base, Florida. WES also worked to develop perimeter security systems for air bases. The Ballistic Missile Office (BMO) received the following WES support: geological and structural studies for BMO's deep basing concepts; a proposal for assessing concrete quality; and an evaluation of tunnel boring machine seismic signatures.

CRREL performed several studies for the Air Force on ground conditions in permafrost and seasonal frost areas for airfield construction. The laboratory's scientists conducted site selection studies along the existing Distant Early Warning (DEW) Line in Canada for the North Warning System. The BMO commissioned a,CRREL study on heat sinks for MX deep basing. The study should result in a manual for the preliminary design of buried ice heat sinks.

CERL worked on developing guidance for the selection and installation of durable roofs at remote Air Force sites as well as several projects for testing tactical shelters for electromagnetic protection.

Corps of Engineers' military engineering research and development activities for the Navy included several major projects conducted by WES and CRREL. In FY 84, WES cooperated with the Naval Energy and Environmental Support Activity to identify and control hazardous waste disposal sites on Navy bases. CRREL conducted several research projects on sea ice for the Navy that included developing large-scale numerical models of the east Greenland marginal sea ice zone to improve Arctic ice forecasting methodology and battlefield weather forecasts.

The Corps of Engineers also conducted an extensive civil works research and development program. On 12 December 1983, the Director for Research and Development, Corps of Engineers, and the Director General of the Finnish Research Center in Helsinki signed a Memorandum of Understanding covering technology transfer and joint projects in Arctic research, river ice management, and cold region construction. CRREL began to monitor and

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analyze ice stress around a man-made gravel island in the Beaufort Sea to determine the effect of ice on structures.

Representatives of WES, OCE, the Los Angeles District, and the South Pacific Division met in October 1983 to plan for a demonstration of remote sensing devices to gather wave information. This information would be used to prepare for high wave damage while the waves were still far away from the California shore. Similarly the National Hurricane Center and the WES Coastal Engineering Research Center cooperated on a project to gather surge data from hurricanes, which will lead to better warnings for those people in a hurricane's path.

The National Park Service asked WES to identify inexpensive, expedient, and aesthetically pleasing bank stabilization techniques for protecting a valuable archeological site in the Great Lakes area. WES provided research results from the Environmental and Water Quality Operational Studies and Stream-bank Protection programs, which solved the problem. WES also initiated a study on the retreat of loess bluffs near Vicksburg. The study was part of a larger National Park Service investigation on the feasibility of stabilizing the Natchez Bluffs.

The WES Geotechnical Laboratory, at the request of the Environmental Protection Agency (EPA), provided emergency assistance at leaking waste storage lagoons in Greenup, Illinois. The laboratory's scientists and engineers evaluated the stability of the lagoons' dikes and the possibility of waste spilling into the flood plain.

The National Academy of Sciences and National Research Council, at the request of Under Secretary of the U.S. Army James R. Ambrose, established the Board on Army Science and Technology (BAST) on 15 February 1982. Operating under the National Research Council's Commission on Engineering and Technical Systems, BAST, composed of 13 civilian members of the academic and commercial research communities, carried out independent, multidisciplinary studies of scientific, technical, and management issues bearing upon the mission of the U.S. Army.

The board met three times in FY 84 to discuss BAST planning for future initiatives and to investigate specific technical aspects of the Army's mission. The first meeting, held at the Corps of Engineers Waterways Experiment Station from 25-26 October 1983, introduced board members to scientific and technological issues of major concern to the Corps. The BAST met next at Fort Benning, Georgia, from 27-28 March 1984, and learned about the training programs for infantry soldiers as well as the issues that affected the Infantry's capability to perform its mission. The final meeting, conducted at Fort Detrick, Maryland, 11-12 July 1984, provided

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BAST members with an understanding of the capabilities of the Medical Research and Development Command.

The board, at the request of Dr. Jay R. Sculley, Assistant Secretary of the Army for Research, Development, and Acquisition, formed a Structural Materials Planning Panel in October 1983 to study materials research and development. The panel decided to propose a two-phase study. The first phase would define the requirements and assess the technical capabilities of Army research and development centers to meet them. The second phase would identify expected advances in materials, analyze the barriers to their successful development, and recommend ways for the Army to achieve its goals. After nearly ten months of negotiations with the Army on the study's scope, BAST submitted a proposal, on 21 September 1984, for a study of critical materials required for advanced Army weapon systems. The board awaited a reply at the end of FY 84.

An Electronic Components Panel, also formed in October 1983 at the request of Dr. Sculley, developed a study proposal to identify the most important categories of electronic components required by the Army and to examine factors controlling their availability and methods of reducing shortfalls. It too awaited an Army reply.

A committee on Energetic Materials Science and Technology, created on 16 April 1984, studied high energy materials technology to identify outstanding technical and military problems as well as research requirements for new materials with properties different from those now available. This classified study will also address the scientific and engineering problems associated with the development, production, and stability of high energy materials.

The BAST Committee on Chemical and Biological Sensor Technologies, formed in FY 83, finished an in-depth assessment of defensive chemical warfare sensor technologies in June 1'984. The Committee on Demilitarizing Chemical Munitions and. Agents, also established in FY 83, completed a careful and painstaking investigation of the risk associated with either continued storage or disposal of the existing stocks of chemical agents and munitions located at eight storage sites in CONUS. The committee submitted the report to the Army on 5 September 1984.

Ballistic Missile Defense System

As a component of President Reagan's Strategic Defense Initiative (SDI), the Ballistic Missile Defense Organization (BMDO) re-

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ceived increased attention in FY 84. The organization's research and development mission contributed significantly to the SDI program. Furthermore, BMDO supplied vital assistance to the initial SDI Organization (SDIO). All BMD programs complied with the Strategic Arms Limitation Treaty. Funding for RDTE for FY 84 was as follows:

1. Advanced Technology Program-$153,372,000.
2. Systems Technology Program-$319,246,000.
3. Kwajalein Missile Range-$142,341,000.
4. Small Business Innovative Research-$695,000.

BMDO comprised the BMD Advanced Technology Center (BMDATC) in Huntsville, Alabama, which performed long-term research and development; the BMD Systems Command (BMDSCOM), also in Huntsville, which executed

potential systems design research and development; and the BMD Program Office (BMDPO) in Arlington, Virginia, which provided a centralized point of contact for DOD, Congress, and other agencies. BMDSCOM continued to operate the Kwajalein Missile Range (KMR) in the Marshall Islands for various BMD experiments and demonstrations. KMR also provided assistance for other services, the National Aeronautics and Space Administration's (NASA) shuttle program, and data collection on targets for DOD.

The most important internal organizational change with BMDSCOM occurred as a result of the termination of the SENTRY program in FY 83. The SENTRY design used nuclear armed interceptors to destroy enemy Intercontinental Ballistic Missile (ICBM) launched nuclear warheads. In FY 84, BMDSCOM created the Systems Projects Directorate (SPD) and the Systems Development Directorate (SDD) to redirect the SENTRY program toward soft-target ballistic missile defense concepts and technologies as well as aligning operations with the SDI effort.

On 10 June 1984, BMDO successfully completed the fourth and final flight of the Homing Overlay Experiment (HOE) program, the first demonstrated destruction of a ballistic reentry vehicle by non-nuclear means. The event made international news. Launched from KMR, the HOE nonnuclear, infrared homing and-kill device intercepted and destroyed by direct impact an unarmed reentry vehicle that had been launched atop an ICBM in California. The destruction occurred more than 100 nautical miles above the Pacific Ocean.

Four firms received contracts totaling $18 million for the concept definition phase of the High Endo-atmospheric Defense System (HEDS) program. The engineering studies for this phase will

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define interceptor kill vehicle and critical components, viable propulsion/control design, and warhead/fuse requirements. In late FY 84, BMDSCOM redesignated the program as the High Exoatmospheric Defense Interceptor (HEDI) *project office*. The command awarded another four contracts, worth approximately $500,000 each, for the concept definition phase of the Excatmospheric Reentry vehicle Interceptor Subsystem (ERIS) to develop interceptor technology that will use external precommit sensor capabilities in a nonnuclear kill design.

BMDSCOM awarded a five-year $289.4 million contract for the Airborne Optical Adjunct (AOA), which will use a modified commercial jet aircraft with two long-wave infrared sensors to acquire, discriminate, and accurately track reentry vehicles (warheads) to augment data being processed by ground-based radars such as the Terminal Imaging Radar (TIR). The TIR project will develop and demonstrate a radar to receive and combine AOA data with its own tracking data and then furnish target data to HEDI. In July 1984, the Department of the Army selected and assigned project managers to the AOA and TIR projects.

SDD redirected the Command, Control, and Communications/ Battle Management (C3/BM) study from the defense of hard targets such as missile sites to the terminal defense phase of the Defense-in-Depth (DID) concept. In June 1984, the directorate published the DID study and in the following month awarded a $1.1 million technical analysis contract to assess state-of-the-art and emerging technologies. Other SDD projects included the Airborne Optical Sensor, the Active/Passive Defense study, the Threat Specific program, and the Antitactical Missile Analysis. The Advanced Technology Center made progress in the Optical Aircraft Measurements Program (DAMP), with construction of the OAMP hangar/operations complex proceeding ahead of schedule, the sensor platform modification advancing on schedule, and the sensor-system contractor completing a final sensor design. The first flight of the Small Radar Homing Intercept Technology (SRHIT) program successfully demonstrated the performance of the vehicle's main propulsion system and launch equipment. The system's maneuverability could not be tested on the second flight because of a malfunction, and BMDATC postponed this demonstration until the third flight scheduled for FY 85. The center also changed the Endoatmospheric Nonnuclear Kill (ENNK) program to support the HEDI project, primarily by switching sensor technology from radar to optical.

Another major project of BMDATC included the completion of four feasible guided projectile designs and definition of gun and

projectile characteristics in the Electromagnetic Accelerator program. The Homing Intercept Technology Concepts Technology Assessment program analyzed miniature interceptor approaches and identified several for SDI application. The BMDATC also expanded the Neutral Particle Beam Technology program from the Los Alamos Laboratory to the Oak Ridge, Lawrence Berkeley, and Brookhaven National Laboratories.

KMR supported 25 missions during FY 84 for the Army, Navy, Air Force, and NASA's shuttle program. The latter received assistance with five shuttle missions, and KMR anticipated more missions in the future as NASA accelerates the shuttle program. KMR faced a second year of emergency water shortage and employed reverse osmosis water purification units that furnished 21 million gallons of fresh water during the last six months of FY 84. The Compact of Free Association, negotiated in 1982 between the United States and the Republic of the Marshall Islands through a plebiscite in 1983, still awaited ratification by the U.S. Congress at the end of FY 84. The House Interior and Insular Affairs Committee held hearings during the year to clarify the issues involved, but did not issue a report.

The Army continued its development of new weapons and the upgrading of old ones as part of the Army's modernization program. This program relied upon technology to counter the quantitative superiority of Warsaw Pact armies. Several major programs are discussed below.

Command, Control, and Surveillance

The Joint Tactical Communications (TRI-TAC) program, a joint service and DOD agency program, continued to develop and field tactical multichannel switched communications equipment. The program aimed to achieve interoperability among service tactical communication systems and to provide new equipment using modern technology. Each service assumed responsibility for the development and acquisition of selected equipment for use by all DOD components.

During FY 84, the Army made significant progress in the TRITAC program. The Army's responsibility included two of the systems's major components, the AN/TTC-39 family of switches, which provided automated connections between tactical communication systems, and the Digital Group Multiplexer Family. The Army continued to field the switches, which were the heart of the system, to CONUS and USAREUR, where they were well received

during FY 84. Engineers began a program to improve one of the switches, AN/TTC-39 Circuit Switch, during the fiscal year. Development of the digital group multiplexer transmission equipment and its cable accessory equipment continued as a mutual effort of the Army and Raytheon Corporation. The Army will field this equipment to the training base in the fall of 1985. Development of the single subscriber terminal (an intelligent terminal used for message preparation and reception) continued during the year. The Army and Magnavox Electronic Systems Company signed a production contract for the lightweight digital facsimile. An addition, USAREUR units received prototypes of the Communications System Control Element.

During the FY 84 Battlefield Communications Review, planners made several major doctrinal decisions about tactical communications architecture. These decisions moved TRI-TAC equipment to EAC and placed Mobile Subscriber Equipment (MSE) in signal units at corps level and below. The MSE program will purchase, off the shelf, the commercial equivalent of a telephone system with mobile radiotelephone service and data capability, to avoid a lengthy and expensive research and development effort.

The Army, as the Executive Agent for the Ground Mobile Forces Satellite Communications, continued development and procurement of Tactical Satellite Communications (TACSATCOM) terminals and control systems. Developers completed first production model testing and follow-on evaluation of the multichannel initial system satellite communications terminals (AN/TSC-85A and AN/TSG-93A) as well as developmental and operational testing of the the anti-jam control modem. Production deliveries of the single channel manpack satellite terminals (AN/PSC-3 and AN/VSC-7) started during the fiscal year and the 1st Special Operations Command, Fort Bragg, North Carolina,

conducted a successful follow-on evaluation of the equipment. Meanwhile, deployment of the Special Communication System Satellite Communications terminals continued with 100 AN/MSC-64 terminals delivered to Europe and the Pacific to support the Theater Communications System Improvement Program. Although the Army approved the Single Channel Objective Tactical Terminal (SCOTT) for low rate initial production beginning in FY 84, it halted the program during the fiscal year to evaluate requirements, to project program costs, and to assess the need for further development.

The Army awarded the first Single Channel Ground and Airborne Radio System (SINCGARS) contract to International Telephone and Telegraph, Fort Wayne, Indiana, during FY 84, for 650

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ground radio systems. The contract contained four fixed price negotiated options for a total of 44,100 radios. In February, the Army type-classified the ground system as standard, and the Secretary of the Army approved an acquisition strategy that included production by a second company in FY 85 to meet mobilization requirements and provide a competitor for International Telephone and Telegraph in future procurements. However, because of funding constraints, the Army postponed the establishment of a second production source from FY 85 to FY 87. Meanwhile, research and development continued on deferred items such as the securable remote control unit, airborne radios, installation kits, and test program sets.

The Joint Tactical Fusion Program (JTFP) comprised the Army's All Source Analysis System (ASAS), Tactical Simulation, Technical Control and Analysis Center, elements of the Battlefield Exploitation and Target Acquisition project, and the Air Force's Enemy Situation Correlation Element. Congress directed the Army to change the configuration of ASAS during the year, because Congress believed that the system was too bulky and centralized to be totally effective. As a result of the program restructuring, ASAS work stations will no longer be consolidated in one large ISO-20 van. Rather, they will be separated into smaller huts that can be mounted on 5-ton S-280 trucks and on High Mobility Multipurpose Wheeled Vehicles (HMMWV). This change does not, however, diminish system functionality. The project manager's office completed the restructuring action during this period.

The Army continued to support the modernization of the Defense Satellite Communications System (DSCS) by developing ground communication terminals and control systems for DSCS use by the services and DOD agencies. The Army emphasized the development, production, product improvement, and deployment of modern, jam-resistant systems to the worldwide DSCS. Engineers upgraded the system's efficiency, network control, and operation in a nuclear environment and replaced equipment exceeding its useful service life with modern digital communications equipment.

During FY84, the Army deployed 8 of its 32 jam-resistant secure communications AN/GSC-49 terminals to the field to support defense-wide Command, Control, Communications, and Intelligence programs. The Army also installed 26 additional AN/USC-28 Electronic Counter Countermeasure (ECCM) units worldwide to provide an antijam capability in support of critical JCS validated communications requirements. Furthermore, engineers delivered 10 more AN/MSC-66s to the field as part of the modernization program. The AN/MSC-66 replaced analog circuits with digital ones,

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thus increasing the system's operational capacity. The Army also deployed, installed, and activated five new AN/GSC-39 medium satellite communications earth terminals to back up the expanding role of the DSCS. Furthermore, Army engineers emplaced a new DSCS-Ground Mobile Forces Control Link at Fort Detrick, Maryland, to provide essential control for Ground Forces tactical satellite communications terminals using the DCSC.

The development of the Communications and Control System, the first step of the Advanced Field Artillery Tactical Data System (AFATDS), continued in the advanced development phase during the fiscal year. The AFATDS's next step, the design of the Fire Support System/Fire Support Terminal (FSS/FST) and its associated brigade and battalion software were in preparation for entrance into advanced development. On 30 May 1984, the Army and Magnavox Electronic Systems Company signed a contract for the FSS/FST

The Artillery Locating Radar, AN/TPQ-37 (FIREFINDER), locates enemy projectiles in flight, mathematically backtracks their trajectories, and reports the location of the firing enemy weapons, which allows U.S. counterfire to begin before the projectiles hit the ground. During FY 84, the Army fielded 5 systems within CONUS: 2 each to 2 FORSCOM divisions and 1 to the Combat Surveillance and Target Acquisition Systems Support Center, Fort Monmouth, New Jersey. Full-scale production units replaced 10 early deployed low rate initial-production systems in Korea and Europe. In addition, the Army installed modification kits evolved from the continuing production test program and completed the exchange of the old antenna transporter dolly for the new 6-ton flatbed trailer.

The Army continued fielding the Tactical Fire Direction System (TACFIRE) on schedule with approximately 75 percent of the active force equipped at the end of FY 84 and complete deployment planned for the second quarter of FY 87.

The prime contractor for the Position Location Reporting System (PLRS), Hughes Aircraft, monitored by government agencies, continued its scheduled production of initial systems for the Army and Marine Corps. Hughes Aircraft expected to field the system to both services in 1986. The deployment of the PLRS Engineering Development Model (EDM) continued to field forces of the two services, which tested the system in tactical line scenarios such as maneuver control, line artillery fire, and aviation coordination. Engineers also conducted electronic warfare and propagation evaluations, which successfully demonstrated the system's resistance to jamming. To ensure support for initial fielding, the Army awarded or continued contracts for development and production of the

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PLRS Master Station Trainer, the development of the User Readout Simulator, and software enhancement for Improved Simulated PLRS, Improved Data Analysis, and Scenario Generation. Integrated logistics support initiatives, such as continuation of the development and procurement of the PLRS Test Set and the Direct Support Team Vehicle to be used for field maintenance, continued during FY 84.

On 30 January 1984, the Army awarded a $27,414,000 firm fixed-price contract to the Hughes Aircraft Company for 180 Ground/Vehicular Laser Locator Designators (G/VLLD). The U.S. Army Field Artillery Board at Fort Sill, Oklahoma, conducted the FIST Force Development Testing and Experimentation II at Fort Riley, Kansas, from 9 April to 10 May 1984. Part of this test included the use of a G/VLLD mounted and dismounted from the FIST vehicle, which demonstrated that the observation/lasing team using the G/VLLD was best deployed as far forward as possible. The FISTV modification on the Laser Designator Ranger-finder began in March 1984 at the Sacramento Army Depot, California.

On 26 March 1984, the Missile Command (MICOM) commander recommended a conditional release of 148 G/VLLD units to the Rapid Deployment Force and training centers. Because of urgent fielding requirements, he approved the full release of 41 AN/TVQ 2 G/VLLDs on 17 April 1984-30 to the 101st Airborne Division (Air Assault), 6 to TRADOC at the Aberdeen Proving Ground (APG), and 5 to TRADOC at Fort Sill. On 22 June 1984, the MICOM commander approved the unit's full release; fielding of the first increment of G/VLLD units to USAREUR began on 20 September 1984.

Risk reduction efforts were made on the joint Surveillance and Target Surveillance and Target Attack Radar System radar during FY 84. In May 1984, the Chiefs of Staff of the Army and Air Force signed a Memorandum of Agreement on the U.S. Army-U.S. Air Force Joint Force Development Process. One initiative identified the G18 aircraft (a Boeing 707 converted for military use) as the single platform for the joint Surveillance Target Attack Radar System (JOINT STARS). With both services in agreement on requirements and the choice of a platform, the Army, in August 1984, awarded a contract to Motorola for full-scale development of the Ground Station Module. The Army also completed the system specification for the prime mission equipment (radar, platform, and data link), reconfirmed an acquisition strategy, and in September 1984 started the competitive source selection for the prime contractor.

In December 1983, the Army submitted requests for proposals for the Short Range Air Defense Command and Control System's (SHORAD C2) integration and software development contract.

After receiving proposals in March 1984, the Army began source selection. However, during a series of program reviews held from April through June 1984, the Under Secretary of the Army and the VCSA questioned the system's cost and capability. Planners substantially revised the SHORAD C2 program to lower its cost and accelerate initial operational capability. Therefore, the Army rescheduled the Army Systems Acquisitions Review Council II and Defense Systems Acquisition Review Council 11 reviews to FY 85.

The production of the Position and Azimuth Determining System (PADS) continued for the final year of a two-year contract with Litton Industries. By the end of FY 84, the contractor delivered 99 PADS systems to the Army, which planned for a final production contract to be awarded in FY86.

In the field of night vision devices, the Army awarded advanced development contracts for the AN/PVS-6, Mini-Eye-safe Laser Infrared Observation Set (MELIOS), and the Passive Wide Area Alerting System (PWAAS). Full-scale development began on the C02 Laser Rangefinder, continued on the AN/PVS-7, a third-generating night vision goggle, and ended on the digital scan converter, a real-time video processor of thermal imaging signals. Procurement of the AN/PVS-5A, a second-generation night vision goggle, and the AN/PVS-4, an individual served weapon sight, continued during the fiscal year, while procurement ended for the AN/TAM-3 night test set and the AN/TAM-6 night sight maintenance facility.

The Forward Looking Infrared (FLIR) Mission Payload System (FMPS) and its integration into the AQUILA Remotely Piloted Vehicle (RPV) system proceeded into full-scale development as the Ford Aerospace and Communications Corporation received a $40,789,610 fixed-price incentive contract on 31 May 1984. The FMPS program comprised four air vehicles, a ground system less the ground control station, and a reduced test program. The Initial Production Readiness Review of the RPV system took place at Lockheed Austin Division during 14-18 November 1983. Critical concerns continued to be the mission payload tooling time, laser production capability, and engine performance including operating time between overhauls. On 22 September 1984, the Lockheed Austin Division signed a fixed price contract for developing, qualifying, and integrating a new data management system into the AQUILA ground control station. As of 1 October 1984, the Army had conducted 22 RPV Block 11 test flights, 15 of which were successful, and 20 Early Operational Capability flights, with 19 successes. Problems encountered in the flight testing program were primarily due to lack of test hardware and system design immaturity. The qualification testing for both element/compo-

nent and system/subsystem led to the start of 271 tests, of which 218 were completed by the end of FY84.

At the beginning of FY 84, the Army deployed Remotely Monitored Battlefield Sensor System (REMBASS) prototype components with U.S. forces in Grenada. Used in an area surveillance role under combat conditions, the system did perform well. Combat forces praised REMBASS for its performance in the intense electromagnetic interference environment caused by the widespread and concentrated use of electric equipment during the joint operation.

In early FY 84, REMBASS completed RDTE and received Army approval for production. However, the program suffered a setback when Congress; reviewing operational test results, concluded that the system required additional development. Congress denied an FY 84 production start and appropriated $5 million for further RDTE. Subsequently, Congress received the results of an independent evaluation of the system's performance, which criticized the operational testing and validated REMBASS readiness for production and fielding. Based upon this evaluation and the system's performance in Grenada, the Army obtained congressional support for an FY 85 production start.

The FY 83 Improved High Frequency Radio (IHFR) contracts continued on schedule and within budget through FY 84 for FY 85 delivery. In December 1983 and July 1984, the Army made basic ordering agreements with the IHFR contractors for procuring 44 radios to support the Pershing II in Europe. In August 1984, scientists tested the advanced development model of the Short Term Antijam module, which will provide electronic counter-countermeasure protection through frequency hopping for the IHFR family of equipment. The test demonstrated the technical suitability

of the military standard antijam waveform and prepared the way for the engineering development phase scheduled for FY 85.

The Army awarded the final Battery Computer System (BCS) increment (146 systems) of the five-year production contract with Norden Systems in March 1984, and fourth year deliveries (147) started in April. The BCS deployed to the 193d Infantry Brigrade, Panama, in July 1984, and to the 2d Infantry Division in Korea. The Army negotiated a BCS Test Program Station contract during the fiscal year, as well as a BCS Interface Training Simulator contract (September 1984).

The Army recognized the current threat to Army telephone communications from enemy espionage agencies and took several actions during FY 84 to enhance communications security. These included procuring 2,570 secure telephone units for delivery and installation between FY 84 and FY 85 and purchasing 106 TSP

2,000 secure telephones for the AMC/PM contractor community for complete installation by September 1985. In addition, the Army activated the CSA portable secure voice package and installed secure telephones in the quarters of key Army leaders.

Combat Support

The High Mobility Multipurpose Wheeled Vehicle (HMMWV) program used modifications to a newly designed, light, highly mobile vehicle to satisfy weapons carrier, communications, utility, and ambulance missions. It will replace the M274 Mule, the M561 Gama Goat, and some M151 Y4-ton trucks. In FY 84, the HMMWV program entered postproduction vehicle testing. The contractor delivered initial production vehicles in January 1984 and started shakedown testing. Initial production tests began at Yuma Proving Ground and Aberdeen Proving Ground in July 1984, and the U.S. Army Operational Test and Evaluation Agency started a Follow on Evaluation in September 1984. The Army conducted extensive integrated logistic support activities parallel to the testing program. In addition, the contractor developed squad carrier and Stinger weapon carrier prototypes and delivered them to the Army for evaluation.

In FY 83, the Army awarded a sole-source low rate initial production contract to the Pacific Car and Foundry Company for 15 M9 Armored Combat Earthmovers (ACE) and accepted delivery of them in FY 84. Initial production testing occurred from April through September 1984. Results indicated that the M9 had to demonstrate better operational reliability and effectiveness. Therefore, the Army withdrew a follow-on five-year contract, which was to be awarded in late FY 84, and directed that a follow-on evaluation be made. This evaluation program, by the U.S. Army Operational Test and Evaluation Agency, would identify and correct deficiencies, develop test parameters to evaluate operational reliability and effectiveness, and complete an independent evaluation. report before the fourth quarter of FY 85.

In FY 84, Commercial Utility and Cargo Vehicle production continued, and the Army deployed a total of 21,399 vehicles to all MACOMs as well as to the Air Force, Navy, and Marine Corps. The M939 5-ton truck program reached full production with 8,313 vehicles built and fielded to all MACOMs.

Initial production testing of the front axles and Grove Crane began in August 1984 on the Heavy Expanded Mobility Tactical Truck (HEMTT), 10-ton. In August 1984, the Army fielded HEMTTs to multiple launch rocket system units. The Army also modified the

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HEMTT contract in October 1983 to develop an improved wrecker. HEMTT production during FY 84 reached 2,500 trucks. The M.A.N. 10-ton truck supported the Pershing II and ground-launched cruise missile initial operational capability in Europe. M.A.N. built 83 trucks during FY 84.

During FY 84, the Army completed initial production testing of the first Ground Emplaced Mine Scattering System (GEMSS) dispensers from Engineering Systems Development Corporation and the M75 antitank mine. Later in the year, first article testing began on first production dispensers from AAI Corporation. Logisticians identified all dispenser provisioning items and awarded contracts to obtain them by the end of FY84. In August 1984, the Army awarded Engineering Systems Development Corporation a contract for 41 GEMSS dispensers for delivery starting in May 1986.

Munitions

During FY 84, production and fielding of the M753 improved 8-inch nuclear projectile continued on schedule. The Army conducted the second cycle of stockpile reliability testing during the fiscal year with joint test units and fuses meeting or surpassing test standards. However, during rocket motor testing in January 1984, four motors prematurely ignited for unknown reasons. At the end of FY 84, the exact cause of these failures remained unknown, and investigators suspended the test program pending identification and elimination of the problem.

The Army conducted numerous exploratory development activities on binary chemical agents, munitions materials, and prototype weapon design. These included studies on new binary agents or methods of defeating protective ensembles and equipment. Construction of the DF (intermediate agent for binary nerve GB) facility started at Pine Bluff Arsenal, Arkansas, with a schedule for completion in FY85. Scientists also investigated new or improved binary submunitions for the MLRS chemical warhead. The Army continued its engineering development support for the Navy's BLU-80/B BIGEYE bomb. Engineers also continued engineering options studies for commercial and/or government facilities to manufacture dicloro (DC) for the M697155-mm. projectile and CAL for the BIGEYE bomb.

Aviation

During FY 84, the third year of production, the Army awarded contracts to Hughes Helicopter, Inc., for 112 AH-64 Apaches and

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to Martin-Marietta for 112 Target Acquisition Designation Sights and Pilot Night Vision Sensors (TADS/PNVS). Hughes Helicopter, Inc., delivered the first production aircraft in February 1984, followed later in the fiscal year by 7 more of the Lot I production contract (11 helicopters). The remaining 3 arrived in October 1984.

In December 1983, the program manager assumed responsibility for funding Apache Combat Mission Simulators and awarded long lead time contracts for two simulators during the second quarter of FY 84. The Army's Apache aviator training program included pilot training in PNVS-equipped AH-1S Cobras. The Northrop Corporation began assembling these surrogate trainers in June 1984. The Army started integration verification on the first completed aircraft by the close of the fiscal year.

During FY 84, the Army continued to upgrade the AH-1S Cobra/TOW attack helicopter by deciding to integrate Forward Looking Infrared sensors with the TOW 2 to provide the Cobra with a night operations capability. The Cobra Fleet Life Extension (C-FLEX) program to upgrade twenty-two AH-1Ss and seven AH-16s to fully mission capable status began in January 1984 at the Corpus Christi Army Depot, Texas. On 26 September 1984, Bell Helicopter Textron, Inc., received a contract to modify these aircraft for the Army National Guard.

The performance and battle worthiness of the UH-60 Black Hawk in the Grenada operation were impressive. For example, one UH-60 successfully completed its mission although the pilot was wounded, the fuel tanks were punctured, most of the control instrumentation was destroyed, and the rotors were damaged. Since FY 84 was the last year of the FY 82-84 multiyear procurement airframe contract, the Army negotiated a follow-on FY 85-87 contract for awarding in October 1984. During FY 84, the Army fielded 154 aircraft: 52 to Germany, 84 to Korea, and 8 to Panama. Black Hawk total production reached 574 by 30 September 1984. Sikorsky Aircraft received approval to maintain a ten-aircraft-per-month delivery rate rather than the eight-per-month rate through FY 85.

The contractor completed the upgrading of the UH-60's corrosion protection to the Navy's SH-60B level and

incorporated it into all production deliveries beginning June 1984. The Hover Infrared Suppressor Subsystem completed both development and operational testing during FY 84 and awaited production readiness review in the first quarter of FY 85, with production incorporation planned for February 1987. The FY 84 Defense Appropriations Act directed that the Army integrate and qualify the Hellfire missile system on the UH-60A. As a result, the Army awarded a $7.9 mil-

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lion contract on 21 September 1984. A separate contract for integrated logistics support; producibility, engineering, and planning; and a technical data package will be added to it in FY 85. The Fiber Technology Corporation received a contract in December 1983 to produce a 230-gallon crashworthy external fuel tank for the UH-60A (Army), HH-60A (Air Force), and AH-64 (Army).

The CH-47 modernization program continued on schedule through the fourth year of production with 42 of the 88 contracted aircraft delivered by the end of the fiscal year. The modernized CH-47D arrived at Fort Campbell, Kentucky, in February 1984, on schedule. Its performance met or exceeded all design requirements, with an operations readiness of 78 percent against a standard of 70 percent for the aircraft during the fiscal year. Congress approved a five-year multiyear procurement of 48 modernizations per year for FY 85 through FY 89. The Army started negotiations for this procurement by the end of FY 84.

The Army conducted the Army Helicopter Improvement Pro gram (AHIP) Development Test II during July and August 1984 and began the Operational Test II in September. A Headquarters, Department of the Army, In-Process Review (IPR) assessed program status before awarding a low rate initial production contract. Based upon this assessment of subsystem test results and reasonable program maturity, including program cost, the IPR members recommended and received approval to award a contract for sixteen aircraft. In September 1984, Bell Helicopter Textron received the contract for airframe components and integration of the mast mounted sight.

During FY 84, the Army Acquisition Objective for C-12 Fixed Wing Utility Aircraft remained at 365 planes. However, the Army, because of higher priority requirements, omitted C-12 procurement from its FY 84 budget request. Nevertheless, Congress again added $11.7 million to the FY 84 defense authorization bill to purchase six aircraft. For the fiscal year, the C-12 maintenance and training contracts continued with Beech Aerospace Service, Inc., and the operational readiness rate for FY 84 averaged 92 percent.

The Army continued to monitor the V-22 (JVX) tilt rotor development program, which the U.S. Navy managed, and planned to procure 231 aircraft beginning in FY 91. The Operational and Organization Plan will be drafted during FY 85. The JVX, officially named the V-22 OSPREY, will enter full-scale development during July 1985 with a Defense Systems Acquisition Review Council Decision in October 1985.

The current Army fleet of Vietnam War vintage AH-1, UH-1, OH-S8, and OH-6 helicopters, nearly 30 years old by the mid-

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nineties, is becoming increasingly expensive to maintain and is not capable of fully performing its required mission in many parts of the world today. Since the mid-seventies, the Army has explored a concept of an advanced rotorcraft family that could meet its future requirements while maintaining a maximum degree of component commonality. The light helicopter (LHX) family is designed to meet the requirements of AirLand Battle doctrine and Army 21 as well as the demands of force modernization. The LHX, developed around two basic configurations, scout/attack (SCAT) and utility, will be a lightweight, highly reliable, and easily maintained weapon system that will achieve a high degree of standardization and a reduction in support costs. Both models will share common engine and dynamic components, as well as a fully integrated/automated cockpit arrangement. The LHX will give the Army a day/night/all weather, NBC-capable, self-deployable, and survivable weapon system for the next century. In FY 84, the Army attempted to narrow the scope and clearly define the LHX program and continued to explore and formulate operational concepts. In May 1984, an LHX Program Review established that scout/attack and utility configurations will be developed concurrently.

Missiles and Air Defense

The Army also pursued its development of the minimum smoke motor and the improved low visibility autopilot of the Hell fire missile system during FY 84. Engineers finished tests of first production models (first article tests) of the missile launcher and laser seeker and started first article tests on the missile. The Army awarded a third year production contract for 4,651 missiles for Army procurement and 220 missiles for Navy procurement

Congress provided funding for the existing low rate of production for the multiple launch rocket system (MLRS) including the procurement of 36,000 tactical rockets and 76 self-propelled launcher loaders. Congress also restored RDTE funding for the MLRS Binary Chemical Warfare in the FY 84 budget after deleting it from the FY83 Defense Appropriations Bill.

As a result of the MLRS Fire Control System Operational Testing III, the contractor designed a new version of the tactical software to increase capabilities, improve ballistic computations, enhance position-determining system accuracy, simplify operation, and correct minor deficiencies. Acceptance testing started on 18 January 1984 at While Sands Missile Range, New Mexico. The Army halted these tests in March 1984 because of a fuse problem. The contractor corrected

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the problem and tests resumed in October 1984. A 54 rocket follow on evaluation test program began in July 1984 to evaluate system software and accuracy with 48 rockets flight tested by the end of FY 84.

LTV Aerospace Corporation delivered 2,178 tactical rockets and 78 self-propelled launcher loaders to the Army, bringing total deliveries of each to 5,862 and 132 respectively. On 30 December 1983, the contractor exercised Option 1 to the multiyear contract, which provided $82,673,000 to acquire the advance materials required for the FY 88 procurement of 3,948 practice rockets and 72,000 tactical rockets.

MLRS fieldings continued on schedule during FY84 with CONUS tactical batteries deployed to FORSCOM units and two batteries sent to USAREUR for the 1st Armored Division, Erlangen, Germany, and the 3d Armored Division, Hanau, Germany. The Army fielded another battery to the 2d Infantry Division in Korea, which represented the largest single increase in -Eighth United States Army firepower since October 1978. To help improve support to the recently deployed batteries, the Army delayed the deployment of two POMCUS batteries from FY 84 until FY 85.

The Army awarded a fixed price incentive contract during FY 84 for 12 fire units and 440 missiles in the Patriot missile system. This brought the total number under contract to 43 fire units and 1,150 missiles out of a planned total program of 103 and 5,977, respectively. It received 66 missiles and 21 fire units during FY 84, and conducted operational testing in FY 84 that confirmed the system's reliability, readiness, and capability. At the end of the fiscal year the system awaited Army certification for fielding to Europe in FY 85.

Early in December 1983, the United States and the Federal Republic of Germany (FRG) entered a historic agreement for enhancing air defense for Central Europe. The agreement called for the United States to furnish Patriot missiles to FRG in return for FRG providing, operating, and maintaining Roland units to defend certain U.S. air bases in southern Germany. The first foreign sales of Patriot occurred in February 1984, when the Netherlands signed Letters of Agreement covering Patriot system hardware, spares, and training. In August 1984, the Japan Defense Agency announced its approval of Patriot as the replacement for its aging Nike Hercules.

On 16 May 1984, the Department of the Army terminated the U.S. Roland Air Defense System and replaced it with Chaparral. It based this decision solely upon affordability and supportability, because the Roland's system had demonstrated effectiveness and reliability. However, the Senate Armed Services Committee (SASC) included language in the Omnibus Defense Authorization Act of 1985

that supported the continued deployment of Roland in the Army National Guard. At the same time SASC recognized that the Army should eventually replace the Roland system because of the extra expense of operating a one-of-a-kind unit. The House Armed Services Committee agreed and the Army, on 2 July 1984, agreed that if Congress so directed it would take no irreversible actions that would make it impossible to field Roland in the National Guard. The contractors delivered the total procurement of 595 missiles and furnished the 27 fire units for testing. The Army fielded one Roland light battalion (5th Battalion, 200th Air Defense Artillery [Roland]) in the New Mexico National Guard during the fiscal year.

The Army continued to improve the Chaparral air defense system in FY 84 to enhance missile fuse performance, upgrade the master control indicator panel, and improve NBC protection. The Ford Aerospace and Communications Corporation received a production contract in January 1984 to provide the 9th Infantry Division with thirteen towed Chaparral systems. The towed system also will be fielded to the light divisions. Deployment to the National Guard started in FY 84, with the first tracked systems going to the New Mexico National Guard.

Increased Army efforts to maintain Hawk Missile System readiness led to creation of a special team of USAREUR, MICOM, and industry representatives to study the system and recommend methods to improve it. In addition, logisticians established an intensive management system to reduce the turnaround time of reparable parts. Program planning, budget formulation, and acquisition strategy began for supporting future Hawk deployment. Fielding of Phase II product improvements continued during the fiscal year with the first CONUS battery equipped in July. Meanwhile, contractors completed the Phase III preproduction model hardware for testing. In February 1984, the Hawk project office finished plans to transfer two Hawk battalions to the ARNG and awaited Army concurrence. The Army deployed Pershing II missiles to Europe in December 1983, replacing Pershing la missiles on a one-to-one basis, and also approved a Service Life Extension Program (SLEP) in FY 84 to keep the Lance missile system viable into the 1990s and started its first SLEP improvement program in June.

The Department of the Army awarded its final purchase of Basic Stinger in March 1984 and exercised its option to procure 515 Stinger-POST (Passive Optical Seeker Technique) rounds in September 1984. Production deliveries of Stinger-POST will begin in September 1985 followed by deliveries of Stinger-RMP (Reprogrammable Microprocessor) to U.S. Forces in July 1987. On 20

September 1984 Congress approved $47.4 million for Stinger-RMP program RDTE.

The U.S. Infantry School fielded new training devices for the Dragon antitank weapon system in FY 84. The Launch Effects Simulator provided a major improvement over previous trainers in simulating recoil, high noise level, blast overpressure, flame, smoke, debris, and short-term obscuration. After testing Dragon missiles stored since 1974 and 1977, respectively, the Army extended the shelf-life reliability period from ten years to twelve.

The Army received 18,000 TOW 2 missiles during FY 84 and the TOW 2 continued to maintain a reliability rating greater than 90 percent based upon Annual Service Practice, the Shelf-Life Reliability Program, and the Fly to Buy Program. The first TOW 2s reached Europe and Korea during the fiscal year as Army researchers continued the product improvement program to ensure the missile's effectiveness into the 1990s.

As a result of systemic quality control problems found by the Air Force and Navy on the AMRAAM (Advanced Medium-Range Air-to-Air Missile) and PHOENIX missile, the Army and Hughes Aircraft conducted a quality control inspection of the TOW 2 missile production line that resulted in closing the Hughes plant at Tucson, Arizona. At the end of FY 84, the plant remained closed although both Hughes and the Army expected it to reopen within a few months because of the contractor's improved quality control procedures.

The Army Chief of Staff approved the replacement of the Rattler medium antitank system with the Advanced Antitank Weapon System (AAWS) in February 1984. The AAWS-M program was undergoing ASARC evaluation and the Army

expected their decision on the program's scope and final plan during August 1985.

The Memorandum of Agreement on U.S. Army-U.S. Air Force Joint Force Development Process, dated 22 May 1984, mandated the creation of a joint statement of need for the joint Tactical Missile System (JTACMS). The statement delineated the services development programs, but required the components to be complementary. Both services issued this statement on 3 August 1984, thereby establishing the basis for either service separately to develop complementary weapons. Therefore, the Air Force terminated its on-site participation in the JTACMS project at the Army's Redstone Arsenal, Alabama.

The Antitactical Missile (ATM) System Project Office continued to study Patriot as an antitactical missile, but in February 1984 stopped due to a lack of FY 84 funding. They also extensively evaluated the Hawk for the same role. Afterward, the Army Missile Labo-

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ratory, following instructions from the VCSA, analyzed the system's capabilities to seek ways to overcome the identified deficiencies.

The Sgt York Division Air Defense (DIVAD) Gun System program received extensive publicity during FY84, much of it unfavorable. Four Secretary of Defense Performance Reviews examined system performance and reliability, the need for operational testing of production hardware, and the contractor's ability to meet production schedules. A Design Verification Test started in March and continued through the fiscal year to complete contractor system acceptance testing and further evaluate Sgt York performance. In response to the Secretary of Defense's direction to perform operational testing of production hardware, the U.S. Army Operational Test and Evaluation Agency conducted a Sgt York Limited Test at Fort Bliss, Texas, from 20 July to 2 August 1984, using military crews and three production units. A complete evaluation of the system in a realistic battlefield environment was not possible because of limited crew training and incomplete doctrine; contractor performance of all field maintenance except for government furnished equipment and supply actions; an inability to generate a totally realistic threat as outlined in approved threat documents; and range resources and safety limitations, which restricted tactical scenarios.

The first production fire unit scheduled for delivery in October 1983 was delayed until 13 March 1984 because of initial startup problems at the contractor's production and test facilities. Eventually, the contractor delivered seventeen fire units during FY 84. The Secretary of Defense, in September 1984, postponed the Army's exercise of the third production option for procuring 117 fire units (planned for 5 November 1984) until the Army could perform more realistic operational testing in FY 85.

The Army also countered two major DOD Inspector General (IG) actions concerning the Sgt York during FY 84. The first resulted from a DOD IG "hotline" complaint that alleged that the Army did not furnish the DSARC with all available test data. The second concerned a DOD IG audit that claimed the prime contractor negotiated lower prices with his subcontractors after the completion of Army negotiations. This cost the government $84 million in excess costs. At meetings held during May and June 1984, the Army provided extensive documentation to prove that the hotline complaint was untrue. In its response to the draft DOD IG audit, the Army explained in detail the factual errors that led to the IG findings.

Ground Combat

The Ml Abrams tank production rate continued its gradual increase to 3.5 tanks per day in September. *Table 13* details delivery rates:

TABLE 13 - M1 ABRAMS TANK DELIVERIES
(Fiscal Years 1980-1984)

	LATP 1	DATP 2	Combined Production
1980	16	-	16
1981	156	-	156
1982	370	70	440
1983	388	366	754
1984	390	387	777
Total	1,320	823	2,143

1 Lima Army Tank Plant.
2 Detroit Army Tank Plant.

The Army fielded 791 Ml tanks during the fiscal year to USAREUR and FORSCOM units and to POMCUS. In USAREUR, three squadrons and one battalion received the vehicles, thereby completing the fielding effort for the 11th Armored Cavalry Regiment and the 2d Armored Division (Forward). Deployment to the 2d Armored Cavalry Regiment began with the outfitting of one squadron. In addition, the Army completed delivery of four battalion sets for POMCUS.

In CONUS, the Army completed delivery of the full complement of Ml tanks to the 1st Cavalry Division with new equipment training scheduled to conclude in the second quarter of FY 85. In addition, the materiel fielding team finished new equipment training for the North Carolina National Guard and moved to Mississippi to prepare that state's National Guard for further M1 fielding. By the end of FY 84, a total of 19 Active and roundout battalions received MIS with another 8 battalion sets going into POMCUS.

In FY 84 the Army continued to reduce the tank program's operations and support costs through potential savings in unit training ammunition and fuel consumption. Other cost saving actions included R&D/technological innovations for the track and starter, revalidation of the tank's operating scenario, utilization of the combat vehicle evaluation program for M1 overhaul activities, and establishment of an Army policy restricting M1 annual usage to 850 miles. Furthermore, the Army began a study to determine the cost benefits of installing oil screens to prevent oil line clogging.

During the reporting period, Should Cost Reviews supported intensive negotiations for the tank program's major component procurements. For example, the fourth and fifth year production contracts showed associated hardware cost savings of $230,263. Multiyear procurement strategies also produced significant savings in hardware unit costs. For example, the current savings in FY 83-85 multiyear procurements amounted to $131.1 million or approximately $54,000 per tank.

At congressional direction, the DOD Cost Advisory Improvement Group and the Army conducted a study in December 1983 and January 1984 to determine the feasibility of obtaining the Ml's AGT-1500 engine from a second source. In March 1984, the Deputy Chief of Staff for Research, Development, and Acquisition recommended to the Under Secretary of Defense for Research and Engineering that multiyear contracts be awarded to AVCO (prime contractor) and a second source. The subsequent DOD recommendation to Congress called for awarding of a second source contract on a single year basis with successive variable quantity competitive buys from AVCO and the second source. Nevertheless, the FY 85 congressional legislation continued the prohibition on awarding a second source contract as stipulated in the FY 84 defense appropriations bill.

Successful completion of the power train durability test in December 1983 allowed Ml production to increase to a nominal rate of 70 per month. The tank's outstanding performance during the test finally laid to rest one of its major criticisms. The Army also focused attention in FY 84 on starting production of the Improved Ml (IPM1), which was co-produced with the Ml and featured an improved suspension system and enhanced survivability features. The production program was three months ahead of schedule and the first IPM1 will roll off the assembly line in October 1984. The overall production program of the Ml and IPM1, both with the 105-mm. main gun, called for 2,374 M1s and 894 IPM1s. The Ml program manager office began developing plans to enhance the M1s' fire control optics with new technology and to add an auxiliary power unit for peacetime use that will enable crew members to operate electrical systems

without running the tank's main engine.

In August 1984, the Army's extensive investigation of Texas Instruments-manufactured microcircuits uncovered the possibility that these devices, used in the Ml and M60 tanks, may have received incomplete testing at the factory. The Army approved waivers to permit use of the microcircuits and, to date, no component failure has been attributed to the suspect devices.

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The Abrams tank program included a number of improvements such as a 120-mm. smoothbore gun and ammunition, a hybrid NBC protective system with microcooling, and an armor modification package. The Ml tank incorporating these changes was designated the M1A1. The M1A1 completed Operational Test II in April 1984 and all essential Development Test II requirements in July. Fourteen prototypes traveled a total of 44,000 miles, fired a total of 12,000 main gun rounds, and met or bettered all RAM-D (reliability, availability, maintainability, and durability) requirements. The M1E1 ASARC III type classified the M1A1 Standard in August 1984. The new tank will weigh 63.0 tons and move at 41.5 mph.

The U.S. 120-mm. program to transfer the technology for the German-design cannon and ammunition neared completion and initial production started. The U.S. development of the XM829 Armor Piercing Fin Stabilized Discarding Sabot Tracer cartridge finished the full-scale engineering development phase and the program resolved major technical issues and completed the test phase of the Technology Transfer, Fabrication and Test program. The Army continued its successful transfer of the cannon technology during the fiscal year with Watervliet Arsenal fabricating 31 complete XM256 cannons and 56 spare tubes. Although the U.S.-made XM827 kinetic energy rounds with depleted uranium cores successfully passed accuracy and armor penetration tests, the Army decided not to produce them but to concentrate on the XM829 round.

Program managers continued development of the XM829 cartridge with a successful test in Panama of straight wall cartridge cases and a DTII test at Aberdeen Proving Ground. As a result of these tests the contractor made improvements in the round and received approval for producing 8,500. In September 1984, the Army awarded two contracts to develop, test, and demonstrate a successful design for the engineering development of the XM859 HEAT multipurpose cartridge.

The production of the M60A3 Tank Thermal Sight (TTS) tank for the Army concluded in FY 84 with a total of 1,052 M60A3 (TTS) tanks built since production started in FY 80. Production of M60A3 tanks continued for Foreign Military Sales (FMS) with the last tank scheduled for May 1986 delivery. The Army also increased its M60A3 (TTS) fleet through the M60AI tank conversion program and the M60A3 tank field retrofit program conducted by the Anniston Army Depot and the Mainz Army Depot. Depot field teams retrofitted all of the Army's 748 M60A3 tanks to the TTS configuration by the end of FY 84. In addition, the two depots converted a total of 1,391 M60AI tanks to the M60A3 (TTS). To date,

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the new production, retrofit, and conversion programs provided the Army with 3,191 M60A3 (TTS) tanks. The currently funded program calls for the conversion of an additional 2,209 M60A1 vehicles by FY 89. The Army did not plan on converting its remaining 1,952 M60Als to the M60A3 (TTS) configuration. Work on the M60 series tank product improvement program also continued during FY 84 to enhance tank performance in firepower, mobility, survivability, and RAM-D as well as to provide greater commonality and interoperability with the Ml tank.

The Army continued the 105-mm. Tank Gun Enhancement Program to extend the useful life of the fielded M60 and Ml tank fleets at a minimal cost. The program's goals were the development of an improved kinetic energy round, the XM900, and an extended (approximately 1.6 meters) 105-mm. gun tube, the XM24, to retrofit onto the M60A3 and Abrams tanks. During FY 84, the Watervliet Arsenal manufactured and delivered 14 XM24 tubes and 17 breeches for cannon, vehicle, and ammunition evaluations. The XM900 projectile received design evaluation testing during the fiscal

year. The Army completed the advanced development phase in February 1984 and initiated it for the Ml in March. Full-scale development will begin in November 1984 for the M60A3 and January 1985 for the Abrams.

The Army successfully and smoothly fielded the Bradley Fighting Vehicle Systems at Fort Hood and in Europe with a total of 1,336 vehicles delivered by the end of FY 84. The logistics support package functioned well and the Bradley proved itself operationally, with a reliability exceeding the Army's specifications. The program was mature, stable, well supported by Congress, and enthusiastically received by the soldiers. After delivery of the FY 84 procurement of 600 vehicles, production will be shifted to a modified Bradley. This major modification of the TOW 2 missile guidance subsystem will increase the crew's ability to fight effectively at night, in bad weather, and under smoke, dust, or electro, optical jamming conditions.

Under congressional pressure to reduce cost, the program manager actively sought ways to minimize Bradley costs, even though the Army procured the vehicles below budgeted levels. Several areas under investigation included the judicious application of multiyear and competitive contracting techniques and the opening to competition of production of the integrated sight unit and 25-mm. cannon.

The Ballistic Research Laboratory conducted a new test on the Bradley in 1984 to define the behind armor effects of shaped charged munitions hitting the vehicle. The test laid the groundwork for future plans to improve crew survivability against these munitions.

The Army continued development on several components of the mobile protected gun project during FY 84. These included a lightweight long recoil 105-mm. gun with muzzle brake, lightweight track and suspension systems, a lightweight hull structure, and appliqu armor. The resulting vehicle will be air deployable and provide light and motorized forces with an assault and antiarmor armored weapon.

The latest modifications of the venerable M113 family of vehicles included armored external fuel tanks, spall suppression liners, attachment points for appliqu armor, and an increased drive train capability. The Army planned on upgrading 6,500 to 8,000 M113 vehicles as well as incorporating the improvements in new FY 84 production vehicles, which will be fielded in FY 87. These modified vehicles will be designated M13A3. During the year development began on appliqu armor for the M113 and improvement of spall suppression technology for the Improved TOW Vehicles (ITVs) and Fire Integration Support Team Vehicles (FISTVs).

A modification program began in FY 84 to adapt all ITVs to fire basic TOW, Improved TOW, and TOW 2 missiles and finished 1,225 conversions during the year. All new production vehicles were TOW 2 capable. During hearings on the FY 85 budget, Congress added $27.0 million for procurement of ITV modification kits to upgrade the National Guard's assets. Deliveries will begin in March 1986.

The Army continued to assess the equipment requirements of the light infantry division and other light forces, such as the 82d Airborne Division, to meet their capability of rapidly deploying by air worldwide and operating unreinforced for an extended period against more heavily armed enemy forces. This mission underscored the need for towed artillery indirect fire support that provides increased range and lethality, high strategic and tactical mobility, ability to use existing ammunition stockpiles, and capability of its being fielded by FY 87. To meet this requirement, the Army investigated several 105-mm. howitzer systems and found that only the British L119 met all qualifications. In addition, the Army initiated a program to develop improved 105-mm. ammunition.

The medium (155-mm.) towed howitzer systems, utilized as a general support/corps artillery system, remained unchanged during FY 84. The Army continued to modernize the M114 to extend its range from 14.6 to 19.3 kilometers and to allow it to use upgraded ammunition. The Rock Island Arsenal delivered several M198s, significantly improved replacements for part of the M114 inventory, which were capable of firing rocket assisted rounds with a 30 kilometer range. Because of fiscal constraints, the Army was unable to procure more than a small number of M198s during FY84.

In FY 84, the Army completed the engineering design for the crew ballistic shelter to include improved NBC protection for the M110 (8-inch) self-propelled howitzer. This was part of a mid-life product improvement program for various M110 system upgrades to enhance reliability, availability, and maintainability. However, monetary constraints precluded immediate funding for these modernizations and the Army budgeted for them in the Five-Year Defense Plan.

M109A2 (155-mm.) self-propelled howitzer procurement funding restarted in FY 84 for 120 guns in FY 84 and 70 in FY 85. This will fulfill the Army's requirement. The Howitzer Extended Life Program and the Howitzer Improvement Program continued during FY 84 to extend the system's usefulness to 2000. As the result of an ASARC conducted in April 1984, the Army selected the most critical and cost effective improvements from both programs for consolidation into a product improvement program in FY 85.

In FY 84, the Army signed its second contract to procure 170 Field Artillery Ammunition Support Vehicles. The first vehicle from the first procurement contract will be fielded in the fall of 1985.

The United States and the United Kingdom completed joint development of the M252 81-mm. mortar in July 1984. The British manufactured the mortar tubes and bipod, while the United States fabricated the sight systems and baseplates. Under the licensing agreement with the United Kingdom, the Army will purchase 4,000 mortars as well as explosive rounds before production begins in the United States. Army scientists developed smoke, illumination, and 1/10 range training rounds concurrently with the mortar development program. The Army will replace the M29 system with the M252 and will field it company-level in the standard and mechanized infantry H-series TOE units and at battalion-level in the light infantry, airborne, air assault, and mountain divisions.

The Deputy Secretary of Defense, on 6 October 1983, directed the Army, as executive agent for the Armed Services, to begin a program for procuring the authorized acquisition objective of the joint services' requirement for a new 9-mm. personnel defense system. The Army issued a request for test samples on 6 November and received 30 test samples from each of eight United States and foreign manufacturers on 31 January 1984. Testing of these weapons, using the M119M1 .45 caliber pistol as a baseline, began on 1 February 1984. The Army evaluated thirteen elements during the testing, which ended in September, and issued a final report on 24 September 1984.

Planners expected to begin procurement of the 9-mm. Beretta in December 1984.

International Research and Development

In November 1982, the U.S. Secretary of Defense advanced a proposal to improve the conventional defense capabilities of NATO by focusing on emerging technologies that would be developed by the early 1990s. During FY 84, the emerging technologies program crystallized into a set of eleven NATO projects, three of which were of particular interest to the U.S. Army: remotely piloted vehicles, multiple launch rocket system, and 155-mm. precision guided munitions.

The International Office, Assistant Deputy Chief of Staff for Research, Development and Acquisition, worked closely with the Department of Defense and the Netherlands to achieve an agreement on the use of the Netherlands Wind Tunnel as part of the U.S.-Dutch Patriot offset arrangement. Members of the International Office expected negotiations conducted between the United States and the Netherlands in March 1984 to lead to the signing of a contract in December 1984.

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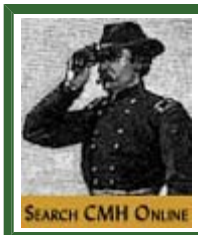

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Organization and Management

Field operating agencies (FOA) execute and implement policies formulated by their Army staff proponent agency and produce guidance on these policies for the Army. In 1974, FOAs accounted for more than 32,000 personnel. Since then, the number of FOAs increased by eight and their strength by 7,490. In FY 84, 13 of the 15 Army Staff agencies were assigned 57 FOAs. However, unlike TOE units, FOA missions do not exist in priorities. When new FOAs are created, the existing ones are neither reduced in size nor disestablished.

Reorganizations

On 11 January 1984, the Director of the Army Staff asked Army Staff agency chiefs to submit plans to cut their staffs by 10 percent and report on the reduction's effect on their field operating agency capabilities. Office of the Chief of Staff, Army, management personnel analyzed these submissions and the Director of the Army Staff reduced FOAs by nearly 1,200 military and civilian spaces. The agencies completed their force reduction on 30 September 1984. Since 1975, Congress has taken a special interest in containing the growth of management headquarters. In the FY 84 Defense Authorization Act, Congress directed that management headquarters be reduced by 5 percent from the levels imposed in the FY 84 President's Budget. The Army complied by eliminating 1,260 manpower authorizations (spaces) in Army Management Headquarters Activities (AMHA) for FY 84 and 1,271 AMHA authorizations for FY 85.

Congress directed the Army to reorganize its information management operations to have a single "information manager." As a result, General Order 26, 25 July 1984, established the Office of the Assistant Chief of Staff for Information Management (OACSIM) as an Army General Staff Agency and the U.S. Army Information Systems Command (USAISC) at Fort Huachuca, Arizona. Composed of assets from the Command, Control, Communications, and. Computer Directorate of ODCSOPS; the Management Directorate of OCSA; and the Adjutant General Center, OACSIM began operations on 27 July 1984. It assumed Army General Staff responsibility

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for the tactical, strategic, and sustaining base aspects of automation, telecommunications, records management, publications and printing, and audiovisual operations.

The USAISC consolidated the assets of the U.S. Army Communications Command; the U.S. Army Computer Systems Command; the U.S. Army Computer Systems Selection and Acquisition Agency; and the U.S. Army Audio Visual Center on 15 May 1984. In conjunction with OACSIM it will modernize the Army's information management, command and control, and communications systems. In addition, it will provide air traffic control support to the Army.

During FY 84, the U.S. Army Materiel Development and Readiness Command (DARCOM) was redesignated the U.S. Army Materiel Command (AMC), its name from its founding in 1962 until 1976.

In early October 1983, TRADOC forwarded to the Office of the Chief of Engineers (OCE) a draft Case Study and Justification Folder for the relocation of the Engineer School from Fort Belvoir, Virginia, to Fort Leonard Wood, Missouri. The folder presented all of the economic data developed for the realignment study as well as the data contained in the backfill study for Forts Belvoir and Meade. The total cost of proposed construction to support the relocation of the Engineer School equaled $61.75 million at Fort Leonard Wood, exclusive of family housing. The estimated net first year cost of realignment ranged from $66.21 million to $88.49 million, depending upon the backfill alternative chosen for Fort Belvoir. OCE forwarded its comments on the proposed realignment to TRADOC on 19 October 1983. In September 1984, TRADOC revised the cost estimate for construction at Fort Leonard Wood to $36.62 million. Dropping construction of an engineer museum caused the reduction in the cost estimate.

Under initial relocation plans, HQ,, Intelligence and Security Command, elements from Arlington Hall Station and Fort Meade would move to Fort Belvoir. The HQ,, Criminal Investigation Command, or HQ, 1st Region Criminal Investigation Command could use the vacated space at Fort Meade. The Corps forwarded a Backfill Study Addendum to TRADOC on 31 August 1984.

The Cohesion, Operational Readiness, and Training Program, described in detail in previous DAHSUMS, added 42

company/battery-size units with 4,396 soldiers and disestablished 15 units during the fiscal year. As a part of the planned expansion of the New Manning System (NMS) the first Cohesion, Operational Readiness, and Training battalion (2d Battalion, 5th Field Artillery) was created at Fort Riley, Kansas. The program continued to plan for the activation of additional company/battery-size units and seven more battalions

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during FY 85. In the following fiscal year, the eight Cohesion, Operational Readiness, and Training battalions will begin the NMS Battalion Rotation Program.

The U.S. Army Regimental System paired CONUS battalions with OCONUS battalions in non-tactical regiments with their personnel affiliated with that regiment for their entire period of service. The Army believed the affiliation with a regiment that possessed a distinguished lineage would foster a sense of belonging in its personnel and improve the unit's esprit de corps. Fifteen of the proposed 64 combat arms regiments had been created by the end of FY 84, which affiliated 27,000 soldiers. On 29 June 1984, the Army changed the affiliation policy and suspended the affiliation of first-term soldiers to a specific regiment. This allowed soldiers to experience service in several regiments before their first enlistment and commitment to a particular regiment. The Army announced, on 22 August 1984, the expansion of the honorary positions in the U.S. Army Regimental System with the addition of an Honorary Sergeant Major of the Regiment.

Functional Area Assessments (FAA) integrated reviews of Headquarters, Department of the Army-level short-range plans and programs, started in early FY 84. FAAs were divided into two categories: functional branch assessments and management area assessments. While the former was a biennial analysis of a branch of the Total Army such as Infantry, the latter analyzed, on a schedule determined by the VCSA, specific functions such as depot maintenance. FAAs allowed experienced officers to examine, in detail, the Army's progress in force integration to identity and rectify problems early in the process. In the long run, FAAs will ensure that new equipment, personnel, training, and sustainment requirements are determined and assimilated into the total force more effectively and efficiently. During FY 84, the Army conducted 15 FAAs, which examined Field Artillery, Aviation, Military Intelligence, Air Defense Artillery, Armor, Infantry, Ordnance, Quartermaster, Military Construction, Engineers, Total Package Fielding, Chemical, Depot Maintenance, Terrorism, and Communications/Electronics.

Financial Management

Table 14 presents an audit trail of the FY 84 budget from President Reagan's budget submission through final congressional action.

Overall obligation (appropriated funds reserved for expenditure in payment of an order placed, contract awarded, or service received) performance was below the DA planned level for FY 84.

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TABLE 14 - DEPARTMENT OF THE ARMY ACTIONS ON THE FY 84 BUDGET
BA/TOA ($ In millions) [1]

	President's Budget		President's Budget	Authorization	Appropriation		Appropriation	
	31 Jan 1983	Amendments	17 May 1983	Enacted [4] P.L. 98-94 15 Sep 1983	Enacted [4] P.L. 98-212 8 Dec 1983	President's Supplemental Request	Enacted [3,4] P.L. 98-396 22 Aug 1984	Total Appropriation Basic & Supplemental
MPA	15,214.7	+23.1	15,237.8	-	15,048.5	376.6	340.3	15,388.8
RPA	1,386.5	+ 1.8	1,388.3	-	1,361.2	34.3	-0-	1,361.2
NCPA	1,914.8	+2.3	1,917.1	-	1,883.0	49.9	-0-	1,883.0
OMA	17,867.8	-212.0	17,655.8	17,523.1	17,054.8	263.6	242.7	17,297.6
OMAR	662.8	-8.0	654.8	685.5	683.9	9.0	8.5	692.4
OMARNG	1,135.0	-17.0	1,118.0	1,180.2	1,170.2	19.2	18.2	1,188.4
NBPRP	.9	-0-	.9	.9	.9	-0-	-0-	.9
Procurement	[2]	(-221.0)	(18,971.1)	(18,052.6)	(17,291.5)	(-0-)	(-0-)	(17,291.5)
Total BA	(19,192.1)							
TOA	(19,192.1)	(-221.0)	(18,971.1)	(18,052.6)	(17,473.1)	(-0-)	(-0-)	(17,473.1)

Aircraft BA	3,472.1	-31.0	3,441.1	3,331.4	3,214.0	-0-	-0-	3,214.0
Aircraft TOA	3,472.1	-31.0	3,441.1	3,331.4	3,214.0	-0-	-0-	3,214.0
Missiles BA	3,088.5	-28.0	3,060.5	2,903.4	2,822.7	-0-	-0-	2,822.7
Missiles TOA	3,088.5	-28.0	3,060.5	2,903.4	2,855.3	-0-	-0-	2,855.3
W&TCV BA	4,934.4	-44.0	4,890.4	4,734.5	4,594.1	-0-	-0-	4,594.1
W&TCV TOA	4,934.4	-44.0	4,890.4	4,734.5	4,743.1	-0-	-0-	4,743.1
Ammunition	2,334.2	-23.0	2,311.2	2,147.1	1,980.1	-0-	-0-	1,980.1
Other	5,362.9	-95.0	5,267.9	4,836.2	4,680.5	-0-	-0-	4,680.5
NGE	-0-	-0-	-0-	100.0	-0-	-0-	-0-	-0-
RDT&E	6 4,792.2	-81.0	4,711.2	74,204.6	4,199.1	-0-	-0-	4,199.1

	President's Budget		President's Budget	Authorization	Appropriation		Appropriation	
	31 Jan 1983	Amendments	17 May 1983	Enacted [4] P.L. 98-94 15 Sep 1983	Enacted [4] P.L. 98-212 8 Dec 1983	President's Supplemental Request	Enacted [3,4] P.L. 98-396 22 Aug 1984	Total Appropriation Basic & Supplemental
Army Stock Fund	408.6	-0-	408.6	-	388.6	-0-	-0-	388.6
Army Conventional Ammunition. Stock Fund	-0-	-	-0-	-	-0-	-0-	-0-	-0-
Army Industrial Fund	-0-	-0-	-0-	-	-0-	-0-	-0-	-0-
Summer Olympics	50.0	-0-	50.0	50.0	45.0	-0-	-0-	45.0
Subtotals Excluding BA	[6] (62,625.4)	(-511.8)	(62,113.6)	[7] (41,696.8)	(59,126.7)	(752.6)	(609.8)	(59,736.4)
MILCON Act [5] TOA	[6] (62,625.4)	(-511.8)	(62,113.6)	[7] (41,696.8)	(59,308.3)	(752.6)	(609.8)	(59,918.0)
Trust Funds BA	.1	-0-	.1	-	.1	-0-	-0-	.1
Trust Funds TOA	-0-	-0-	-0-	-	-0-	-0-	-0-	-0-
Offsetting Rects BA	-218.9	-0-	-218.9	-	-218.9	-0-	-0-	-218.9
Offsetting Rects TOA	-0-	-0-	-0-	-	-0-	-0-	-0-	-0-
MILCON Act Total	(2,723.9)	(-30.9)	(2,693.0)	(2,572.5)	(2,541.5)	(3.8)	(-0-)	(2,541.5)
MCA	1,375.0	-5.9	1,369.1	1,157.5	1,184.1	-0-	-0-	1,184.1
MCAR	52.7	-1.0	51.7	54.7	54.7	-0-	-0-	54.7
MCARNG	55.3	-1.0	54.3	66.8	67.6	-0-	-0-	67.6
Fam. Hsg. Con. Army	186.3	-0-	186.3	173.1	172.7	-0-	-0-	172.7
Fam. Hsg. Opn. & Debt	1,054.6	-23.0	1,031.6	1,120.3	1062.3	3.8	-0-	1062.3
Grand Total [5]	[6]	(-542.7)	(64,587.8)	[7] (44,269.3)	(61,449.3)	(756.4)	(609.8)	(62,059.1)

BA	(65,130.5)						
Grand Total TOA	[6] (65,349.3)	(-542.7)	(64,806.6)	[7] (44,269.3)	(61,849.3)	(756.4)	(609.8)	(62,459.5)

1 BA = TOA unless otherwise stated.
2 ( ) = Totals.
3 MILCON Authorization P.L. 98-115, dated: 11 Oct 83; no supplemental authorization act.
4 MILCON Appropriation P.L. 98-116, dated: 11 Oct 83. MILCON supplemental appropriation act same as DOD act.
5 Detail may not add totals due to rounding.
6 Does not include Army RDT&E share of Special Foreign Currency Account.
7 Authorization figures include Army RDT&E share of Special Foreign Currency Account.

However, the outlay (actual payment of obligated funds) performance was very good, with FY 84 actual outlays only $49 million or 0.1 percent below the planned level. These performances are summarized in *Table 15.*

TABLE 15 - 30 SEPTEMBER 1984 OBLIGATION AND OUTLAY STATUS
($ In millions)

	Obligations			Outlays		
	Plan	**Actual**	**Variance**	**Plan**	**Actual**	**Variance**
Military Personnel.	$18,902	$18,681	-$221	$18,464	$18,327	-$137
Operations	21,348	21,505	157	18,288	18,362	74
Procurement	19,427	17,387	-2,040	12,972	13,577	605
RDTE	5,210	4,954	-256	4,030	3,812	-218
Construction	2,114	2,148	34	859	963	104
Family Housing	1,246	1,270	24	1,047	1,012	-35
Funds/Accounts	14,441	13,321	-1,120	44	-398	-442
Total	82,688	79,266	-3,422	55,704	55,655	-49

As a result of the increase in the defense budget request for FY 85, the increasing congressional concern on the expanding federal deficit, and reports of procurement abuses, the FY 85 Department of Defense budget request met immediate opposition when it was submitted. *Table 16* gives a breakdown of the FY 85 budget request and compares it to the FY 83 and FY 84 Defense Budgets.

TABLE 16 - FY 85 DEFENSE BUDGET FINANCIAL SUMMARY
(TOA $ in billions)

DOD Component	FY 83	FY84	FY85
Department of the Army	$57.6	$62.6	$77.9
Department of the Navy	81.5	82.0	101.3
Department of the Air Force	73.8	86.3	108.7
Retired pay	16.4	17.3	-
Defense Agencies/OSD	9.4	10.9	[1] 17.8
Total Direct Program (TOA)	238.7	259.1	305.7

1 Includes FY 85 Pay Raise & BMD (SDI) Funds.

The $77.9 billion Army request represented a real budget growth of approximately 10.2 percent. FY 85 marked the first time that the retired pay accrual (funds to pay the cost of future military retirees) was included within each service's budget and this added $6.7 billion to the Army's budget request. While significantly increasing the size of the request, it did not enhance military capability. For FY 85, the

accrual overstated the Army's real growth. Fortunately, this was a onetime distortion of budget totals and military pay trends, since each future budget will contain the retired pay accrual. *Table 17* shows details for the Army's retired pay accrual.

TABLE 17 - ARMY RETIRED PAY ACCRUAL
(In millions of $)

Retired Pay Accrual	TOA	BA	Outlays
Military Personnel, Army	$5,325	$5,325	$5,310
National Guard Personnel, Army	828	828	756
Reserve Personnel, Army	560	560	516
Total	6,713	6,713	6,582

The congressional debate over the DOD budget focused on the federal deficit, conventional forces, and the United States role in Central America. However, national attention centered on federal spending and President Reagan and congressional leaders, in the April "Rose Garden" meeting, agreed to cut government expenditures. They reduced the DOD budget by $13.9 billion. The final Army appropriated FY 85 budget is depicted in *Table 18.*

TABLE 18 - FY 85 ARMY BUDGET SUMMARY
(TOA in millions of $)

Appropriations	FY 1984	FY 1985	[1] Real Growth
Military Personnel	$18,601	$26,031	2.1 %
Operation & Maintenance	20,295	21,766	3.6%
Procurement	17,230	19,425	7.4%
Research & Development	4,225	4,349	-1.3%
Military Construction	1,479	1,904	30.2%
Stock Fund	389	366	-10.4%
Total	69,219	73,841	4.2%

1 Real Growth Includes Military Retired Pay Accrual.

During FY 84, the Quick Return on Investment Program (QRIP), the Productivity Enhancing Capital Investment Program (PECIP), and OSD Productivity Investment Funding (OSD PIF) invested $89 million, which is expected to save $112 million.

The Army led all services in the number of Value Engineering Change Proposals (VECP) submitted and approved as well as in total VECP savings. Total Value Engineering Savings increased from $405.3 million in FY 83 to $477 million in FY 84, an 11.7 percent in-

crease. Savings from the approval of 1,101 in-house value engineering proposals produced an estimated one year net savings/cost avoidance to the government of $413.0 million. Additional savings of $64.0 million resulted from 420 VECPs submitted on Army contracts. The overall return of investment from FY 84 VE actions was $15 for each dollar invested. The Army will start Value Engineering Programs at TRADOC and FORSCOM in FY85.

During FY 84, the Army completed 56 cost studies of in-house activities, 31 of which determined that the status quo was more advantageous than contracting out. The remaining 25 studies indicated that the activities could be contracted out at a lower expense to the Army. As a result, the Army released 1,016 civilian and 574 military specks for other Army requirements and estimated a three year savings of $24.9 million. However, the Army will not complete all of its Commercial Activities Act studies by the end of FY 87. This is due to congressional concerns and legislative actions, rapid turnover of key personnel, a shortage of properly trained personnel, and the large number of cost studies remaining to be completed.

The Army's Nonappropriated Funds Financial Management NAF centralized cash management system pooled and invested NAF cash not needed for installation operations. The interest was returned to Nonappropriated Fund Instrumentalities depositors. *Table 19* below summarizes the system's FY 84 activities.

TABLE 19 - NAF CENTRALIZED CASH MANAGEMENT AND INVESTMENTS PROGRAM ACTIVITIES
(In millions)

Fiscal Quarter	Total Deposits	Interest Rate Percent	Total Interest Paid
1st	$309.5	9.0	$7.0
2d	306.3	9.25	7.0
3d	325.4	9.375	7.5
4th	345.7	10.25	8.9
Total	1,286.9		30.4

Table 20 presents details of NAFI earnings during FY 84.

TABLE 20 - NAFI EARNINGS DURING FY 84
(In millions of $)

NAFI Category	Total Revenue	Net Income
II	$166.3	$32.8
III	219.9	2.8
AFRCs	50.0	3.1
V [1]	269.2	8.9
VI	30.2	1.1
VII TRADOC	-	(3.2)
VIII	76.7	12.3

1 69% of Army clubs were profitable. Beverage sales dropped $5.7 million from FY 83.

Armed Forces Recreation Centers (AFRO) and Army hotels received total revenues of $55.2 million, a 12 percent increase over FY 83. Net income as a percentage of total revenue rose to 5.5 from FY 83's 3.3. *Table 21* gives more details.

TABLE 21 - AFRC AND ARMY HOTEL EARNINGS

Facility	Total Revenue	Net Income	Change
Hale Koa Hotel	$15,400,000	$457,400	3.0 %
Kilauea Military Camp	1,700,000	41,000	2.5 %
Naija Hotel	2,000,000	306,800	15.6 %
AFRC Europe	20,800,000	2,400,000	11.3 %
Thayer Hotel	5,100,000	(17,300)	(0.3)%
Seoul Garden Hotel	10,200,000	(100,200)	(1.0)%

The Army MWR Fund's (AMWRF) major sources of revenue were interest income and the Army's portion of Army and Air Force Exchange Service dividends. Starting in FY 84, the AMWRF stopped its support of Installation/MACOM Morale Support Programs' recurring operating expenses and capital expenditures under $300,000 and began funding NAF major capital construction. The current NAF construction program had a $2.0 billion backlog and AMWRF programmed over $236.2 million over the next three years to catch up on construction projects. The installation/MACOM commanders and their MWR staffs worked hard to pay their own operational and Capital Purchases and Minor Construction (CPMC) bills, which allowed the AMWRF to fund capital construction projects. *(See Table 22.)*

TABLE 22 - AMWRF FINANCIAL SUMMARY
(In millions)

Item	Dollars	Dollar change over 1983
Total Revenue	79.3	7.8
AAFES Dividends	65.6	4.5
Interest Income	9.1	1.8
Expenses	52.7	(6.0)
Operating Dividends	-	(2,6)
CPMC	-	(10.8)
Major Construction	-	7.6

The NAF insurance rates for self-insured property remained the same or were reduced as a result of an improved claims and loss record. Likewise the Workers Compensation Program realized a reduction, for the third consecutive year, in premiums of 11 percent for the United States and 17 percent for overseas. However, insurance companies substantially raised rates for General Tort (liability) and Excess Aircraft Liability. The NAF General Tort record increased the number and cost of claims. One example was the payment of $157,858 in FY84 to settle a claim by an officers club patron who was seriously burned on the face and neck during the preparation of a flambe dessert in December 1981. The Excess Aircraft Liability insurance premium increased because of poor loss record for Army flying clubs. During FY 84, two serious aircraft accidents killed six people. As a result, the insurer raised the commercial liability policy premium and the U.S. Army Safety Center helped to develop an Army-wide program of safety initiatives for flying clubs.

The U.S. Army Audit Agency (USAAA) investigated problems at numerous installations and issued reports during the year that showed an estimated $733 million could be saved. The Army agreed with USAAA recommendations, which saved $444 million. An example of the savings that could be achieved by auditing program results was the audit of the Modern Technology Engine Program. An analysis showed that the engine development would be completed six years before the airframe. By canceling plans to acquire the prototype engines, the Army saved approximately $53 million. In addition, members of the agency discussed with field commanders problems with civilian personnel procedures, research and development activities, acquisition and use of computers, as well as other problems which the local commander could correct. Usually these problems could be alleviated by following Army Guidance.

Management and Information Systems

The Army emphasized the improvement of installment management during FY 84 by developing a Standard Installation Organization; revising the Army Installation Management Course; participating in peer competition analysis, Commander-in-Chief's Award for Installation Excellence, and the OSD Model Installation Program; and coordinating innovative base operations support management techniques with its sister services.

Project VIABLE (Vertical Installation Automation Baseline Project), an automatic data processing modernization program, operated at 47 installations throughout CONUS, Alaska, Hawaii, and Panama. VIABLE replaced obsolescent Base Operating Information Systems, which performed nontactical administrative, logistical, and financial information management. By linking each installation's computer to one of five large contractor-operated regional data centers (three established in FY 84), the Army replaced a stand-alone installation system with a service-wide system capable of facilitating data and resource sharing to improve base operations.

The Army Worldwide Military Command and Control System (WWMCCS) Information System (AWIS) continued to modernize its portion of the joint WWMCCS by aligning and implementing the Army's service and joint WWMCCS Information System requirements. WWMCCS, the command and control network of the National Command Authority, provided daily planning as well as operational information and assessments to key authorities and military commanders on the entire spectrum of crisis and conflict actions up to nuclear war. The Army continued to add twenty-five terminals per year to the system.

The Army completed and began testing the Force Structure Analysis System, an automated system designed to assist HQDA command managers create and better employ work forces. The system will begin operations after the installation of TEMPEST terminals.

The Office of the Deputy Chief of Staff for Operations and Plans used the Structure and Composition System (SACS) to transfer

personnel and equipment requirements to DCSPER/MILPERCEN, DCSLOG/AMC, Corps of Engineers, and DCSRDA for planning and programming personnel accession, training, and distribution; equipment acquisition and distribution; military construction; and related budgets. In an effort to enhance SACS's operation, the Army awarded a contract to redesign it.

The Army Authorization Documents System (TAADS) provided documentation for organizational structure and unit requirements, authorization for personnel and equipment, and a management re-

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porting capability. The system operated at 17 MACOMs and 68 installations during FY 84. Among the numerous improvements made to the system, one of the more important was the Project VIABLE equipment enhancements within CONUS. The Army upgraded three MA COMB and 31 installations by the end of FY84 and continued to plan for replacing TAADS with the Vertical Force Development Management Information System. TAADS use increased during the year with over 3.5 million update transactions conducted at HQDA-

The Decentralized Automated Service Support System (DAS3), a tactical transportable computer system, automated manual operations or upgraded automated operations of combat service support units. The system used several functional software systems such as supply, maintenance, personnel, finance, ammunition, transportation, and port operations. The DAS3 was composed of two models which differed only in processing capacity and communications capability.

The A -Model, the smaller of the two, supported Active and Reserve Component nondivisional logistics supply and maintenance units as well as medical supply, optical, and maintenance (MEDSOM) units. During FY 84, the Army completed fielding the A -Model and had 211 in its inventor: The B-Model was approximately twice the size of the A -Model and had an inherent communications capability. It supported theaters, corps, divisions, separate brigades, personnel units, and Military Traffic Management Command (MTMC) ports. Fielding of the B-Model began during October 1983, and 58 entered the Army's inventory during the fiscal year.

Significant Records and Publications Management Developments

An interdisciplinary team of office automation specialists studied Military Personnel Office operations in CONUS and USAREUR during the year. Office planners will use the results of the review of current operations, existing applications of office automation technologies, and work load volumes to develop office automation functional descriptions and systems requirements for the redesigned Army wide military personnel system.

The Reduction of Administration Work Load Task Force published its second "Baseline Report" identifying 29 publications, 21 forms, and 21 reports that could be combined or removed from company-level units. Its first report, presented in early FY 84 had already deleted 116 publications, 8 forms, and 42 reports.

The Modern Army Recordkeeping System (MARKS) will replace The Army Functional File System (TAFFS), in use since the early 1960s, in the near future. MARKS identifies record informa-

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tion with the same number as the directive that prescribed it (usually an Army Regulation or DA Pamphlet). The new system was successfully tested at the TOE unit level (5th Battalion, 73d Armored Regiment, 194th Armored Brigade, Fort Knox, Kentucky) from July 1983 to June 1984. A one-year pilot test started on 1 January 1984 at the installation headquarters level (U.S. Army Armor Center and School, Fort Knox).

The Army received 24,734 reportable requests for records and other information under the Freedom of Information Act (FOIA) during FY 84. Although the Army collected $148,365 for search and copying costs, it expended 124 person years at a gross cost of $1,966,172 to process the requests.

The Government Printing Office (GPO) awarded its largest contract (Program 4005) on 9 February 1984 to joint venture organization Fry Communications, Inc., of Mechanicsburg, Pennsylvania, and Info Conversion of Woodbury, New York. Program 4005 published all Army regulations and standards pamphlets with sophisticated typography and printing services. This included electronic changes to publications from remote locations. To support this system, the Army installed 27 editorial microprocessors within CONUS, and GPO received the first electronic change from St. Louis, Missouri, on 24 August 1984. By the end of FY 84, Program 4005 produced 7 handbooks, 17 ARs, and 1 DA Pamphlet. The VCSA noted the program's success and directed that it be

expanded to include training and equipment publications. As a result, GPO successfully published FM 1-100, *Combat Aviation Operations,* on 28 September 1984, as a test publication. The Army and GPO planned to publish two more field manuals and a technical manual under the new format in FY 85.

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Personnel

The demands of force modernization, consequent introduction of new equipment into units, and the disparity in conventional forces between the U.S. and the Soviet Union demanded that the Army recruit and retain more highly qualified personnel.

Military Strength

At the close of FY 84, the total Active Army strength exceeded the programmed strength of 780,000 by 180 persons. The average strength in terms of man-years was 782,200. *(See Table 23.)*

TABLE 23 - TOTAL ACTIVE ARMY STRENGTH

	Programmed	Actual	Difference
Officer	108,412	107,883	-529
Enlisted	667,169	6671711	+542
Cadet	4,419	4,586	+167
Total	780,000	780,180	+180

Enlisted Personnel

Total Army recruiting succeeded in FY 84 as the U.S. Army Recruiting Command (Active Army and Army Reserve) and the In-Service Recruiting Program (Army Reserve) met their total accession objectives, while the ARNG met its objectives only partially during the year. *Table 24* provides a breakdown of recruiting statistics.

TABLE 24 - FY 84 RECRUITING STATISTICS
Production

	NPS (M)	NPS (F)	PS	Total
Active Army				
MSN	114,164	17,189	10,400	141,753
ACH	114,511	17,191	10,614	142,316
Percent	100.3	100.0	102.1	100.4

TABLE 24 - FY 84 RECRUITING STATISTICS - Continued
Production

	NPS (M)	NPS (F)	PS	Total
USAR				
MSN	26,375	8,100	27,650	62,125
ACH	22,732	5,806	33,373	61,911
Percent	86.2	71.7	120.7	99.7
ISR TPU				
MSN			7,000	7,000
ACH			7,585	7,585
Percent			108.4	108.4
ARGN				
MSN	54,000	6,000	50,000	110,000
ACH	43,345	2,824	39,371	85,540
Percent	80.3	47.1	78.7	77.8

Recruiting success is measured not only quantitatively but also qualitatively. Fiscal year 1984 proved to be highly successful in this regard. Congress defined quality recruits as those scoring above the 50th percentile on the Armed Forces Qualification Test (AFQT) of the Armed Services Vocational Aptitude Battery (ASVAB) and having at least a high school diploma. Congress also restricted substandard accessions by allowing no more than 20 percent of male recruits to score below the 30th percentile (Test Category IV) while insisting that at least 65 percent of all non-prior service male accessions must be high school graduates. The Army applied these criteria to all three of its components and established goals beyond those mandated by Congress. Moreover, the Army implemented yet another qualitative yardstick by establishing the objective of obtaining 63 percent of its non-prior service recruits from those applicants who scored in the upper half of the AFQT tested population (AFQT Category I-III A). These recruits would serve as the Army's source of future NCOs. The following table gives detailed figures on recruit quality. During FY 84, the Active Army finished putting into operation the concept of distributing quality recruits to all military occupational specialties while the Reserve began implementation. By 30 September 1984, 272 of 331, Regular Army MOS or 82.2 percent, met or exceeded their Test Category I-III A target floors, while 297 or 89.7 percent met or fell below their Test Category IV target ceilings. *(See Table 25.)*

TABLE 25 - QUALITY OF RECRUITS

	% NPS TC I-III A	% NPS HSDG	% NPS TC IV
Active Army			
MSN	63.0	90.0	10.0
ACH	63.4	90.8	10.2
USAR			
MSN	57.5	75.5	12.7
ACH	50.4	77.1	11.8
ARNG			
MSN	[1] No Data	68.5	12.0
ACH	[1] No Data	69.0	6.9

1 ARNG did not account for I-III A separate from IIB.

The Army increased its emphasis on retention of quality soldiers. The first priority of the program was the assignment of troops to the Reserve Troop Program Units. Next was the enlistment of soldiers without military obligation into the IRR. The last priority was the referral of personnel to National Guard recruiters in the various states. *(See Table 26.)*

TABLE 26 - IN-SERVICE RECRUITING PROGRAM

	Target	% Fill	Assignments
Troop Program Units	[1] 7,000	108	7,585
IRR	4,200	158	6,636
ARNG Referral	9,400	218	20,492

1 Raised from 5,500 in April.

In FY 84, the Army continued to recruit COHORT units for the New Manning System. The COHORT concept of keeping personnel together in a unit throughout their enlistment increased cohesion, esprit de corps, and teamwork. During FY 84, the Army filled all of its programmed units (45 infantry, armor, and field artillery units with a minimum aggregate strength of 3,693 recruits) at or above 100 percent.

The Army employed a similar concept to recruit combat support and combat service support military occupational specialties for airborne assignments. Soldiers recruited for designated airborne platoons served together through basic training, AIT, and airborne school. After finishing their training, the soldiers sepa-

rated from the platoon and reported to their first duty stations. The trainers benefited from the increased buddy support and teamwork to overcome Initial Entry Training stress. The Army programmed 56 airborne platoons with a minimum aggregate strength of 2,585 recruits and filled 53 at or over 100 percent and achieved 105.5 percent of the aggregate file requirement.

Reenlistment bonuses and the worldwide institution of bonuses worth up to $8,000 were used for retention. The Army also opened the loan repayment program to all skills in June 1984.

Table 27 provides historical and forecast attrition rates for the period FY 78 through FY 84.

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TABLE 27 - THREE YEAR FIRST TERM ATTRITION RATES [1]

Sex	Education Level	Mental Category	[2] FY 78	[2] FY 79	[2] FY 80	[2] FY 81	[1] FY82	[3] FY 83	[3] FY 84
Male	HSDG	All	25.8	25.7	27.3	28.2	29.7	28.3	27.0
Male	NHSDG	All	45.8	46.8	51.4	52.5	52.8	51.6	50.8
Male	All	All	31.9	34.5	39.9	33.8	33.8	31.9	30.0
Female	HSDG	All	44.6	44.6	46.6	46.0	43.8	42.8	41.5
Female	NHSDG	All	55.2	(4)	66.2	66.1	NA	NA	NA
Female	All	All	45.2	44.7	49.4	47.4	43.8	42.8	41.5
Male	HSDG	I-IIIA	25.6	25.3	27.4	28.3	29.2	27.5	26.2
Male	HSDG	IIIB-V	25.6	26.0	27.4	28.6	30.3	29.0	27.5
Male	HSDG	IV	26.9	25.8	26.9	27.6	30.0	29.7	28.7
Male	NHSDG	I-IIIA	46.7	46.1	51.0	52.4	52.6	51.4	51.2
Male	NHSDG	IIIB-V	44.6	47.2	51.6	52.3	53.0	52.6	(4)
Female	HSDG	I-IIIA	44.5	44.8	48.8	47.8	44.9	43.2	41.9
Female	HSDG	IIIB-V	46.4	44.0	44.5	44.6	41.8	41.5	40.4
Female	NHSDG	I-IIIA	55.2	(4)	66.4	66.2	NA	NA	NA
Total			33.8	35.9	41.3	36.1	35.1	33.3	31.5

1 Term 3 and Term 4 Accessions only.
2 Historical Rate. Source: ELIM-COMPLIP, as of ME Apr 85.
3 Forecasted Rate. Source: ELIM-COMPLIP, as of ME Apr 85.
4 Represents an insignificant percentage of the accession cohort population.
NA = Loss rates probably not representative.

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In response to General Accounting Office criticisms, the Army implemented Force Alignment Plan I in the second quarter of fiscal year 1982 to end NCO shortages in certain career management fields (combat arms, intelligence, and electronic warfare). Through FY 84, the Force Alignment Plan reduced these shortages both in the aggregate and within each of the thirty career management fields. During FY 84 the Army met its NCO requirement in the aggregate, by grade, and within most of the career management fields.

The Army initiated the Civilian Substitution Program to stabilize military end strength and increase readiness by releasing soldiers to perform duties within their units. Without increasing the Active military end strength, the Army improved its modernization and readiness programs by channeling military personnel back into the force structure. In FY 84, the Civilian Substitution Program converted 1,967 military positions into civilian positions and programmed further conversions through FY 88.

Effective 12 July 1984, the Army assigned responsibility to the U.S. Army Manpower Requirements and Documentation Agency, as the ODCSPER agent, to review the personnel portions of Tables of Organization and Equipment (TOE) and Basis of Issues Plan (BOIP). At the same time, the agency received authority to approve the personnel sections of Army authorization documents (i.e., TDAs and MTOEs); to enforce the personnel provisions of Army regulations in the 611,310, and 570 series as those provisions relate to documentation; to approve and disapprove conversion of civilian positions to military; and to prepare and maintain authorization documents for joint, defense, and outside-DOD activities.

Officer Personnel

The officer accessions by source for FY 84 are shown in Table 28.

TABLE 28 - OFFICER ACCESSIONS

	Active	USAR	ARNG
USMA	940	-	-
ROTC	5,446	2,379	1,754
OCS	756	-	-
Warrants	1,762	-	-
State OCS	-	50	1,400
OCS RC	-	21	190
IRR TFR	-	2,581	930
Other	1,750	3,266	1,841
Total	10,614	8,297	6,115

A DCSPER established study group aimed to determine ROTC program adjustment that would produce high quality leaders for the Army of the 1990s. Major areas of consideration included organization, recruiting (marketing, resources, and incentives), retention, education/ training, and entry/ commissioning standards. The report will be completed by the end of FY 85.

ROTC enrollment declined in FY 84 (school year 83-84) as can be seen in *Table 29.*

TABLE 29 - ROTC ENROLLMENT

	FY82	FY83	FY 84
Total Enrollment	72,463	73,819	72,759
Production	7,079	8,093	8,245
Advance Course Enrollment	17,686	19,676	19,812
Scholarship Applicants	12,775	16,400	17,906
Scholarships Awarded	3,585	3,606	6,188
Scholarships in Force	7,535	8,500	11,704
Basic Camp			
Reported	4,055	4,601	4,052
Completed	3,583	4,150	3,640
Advanced Camp			
Reported	8,157	9,806	9,255
Completed	7,815	9,301	8,838

The 1976 Nunn Amendment shifted a large part of the Combat Service Support company grade structure to the Reserve Component, thereby causing an imbalance in the grade structure throughout the Active Army and creating a demand for Combat Service Support captains twice that for qualified lieutenants. Conversely, requirements for combat captains were fewer than those for lieutenants. To resolve this imbalance Regular Army and Other Than Regular Army officers were permitted to transfer voluntarily from one branch to another. Year group screening boards, meeting at 3Y2 and 7 Y2 year points of service will transfer quality officers from overfilled branches to those with shortages, reduce officer strength to meet budgeted end strength, and supply Reserve Components with quality officers. The first review will enable the Army to meet captain-level requirements while the second will handle field grade requirements. The Chief of Staff, Army, approved the Force Alignment Plan III in March 1984.

In October 1983, the Army implemented the Manpower Staffing Standards System (MS-3) in response to Government Ac-

counting Office and congressional criticism of the Army's methodology for determining manpower requirements. Implementation

of MS-3 established a sound basis for determining peacetime manpower requirements, projecting manpower requirements for mobilization and other contingencies, measuring effectiveness and efficiency, and enhancing personnel utilization. In FY 84, a number of projects were initiated to support further the development of workload driven standards. The MS-3 program resulted in improved Army credibility with the DOD, GAO, and Congress. The goal for MS-3 manpower requirements coverage is 400,000 positions by end of FY 89. The Army achieved 8 percent of this goal and placed 45,000 positions under evaluation for coverage by the end of FY 84.

Equal Opportunity

The Army significantly changed the thrust of its Military Equal Opportunity Programs during FY 84 to increase leadership responsibility for equal opportunity through two initiatives. The first initiative made the Department of the Army Office of Equal Opportunity a branch of DCSPER's Leader Policy Division to emphasize the responsibility of civilian and military leaders for supporting equal opportunity.

The second converted the enlisted equal opportunity adviser from a specific MOS (OOU) to a special qualification identifier "Q." Previously, soldiers from one MOS served consecutive tours as equal opportunity advisers. Under this initiative, outstanding NCOs from any MOS attended the Defense Equal Opportunity Management Institute and then served as an equal opportunity adviser for a one year tour. The soldiers served in units in which their MOS matched that of the majority of the unit's enlisted personnel. After a year, they returned to their primary MOS duties. Started midyear in 1984, this change should be completed by the close of FY86.

During FY 84, the Army's Equal Employment Opportunity Program showed a steady increase in the percentage of minorities, women, and disabled veterans within the Army's work force.

	FY 83	**FY 84**
Minorities	22.4	22.6
Women	39.2	40.1
Disabled Veterans	6.7	6.8
Handicapped	7.0	7.0

Likewise, the Army increased minority and female representation within the higher grade levels.

	FY83	**FY 84**
GS/GM 13-15		
Minorities	7.3	7.8
Women	6.0	6.8
SES		
Minorities	5.0	5.2
Women	2.9	3.2

Alcohol and Drug Abuse

The Army signficantly changed its policy for dealing with alcohol and other drug problems by assigning the Alcohol and Drug Abuse Prevention and Control Program (ADAPCP) to the Leader Policy Division, Human Resources Directorate, DCSPER, to increase officer and civilian manager awareness of their responsibility for controlling, treating, and eradicating alcohol and drug abuse.

A group of specially selected experts studied the scientific, technical, and procedural aspects of the Army's drug testing laboratories to determine whether the test results legally met the military rules of evidence for disciplinary and administrative action. On 12 December 1983, the panel released their findings, which concluded that the testing system was legally accurate and that it deterred drug use. During FY 84, 6.2 percent of the 571,632 samples tested proved positive for either cocaine or THC (marijuana). A downward trend, starting with the beginning of drug abuse testing in 1981, in illegal drug abuse among soldiers continued. During FY 84, the ADAPCP treated 65,198 personnel and was successful with 72 percent.

Discipline, Law Enforcement, and Military Justice

Throughout FY 83 and well into FY 84, the Army's prisoner population approached the maximum capacity of the available military detention facilities. The United States Disciplinary Barracks (USDB), Fort Leavenworth, was full, and installation detention facilities held prisoners serving long-term sentences who were awaiting transfer to the USDB. The U.S. Army Correctional Activity (USACA), which recently changed its mission and name from retraining to correctional, could not relieve this backlog without changes. The commanders' and court system's more stringent policy resulted in longer sentences, which produced more prisoners for the USDB, fewer for the USACA, and even fewer for the installation detention facilities. After a successful six-month test ito determine whether USACA could handle soldiers with longer sen-

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tences, the Army began confining prisoners there. This eliminated the installation detention facility backlog, reduced the USDB population, relieved the prisoner population pressure throughout the Army's correctional system, and provided a more balanced prisoner-to-guard ratio for the entire system. (See Tables 30 and 31.)

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TABLE 30 - Indiscipline Indicators
(World Rates Per 1,000 Military Population)

FY	Qtr.	Crimes of Violence	Crimes Against Property	Marijuana Use & Possession	Other Drug Offenses	Total Courts-Martial	Non-Judicial Punishment	Separation Other Than Honorable	AWOL	Desertion	Drunk Driving
83	1	1.12	15.95	5.16	1.09	2.52	39.24	3.74	4.9	1.9	
	2	1.18	14.75	4.62	1.45	2.53	42.25	3.29	5.1	1.6	5.08
	3	1.09	15.64	4.10	1.30	2.33	42.84	2.63	4.7	1.7	6.27
	4	1.18	16.19	3.54	1.16	1.88	44.24	2.24	4.9	1.9	6.35
Total		4.57	62.53	17.42	5.00	9.26	168.57	11.90	19.6	7.1	
84	1	.96	14.47	2.68	.94	1.77	35.39	2.81	3.3	1.6	6.43
	2	.83	13.70	2.97	1.09	1.66	37.99	2.50	3.5	1.4	6.33
	3	1.00	14.24	2.60	.92	1.54	36.04	2.26	3.2	1.5	5.91
	4	.96	15.69	2.60	.88	1.31	35.22	2.27	3.6	1.6	5.93
Total		3.75	58.10	10.85	3.83	6.28	144.64	9.84	13.6	6.1	24.60

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TABLE 31 - INDISCIPLINE RATES

Offense	Rate Change from FY 83 [1]
Property Crime	-7.1
Violent Crime	-17.9
Marijuana use/possession	-37.7
Other drug offenses	-23.4
AWOL	-30.6
Desertion	-14.1

1 Per 1,000

During FY 84, losses of conventional arms, ammunition, and explosives continued to be mostly single weapons and small numbers of munitions stolen by trusted personnel authorized to enter ammunition storage facilities or by military members during training periods.

Based upon recommendations and taskings made by the joint Security Chiefs Council in 1982, the U.S. Army Military Policy Operations Agency developed and published in March 1984 a joint regulation to standardize general physical security policies.

During fiscal year 1984, the Criminal Law Division of the Office of the Judge Advocate General continued to monitor courts-martial proceedings, to review and prepare military justice regulations and publications, and to develop draft changes to the *Manual for Courts-martial* and the *Uniform Code of Military, Justice* (UCMJ). See *Table 32* for breakdown of courts-martial proceedings.

TABLE 32 - COURTS-MARTIAL

Court	1980	1981	1982	1983	1984	Change
GCM	1,353	1,426	1,500	1,588	1,442	9% (-)
SPBCD	1,385	1,792	2,556	2,082	1,403	33% (-)
SPCM	3,065	2,802	1,649	777	461	41% (-)
SCM	3,467	4,418	4,151	2,856	1,645	42% (-)
Total	9,270	10,438	9,856	7,303	4,951	32% (-)

The Office of the Judge Advocate General interpreted the decreases in the number of lower-level courts-martial in FY 84 partly due to higher recruiting standards and an increased use of administrative discharge proceedings for less serious offenders. The overall conviction rate of courts-martial increased to 93.4 percent from 93.2 percent in FY 83, while nonjudicial punishment declined by 24 percent from FY 83.

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On 6 December 1983, Congress passed the Military Justice Act of 1983 (PL. 98-209), effective 1 August 1984, which improved the military justice system and established an advisory commission to study military law and recommend changes to Congress. On 13 April 1984, President Reagan signed Executive Order 13473, which promulgated the Manual for Courts-martia4 United States, 1984, also effective 1 August 1984. The first complete revision since 1969, its changes streamlined the pre- and post trial processing of cases and reflected the recent changes in substantive law made by the Military Justice Act of 1983 and Executive Order 12460. The latter amended the old manual provisions for military death sentencing procedures.

The Office of the Judge Advocate General published a complete revision of AR-27-10 (Military Justice) on 1 July 1984 (effective date 1 August 1984), which reflected the 1983 and 1984 revisions made in the Uniform *Code of Military Justice* and the Manual for Courts-martial.

Civilian Personnel

In September 1983, DCSPER approved the concept of a plan to revise the training program for 87,000 civilian employers in 23 different career programs. The Army Civilian Training, Education, And Development System (ACTEDS) revised the training and development framework to produce a structured career program for the civilian managers of the future, similar to the military system one that blends progressive and sequential work assignments and formal training for individuals as they progress to key managerial positions. The DCSLOG, DCSPER, and Commander, U.S. Army Materiel Command selected the Logistics and Acquisition Management Program (LOGAMP), involving the career programs in logistics and acquisition fields, as the ACTEDS prototype. LOGAMP's principal goal was to staff key positions with employees possessing the required disciplinary knowledge and competence to acquire and manage materiel throughout its life cycle. By the end of FY 84, the LOGAMP test was continuing.

In September 1983, the Army started an eighteen-month test of the Department of The Army Family Member Priority Placement Program, an adjunct of the DOD Priority Placement Program. The program offered computerized registration and referral, on a priority basis, to family member DA status employees of DA civilian or military sponsors who relocated on orders within CONUS. By the end of the fiscal year, the program had reached a 72 percent placement rate that benefited both family members and supervisors.

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The Department of the Army Scientific and Engineering Re serve Officers' Training Corps Cooperative Program (DASE ROTC CO-OP) combined the ROTC program with study-related civilian work opportunities at Department of the Army activities to recruit and retain high quality scientific and engineering students into the military and civilian work force. The program started on 15 February 1984 with a one year test in the first ROTC region and offered nationwide Department of the Army employment

opportunities. The Army established a task force to supervise the program and, in mid-August, began an extensive recruiting drive. The Army will use the results to determine the future, if any, of the program.

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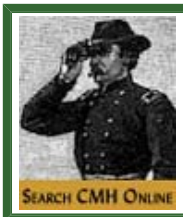

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Logistics

Management and Planning

The Office of the Deputy Chief of Staff for Logistics study program sponsored analyses to solve historic operational problems and then connect these problems to functional areas within Army goals. However, in FY 86 emphasis will be on guidance contained in the Army plan and Defense guidance, as well as significant problems determined by DCSLOG. The new studies will investigate present and future logistics problems rather than the solution of past problems and adjusting the solutions to current problems. The FY 84 program listed twenty-eight programs and the FY 85 nineteen. The Army War College and National Defense University received nineteen topics for potential student research projects. The Logistics Models Working Committee met several times in FY 84 to review logistics modeling problems and progress in solving them. The committee continued to remind logisticians and logistics modelers of the necessity for including NBC environmental conditions, combat damage, and other problems in the Combat Service Support area in combat and logistics models.

The ODCSLOG developed and implemented a series of initiatives to improve logistics capability. They improved the utilization of existing logistics manpower through increased productivity, better use of existing technology, more emphasis on external support, and reduced personnel and equipment requirements.

The Army increased productivity by decreasing unnecessary overhead and by using more materials handling equipment. The Army Vice Chief of Staff approved $700 million for additional materials handling equipment in nine logistics TOE units, such as the direct support ammunition company; petroleum, oils, and lubricants truck company; heavy transportation company; and terminal service company, for the years 1986 to 1990. Logisticians also exploited existing technology such as nondevelopmental items (NDI). This non developmental item materiel was off-the-shelf equipment employed in the civilian sector for the same tasks. Equipment for Southwest Asia water units, as well as POL handling equipment were excellent

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examples of NDI equipment, which the Army obtained from the manufacturer's existing stock. To ensure a quicker and more efficient response in time of crisis or conflict, the Army also increased host-nation support and contingency contracting.

In the area of strategic mobility, the Army continued the SL-7 conversion program and received the first four roll-on/roll-off vessels by the end of FY 84. The remaining four will be completed by March 1986. The investment in these ships represented the most significant enhancement of strategic sealift during the last decade. The Army also planned to field its second Lighter, Air Cushioned Vehicle (LACV-30) Company at Fort Story, Virginia, in October 1984. This will increase the LACV-30 fleet to 24 vehicles.

DCSLOG worked with USCENTCOM, the Military Traffic Management Command, the Third U.S. Army, and other DA agencies to develop afloat pre-positioning requirements for Southwest Asia. A key component to fulfilling these requirements was the Heavy Lift Pre-positioning Ship (HLPS) planned for deployment in the Indian Ocean. It will carry combat support and combat service support equipment such as cranes, forklifts, lighters, and tugs to offload the pre-positioning ships and the early arriving strategic sealift ships. In addition, DCSLOG supported the Navy sealift readiness program as well as Air Force strategic mobility enhancement programs. The latter included procurement of additional KC-10 and C-5B aircraft, development of the C-17, expansion of the civil reserve air fleet, and wing modification of the C-5A and C-130.

Logistic planners identified weak links in the CONUS, intertheater, and intratheater lift segments of the total mobility system. Breaking any of these links would seriously diminish U.S. military operations because of the American inability to sustain or reinforce the far-flung combat units. To improve further the Army war-fighting capability, DCSLOG's Strategic Mobility Division participated in the development of the Army Program Objective Memorandum (POM). Its contribution was the identification of critical mobility equipment and force requirements affecting the Army's transportation and mobility systems. As a result, these systems received significantly greater funding.

The Strategic Mobility Division also responded to a growing rail line abandonment threat posed by the relaxed abandonment procedures under the deregulation of the transportation industry. The division established a small $5 million program, for FY 85 to FY 89, to lease or purchase rail feeder lines serving key Army deployment and mobilization stations and facing rail carrier abandonment.

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Supply and Maintenance

The Total Army Equipment Distribution Program (TAEDP), an automated system which projects equipment requirements, assets, and distribution to Active and Reserve Components, POMCUS, and war reserve stocks from the budget year through the POM years, entered its modernization phase in September 1984. The improvements will increase the capability of the system, enhance its operation, and cut the report production time from eight weeks to two.

The Ammunition Buildup Program in Europe continued on schedule and the Army planned to meet Defense Guidance levels of supply during FY 90. The FY 84 Call Forward Program necessitated shipping 75,000 short tons of ammunition for the Pre-positioned War Reserve Buildup and to support training activities. However, the Army delivered only 71,146 short tons. The Army also removed 3,338 short tons of older munitions for use elsewhere.

The FY 84 Army Stock Fund (ASF) program had $7,127.6 million in demands, $6,517.7 million in net sales, and $6,750.5 million in obligations. Congress mandated a reduction from 15 days to 11 days in the FY 84 stock fund cash standard. Partly as a result of this, the Army had $102.3 million of excess cash it could refund into O&M accounts during FY 85. Congress authorized the ASF to use Peacetime Inventory Augmentation Cash and appropriated $146.6 million dollars for the program, which supported the Army's Equipment Modernization Program as well as Equipment Modifications and Readiness Initiatives. Congress also appropriated $242 million for stock fund war reserves. The Army fully implemented the Simultaneous Obligation Policy in FY 84. This policy allowed the consumers to obligate their funds for items that would not be received before the end of the fiscal year. The Army realized a savings in money, time, and effort by eliminating a need for the year end Stock Fund By-Pass.

Army Industrial Fund (AIF) operation had revenues of $3,339.9 million and costs of $3,263.1 million in FY84. The Army, in response to OSD concerns about operating depot and arsenal supply functions within the AIF, directed the Army Concepts Analysis Agency to review these functions' management. The study concluded that it was cost effective to retain supply activities within AIE Furthermore, it determined that supply equipment acquisition should be incorporated under AIF's Asset Capitalization Program (ACP), a decision that ran counter to OSD's prohibition against using AIF revenue to finance the procurement of supply equipment through the ACP.

Congress provided $1,853.7 million for appropriation-financed secondary items in FY 84, an increase of $171.6 million over FY

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83's $1,682.1 million. The additional money was due to inflation and to the support for new weapon systems being fielded to modernize the Army.

The Fully Mission Capable (FMC) rate for missiles and vehicles (combat and tactical) fluctuated between 85 percent and 94 percent, while the Army's goal was 90 percent. *Table 33* shows funding for depot maintenance.

TABLE 33 - FY84 DEPOT MAINTENANCE PROGRAM FUNDING
(In millions)

	Funded	Unfunded
Depot Material Maintenance	$1,277	$24
Maintenance Support Activities	530	349
Total Program	1,807	373

The Maintenance Management Improvement Program, established in 1979 to correct serious maintenance shortfalls throughout the Army, continued to enhance maintenance operations, strengthen maintenance training, and improve personnel management during FY 84. Furthermore, ODCSLOG conducted a Worldwide Maintenance Conference at the U.S. Army Ordnance Center and School, Aberdeen Proving Ground, Maryland. The conferees agreed on several maintenance improvement initiatives, which ODCSLOG incorporated into a Maintenance Master Plan and followed systematically to enhance the Army's maintenance operations.

The Army overhauled 236 aircraft in FY 84, with 132 from the Active Component and 104 from the Reserve Component. *Table 34* shows a breakdown by type of aircraft.

TABLE 34 - BREAKDOWN BY TYPE OF AIRCRAFT

Type	Number
UH-60	3
HUH-1H/V	192
AH-1	9
CH-58A	25
CH-58C	7

Maintenance support activities included maintenance engineering, new equipment training, developing and updating depot maintenance work requirements, updating and printing maintenance publications, provisioning, and technical assistance to

troops in the field. The program received funding of $530 million, leaving an unfunded requirement for $349 million.

The Army operated and maintained 341 installations worldwide during FY 84. Base operations funding supports supply operations; maintenance of materiel (excluding combat vehicles and missile systems); administrative transportation services; laundry and dry-cleaning operations; unaccompanied personnel housing activities, administration, and furnishings; the Army Food Service Program; data processing; GSA and non-GSA real estate leases; fire and police services; and administration. Base operations cost $2,670.6 million in FY84, $52.8 million over the budgeted amount. Major commands reprogrammed funds from mission accounts to base operations to pay for priority requirements. President Reagan requested $2,834.2 million for FY 85 base operations. The increase of $216.4 million over FY84 included $107 million for program growth and $109.4 million for cost growth. Congress initially reduced this increase by $41.2 million, but finally approved $18 million for GSA lease rate increases and a $36.9 million readiness supplement for organizational maintenance and ammunition storage requirements.

The Secretary of Defense published a ten-point program and twenty-five initiatives in FY 83 to tighten procurement procedures. The Army Materiel Command, at the direction of ODCSLOG, established a task group to analyze the Army's initial provisioning and replenishment parts acquisition process. The Army also developed the SPRINT (Spare Parts Review Initiatives) program to reduce the cost of spare parts. In FY 85, SPRINT provided auditable savings of $53.6 million. Competition for supplying spare parts increased 51 percent in FY 84, with a goal of 55 percent in FY 85.

Furthermore, the balance of unpriced instruments dropped by 64 percent during FY 84.

Transportation

ODCSLOG continued to improve the capabilities of CON11S installations to receive and outload cargo to support early deploying or mobilizing units. The Army programmed approximately $45 million through FY 89 to upgrade installation rail lines, build loading facilities, and purchase blocking/bracing material and rail car spanners. However, shortfalls remained and ODCSLOG and the MACOMs will identify and rank unfunded requirements in the next POM.

The Logistics Evaluation Agency, in coordination with FORSCOM and the Military Traffic Management Command, completed an evaluation of the 800-mile roadmarch policy. The agency

concluded that although the Army's wheeled vehicles could deploy up to 800 miles or more, other logistical and operational factors, previously not considered, also affected current DA policy. Therefore, the Army changed from an 800-mile policy to one-day road march policy to minimize the wear and tear on wheeled vehicles that might result in decreased operational capability. The policy also increased the planning for and use of commercial transportation within CONUS.

ODCSLOG pursued an aggressive Logistics Over the Shore program to modernize the Army's watercraft fleet and to increase its capability to support operations where commercial ports are inadequate, unavailable, or denied. The Army fleet proved its capability by successfully participating in the FY 84 Joint LOTS II exercise. The Army also appropriated funds in FY 84 to purchase the first of four Logistics Support Vehicles (LSV), each capable of hauling 2,000 short tons of dry cargo and requested FY 85 funding for a second LSV In addition, the FY 85 budget request included funding for a new Commercial Landing Craft, Utility, and Navy-developed causeway systems such as the Roll-on/Roll-off Discharge Platform and the Floating Causeway.

The Army continued to update its nontactical vehicle (NTV) fleet, which supports training, medical, security, facility maintenance, sanitation, and other housekeeping functions. However, 33 percent of the fleet remained over-age and overmileage at the end of FY 84. In July 1984, the U.S. Army Materiel Systems Analysis Activity began a major study to develop a more economically sound replacement policy for the NTV fleet. The Army started another study to investigate interchanging M880 trucks and NTVs to save money. Furthermore, the ODCSLOG, through the Model Installation Program, granted exceptions to the NTV leasing policy. Five test activities received long-term NTV lease authority without the requirement that they obtain exceptions to the NTV leasing policy for long-term leases. Planners thought that this experiment could lead to Army wide long-term leasing policy changes.

The Army continued to redesign the DA Movements Management System (DAMMS) to provide an on-line capability to manage theater movements during peacetime and war. The redesigned system, DAMMS-R, consisted of three parts. The first was the basic DAMMS-R, which manages theater physical distribution and will be fielded to USAREUR in later FY 87. Second, the Mode Management Module, manages theater-level Army transportation assets and will be fielded with the basic DAMMS-R. The third element was the Movements Planning Module, which analyzes the trans-

portation network and develops the wartime movements program. It will be fielded to USAREUR in the fourth quarter of FY 85 and, subject to acquisition and force structure actions, to Eighth U.S. Army and Third U.S. Army.

The Army also worked on upgrading another theater of operations system, the DA Standard Port System (DASPS). Logisticians expect DASPS-Enhanced to be fully fielded by the end of FY 87 in six MTMC OCONUS ports and in seven terminal battalions (three Active, four Reserve) for contingency operations. Problems encountered during

software acceptance testing delayed fielding, but these will be solved by the first half of 1985 and one system will enter the system every two months. Fielding on the DAS3 B-Model computer will begin in Europe in June 1985, in the Far East in January 1986, and in the 7th Transportation Group in July 1986.

The Army designed the Transportation Coordinator Automated Command and Control Information System (TC ACCIS), a joint prototype automated system development project, to improve timeliness, accuracy, and availability of unit movement information at brigade, battalion, division transportation office, and installation transportation office level. The project, cochaired by the joint Deployment Agency and the WWMCCS (Worldwide Military Command and Control System) Information System Programs Management Office, used the 24th Infantry Division (Mechanized) and the MTMC Eastern Area Command to test TC ACCIS. A demonstration of the prototypes operation will be conducted in May 1985.

The Automated Air Load Planning System (AALPS) interfaced with and supported TC ACCIS. The Defense Advanced Research Projects Agency originally developed AALPS to test radio packet switching technology. However, the system contained a load planning and documentation capability that the XYIII Airborne Corps successfully used. The Army planned to field a fully deployable military version by September 1986.

The Army staff, recognizing that foreign and allied countries relied heavily upon rail movement of war materiel, decided to reestablish a railway operating capability in the Total Army. Therefore, the Army included funds in the POM for FY 86-90 to establish railroad training for members of U.S. Army Reserve railroad units. This was the first railway training in the Army since it removed railroad operations and associated training from the Active Army in 1972. The Western Nebraska Technical College in Sidney, Nebraska, received a contract to perform MOS skill training.

Security Assistance

Security assistance is the transfer of military and economic assistance, through sales, grants, leases, and loans, to friendly foreign governments to support United States foreign policy. Authorized by the Foreign Assistance Act, as amended, and the Arms Export Control Act, as amended, FY 84 security assistance programs aided 124 countries and international agencies. These programs included the Foreign Military Sales Program, the Military Assistance Program, the International Military Education and Training Program (IMET), and the Coproduction Program.

Foreign Military Sales (FMS) are government-to-government transactions for defense equipment, engineer instruction services, and training from the U.S. government. The Army managed FMS programs worth $3.8 billion out of a total DOD amount of $14.6 billion. The Military Assistance Program provides defense items and related services other than training to foreign governments on a grant basis. During FY 84, new program orders amounted to $8.4 million for 15 countries. The International Military Education and Training Program also works on a grant basis by instructing military and related civilian personnel in the United States, in overseas military facilities, or by mobile training teams. The FY 84 program consisted of $21.2 million for 78 countries. Coproduction enables a foreign government, commercial firm, or international organization to acquire the technical expertise to assemble or manufacture an Army weapon system either in its entirety or in part. A Memorandum of Understanding requires foreign producers to purchase United States components. The cumulative value of active, pending, and closed FY 84 coproduction programs was $6.9 billion.

The Conference of American Armies (CAA), a biennial meeting initiated in 1960, provides a forum for Commanders of American Armies to discuss security issues of mutual interest. The forum promotes cohesion, improves hemispheric security, and strengthens inter-American friendship. The U.S. Army established the Interim Permanent Secretariat in January 1982 to provide for a continued information exchange among the CAA members. The XV Conference voted not to accept the Interim Permanent Secretariat but to have its mission and functions assumed by the host country of the next CAA. The Republic of Chile accepted responsibility for the XVI CAA as well as the U.S. CSA's offer of an officer to assist in operating the secretariat. The first selectee reported to the Chilean Army in January 1984.

NATO interest in security assistance remained high in FY 84 as its members continued to improve combat effectiveness through

weapons modernization. However, budget constraints allowed only gradual progress toward the attainment of all objectives. Furthermore, long production lead times continued to plague NATO modernization efforts. The United States maintained its firm commitment to weapons standardization and interoperability, as well as to increased host-nation support. The United States initiated important cooperative efforts for future arms development and production in three areas. First was the "two way street" in which reciprocal procurement agreements among NATO countries made the total NATO defense market available to all members of the alliance. By the end of FY 84, the "two way street" had improved between some NATO countries and between the United States and several NATO allies. Second, NATO completed plans for the dual production and coproduction of armaments already past the development phase. This reduced the unit cost of some weapons in each NATO nation's inventory. Negotiations to extend the coproduction of modern weapons to non-NATO European allies continued during FY 84. Third, NATO allies signed agreements for sharing new developmental projects so that modern technology could be incorporated into new systems without incurring redundant research and development costs.

In FY 84, the United States negotiated security assistance treaties with Greece and Turkey that shifted away from relative, perceived formulas to recognized requirements. Nevertheless, several agreements required offsets or linked specific amounts of aid to percentage formulas based on assistance received by other countries. Allied efforts significantly assisted Turkey's modernization of its forces, especially tanks and aircraft. The United States furnished technical data to Turkey to convert 2,800 M48 tanks into M48A5s. Turkey had purchased, through foreign military sales, hardware (including 2,120 conversion kits) and support services valued at $550 million by the end of FY 84. Turkey has converted over 200 tanks thus far and is expected to reach its maximum annual conversion capability of 500 in 1985.

On 14 February 1984, the Netherlands signed Letters of Offer and Acceptance for 160 Patriot missiles, 20 launchers, and miscellaneous support items. This acceptance, worth $300 million, was the first firm commitment by a foreign country to acquire the Patriot air defense system. In negotiations held prior to the acceptance, the United States agreed to waive up to $33 million of nonrecurring expenses. These were subject to the Dutch and the U.S. Army agreement on areas of cooperation, in which the United

States will receive in-kind compensation, calculated in constant dollars, over ten years.

The United States, under basic and implementing air defense agreements signed in December 1983 and July 1984, will sell at least 680 Patriot missiles, 100 launchers, and associated support equipment to the Federal Republic of Germany. The Letters of Offer and Acceptance will be signed in February 1985. This acquisition was a complex program, with the United States supplying an equal number of Patriot fire units and the Federal Republic of Germany procuring, manning, and supporting 27 Roland fire units for defense of U.S. bases in Germany, as well as additional Roland systems to protect several FRG/U.S. co-located bases. Both countries worked on developing cooperative logistics support, configuration management, and other programs that will include eventually the Netherlands and other Patriot users (other European countries showed an interest in Patriot, but did not begin the acquisition process). The FRG/U.S. program was valued at well over $2 billion. The United States continued negotiations with Switzerland on coproduction of the TOW 2 and Basic Stinger missile systems and the MOD FLIR Night Sight for the Leopard 2 tank. The TOW 2 and MOD FLIR Memorandum of Understanding will be signed in early 1985 with a Stinger Memorandum of Understanding having a lower Swiss priority.

The security assistance programs in the Asia/Pacific region enhanced the security of the Republic of Korea, Thailand, and Pakistan; protected base rights in the Philippines; and maintained a defense relationship with countries such as Malaysia and Indonesia, which are strategically close to key sea lines of communications. FY 84 foreign military sales for the region that supported the above objectives are shown below:

Pakistan	$300,000
Korea	230,000
Thailand	94,000
Philippines	80,000
Indonesia	45,000
Malaysia	10,000
Total	$759,000

Thailand received the only Military Assistance Program grant funds ($5,000) for defense items and services. The United States allocated $9.896 million of International Military Education and Training Program funds to the region in FY 84 so that 1,279 students could receive military training within the United States.

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The People's Republic of China, as a result of a 2 June 1984 presidential directive, became eligible for foreign military sales in FY 84. These sales included publications, training materials, and site surveys to investigate the feasibility of future purchases. Incursions by the Socialist Republic of Vietnam's Army along the Thailand-Kampuchian border caused Thailand to make several emergency requests for support. In addition, these incursions prompted members of the Association of Southeast Asia Nations to speed up their modernization. programs, which resulted in increased security assistance requirements.

The security assistance program for Pakistan continued as one of the largest conducted by the Army. Since Pakistan opposed the Soviet occupation of Afghanistan and suffered over 200 civilian deaths in Soviet cross-border attacks, Pakistan needed a modern, mobile force to deter potential aggressors. Nonetheless, Congress cut $25 million of foreign military sales credits from the $325 million requested by the Reagan administration and included in President Carter's 1981 five-year aid package of $3.2 billion dollars. The remaining funds purchased 100 M48A5 tanks, 24 M901 Improved TOW vehicles, 75 M198 155-mm. howitzers, 40 M110A2 howitzers, 33 M88AI recovery vehicles, as well as Cobra attack helicopters and M109A2 howitzers.

Security assistance to the Middle East/North Africa region supported United States foreign policy objectives of lasting peace in the region, reducing hostilities between Israel and the region's Arab states and providing an alternative to Soviet military equipment. The region continued to receive the lion's share of worldwide foreign military sales credits ($3.366 billion of $5.7 billion) with Israel ($1.7 billion, $850 million forgiven) and Egypt ($1.365 billion, $465 million forgiven) as the major recipients. Israel spent most of its FMS funds on maintenance, logistics, and research and development projects. Egypt used the bulk of its funds to pay for previously delivered equipment and the development of supply and logistics systems. Egypt ordered 384 Chaparral missiles and 25 fire units worth $120 million and Hawk Product Improvement Program II with a value of close to $62.4 million. The United States and Egypt started the coproduction of 105-mm. tank ammunition, which the Egyptians managed ;successfully However, both Israel and Egypt faced serious economic troubles-Israel with balance of payments deficits and a per-annum 400 percent inflation during the first seven months of the year and Egypt with an overall fiscal deficit. In addition, Egypt possessed a large deteriorating Soviet equipment inventory that needed replacement.

The military and political situation remained unstable in Lebanon during FY 84, and the gradual withdrawal of American military

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personnel continued. Prior to FY 83, the Lebanese paid in cash, but during FY 84 they relied heavily upon FMS credits and were $70 million behind on their payments by the end of the fiscal year. Many analysts considered FY 84 as a crossroads year in the United States-Jordanian relations, since congressional limitations on weapon sales and funding limitations made Jordan question its perception of the United States as a reliable partner in defense.

Saudi Arabia made more than $3.1 billion in FMS cash purchases during FY 84. The Saudis emphasized training and

modernizing the land forces and the National Guard as well as improving the Air Force's air defense posture. During May 1984, Saudi Arabia asked the United States to sell them Stinger missiles, because of the increased number of air attacks on Persian Gulf shipping. President Reagan directed that the Army sell 400 missiles, along with support equipment and spare parts, to the Saudis. They were taken from U.S. Army stocks. Furthermore, a mobile training team provided training in the missiles' operation. The Saudi Arabian Land Forces requested 100 M60A3 tanks with tank thermal sights in June 1983. They signed the contract in December 1983 with first delivery expected in the second quarter of FY 85. The sale included support equipment and spare parts. However, since the land forces already operated M60A1 tanks, the Saudis purchased only special tools and support equipment required for the newer tanks.

Kuwait spent most of its FMS funds on training and integrating the Hawk surface-to-air missile into its air defense system. The Hawk program will cost approximately $58.8 million and will begin arriving in late 1986 and early 1987. The Bahrain FMS program continued at a modest level with the cash purchase of seven M198 howitzers. On 7 December 1983, USACE agreed to design Phase I of the new Suman Air Base for the Bahrain Defense Forces with a construction cost programmed at $155 million. The number of International Military Education on Training Program students significantly increased in Oman. Likewise, Qatar primarily limited its small FMS purchases to training, as did the United Arab Emirates. The latter began predelivery officer and enlisted maintenance training in FY 84 for the five I-Hawk batteries purchased in 1983. The Yemen Arab Republic spent most of their $4 million of Military Assistance Program funds on supplying and maintaining previously purchased equipment. They also used nearly $1 million in International Military Education and Training Program funds for sending thirty-one students to the United States and several in-country training teams.

Morocco's FMS program focused on improving the logistical support system, particularly the Royal Moroccan Army's Southern Com-

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mand, as the war in the Sahara continued to dominate Moroccan military requirements. Tunisia received 54 M60A3 tanks as a major part of the Tunisian Armed Forces' five-year modernization program.

The United States, in the Sub-Saharan region, increased its commitment to those nations threatened by subversion as well as those countries whose location or long-standing support for American interests made them important partners in the United States' African strategy. Thirty-six African nations south of the Sahara qualified for some form of security assistance in FY 84. The four countries with the most aid (Zaire-$7.8 million; Kenya-$23.6 million; Somalia$33 million; Sudan-$46.5 million) received 86 percent of the security assistance. The International Military Education and Training Program remained one of the most successful long-range programs in Africa with 33 nations using its funds. The programs with the largest number of students were Sudan (132), Kenya (126), Liberia (55), Somalia (47), and Zaire (41). The Seychelles Islands, Swaziland, and Upper Volta entered the IMET program during FY 84.

Relations between Somalia and Kenya, both linked to the United States by base access agreements, remained peaceful during FY 84. However, Somalia and Kenya continued serious fighting with Ethiopia along the poorly defined borders. Therefore, the United States security assistance improved the Somalia defensive capability without giving them the wherewithal to conduct offensive operations against Ethiopia or Kenya. The Army delivered six M198 155mm. howitzers to Somalia in September 1984 and planned to supply twelve more in FY 85. Total cost was close to $13.2 million. Major elements of the Kenyan program were Hughes 500 helicopters and engineer equipment. The provision of repair parts during FY 84 enhanced Kenya's helicopter readiness.

The United States responded to a request for expedited assistance from Sudan in early FY 84. In April 1984, the Army supplied, via a C-5A aircraft, 650 armor vests, 96 radios, as well as other Army communications equipment. From June to September 1984, Sudan also received 36 V150 Commando armored cars worth nearly $13.1 million. President Reagan continued to use his emergency draw down authority under Section 506A to provide Chad with weapons, ammunition, individual clothing and equipment, and spare parts. Chad also purchased 24 M151A2 ¼-ton and 16 M35A2 2 ½-ton vehicles with $2 million of FY 84 Military Assistance Program Funds.

Twenty-seven countries in the Western Hemisphere received U.S. security assistance during FY84, with El Salvador, Honduras, and Costa Rica accounting for over one-half of these funds. In addition, Congress provided El Salvador with $131,750,000 in Military Assistance Program

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funds through four supplemental bills. Congress also appropriated $15 million for the peacekeeping operations of seven Caribbean countries on Grenada. El Salvador expanded its UH-1H helicopter fleet from 19 to 44 aircraft and purchased four Hughes 500 helicopters to use as gunships. Using FMS credit, the government bought 50 reconditioned M35A2 trucks and utilized MAP funds to purchase 120 more. The Army also provided small arms, mortars, grenade launchers, night vision equipment, communications equipment, ammunition, uniforms, and general supplies. During FY 84, the United States obligated nearly $7 million in MAP funds from the country accounts of El Salvador and Honduras for the operation and maintenance of the Regional Military Training Center in Trujillo, Honduras.

The Army provided five Operations and Plans Training Teams for instructing El Salvadoran Armed Forces personnel, as well as U.S. mobile training teams, for teaching Caribbean Peace Force Special Service Units about peacekeeping operations on the island of Grenada. Meanwhile, United States/Panamanian negotiations over keeping the United States Army School of the Americas at Fort Gulick, Panama, failed because of unresolved issues about Panamanian sovereignty. On 26 September 1984, the Army moved the school to Fort Benning, Georgia.

The Army security assistance country programs varied greatly in size and technical sophistication. The smallest program was Paraguay's, with a value of $3,500. The largest was for Saudi Arabia, worth over $23 billion. Other significant programs included Egypt ($2.5 billion), Taiwan ($1.5 billion), Jordan ($1.3 billion), and Germany ($1.0 billion). These six country programs comprised over 75 percent of the Army's open program security assistance.

Security assistance new business was generated from amendments and modifications to prior year cases (orders) and new orders implemented during the current fiscal year. The Foreign Military Sales open programs totaled $44.4 billion by the end of FY 84. The status of this program at the close of the fiscal year is shown in *Table 35.*

TABLE 35 - FOREIGN MILITARY SALES
(In billions)

	Total	Delivered	Undelivered
AMC	$22.6	$13.5	$9.1
Non AMC	21.8	14.1	7.7
COE	18.9	13.5	5.4
DLA/GSA	2.3	0.5	1.8
Other	0.6	0.1	0.5
Total	44.4	27.6	16.8

Most of $18.9 billion managed by the Corps of Engineers was for its substantial construction program in Saudi Arabia. The Corps limited its responsibility to a supervision/management role with 90 percent of the work performed by U.S. and foreign civilian contractors.

Equipment diversions declined in FY 84 with diversions from U.S. Army stocks approved only to satisfy national political commitments or to support allies and friendly countries faced with ongoing or imminent threats. During FY 84, 167 tanks, 47 helicopters, 132 recoilless rifles, 91 howitzers, 579 machine guns, 872 radios, and 299 mortars were diverted. The number of rounds of large-caliber ammunition diverted during FY 84 dropped from 677,000 during FY 83 to 240,000. El Salvador and Honduras were the major recipients of diverted assets during the fiscal year.

The following items were in highest demand by FMS customers during FY 84: towed howitzers; self-propelled

howitzers; personnel/weapons carriers; tank recovery vehicles; TOW launchers and missiles; I-Hawk missiles and battery sets; Chaparral launchers and missiles; Stinger weapons systems; artillery ammunition; and radios.

Unfortunately, FMS customers competed for the same items fielded by Army forces and diversion of this materiel reduced Army readiness. The Army initiated the Special Defense Acquisition Fund (SDAF) to purchase and stockpile long lead time, high-demand items in anticipation of urgent foreign requirements, thus reducing the diversion of these items from Army stocks. The following items were among those purchased with the $175 million FY 84 SDAF program: 54 M198 towed 155-mm. howitzers; 2,120 TOW -2 missiles; 1,120 Stinger missiles; 621 M151 X-ton vehicles; 2,000 M60 machine guns; 1,800 .50 caliber machine guns; 75 M1 13A2 armored personnel carriers; 21,800 rounds, 105-mm. tank ammunition; and 11,000 rounds, 155-mm. artillery ammunition.

The Coproduction Program's cumulative value of active, pending, and closed projects totaled $6.9 billion, of which $2.5 billion will eventually be returned to the U.S. economy. During FY 84 the United States participated in coproduction projects with Egypt, Germany, Italy, Japan, Korea, the Netherlands, Norway, the Philippines, Switzerland, Taiwan, Turkey, and the United Kingdom.

The Army realized during FY 84 that it lacked the capability to train and prepare all its Foreign Area Officers (FAO) to meet requirements. As a partial solution, the Army established a new FAO site in Liberia and one in Portugal. The Liberian site broadened the slim FAO training base in Sub-Saharan Africa. The FAO training tour was twelve months long and covered area orientation,

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travel, and research. Training at the Portugal site included attendance at the Portuguese Armed Force Staff College for one year and four to six months of subsequent area orientation, travel, and research. Each site trained one FAO annually.

During FY 84, 7,386 foreign students from 108 countries received military training under U.S. Army sponsorship. Of these, 2,572 took 3,586 courses through the International Military Education and Training Program (grant aid) and 4,874 participated in 5,567 courses in the Foreign Military Sales Program (paid by foreign government). Total value (including some travel and living allowances) of foreign training amounted to $53 million (IMET-$14.5 million; FMS-$38.5 million). In addition, students from Canada, Colombia, France, Germany, Indonesia, Italy, Japan, Kenya, Korea, Lebanon, Nigeria, Pakistan, Peru, the Philippines, Sudan, Thailand, Turkey, the United Kingdom, and Venezuela participated in the International Fellows Program at the U.S. Army War College.

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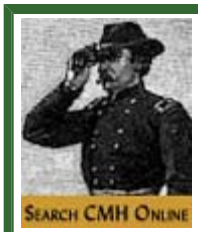

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Support Services

Health and Medical Care

The Army of Excellence must have high quality medical care for its members. However, resource constraints make health care providers balance medical care against cost containment to provide the best care possible within given resources. The U.S. Army Medical Department (AMEDD) introduced measures improving various programs-among them the Defense Enrollment Eligibility Reporting System (DEERS) and the Tri-Service Medical Information System (TRIMIS)-that promised to lower costs and expenditures. The Office of The Surgeon General (OTSG) resorted to contracting, the joint services health benefits delivery program, and DOD/VA sharing to improve and expand primary care capability. Taken together these methods will provide a cost effective direct care system for Army military personnel and Civilian Health and Medical Program of the Uniformed Services (CHAMPUS) subscribers. AMEDD also reviewed CONUS Army psychiatric facilities to determine whether CHAMPUS beneficiaries could receive the same 'care as that received in civilian facilities, but at a lower cost. During FY 83, close to 17 percent ($138 million) of CHAMPUS hospital costs went to 18,416 admissions, mainly routine in nature, for inpatient psychiatric care. Adolescents and children accounted for 35 percent of. the admissions and were responsible for 65 percent of the CHAMPUS inpatient psychiatry hospital costs. AMEDD planned a trial adolescent inpatient psychiatric facility to provide the same services as those offered by civilian institutions.

AMEDD held quality assurance seminars in CONUS and Europe for hospital commanders, clinical services chiefs, and. training program directors, designed to improve health care treatment. In February FY 85, the initial formal training course for hospital quality assurance coordinators will be held in San Antonio, Texas. The AMEDD also completely revised its quality assurance regulations during FY 84, emphasizing the examination of a doctor's credentials before entry onto active duty to ensure that all military physicians meet professional medical standards before entering

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the Army and treating military beneficiaries. Along with a continuing evaluation of quality assurance programs, this improvement enabled the Army to provide a high level of quality health care.

As a part of the Over-40 Medical Screening Program, soldiers older than 40 received a cardiovascular screening as part of their routine periodical medical examinations. Now in its third year, this screening analyzed seven potential risk factors: age, sex, blood pressure, smoking habits, fasting blood sugar, electrocardiogram results, and serum cholesterol levels. Physicians evaluated each soldier's screening data to determine safe participation in the Army physical readiness test. As of June 1984, a total of 49,208 soldiers had been screened with early detection of life-threatening cardiovascular disease, saving an estimated 1,186 lives.

The AMEDD successfully finished a twelve-month pilot health promotion program to increase military readiness. The Task Force on Fitness and the Organizational Effectiveness Consultants Division produced and assessed the effectiveness of a stress management program. Based upon the final results, a corporate fitness program will be established for all 4,500 military and civilian Army staff personnel in 1985. This program, designed to demonstrate the cost effectiveness of cultivating good health at the workplace, will determine, to a large extent, future federal personnel policies concerning fitness programs.

The Army implemented its new weight control program in FY 84 to enhance the health and physical fitness of the soldier. The AMEDD contribution was to furnish medical evaluation and body fat percentage testing. The program did decrease the number of overweight soldiers. Another related project conducted an extensive cross-sectional study of the correlations between weight and strength. The results will be used in future weight control and fitness programs. As a

part of its program to deglamorize alcohol and reduce its use for health reasons, the Army prohibited all Army Club sponsored events, such as Happy Hour, which offered reduced pricing or unlimited alcoholic beverages.

The health hazard assessment program monitored the materiel acquisition decision process to identify, analyze, and suggest controls for potential dangers to the physical well-being of the Army's members. Its aim was to remedy health hazards before equipment and materiel reached the field. The Army investigated likely hazards such as excessive vibration of machinery, toxic exhaust gases, shock/recoil tolerances, toxic chemical leakage, radiation leakage, and excessive noise.

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In the area of medical readiness, the AMEDD provided the chairman/DA member of the four service Military Field Medical Systems Standardization Steering Group. Composed of general/flag rank medical officers, the group agreed on the exclusive use of specific medical materiel sets and non-medical support equipment by all Deployable Medical System (DEPMEDS). One of the items of new nonmedical equipment, which the group approved as a component of DEPMEDS, was the standardized fabric-wall tent, extendable modular, personnel (TEMPER). It will replace the general purpose tents now in use, as well as the Medical Unit Self-Contained Transportable (MUST) inflatable shelters. Furthermore, MUST expandable shelters will be replaced by DOD rigid wall tactical shelters.

Besides modernizing the medical aidmen's bags to improve emergency field medical care for combat soldiers, the AMEDD standardized the number of items in medical assemblies that will reduce logistical work load and materiel losses due to expiration of drug potency. The AMEDD reconfigured the medical battalions that support all armor and mechanized divisions to the main support battalion and forward support battalion concept. Moreover, the new light infantry division received a new medical battalion that displayed increased mobility with fewer resources. In August 1984, the Army organized the 18th Medical Command to support the Eighth U.S. Army, Korea. Army planners also assigned a 200 bed combat support hospital to the Western Pacific to meet wartime contingencies. The AMEDD made significant progress in the aeromedical evacuation field as aeromedical evacuation units in Europe and. Korea received the UH-60 Black Hawk helicopter ahead of schedule. By the end of calendar year 1984, all units in Panama will also be equipped and CONUS units will receive the Black Hawks beginning in 1985.

The primary mission of the Army Medical Department is to care for the health of the soldiers, especially during combat. The Army Medical Research and Development Command's two-fold mission is to study ways to prevent disease among troops and to improve their chances for recovery if wounded. During FY 84, the command successfully tried, on humans, a new recombinant oral vaccine for diarrheal diseases. Walter Reed Army Institute of Research investigators also worked to bring a malaria vaccine closer to reality and field tested new drugs in Thailand against heretofore multi-drug-resistant malaria. The command's researchers studied tank crews and infantry platoons using military operational protective gear to determine crew performance limitations in a chemical environment. Scientists also explored potential anti-chemical warfare agents, several of which showed promise.

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The AMEDD's health care facilities contributed to active force readiness by providing health care, training health care providers, and supplying a fixed operating bed capacity for mobilization. At the beginning of FY 84, the health facility modernization program had 15 projects under construction with a value totaling over $422 million. The Army scheduled 14 projects for FY 85 with a value close to $164.8 million. A breakdown of AMEDD officer strength is shown in *Table 36.*

TABLE 36 - AMEDD OFFICER STRENGTH

	FY 83	FY 84	Change
Total Authorized	16,743	17,244	501
Total Actual	16,844	17,149	305
MC	5,031	5,214	183

DC	1,798	1,763	(35)
VC	417	434	17
ANC	4,038	4,243	205
MSC	5,099	5,023	(76)
AMSC	461	472	11

Chaplain Activities

While the Army Medical Department treats the soldier's medical and mental well-being, Army chaplains minister to the soldier's spiritual needs. During FY 84, the chaplains attended several courses dealing with family counseling. Thirty-six chaplains were selected for resident instruction at civilian and military schools and more than 100 active duty chaplains were enrolled in Command and General Staff College nonresident courses as well as workshops on homilectics, multicultural ministry, and mobilization planning. Another 233 chaplains graduated from the Chaplain Basic Course and 97 from the Chaplain Career Course held at the U.S. Army Chaplain Center and School.

Pay

Congress mandated, despite Department of Defense concerns of incapability with the civilian sector, a 4 percent military pay raise effective 1 January 1984. The fifth Quadrennial Review of Military Compensation (Q,RMC) concluded in FY 84 by recommending enhanced military compensation, survivor benefits, and adjusting certain types of incentives, as well as special pay. The QRMC rejected the Grace Commission proposals because the latter would

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lower individual entitlements and costs without improving the ability of DOD to meet defense requirements. The Q,RMC recommendations await review by the President and Congress.

Housing

Army Family Housing became an integral part of the Corps of Engineers Facilities Account during FY 84 as funding increased 27 percent over FY 83's level. Deferred Maintenance and Repair fell from $747 million to $635 million. Army Family Housing established a Consolidated Family Housing Office in Oahu to manage nearly 19,000 housing units for all services. During FY 84, the Army developed and deployed the Housing Operations Management System, a computerized method that automates installation housing functions. Furthermore, the Army awarded the first manufactured housing contract in USAREUR during FY 84. The Corps of Engineers continued to acquire more housing, both new construction and leased; to upgrade substandard units; to renew the aging inventory; to and reduce high cost housing.

The family housing new construction program (see Table 37) authorized the building of 865 housing units at a cost of $58,625,000 at eleven installations and one community center costing $7,3100,000.

TABLE 37 - FAMILY HOUSING NEW CONSTRUCTION PROGRAM

Installation	Units	Cost Estimates (in thousands)
Aberdeen Proving Ground, MD	106	$6,816
Bethel, AK	2	324
Nome, AK	2	324
Kotzebue, AK	2	324
Fort Greely, AK	38	4,633
Fort Stewart, GA	244	12,637
Fort Polk, LA	200	13,436
Bayreuth, Germany	13	908
Kitzinge, Germany	103	8,943

Wildflecken, Germany	153	9,988
Vicenza, Italy	2	292
Aliamanu, HI (community center)	NA	7,300
Total	865	$65,925

The Army authorized $1,002,000 to the Family Housing Post Acquisition Construction Program. These funds went to the program's two subprograms: $73,367,000 for improving 12,179 units in the line item improvement program and $26,623,000 for energy

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improvements to 38,283 units under the energy conservation investment program.

During FY 84, the Army approved the following unaccompanied personnel housing accommodations:

CONUS	
New Construction	4,955 persons
Modernization	884
OCONUS	
New Construction	3,971 persons
Modernization	724

Congress and DOD policies required all services to use all available local adequate community housing assets before acquiring additional government housing. To meet these policies, Headquarters, Department of the Army, developed the methodology for the Segmented Housing Market Analysis (SHMA) during FY 84. The SHMA provided a more precise accounting of available community assets and enhanced the Army's ability to justify the acquisition of housing units when the community's capability was inadequate.

Public Law (PL) 98-115 authorized pilot programs, ending at the close of FY 85, for providing family housing to the government. The Military Family Housing Leasing Program and the Military Housing Rental Guarantee Program sought to increase the number of housing units available for assignment or rental by military personnel and their dependents. Both programs had private contractors constructing dwelling units for long-term government use. Forts Hood, Polk, Campbell, and Rucker were test locations for these programs. The Army, because of congressional interest and direction, initiated a two-year study to determine the cost of upgrading and maintaining historical family quarters. Based on the conclusion of the study, the Corps of Engineers identified over 2,000 units requiring repairs and/or replacement over a five-year period.

Morale, Welfare, and Recreation

This area covers many disparate functions. During FY 84, 283 Child Development Services facilities (childcare), with a total of over 115,000 children, operated at 162 Army installations. Forty percent of the children were infants or toddlers and 62 percent lived on post. These day care operations raised morale of the soldier-parent and improved welfare by providing a safe place for military dependents to stay while their parents were on duty.

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In October 1983, the Army again began operating slot machines, as a revenue source and recreational pursuit, in clubs and Armed Forces Recreation Centers in Europe, Japan, and Korea. Machines for Panama were installed in August of the same year. During the fiscal year, they brought in $16.2 million for NAF Morale, Welfare, and Recreation (MWR) projects.

The Clubs and Community Activities Management Directorate and TAGO developed a 30 hour course to teach managers and their staffs methods to operate a business successfully. Since its beginning in March 1984, the course

instructed over 900 MWR managers and staffers from all TRADOC installations.

One hundred and sixteen performing units presented 3,133 DOD or combined DOD/USO performances at military installations throughout the world. Close to 525,000 personnel attended.

Fiscal year 1984 saw *a* large increase in nonappropriated funded (NAF) as well as MCA funded MWR construction due to past changes in MWR policies and procedures. Table 38 provides details.

TABLE 38 - CHANGES IN MWR POLICIES

	MCA		NAF		Total	
	No. Proj.	**$0.M**	**No. Proj.**	**$0.M**	**No. Proj.**	**$0.M**
FY83	7	11.9	27	36.7	34	48.6
FY84	37	71.5	47	78.5	84	150.0
Growth %	528	600	174	214	247	309

Clothing and Personal Equipment

Three Army clothing and equipment boards met during the year. The CSA approved several of their recommendations, including reinstating the female garrison cap and phasing out the women's black beret; adding side pockets to the female slacks; adopting a Hot Weather Battle Dress Uniform; reducing the number of AG415 shirts and AG344 trousers in the clothing bag; modifying the Temperate Weather Battle Dress Uniform; and adopting a new black combat boot.

Food Services

Under the Dining Facility Modernization Program, Major Army Commands identified 221 facilities requiring modernization during fiscal years 1984 to 1990 at a cost of $182 million. Ten facilities were modernized in FY 84 with 11 planned for FY 85 and 20 for FY 86. The remaining facilities will be renovated from FY 87 to FY 90.

A total of 1,113 dining facilities, including those 103 contractor-operated, provided meals worth $248 million during the fiscal year. In addition, the Army signed a contract with Burger King allowing it to open and operate fast food restaurants on its installations. This was the first such service-wide contract signed by the Army. Heretofore, each base or installation had approved its own contract for fast food services.

Commissary and Subsistence Operations

The U.S. Army Troop Support Agency, in coordination with the U.S. Army Health Services Command, installed the AMEDD Property Accounting System (AMEDD PAS) in the commissary system to improve property accountability. AMEDD PAS identified a substantial number of items of excess equipment in the stores. By transferring excess equipment to those stores planning to purchase it, the commissary system saved money, which will be used for construction.

Casualty and Memorial Affairs

On 3 April 1984, the Vice Chief of Staff directed ODCSPER to review the Army Casualty System and determine whether improvements were needed. After an extensive review, including discussions with other services as well as civilian coroners and morticians, DCSPER transferred the Casualty and Memorial Affairs Directorate. The Adjutant General Center, to the U.S. Army Military Personnel Center and redesignated it the Casualty and Memorial Affairs Operations Center (CMAOC), as of I July 1984.

The CMAOC partially solved a shortage of personnel to manage peacetime requirements by long-term assignment of Reserve Component personnel. It also improved its mobilization plans by identifying augmentation staffing requirements.

Two of CMAOC's organic units, Arlington National Cemetery and the Central Identification Laboratory, Hawaii (CILH) participated in the ceremony conducted for the burial of the Unknown Soldier from the Vietnam War. CMAOC also completed the concept design of the Permanent Visitor's Center and Parking Facility at Arlington National Cemetery. Casualty and memorial affairs statistics for FY 84 are shown below:

1. Service members who died on active duty 827
2. Retirees who died over 120 days after retirement 6, 176

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3. Very seriously ill/seriously ill service members in overseas commands 407
4. Records of emergency data 718,228

Other actions:

1. Remains of CONUS active duty service members/dependents processed by Army 782
2. Remains processed through the six overseas mortuaries 834
3. Remains identified at Central Identification Laboratory, Hawaii 9 (WWII: 1 SEA: 7 Current: 1)
4. Ground burial at Army post cemeteries 568
5. Ground burial at Arlington 2,791
6. Ground burial at U.S. Soldier's and Airman's Home National Cemetery 23
7. Cremated remains inurned at Arlington 955
8. Presidential exceptions to permit ground burial at Arlington 0

ODCSLOG continued work on a draft. revising FM 10-63, the basic graves registration field manual. Pending approval by all of the services, publication was set for no later than March 1985. It will be the first revision of FM 10-63 since 1959. In addition, ODCSLOG received funding approval for the purchase of $2 million of essential war reserve stockage graves registration materiel. Procurement will begin in FY 87.

This year, the Army commemorated the 40th anniversary of its invasion of Northwest Europe, which aimed to destroy Nazi tyranny. In a year of ceremonies to mark the momentous events of 1944, the memorial service on the Normandy Beaches was the highlight, since the President, the Secretary of the Army, and senior Army leadership attended. Units from CONUS and USAREUR supported the various observances.

Army Safety Program

During FY 84, FORSCOM and USAREUR developed model plans to use civilian safety professionals in major field training exercises. These safety professionals reviewed operations plans, performed risk assessments of training scenarios, and evaluated training to document the use of accident prevention techniques.

TRADOC established the TRADOC Privately Owned Vehicle Accident Prevention Program. This program was a multifaceted approach to preventing automobile accidents. It combined the

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functions of military police, safety, club management, public affairs, chaplain, etc., and focused their efforts on a command-wide effort to reduce fatalities as a result of highway traffic accidents. As a result of an improvement in accident investigation procedures, the Army was able to improve the operational aspects of training, as well as enhancing equipment and maintenance procedures.

Postal Services

The Military Postal Service again provided full postal services to service members stationed worldwide during FY 84. Deployments to Central America, the Eastern Mediterranean, Grenada, the Indian Ocean, and Lebanon highlighted the flexibility of postal services to respond to new tasks and demonstrated again the importance of postal operations to troop morale. These operations, though not trouble-free, provided adequate postal support under a broad range of geographical, operational, and environmental conditions.

The Grenada operation and the destruction of the Marine Corps barracks in Beirut by a truck bomb led to Congress authorizing postage-free personal letter and sound-recorded mail for military personnel serving in those areas. Because of legislative enactments, the Military Postal Service Agency, at the end of FY 84, was working on an Executive Order that would determine who would identify free mail areas.

The Military Postal Service instituted ZIP+4 (the nine digit ZIP code) on 1 July 1984 and all stateside DOD activities finished their coding during the fiscal year. Coding of military post offices started during the year and will be finished by 31 March 1985.

Since the current DOD-USPS (United States Postal Service) Postal Agreement was signed in February 1980, the two agencies have negotiated the postage-free delivery of intratheater personal correspondence. After the Military Postal Service Agency estimated that USPS would lose nearly $1 million annually, the USPS decided to absorb the loss and agreed, on 27 January 1984, to the Intratheater Delivery Service. This service started on 2 April 1984. Restricted to personnel eligible to use the military postal service, the service delivers personal first-class letters, post cards, and audio cassettes weighing 12 ounces or less within the Atlantic, Latin America, and Pacific theaters. None passes through USPS channels and official, business, and commercial correspondence is ineligible for shipment.

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Heraldic Activities

The Institute of Heraldry accomplished the following during the year. This includes the reimbursement of $123,000 for services provided to non Army agencies.

Activity	***Number***
Heraldic Designs	686
Manufacturing drawings, paintings, and illustrations	721
Sculptured items	95
New items developed	225
Metal and textile items inspected	150,800

The items listed below demonstrate the scope and variety of the Institute of Heraldry's work during the fiscal year:

1. For the Army:

U.S. Army Community and Family Support Center plaque, pin, and shoulder sleeve insignia.
National Guard Master Recruiter Badge Army Service Lapel Button
Army Research Institute Plaques
U.S. Army Triathlon Award (Designs)

2. For the Navy:
Thirty coats of arms for Navy ships

3. For the Air Force:
Two hundred artwork cases for organizational emblems

4. For other agencies:
Sculptured replica of the White House for use in the White House Press Room
Logo for the Armed Forces Inaugural Committee
Emblem for DOD Medical Examination Review Board
Emblem and Drawing of Flag for DOD Inspector General
Seal for Fifth U.S. Coast Guard District
Coat of Arms for U.S. Coast Guard Training Center, Cape May

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Construction, Facilities, and Real Property

The Army maintained a large inventory of facilities to house personnel, to store equipment and other materiel, to provide offices and services, and to support training functions. The Corps of Engineers (COE) was responsible for building, modernizing, maintaining, and supplying physical security equipment for these facilities. The following chapter presents the major accomplishments of the Corps' mission.

Construction

The FY 84 Military Construction, Army, program value amounted to $975.9 million with a goal of completing 95 percent of that program by the fourth quarter of the fiscal year. COE surpassed that goal by 4.7 percent for a total execution of $972.67 million. The COE added a $2 million carryover from FY83 to the total funding available for the fiscal year. The FY 84 Military Construction, Army Reserve, program totaled $34 million with an executing goal of 95 percent by the fourth quarter. The Corps fulfilled 100 percent of the program. The FY 84 Military Construction, Air Force, program amounted to $1,194.38 million and the execution goal of 95 percent by the fourth quarter was met exactly with expenditures of $1,134.54 million.

Miscellaneous non-Army construction programs equaled $374.93 million with an execution goal of 94 percent ($350.69 million) by the fourth quarter. The Corps of Engineers executed only 84 percent ($314.17 million) of the goal and attributed much of the delay to redesign efforts in the Defense Language Institute and National Security Agency programs.

Work continued on the King Khalid Military City in Saudi Arabia, which will house 70,000 people and three brigades of Saudi Arabian troops. USACE, the organization responsible for contracting out the work, provided design and construction services on approximately $17 billion worth of projects since 1974. During FY84, the Saudis continued to become more involved in developing and managing the contracts. The Corps finished construction of a $4 million incinerator for the Japanese government on Yokota Air

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Base. The incinerator will burn all of the waste generated on Yokota except for glass and rubber, thereby greatly reducing landfill requirements. The U.S. Navy asked the COE to assist the Peruvian Navy in its plans to build a base at Chimbote. The Corps will proceed with a base development plan upon the approval of the Peruvian Navy and appropriation of funding. WESTCOM requested Corps of Engineers planning assistance to revise Hawaiian installation master plans. This was WESTCOM's first regional planning effort since their 1979 establishment as a MACOM.

Facilities and Real Property

For the first time since becoming the Executive Agent for recruiting facilities, the Chief of Engineers maintained direct control over almost all of the recruiting facilities programs. The Corps completed 99.3 percent of the program's 2,048 actions by the fourth quarter, exceeding the goal of 95 percent. In a 29 November 1983 meeting of the DOD Task Force on Recruiting Facilities, the OCE representative from the Real Estate Directorate discussed with the Recruiting Commands what initiatives the Corps had undertaken to stabilize the program. The primary one was OCE's assuming the responsibility to approve modifications to facilities. Previously, Corps district and division commanders made these decisions. The Facilities and Installation Planning and Design statistics are shown on the following tables. *(See Tables 39* and 40.)

TABLE 39 - FACILTTIES AND INSTALLATION PLANNING
(In percent)

	MCA		MCAF	
	Goal	Actual	Goal	Actual
FY 85 projects 35 percent design complete by 1 Jan 84	100	99	100	92
Design ready to advertise:				
FY 84	100	94	100	97
FY 85	75	24	75	50

TABLE 40 - PLANNING AND DESIGN COSTS MILITARY PROGRAMS
(In millions)

	Contract	In-house	Total
Costs	268.8	66.9	335.7
Total projects cost	4,393.1	1,065.0	5,458.1
Percent total budgeted project cost	6.1	6.3	[1] 6.21

1 COE established goal met.

Representatives from the Directorate of Engineering arid Construction, one Corps division, and several COE districts attended the FORSCOM Design Review Conference from 31 May to I June. Attendees discussed military construction project planning and development and participation by installation personnel in subsequent design, construction, and operation. Conference members also identified a number of areas of poor communication and lack of common understanding among the installations, Corps districts, and the Office of the Chief of Engineers.

The Corps of Engineers continued to work on the Installation Facilities System-Redesign project, a sophisticated information management system on VIABLE to support directors of engineering and housing at Army installations. The Facilities Engineering Support Agency handled functional aspects while the Information Systems Command developed the ADP systems. When implemented in the third quarter of FY 85, the project will replace the present system operating at seventy installations.

The Corps published two new guides during FY 84. The design guide for libraries governed the layout of Army libraries and technical information facilities, while the design protocol for interiors regulated the specifications of all interiors for Army facilities.

The Army received four DOD Design Awards in FY 84, including two shared with the Air Force:

Project	*Design*
U.S. Army Hospital, Fort Campbell, Kentucky	U.S. Engineer District, Mobile
Conversion, Bldg. 606, U.S. Military Academy, West Point, New York	U.S. Engineer District, New York
Additions/Alternatives, Cadet Library U.S. Air Force Academy, Colorado Springs, Colorado	U.S. Engineer District, Omaha
Heating Plant, F. E. Warren Air Force Base, Wyoming	U.S. Engineer District, Omaha

The Backlog of Maintenance and Repair (BMAR) program improved living and working conditions for U.S. troops, particularly those stationed overseas. The Real Property Maintenance Activities (RPMA) program directed BMAR activities based upon an FY 83 priority system that identified the most critical projects requiring attention. RPMA's K account, Maintenance and Repair of Real Property, expanded through the 1980s, reflecting an increased concern about the relation of facility conditions to troop morale. As a result, the BMAR dropped for three consecutive years with

approximately $428 million contracted out during FY 84.

A DOD memorandum of 18 June 1984 increased delegated authority for repair projects to all services. Therefore, on 10 July the Assistant Secretary of the Army (Installations and Logistic) redelegated approval authority as follows:

COE-up to $3.0 million.
MACOM-up to $2.0 million.
MACOM-may redelegate authority to installation for up to $1.0 million.
MACOM-required to review repair projects for WWII temporary buildings costing over $10,000 for compliance to DA policy.

On 13 February 1984, the Secretary of the Air Force transferred Hamilton Air Force Base, California, to the Department of the Army. The Army acquired approximately 762 acres of the base and retained care and custody over the remainder. The House and Senate Appropriations Committees approved the $3.5 million purchase of 39.49 acres of Ladycliff College, which the Army had leased for use by the U.S. Army Military Academy since December 1982. The New York District of the Corps of Engineers received the deed on 28 June 1984. The Directorate of Real Estate and the Chicago Mill and Lumber Company agreed on the purchase prices of two separate tracts of land for the Tensas River National Wildlife Refuge in Louisiana. The first tract of 16,342.28 acres cost $14,543,280, exceeding appraised value by 9.5 percent and the second tract of 2,355.34 acres sold for $2,355,000 or 13 percent over the appraisal. With these purchases, the refuge totaled 35,523 acres.

The Department of Defense issued policy guidelines (DOD Directive 4700.3) on making DOD lands available for private exploration and extraction of resources on 28 September 1984. The Army was the Executive Agent for the directive, which stated that such activities may be allowed if they would not interfere with military operations, national defense activities, or Army civil works projects. The Property Review Board declared 150 acres of land on the Parks Reserve Forces Training Area, California, as excess to

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Department of Army requirements. In addition, the Sacramento District Real Estate Division sent a right of entry and draft lease to Alameda County on 1 June 1984. The lease formed the basis for a homeless shelter, DOD's largest, comprising two buildings, and two acres of land. Effective 1 July, the county undertook the two-year lease that required the state to assume law enforcement functions in the shelter area prior to occupancy.

In December 1981, Public Law 97-128 terminated construction of Meramec Park Lake, Missouri, and made COE responsible for offering previous landowners the opportunity to repurchase their property (less that already conveyed to Missouri) at current appraised value. The St. Louis District completed an appraisal which showed that 26 percent of the properties increased over 50 percent in value since the original purchase and 25 percent dropped by 50 percent or more in value. The Corps expected some previous owners to react adversely to their higher repurchase costs. COE mailed the first letters to over 600 former property owners in November 1983. In December, more than 100 owners met to denounce their appraisal and to discuss legal action. Subsequently, they filed a law suit to nullify the conveyance of land in the Meramec Basin to the Missouri Department of Natural Resources and to arrange a formula for setting resale prices that the landowners felt would be fair.

The Departments of Interior, Agriculture, Defense, and the Tennessee Valley Authority issued final regulations in the Federal Register on 6 January 1984 that established uniform procedures for implementing provisions of the Archaeological Resources Protection Act of 1979. The 1979 act replaced a 78-year-old measure archaeologists said was ineffective in preventing people from selling or destroying priceless artifacts unearthed on federal land. The Corps' Directorate of Real Estate acted as DOD's Executive Agent. One aspect of the new regulations allowed recognized Indian tribes to testify before permits are issued for archaeological excavations in areas outside their reservations that they consider important for ceremonial or religious reasons. However, some Indian groups remained displeased, because the new act still allowed burial sites to be excavated once the archaeologists have obtained the necessary permits.

Senate Report 97-440 directed the services to dispose of their WW II temporary buildings by 1990, to limit any further expenditures on them, and to replace them, where necessary, with pre-engineered buildings. As a result, the VCSA signed

a policy letter in February on the disposal of WWII temporary buildings containing nearly 38 million square feet of space. This letter was an attempt to address con-

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gressional concerns while protecting favorable MCA funding and maintaining the missions of the installations.

The Corps of Engineers satisfied Delaware's urgent need for solid waste landfill areas by allowing the Delaware Solid Waste Authority to establish a disposal site at the Corps' Cherry Island Disposal Area. The agreement for joint use allowed the Delaware Solid Waste Authority to use immediately the first of five incremental land areas they would receive. The discontinuance of Corps use of 210 acres on Cherry Island depended upon Delaware providing the Corps a replacement disposal area for dredge spoil. The land exchange will occur in the near future.

The Directorate of Real Estate recommended that the Secretary of the Army convey 37.6 acres of land and water areas at the Newt Graham Lock and Dam No. 18, Oklahoma, to the city of Tulsa-Rogers County Port Authority. The Port Authority asked for this real estate to meet the expected growth of waterfront and industrial activities at the public port facility. The Port Authority agreed to pay $950,000 and to assume the responsibility for dredging the turning basin and maintaining the river banks in the area conveyed.

Physical Security

The Corps of Engineers concentrated most of their physical security work overseas. In October 1983, it approved $738,000 for the construction of security fencing, lighting, and aircraft hardstands at Mutlangen Air Base, Germany. The airbase at Greisham, Germany, received funding in February 1984 for perimeter fencing and lighting.

Within the United States, the Corps, in November 1983, approved $400,000 for security fencing and parking areas in the ammo limited area of the Red River Ammunition Depot, Texas.

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Special Functions

The Corps of Engineers through its civil works, environmental protection, and energy programs comes into close contact with the civilian community. Unfortunately, the Corps' views or operations in these programs do not always match those of the civil sector and the Army must respond to the resulting litigation. This chapter details the major activities in civil works, environmental protection, energy, and litigation (against both Corps and non-Corps Army activities).

Civil Works

Total appropriations for Civil Works projects increased approximately $262 million over the FY 83 level with the largest change in the Operation and Maintenance, General, category.

	Millions
General Investigations	$165
Construction, General	1,490
Operation and Maintenance, General	1,416
Flood Control, Mississippi River and Tributaries	427
All Other	183
Total	$3,681

Representatives from the Directorate of Civil Works met with a member of the Soil Conservation Service on 22 May 1984 to delineate flood response and recovery authority during the flood season and each agency's policy for rehabilitating non-federal levees. The conferees agreed to maintain a close liaison so that interservice problems could be resolved quickly as they arose during an emergency.

On 9 July, representatives of the two agencies discussed federal policy for rehabilitating non-federal levees. After comparing policies and responsibilities for this repair work, the conferees agreed to meet later to define areas of responsibility, thereby eliminating confusion when applicants sought federal assistance. In early September, after more discussions, the Director of Civil Works sent an information memorandum to the Assistant Secretary of the

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Army (Civil Works) (ASA[CW]) outlining the agreed upon delineation of responsibilities. The Corps would pursue requirements for 80/20 cost sharing and public sponsorship and would consider limited delegated authority to district commanders to approve rehabilitation projects.

During FY 84, the Corps concluded a seven year study to examine the causes of streambank erosion, to evaluate the effectiveness of existing and new methods of bank protection, and to prepare a report for Congress. The COE published its findings in a booklet, "Streambank Protection Guidelines," and distributed 20,000 copies, primarily to landowners and local governments. On 1 October 1983, the Corps and the Soil Conservation Service began an $8.2 million study of the erosion problem on the Upper Yazoo River that undermined bridges, ruined farmland, and caused downstream flooding. Both agencies expected the study to lead to improved erosion control techniques that could be used nationwide.

Local levee districts and landowners in Missouri sought a permanent injunction against the Corps of Engineers to keep it from artificially crevassing the frontline levees of the Birds Point New Madrid Floodway. The U.S. District Court issued a preliminary injunction on 10 May 1983, but the U.S. Court of Appeals ordered the suit returned for a full

hearing. The hearing, *Story v. Marsh,* covered two primary issues: whether the Corps' operation plan was arbitrary and capricious and whether the United States should be stopped from operating the floodway. The five-day hearing decided against the Corps on both counts, and on 31 October 1983 the District Court continued in effect the 10 May injunction prohibiting the Corps from operating the floodway The federal government immediately appealed. In April 1984, the Circuit Court reversed the lower court on all points, lifted the injunction, and denied all of the plaintiffs' attempts for a rehearing.

The eruption of Mount Saint Helens in 1980 caused several subsequent problems for the Corps. In November, it announced several methods of dealing with two of these-the debris dam on Spirit Lake and sediment in the Cowlitz and Columbia Rivers. The Corps of Engineers preferred to build a buried conduit through the dam to drain the lake's water into the Toutle River, thus reducing the level of Spirit Lake by twenty feet. However, public concern over drainage through a possibly unstable debris dam caused the COE to route the tunnel through rock instead. On 23 February, the Chief of Engineers asked the Assistant Secretary of the Army (Civil Works) to approve recommendations for the stabilized level of the lake and the new tunnel alignment. The Corps finished the

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final environmental impact statement for the 8,500-foot tunnel in April 1984 and started preliminary work on 2 July.

Despite several Corps-funded dredging operations to remove sediment from the Toutle and Cowlitz Rivers in the fall of 1983, the Corps of Engineers failed to maintain 100 year flood protection for all communities along the lower Cowlitz. The Corps determined that dredging an additional three million cubic yards of sediment at a cost of $9.0 million had to begin by mid January to preserve the present 50 year flood protection at Castle Rock, Washington. Otherwise, by March the flood protection would drop to a 10-year level. The COE awarded two Construction, General-funded contracts on 18 January to dredge the sediment. The contractors removed 2,881,000 cubic yards of sediment at a cost of $6.5 million. This excavation, along with favorable runoff conditions during December and January, improved the area's flood protection levels.

Early in FY 84, the Director of Civil Works sent to the Assistant Secretary of the Army (Civil Works) the general plan prepared by the Mobile District for interim flood control measures on the Pearl River at Jackson, Mississippi. Congress authorized these on 30 July 1983. The Mobile District requested $600,000 for preconstruction planning activities. After OCE review, the Director of Civil Works approved $400,000 to continue planning and engineering studies but not to initiate specifications and plans work. He deferred the request for plans and specifications as well as construction funding until two issues were resolved. These were the justification for 108 acres of mitigation land not adjacent to the project and the most cost effective design for a wave barrier in Ross Barnett Reservoir.

The Mississippi congressional delegation questioned the substantial reduction in the Corps' plans for flood control and the final disposition of the funds deleted from the Jackson project. The Director of Civil Works, in response, pointed out that Congress' authorization for the interim flood control measures came at a time when the Mobile District had very preliminary plans and that the ongoing planning and design process would refine these plans and the COE would recommend only those measures that met federal standards. The final comprehensive flood control plan recommended by the Corps would provide a substantially higher level of protection than the interim plans then being considered. Furthermore, the Director assured the congressmen that appropriations in excess of requirements would not be spent on other projects.

The Director of Civil Works, in March 1984, submitted a revised plan on the interim measures to the Assistant Secretary of the Army (Civil Works). On 27 April, Jackson officials received $2.5

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million dollars in federal money to finance a flood-reducing clearing project on the Pearl River. However, the Corps turned down the proposal to strengthen the Ross Barnett Reservoir.

Flooding of the three forks of the Kentucky River and two forks of the Big Sandy River in Kentucky produced damage estimates of $234 million in fourteen counties. However, Huntington District engineers estimated that dams prevented a further $154 million worth of damage during the same period.

New England Division engineers estimated that Corps-built projects in the Connecticut River Basin prevented over $58 million of damage during the December 1983 flood and that the Stamford hurricane barrier deterred $50,000 in damages during a 28 February 1984 storm. In fact, Corps flood control projects in New England set a new record for saving property during FY 84. Corps reservoirs and local protection efforts prevented $780 million in losses during flooding from April through June.

During the December 1983 flood, Baltimore District flood control projects deterred over $914 million in damages, primarily in the Susquehanna River Basin. A further $864 million in savings occurred in February 1984 and cumulative loss prevention totaled almost $2 billion during FY 84, surpassing the previous record of $978 million in FY 76.

The Fourth Circuit Court of Appeals affirmed the decision of the district court which upheld the Corps of Engineers' denial of a permit for filling 8.2 acres of tidal wetlands in Ocean City, Maryland. Shoreline Associates planned to build a waterfront townhouse development on the filled wetlands. For the first time, the Fourth Circuit Court directly addressed the Corps' procedures for considering permit applications and found those procedures adequate even though they did not provide for formal submission of evidence, cross-examination, or rebuttal.

A settlement agreement in *National Wildlife Federal v Marsh* required the Department of the Army to publish proposed regulations for its permit program delineating the status of categories of waters, nationwide permits, rights of private property owners, effect of the 404 (b) (1) guidelines, Corps' deference to local land use decisions, and regulation of solid waste discharged into U.S. waters. The Corps published these proposed regulations in the Federal Register on 29 March 1984 after coordinating their content with the ASA(CW), the Department of Justice, the Army Counsel, the EPA, the intervenors, and the plaintiffs. The Director of Civil Works sent a draft of the final permit regulations and five regulatory guidance letters essen-

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tial to their implementation to the ASA(CW) in August. At the end of FY 84, the Corps still awaited a final decision.

At the direction of the ASA(CW), the Civil Works Directorate drafted guidance on permit decision documentation for especially important or controversial cases. This guidance proved to be necessary after two court decisions remanded permit decisions back to districts, largely because of incomplete documentation in the areas of cumulative impacts, determination of wetland importance, practicable alternatives, and water dependence.

The Corps "pulled the plug" on the divide cut of the Tennessee-Tombigbee Waterway on 20 January 1984, providing full-width navigation from Pickwick Pool to Bay Springs Lock and Dam. The 39mile-long Divide Section took ten years to complete.

Between 21 and 22 July 1984, an extensive 2,400-foot-long shoal formed along Crats (Hershey) Island on the Upper Mississippi, stopping all barge traffic. The Corps attributed the shoaling to sediment from the Chippewa River and sent the dredge *Thompson* to open a passage. The dredge completed a pilot channel on 27 July permitting traverse of the shoaled area by awaiting tows. Continued dredging, natural stream flow, and wash from transiting tows completely reopened the channel.

During FY 84, the Southwestern Division, Corps of Engineers, proposed moving certain dam safety functions out of the Albuquerque and Little Rock Districts and consolidating them in the Tulsa District. A decrease in design and construction of major civil works projects and a reduction in dam safety technical staffs in those two districts necessitated the changes.

In October 1983, the Director of Civil Works sent an update on the one state/one district boundary realignment plan to the ASA(CW). The plan's goal was to eliminate the division of states between two Corps districts. During FY 84,

Kansas went to the Kansas City District, Wyoming transferred to the Omaha District, and Vermont joined the New England Division. Colorado, however, remained divided.

The Corps of Engineers played a major role in the RESPONSE 84 earthquake exercise conducted by FEMA on 7-8 August 1984. The exercise clearly demonstrated the need for Corps engineering and construction contracting expertise in the event of a major earthquake anywhere in the United States.

On 15 March 1984, a tornado caused $8 million in damages to an Arkansas state highway bridge and blew the superstructure into Greers Ferry Lake, destroying a pipeline that provided drinking

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water to two communities. Although Arkansas designed and built the bridge, Little Rock District personnel assisted in the recovery effort.

A General Accounting Office report, released in January 1984, revealed that the Corps took an average of 26 years to begin construction on a project for which a survey was authorized. The study of 18 flood control projects, 16 navigation projects, and a multipurpose water project awarded construction funding between FY 78 and FY 83, showed an average of 29.4 years for flood control projects, 21.6 years for navigation projects, and an overall average of 26.1 years. The GAO noted, however, that 45 percent of the time lag was due to the Corps' waiting for congressional construction authorization and funding.

Environmental Protection and Preservation

A proposal by Virginia Beach to withdraw up to 60 million gallons of water daily from Lake Gaston, North Carolina, brought determined resistance from that state. North Carolina's Governor James B. Hunt, Jr., expressed his concern that the pipeline would decrease the flow of the Roanoke and Chowan Rivers, thereby causing pollution buildup and algae growth at the upper end of Albermarle Sound. The North Carolina government delivered a 35 page document to the Corps of Engineers in November 1983 claiming that construction of the proposed $176 million pipeline would hurt the striped bass, hydroelectric power, and water recreation in the Lake Gaston area. Furthermore, the document argued that the 85-mile pipeline would violate federal laws on the interbasin transfer of water, and the Corps would need congressional approval before starting the project. On 12 January 1984, the state of North Carolina filed suit against the Secretary of the Army, the ASA(CW), the Chief of Engineers, and the Norfolk District Engineer, alleging that on 9 January the Corps had illegally issued the city of Virginia Beach a permit to construct a water intake structure on Lake Gaston, since no environmental impact statement had been prepared and since the Water Supply Act of 1958 mandated congressional approval for the project.

The North Carolina suit involved generally the same issues and facts as that filed by the city of Virginia Beach on 9 January against the Roanoke River Basin Association, seeking declaratory relief against the Governor of North Carolina and others. In addition, the *Virginia Beach v Champion International* case sought to resolve water rights questions associated with the proposed water intake facilities.

In May, a new Corps study presented evidence that the pipeline was the best method to ensure the future drinking water supply of the Virginia Beach area. The Corps defied the House Appropria-

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tions Committee in September by refusing to prepare an environmental study on the project. It justified this stand by claiming that laws allowing the Corps to decide when an environmental impact statement is necessary overruled the committee's direction.

In December 1983, the United States sued a group of manufacturers for the recovery of natural resource damages in the Acushnet River, New Bedford Harbor, and Buzzards Bay areas of Massachusetts. The Environmental Protection

Agency joined the suit in February. The suit alleged that the defendants' operation of capacitor plants resulted in polychlorinated biphenyls discharged into the river and harbors. Federal Pacific Electric Co., a defendant, filed a counterclaim charging that the Corps' dredging operations had caused the damage by disturbing and transporting contaminated sediment.

A U.S. District Court judge ruled in March 1984 that the Corps of Engineers had abdicated its responsibility under the National Environmental Policy Act of 1969, when it issued a permit for a proposed resort development on Galveston Island, Texas. The judge decided that the permit was not sufficiently supported by an environmental impact statement and therefore the permit-wag-unreasonable and arbitrary. The court ordered the Corps to prepare an environmental impact statement including "all past, present, and reasonable foreseeable developments."

In August 1984, the Corps transferred its Chesapeake Bay Model operation and maintenance to the state of Maryland for its use in the Bay cleanup program. The Director of Civil Works, in September, sent a letter to Senator Charles Mathias stating that the ASA(CW) and the Director supported the establishment of a federal coordination agreement to assist in restoring the bay.

The Chairman of the Board of Directors of the Metropolitan Washington Council on Governments sent a letter, on 23 July, to the Secretary of the Army asking him to assign the primary responsibility for evaluating the hydrilla problem in the Potomac River and for developing a plan of action by the Corps of Engineers. The Corps stated that it had started work on the problem and would continue the program during FY 85.

Despite objections by environmentalists, a U.S. District Court judge ruled, on 5 January 1984, that the Corps could proceed with the completion of an expanded Barbers Point Harbor inn Honolulu. The judge decided that the COE had taken sufficient notice of the potential environmental consequences of the project and need not engage in discussions of any other "remote and highly speculative consequences." Several Waianae Coast residents had started the suit in 1982.

In July 1984, a U.S. Circuit Court of Appeals approved the legal adequacy of the Cooper Reservoir (Texas) Project's supplemental environmental impact statement and lifted the injunction that had prevented construction since 1971.

During FY 84, the two studies attempted to determine whether the turbines at the Harry S. Truman Dam and Reservoir, Warsaw, Missouri, could be successfully operated in reverse as pumps without endangering fish populations in the Lake of the Ozarks. A task group of the Truman coordination team and Corps-funded independent review by the University of Missouri will submit a definitive decision by March 1985.

Army Energy Program

In the decade since the OPEC cartel imposed a substantial oil price hike, the Army undertook numerous initiatives to reduce energy consumption. Started as a program to reduce dependence upon foreign energy sources, the Army Energy Program now has evolved to include economics, and will remain a priority issue in the Army's planning operational activities.

The Army implemented its energy conservation program to meet the presidentially assigned goal of reducing energy usage per square foot of active floor space by 20 percent of the FY 75 level. The mobility energy goal was to reduce administrative fuel (MOGAS) consumption by 15 percent and limit operational readiness fuel (diesel and aviation) use to the FY 75 level. The Army did not meet its FY 84 targets. Facility energy consumption was 5.7 percent over the target and mobility energy used exceeded the target by 3.4 percent. The Energy Conservation Investment Program, the Energy Engineering Analysis Program, and the Energy Conservation and Management Program aimed at identifying and implementing energy projects for fixed facilities. Although these projects started to come on-line during FY 84 and produced energy savings, wastage still occurred. To eliminate further or at least reduce this waste, the Army continued its DA Energy Seminars that promoted energy awareness at the installation level. Thirteen CONUS and OCONUS installations held the seminar during FY 84 and 18 will be held in FY 85.

Army Litigation

More than 1,300 lawsuits involving the Army were pending in federal, state, and foreign courts at the end of FY 84. Many of these actions challenged significant Army activities, policies, and deci-

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sions. The RELOOK cases, involving over 100 Reserve officers released from Active duty because of their nonselection for temporary promotion, came closer to final resolution. The plaintiffs claimed that the original selection boards had insufficient Reserve representation and that the Army's reconsideration through special RELOOK boards was inadequate. In March 1984, the Court of Appeals for the Federal Circuit denied the plaintiffs' petition for a rehearing in *Bockoven v. Marsh* and left intact the court's ruling that the RELOOK remedy was adequate and that 1976 promotion boards had "appropriate" Reserve representation. Definitive resolution of these issues in *Bockoven* should control the other RELOOK cases. Therefore, all related cases in the Claims Court were suspended pending the Supreme Court's decision upon the plaintiffs' application for certiorari in *Bockoven.*

The Army's right to exclude homosexuals from its ranks continued to face tests in the courts. In *Watkins v. United States Army,* the Court of Appeals issued a mandate overturning the District Court's order that directed the Army to reenlist Watkins, an admitted homosexual, discharged by the Army for that reason. In *Rick v Secretary of the Army,* the Tenth Circuit affirmed the dismissal of a challenge to Army policy regarding the discharge of homosexuals brought by a former enlisted soldier discharged for fraudulently concealing previous homosexual acts at the time he enlisted.. *Mathezos v. Marsh* involved an admitted lesbian who was removed from the ROTC program at the University of Maine. In April 1984, the District Court ruled that the plaintiff's removal solely on the basis of her admission that she was homosexual, but without evidence of her committing homosexual acts, violated her First Amendment right of free speech. The Army still awaited the court's ruling on its appeal at the end of FY 84. In an administrative proceeding, the Philadelphia Commission on Human Relations attempted to preclude Temple University from allowing military recruiters to use the services of its law school placement office. Two homosexual students and the commission claimed that by permitting this, Temple University impermissibly aided and abetted discrimination based upon sexual orientation because the military excluded homosexuals. The Army entered the proceeding as an *amicus* and filed a brief contending that the Supremacy Clause precluded Philadelphia from taking action against Temple University.

In the area of political questions and activities, pacifist groups sued school boards in Chicago and Atlanta to obtain the same access to schools given to military recruiters. The Army provided information to the school boards in both cases and prepared *amicus*

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briefs. In *Katcoff v. Alexander,* the court ruled that the Army chaplaincy "is a constitutionally mandated end," and did not violate the principle of separation of church and state. An appeal is pending.

In sole parent litigation, the only pending case was the class action *Mark v. Rumsfeld,* which challenged the Army's policies on the enlistment of sole parents in the Regular Army, Army Reserve, and Army National Guard. Cross-motions for summary judgment awaited a judicial decision at the end of FY84.

Vietnam veterans sued the manufacturers of Agent Orange on a product liability theory and impleaded the government. In December 1980, the court dismissed the United States as a third party defendant based upon the *Feres* doctrine but withheld final judgment in favor of the government, presumably to facilitate discovery. In February 1984, the court reinstated the United States as a defendant in the litigation for the claims of spouses and children of Vietnam veterans exposed to the herbicide. The government's appeal proved unsuccessful. On the eve of the trial in May 1984, the chemical manufacturers settled out of court and agreed to establish a $180 million fund for the payment of claims arising from exposure to Agent Orange. The United States remained a defendant in the case at the end of the fiscal year.

A number of nuclear and drug testing cases remained pending during FY 84. In *Broudy v. United States,* the Court of

Appeals ruled that a service member exposed to nuclear radiation could sue the government for damages. The Army sought Supreme Court review. In *Stanley v. United States,* the Army appealed a district court decision that a service member who participated in drug experimentation was not precluded from suing because his participation was voluntary. The Army moved for summary judgment in the related cases of *Barrett v. United States, Barrett v Hoffman,* and *Barrett v. Author,* which involved the death of a civilian after being administered mescaline by an Army research contractor. At the end of FY 84, the Army awaited notice of a hearing date.

Harris v. Marsh, claiming pervasive race discrimination at Fort Bragg, North Carolina, continued as the Army's most significant race discrimination case. In January 1984, trial began on the first of 50 cases. During FY 84, the court dismissed 14 cases with prejudice on the plaintiffs motion and dismissed 12 others on procedural grounds. The Army, arguing that some of the cases' claims were frivolous, moved for sanctions. The remaining cases will be tried in January 1985. The Army defeated class certification in *Hillis v. Marsh,* which alleged race discrimination in promotions at the Red River Army Depot, and prepared for trial on individual claims in early 1985.

The Army faced a deluge of litigation in the Court of Appeals for the Federal Circuit, challenging decisions in favor of the Department of the Army by the Merit Systems Protection Board. Pro *se* petitioners filed most of these appeals and alleged that the adverse action was unsupported by adequate evidence. The court uniformly affirmed the board's decisions.

The Army also saw more filings in district courts seeking to impose individual liability upon Department of the Army officials based upon common law and constitutional tort theories. The Army was significantly successful in protecting officials from liability through pretrial motions, with only one case resulting in a money judgment against a DA official.

A troubling development in tort litigation was the use of artful pleading to overcome express bars to claims under the Federal Tort Claims Act (FICA). Three prominent examples involved the foreign claims and intentional tort exceptions to the FICA. The foreign claims exception precluded "any claim arising in a foreign country." To circumvent this clear and unambiguous language, plaintiffs in *Morris v. United States* and *Conley v. United States* claimed negligence by The Surgeon General in selection, retention, and supervision of the treating medical personnel in Germany as the basis of their suits, rather than the actual negligent medical treatment. The Army moved to dismiss Morris and continued discovery in *Conley.*

Plaintiffs used a similar approach to avoid the intentional tort exception which barred "any claim arising out of assault, battery . . ." They attempted to overcome this express exception by claiming negligent supervision by military superiors as the basis of their cases rather than the actual tortious act by the federal employee or soldier who inflicted the injury. In *Shearer v. United States,* the plaintiff succeeded with this approach before the Court of Appeals for the Third Circuit. The Army's petition for certiorari remained pending at the end of the fiscal year.

Another development of increasing significance concerned affirmative litigation efforts in the medical care recovery area. In several jurisdictions, the effect of no-fault insurance showed a steadily rising number of no-fault insurers refusing to pay the government's medical care claims. At the end of FY 84, Congress was considering remedial legislation.

Fiscal year 1984 saw an increase in the number of Contract Disputes Act cases filed directly in the United States Claims Court, rather than with the Armed Services Board of Contract Appeals, *C3, Inc. v. United States,* one of the most significant, arose out of a dispute over a contract for computer equipment. The plaintiff

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sued for $1 million, and the Army countersued for $4.2 million for fraud by C3, Inc. The court suspended trial proceedings pending the outcome of a federal grand jury investigation.

In contrast, the number of disappointed bidder suits seeking injunctive relief sharply declined during the year. Among the most interesting was *M.N. C. of Hinesville, Inc. v. Department of Defense,* in which a newspaper publishing company challenged the selection of a competitor to publish the civilian enterprise newspaper at Fort Stewart, Georgia. The court denied the plaintiff's motion for a preliminary injunction in January 1984.

The Judge Advocate General's Office devoted a significant amount of time responding to requests for documents from both parties in retired General William Westmoreland's libel suit against the Columbia Broadcasting System. The Army maintained a policy of strict impartiality in this private litigation.

In *United States v Shell Oil Co.,* the Army filed a $1.8 billion affirmative claim against Shell Oil Company under the Comprehensive Environmental Response, Compensation and Liability Act for hazardous waste cleanup costs. Shell created the waste as a byproduct of its pesticide production under a 20 year lease at Rocky Mountain Arsenal. The Judge Advocate General's Office spent much of FY 84 developing an automated litigation support system to cope with the massive discovery requirements in the case. Shell lost its motion to strike the $1.8 billion figure from the suit as well as its motion for dismissal of the Army's contractual claims for indemnification.

The Judge Advocate General established a Contract Fraud Branch on 1 January 1984 to provide a central point for the coordination of all civil, criminal, contractual, and administrative remedies pertaining to contractor fraud. During the remainder of FY 84, the Army suspended 22 contractors and debarred 44 contractors from contracting with the government. In September 1983, the Army suspended a holding company, one of whose subsidiaries held the Army laundry contract in Europe, based upon an indictment for bribery, conspiracy, mail fraud, false statements, income tax evasion, and racketeering. The defendants awaited sentencing at the end of FY 84. During the fiscal year, the Army proposed debarring a manufacturing company because of contract nonperformance. The Army claimed that the company willfully provided over 9,000 defective crankshafts to the Army for military standard engines for a loss of over $1 million. The Judge Advocate General investigated a manufacturer of electronic components for several Army weapon systems for making false claims and false statements. Not yet indicted, the company offered a settlement in which it would plead guilty to sev-

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eral counts of false claims and false statements, would pay approximately $2.6 million in damages under the False Claims Act, and would make specific safeguards to prevent further recurrence. The Army, acting as the DOD Executive Agent, would agree that DOD would not suspend or debar the company. At the close of FY 84, the proposal was being coordinated within DOD.

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Conclusion

I am convinced that the intelligence analysts in the Soviet Union &ad the senior leadership in the Kremlin who look at the U.S. Army and evaluate it see a force much more capable and more formidable than the one they saw a year ago, or three or five years ago. Today, we have better people, more and better equipment, improved training programs and facilities, and better support systems. We are headed in the light direction and I am more optimistic today about our position of excellence than . . . a year ago.

These comments by Secretary of the Army Marsh, in the 1984 *Army Green Book,* summarized the Army's progress during FY 84 in meeting the challenge postulated by General Mahaffey. The Army accomplished much during the fiscal year as it demonstrated its resolve to meet expanding requirements with constrained resources. Personnel, equipment, and training were areas of marked success.

The quality of Active Army personnel reached the highest level since the creation of the All Volunteer Army with almost two-thirds of all recruits from the upper half in AFQT scores and nearly 90 percent high school graduates. Moreover, besides enlisting high quality soldiers, the Army was retaining highly skilled personnel. Except for shortages in a few high technology fields, Army personnel policies eliminated a long-standing shortage of NCOs during the fiscal year.

The Army's extensive modernization program continued during the fiscal year as new weapon systems such as the M1 and M60A3 (TTS) tanks, Bradley Fighting Vehicles, MLRS, PM-64 Apache, and UH-60A Black Hawk reached the field in larger numbers. The Army based equipment fielding policy on mission priority, thereby furnishing new and modernized equipment to Active and Reserve Components on a "first to go, first to equip" strategy.

The Army provided more challenging training through combined arms exercises using the MILES and through work at the NTC, which further enhanced its readiness. Furthermore, Army trainers modernized firing ranges, added funding for training devices, assigned more basic training days, and increased the number of flying hours for Army pilots. The Reserve Component deployment training increased during the period as members participated in REFORGER, BRIGHT STAR, and AHUAS TARA II, among others. Reserve units also passed through NTC training with their Active parent organizations.

The Army substantially improved sustainment capabilities by increasing POMCUS fill and war reserve stocks. These actions reduced the Army's lift requirements and thus deployment times to NATO. In addition, an increase in depot maintenance funding shortened the turnaround times for repairing major pieces of equipment.

The Army continued to streamline and modernize heavy forces while at the same time recognizing the requirements for other essential missions. Therefore, it developed the 9th Infantry Division (Motorized), converted a conventional infantry division to a new light infantry division configuration, and activated a new light division. Furthermore, it augmented special operations forces to meet an increased threat of terrorism and low intensity conflict.

With all of its successes, the Army still faced serious shortcomings. Despite Air Force and Navy efforts, the air and sealift capacity remained far short of the Army's requirements. While POMCUS, forward deployed forces, and new light divisions eased this problem, it will not be solved in the near future. The POMCUS was two division sets short of the authorized level and the war reserve stockpiles remained below requirements. Furthermore, the Army's chemical retaliatory capability was depressingly deficient as was its NBC protective sufficiency. Finally, the Army faced serious problems in rapidly mobilizing Reserve personnel for war. These problems included an inadequate command and

control structure, insufficient manpower with needed skills, and low readiness levels of Reserve combat service support units.

The Army, however, did demonstrate improved capability in the Grenada rescue operation when light, highly mobile, flexible units composed of well-trained and dedicated soldiers using high quality equipment, deployed and successfully completed their mission. Since only 3 percent of these soldiers possessed previous combat experience, this operation underscored the value of the Army's realistic training policy.

As Secretary Marsh wrote:

With the superb soldiers we have today -well trained, equipped, supported and led by leaders who demonstrate personal and professional excellence- the American people can be confident that the Army is ready to protect the freedoms of our great nation.

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Appendix A

Memorandum of Agreement on U.S. Army-U.S. Air Force Joint Force Development Process

Department of the Army
Headquarters, U.S. Army
Washington, D.C.

Department of the Air Force
Headquarters, U.S. Air Force
Washington, D.C.

22 May 1984

MEMORANDUM OF AGREEMENT

ON

U.S. ARMY- U.S. AIR FORCE

JOINT FORCE DEVELOPMENT PROCESS

1. The Army and the Air Force affirm that to fulfill their roles in meeting the national security objectives of deterrence and defense, they must organize, train, and equip a compatible, complementary and affordable Total Force that will maximize our joint combat capability to execute airland combat operations. To that end, broad, across-the-board, war-fighting issues have been addressed. We believe the resulting agreements listed in the attachment will significantly enhance the country's military posture and have a major positive impact on the way future combat operations are conducted.

2. The Army and the Air Force view this MOA as the initial step in the establishment of along-term, dynamic process whose objective will continue to be the fielding of the most affordable and effective airland combat forces. Consequently, the joint agreements embodied in the attached initiatives will be updated and reviewed by the services annually to confirm their continued advisability, feasibility, and adequacy. We will expand this MOA (and attachments) to include future joint initiatives, as appropriate.

3. As an integral part of the joint effort to ensure the development of the optimum airland combat capability, the services will annually exchange a formal priority list of those sister service programs essential to the support of their conduct of successful airland combat operations, the purpose of which is to ensure the development of complementary systems without duplication. The services will resolve joint or complementary sys-

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tern differences prior to program development. The services will ensure that those programs supporting joint airland combat operations will receive high priority in their respective development and acquisition processes. The MOA confirms our mutual dedication to ensuring that the provision of the best combat capability to the Unified and Specified Commanders remains the top priority of the Army and the Air Force.

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

CHARLES A. GABRIEL
General, United States Air Force
Chief of Staff

1 Atch
Initiatives for Action

CSA/CSAF INITIATIVES FOR ACTION

1. Initiatives on Area Surface-to-Air Missiles/Air Defense Fighters:
a. The Air Force will participate in the requirement and development process for follow-on area surface-to-air missile (SAM) systems.
b. The Air Force will lead a joint net sensitivity analysis to determine the optimum program mix of current area SAMs and air defense fighters.
c. The Army will lead a joint effort to study the advisability and feasibility of transferring proponency for area SAMs from the Army to the Air Force.

2. Initiatives on Point Air Defense:
a. The Army and Air Force will jointly develop a plan to resolve air base point air defense (PAD) requirements.
(1) The Air Force will provide to the Army an updated list of outstanding worldwide PAD requirements.
(2) This joint plan will be reviewed annually.
b. The Army and Air Force will develop a joint statement of need for fixture rear-area PAD systems.
c. The Air Force will participate in the on-going Army effort to review air defense requirements and capability at Corps and Echelons above Corps.

3. Initiatives to Counter Heliborne Assault Threat:
a. The Army will lead a joint assessment of the technical characteristics and operational implications of the future heliborne assault threat.
b. Based on the joint assessment the Army and Air Force will jointly develop and field the capabilities to detect and counter the threat.

4. Initiatives on the Tactical Missile Threat:
a. The Army and Air Force will complete the tactical missile threat assessment, to include evaluation of the operational impact of anticipated threat technical capabilities.

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b. Using this threat assessment as the baseline, the Army and Air Force will establish a joint Anti-Tactical Missile Program.

5. Initiatives on Identification Friend or Foe (IFF) Systems:
a. The Army and Air Force will continue joint research in cooperative friendly identification systems to identify cost-effective refinements for the Mark XV Question and Answer (Q,&A) identification program.
b. The Army and Air Force will develop an IFF system (to include noncooperative, positive hostile identification) that will enable the effective employment of beyond visual range weapons against hostile aircraft.

6. Initiatives on Rear Area Operations Centers (RAOCs):
a. The Army will increase full-time manning of RAOCs as part of the on-going Army Reserve/Army National Guard program to expand manning by full-time support personnel.
b. The Army will establish the appropriate number of ARNG long tour (OCONUS) positions in each RAOC unit.

7. Initiative on Host Nation Support Security Equipment. The Army and Air Force support equipage of FRG reserve security units with German equipment and weapons; with US to FRG equipment ratios to be determined in conjunction with overseas commanders.

8. Initiatives on Air Base Ground Defense:
a. The Army and Air Force will develop a joint Service Agreement for:
(1) Army units to provide air base ground defense (ABGD) outside the base perimeter.
(2) Operational control of Army units performing the ABGD mission by the appropriate air component commander.
b. The Air Force will transfer Air Force Reserve Component manpower spaces to the Army, if the Air Force ABGD requirements exceed Army capabilities.

c. The Army and Air Force will develop joint procedures for rear area security reflecting these initiatives.

9. Initiative for ABGD Flight Training. The Army and Air Force will execute a joint Service Agreement for the Army to provide initial and follow-on training for Air Force on-site security flights.

10. Initiative for Rear Area Close Air Support. The Army and Air Force will develop joint doctrine and procedures for the employment of Close Air Support (CAS) in the rear area.

11. Initiative on the Mobile Weapon System. The Air Force will terminate development of the Mobile Weapon System.

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12. Initiatives on Ground-based Electronic Combat against Enemy Air Attacks:
a. The Army and Air Force will reconcile their joint requirements and restructure the Air Defense Electronic Warfare System (ADEWS) programs accordingly.
b. The Air Force will terminate the Comfy Challenge program.
c. The Army will develop ADEWS to incorporate the required capabilities for both services.

13. Initiative on the Airborne Radar jamming System (ARJS). The Army will terminate the ARJS program. The Air Force will provide airborne jamming support.

14. Initiative on the Precision Location Strike System (PLSS). The Army and Air Force will develop a joint concept and attendant hardware to broadcast PLSS target information to designated Army units in near-real-time.

15. Initiatives on joint Suppression of Enemy Air Defenses (J-SEAD)
a. The Army's analytical agencies will model J-SEAR to determine the overall contribution of an effective SEAD campaign and the impact of SEAD on ammunition expenditure rates. The Air Force will provide full time participation.
b. Army Field Manuals will be updated to address transmittal of PLSS targeting information direct to designated Army units.

16. Initiatives on Combat Search and Rescue:
a. The Air Force will remain proponent for Air Force Search and Rescue (SAR) with Special Operations Forces (SOF) providing a back-up capability in special situations.
b. The Air Force will:
(1) Determine Air Force combat SAR objectives in relation to depths on the battlefield defined by capability.
(2) Develop tactics, techniques, and procedures for conduct of SAR in Air Force zones.
c. The Army and Air Force will develop tactics, techniques, and procedures for SOF to conduct SAR beyond Air Force zones.

17. Rotary Wing Lift Support for Special Operations Forces (SOF). The Air Force will transfer the responsibility for providing rotary wing lift support for SOF to the Army. A detailed implementation plan will be jointly developed.

18. Initiatives on the joint Tactical Missile System QTACMS):
a. The Army and Air Force will develop a joint statement of need for the JTACMS. The restructured program will include the joint development of procedures to ensure that respective service components of JTACMS are fully complementary.

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b. The Army will refocus its current development efforts on a shorter range ground-launched system.
c. The Air Force will develop an air-launched system.

19. Initiative on Army and Air Force Munitions RDT&E. The Army and Air Force will develop procedures for a joint

and recurring review of munitions technical base programs keyed to the budget/POM cycle,. This review will use the joint Logistics Commanders structure and include Army and Air Staff participation.

20. Initiatives on Night Combat:
a. The Army and Air Force will jointly determine the requirements for night operations.
b. The Air Force will pursue a spectrum of night capabilities based on the joint requirements and resolve associated training issues.
c. The Air Force will designate a single Air Staff point of contact for night systems and establish an Air Force liaison to the Army Night Vision and Electro-Optics Laboratory.

21. Initiatives on Battlefield Air Interdiction:
a. The Army and Air Force will develop procedures that can be tailored to theater specific requirements, to synchronize Battlefield Air Interdiction (BAI) with maneuver.
b. The Army and Air Force will field test these procedures.
c. The Army will automate the Battlefield Coordination Element (BCE) and connect BCE/Corps/Land Component Commanders via near--real-time data links.

22. Initiative on a joint Target Set. The Army and Air Force will conduct a joint target assessment for use in establishing a consensus on attack of enemy surface targets and development of coordinated munitions acquisition plans.

23. Initiatives on Theater Interdiction Systems:
a. In theater, the Air Component Commander is responsible for the execution of the interdiction campaign.
b. The Air Force will lead a joint study to:
(1) Establish procedures to jointly develop requirements for interdiction systems.
(2) Define future conventional interdiction requirements.
(3) Determine optimum service proponencies for Intermediate Nuclear Force (INF) systems.

24. Initiative on Close Air Support (CAS). The Army and Air Force reaffirm the Air Force mission of providing fixed-wing CAS to the Army.

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25. Initiatives on Air Liaison Officers and Forward Air Controllers:
a. The Army and the Air Force will provide enhanced training in maneuver unit operations for Air Liaison Officers (ALOs) and selected Forward Air Controllers (FACs).
b. The Army and Air Force will conduct an in-depth review and evaluation of FAC operations and Tactical Air Control Party (TACP) structure to include:
(1) Enhancing maneuver unit ground FAC capability with organic Army helicopter support.
(2) Executing ground FAC functions while operating from organic maneuver unit vehicles.
(3) Performance of battalion FAC duties by non-rated officers in order to expand the full time Air Force representation at the maneuver battalion.
c. The review and evaluation will be conducted in the following phases:
(1) Phase I: An internal review conducted by Tactical Air Command (TAC).
(2) Phase II: A joint TAC and Training and Doctrine Command (TRADOC) review, to include development of a joint field test plan of the proposed FAC/TACP concepts.
(3) Phase III. Joint field test.

26. Initiatives on Manned Aircraft Systems:
a. The Army and Air Force will establish specific service responsibilities for manned aircraft systems.
b. The Army and Air Force will establish procedures for developing coordinated joint positions on new aircraft starts prior to program initiation.

27. Initiatives on Joint Surveillance and Target Attack Radar System (JSTARS)
a. The Army and Air Force will support the G18 as the single JSTARS platform.

b. The Army and Air Force will develop a joint Memorandum of Agreement to:
(1) Outline procedures to ensure dedicated support of ground commander requirements.
(2) Ensure adequate platform procurement to provide required support.

28. Initiatives on TR-1 Program. The Air Force and Army will restructure the current TR-1 program to enhance its wartime survivability and effectiveness, within the bounds of affordability.

29. Initiatives for Manned Tactical Reconnaissance Systems:
a. The Army and Air Force will jointly develop requirements for common platforms to meet follow-on manned Special Electronic Mission Aircraft (SEMA) and Tactical Reconnaissance needs.
b. When joint requirements can best be met by a single service platform (Army or Air Force), that service will assume single service mission and development proponency. In parallel with this, procedures will be

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jointly developed and adequate platforms procured by the responsible service, to ensure dedicated support of the other service's requirements.

30. Initiatives on Intratheater Airlift:
a. The Army and Air Force will establish a joint office to determine intratheater airlift requirements to support movement from Aerial Port of Debarkation/Sea Port of Debarkation to destination; resupply by airland/ airdrop; reposition/redeployment of forces, equipment, munitions, and war reserve; and medical/noncombatant evacuation.
b. The Army and the Air Force will develop joint positions, as required, on intratheater airlift programs.

31. Initiative on POM Priority List. The Army and Air Force will formalize cross-service participation in the POM development process. This formalization will include the annual exchange of a formal priority list of those sister service programs essential to the joint conduct of airland combat operations.

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Appendix B

Operation URGENT FURY

Grenada gained independence on 7 February 1974, and the charismatic, autocratic, Sir Eric Gairy became Prime Minister. A coalition of several opposition Socialist groups formed the New Jewel Movement (NJM) with Maurice Bishop, popular with the people, and Bernard Coard, adept at operating behind the scenes, as its leaders. The New Jewel Movement, however, could do little to remove the highly popular, though erratic, Gairy until 14 March 1979. On that day, while Gairy attempted to persuade the U.N. Secretary General to establish a commission on unidentified flying objects, the NJM staged a bloodless coup and made Bishop Prime Minister; with Coard his deputy. Although the NJM started a program to rebuild Grenada's economy, its leaders concentrated on the perceived threat of invasion by pro-Gairy supporters in the United States. This, coupled with their predilection for Marxist Leninist theory, made Grenada a Soviet backed country. Although united on the invasion threat, the Bishop and Coard factions drifted apart over Marxist Leninist philosophy. The Coard group perceived Bishop as a power hungry hindrance to the NJM's ultimate goal of transforming Grenada into a miniature Cuba. Furthermore, they believed that he was not sufficiently aggressive and determined in supporting the NJM and their revolution. On 13 October 1983, the Coard faction placed Bishop under house arrest. Six days later, Bishop's supporters marched to his house, pushed past the guards, freed Bishop, and carried him to Fort Rupert, headquarters of the People's Revolutionary Armed Forces (PRAF). Once there, they dispersed the garrison. Three Soviet made BTR-60 armored personnel carriers manned by soldiers of the PRAF left Fort Frederick and headed for Fort Rupert, where the soldiers opened fire on the demonstrators, seized Bishop and his principal supporters inside the fort, and executed them. Defense and Interior Minister General Hudson Austin announced assumption of power by a military council, including himself and other PRAF officers, with a shoot-on-sight curfew in effect. Meantime Coard disappeared.

President Reagan's concern over the growing Soviet influence in Grenada, principally military assistance, grew even more serious as Cuban construction workers with militia training began building Point Salines Airport, potentially an excellent jump-off point for Soviet supported revolutionaries in the Caribbean. The political situation worsened on the island, as Soviet and Cuban military assistance greatly exceeded the needs of the Grenadian military forces. Democratic members of the Organization of Eastern Caribbean States (OECS), of which Grenada was a member, also grew more apprehensive over events in Grenada. The house arrest and execution of Bishop forced both President Reagan and the OECS to reexamine their op-

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tions. The OECS, believing that the successful leftist military coup in Grenada might encourage leftist revolutionaries in their own countries to take similar antigovernment action, unanimously agreed to ask President Reagan to intervene with military force in Grenada. Barbados and Jamaica, non-OECS members, also asked for United States military action. President Reagan, concerned lest another Teheran type of hostage situation occur because of the presence of American medical students on the island, also viewed the bloody coup and the possibility of leftist foment in the region of pro-U.S. democratic states with alarm. Since a hostile environment in Grenada might compel the United States to use considerable military force to safeguard and evacuate its nationals, the President ordered the joint Chiefs of Staff to determine American military options against Grenada.

The JCS directed Admiral Wesley L. McDonald, Commander-in-Chief, Atlantic command, to develop options for evacuating American nationals, primarily the medical students, from Grenada. Admiral McDonald's staff decided on six options, one of which called for military intervention. After receiving a request for intervention from the OECS and noticing with apprehension the deteriorating and unstable situation in Grenada, on 22 October President Reagan ordered the JCS to prepare for a military intervention.

As a precautionary move, in case American nationals should have to be evacuated with military assistance, the JCS had

already diverted the *U.S.S. Independence* carrier battle group and the 22d Marine Amphibious Unit (MAU) from their course toward Lebanon to a position within 500 miles of Grenada. Now detailed planning for the execution of McDonald's sixth option took place. Based upon intelligence reports stating that the trained PRAF and Cuban military forces on the island outnumbered the ground combat forces available in the 22d MAU, the Atlantic Command expanded the contingency plan to include a substantial Army presence. Planners selected the 75th Infantry (Ranger) and 82d Airborne Division because their training, organization, and mission suited perfectly this type of operation. The 75th Infantry would engage the enemy, with the 82d Airborne arriving later as a peacekeeping force. Admiral McDonald selected Vice Admiral Joseph Metcalf III to command the operational force, Combined Joint Task Force (CJTF) 120 *(see Chart 5),* during the operation code-named URGENT FURY After hurried planning sessions, the joint planning group divided Grenada into two areas of responsibility and assigned the more lightly defended northern two-thirds of the island to the 22d MAU. The Army and Air Force units received responsibility to subjugate the more heavily defended southern one-third of the island, which included the Salines Airport and St. George's. This area also had the heaviest concentration of trained PRAA soldiers, Cubans, armored personnel carriers, and antiaircraft guns. Operation URGENT FURY, on paper, would be simple: after insertion of SOF units, the Army's Rangers would land at Salines Airport, clear the runway, secure the True Blue medical school campus with its American students, and take control of the high ground around the airport. Simultaneously, the 22d MAU would

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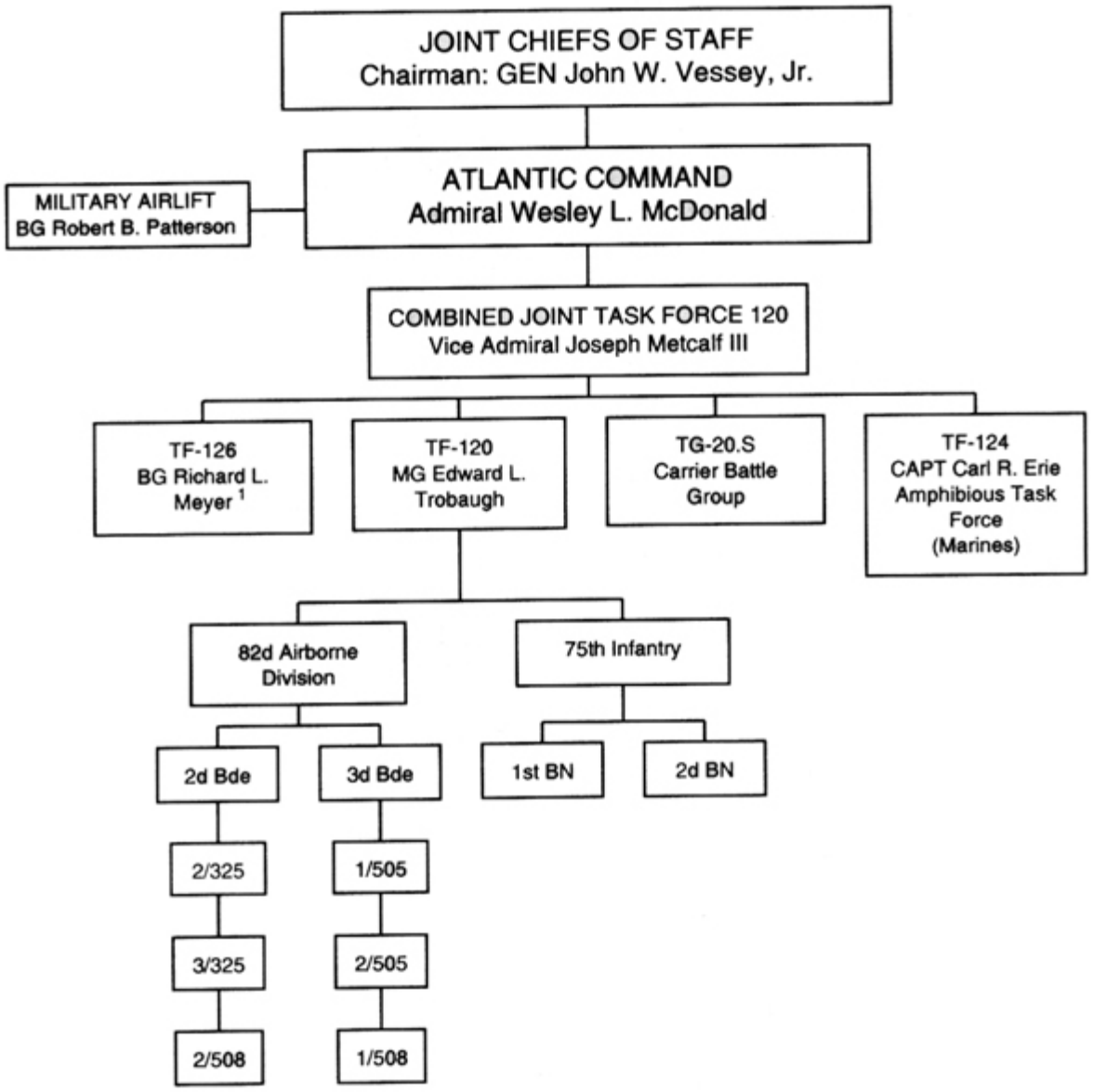
CHART 5 - COMBINED JOINT TASK FORCE 120
25 OCTOBER - 2 NOVEMBER 1983



1 Tactical Air Suport Directly Subordinate to Atlantic Command.

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capture and clear Pearls Airport and Grenville. Elements of 82d Airborne Division would replace the Rangers and continue operations to capture St. George's. The SOF units would be replaced quickly by the Rangers who would turn over responsibility to the 82d Airborne. The 22d MAU would continue on their way to Lebanon, leaving the 82d Airborne as a peacekeeping force. The Navy would supply air support and command facilities while the Air Force would provide AC-130 gunships and military airlift. Although not assigned a combat role, the inclusion of the Caribbean Peace-keeping Force (CPF), composed of members of security forces from several Caribbean island nations, demonstrated their resolve. They desired originally to intervene without United States assistance, but soon decided that they lacked the necessary military force. At 1800, 24 October, President Reagan approved Operation URGENT FURY

Approximately 0530 the next morning, marines from the 22d MAU conducted a heliborne assault on Pearls Airport, meeting light resistance. They quickly secured the area and other Marine elements landed in Grenville with no opposition. Farther south at 0535, two battalions of Army Rangers parachuted from 500 feet into the Salines runway through heavy antiaircraft and small arms fire. They rapidly secured and cleared the runway of the obstructions that Cubans and members of the PRAF had placed on it. The first C-130 with additional Ranger troops and equipment touched down just two hours after the 75th Infantry hit the runway. Simultaneously, members of the 1st Battalion

secured the True Blue Campus with its medical students. Then, for the first time, the Rangers learned that the main medical school campus was at Grand Anse Beach. The rest of the 75th Infantry, after capturing the terminal area and control tower, by 1000 moved to the high ground that overlooked the runway and the Cuban compound at Calliste. The infantry did not fire on this compound because of the possibility that it contained noncombatants. The CPF arrived at Salines forty-five minutes later and shortly thereafter linked up with the Rangers.

In view of the heavy fighting in the Salines area, around noon, Admiral Metcalf decided on an amphibious landing at Grand Mal. Two hours later the first 82d Airborne battalions landed at Salines Airport and moved out to relieve the 75th Infantry. At 1500, 150 Cubans surrended at Calliste, but a large number of diehards remained in the compound. Thirty minutes later, three BTR-60 Armored Personnel Carriers from the PRAF's elite motorized company attacked the 75th Infantry right flank. Ranger fire disabled two of the vehicles and forced the remaining crew to retreat. Since the Marine assault at Grand Mal was in the Army's area of responsibility and because of the slow movement of Army forces, at 1600 Metcalf adjusted the demarcation line between the Marine and Army areas of responsibility southward to a position just below St. George's. Units of the 82d began relieving the 2d Battalion, 75th Infantry, at 1630 and the 1st Battalion at 1800. By 2200 the battalions were on the Salines runway to await evacuation. Meanwhile, elements of the 22d MAU met no resistance when they landed at Grand Mal beach at 1900. At the close of the first

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day's action Army troops held Salines Airport plus most of the surrounding high ground. The marines occupied Pearls Airport and Grenville as well as a beachhead at Grand Mal.

During the night of 25 October and the early morning of the 26th, the senior commanders on Grenada, as well as those in the Pentagon, evaluated the operation. The opposition had been heavier than anticipated and Army progress accordingly slowed. Nor had all of the medical students been rescued. Although all SOF personnel and equipment had departed and the Rangers were awaiting transport back to the States according to the original plan, the evaluation determined that changes were needed. Therefore, the 75th Infantry was placed under the operational control of the 82d Airborne, and Secretary of Defense Caspar W. Weinberger authorized the latter to bring in four more airborne infantry battalions to reinforce the two already in place.

At 0400 on 26 October, the marines advanced from Grand Mal to St. George's and secured the Governor-General's residence at 0710 and Fort Frederick at 1615. Meanwhile, the Cuban compound surrended at 0700 after another heavy exchange of gunfire. Elements of the 82d Airborne reached the military warehouses at Frequente by 1400 and established defensive positions. At 1100, Metcalf ordered Maj. Gen. Edward L. Trobaugh, Commanding General of the 82d Airborne Division, to rescue the students at Grand Anse Beach. Trobaugh decided that the Rangers, with more experience in heliborne assaults, would effect the rescue. Because the 82d aviation assets had not yet arrived, the 22d MAU supplied CH--46 helicopters to deliver and pick up the Rangers and CH-53 helicopters to evacuate the students. A-7 Corsairs from the *U.S.S. Independence* and an Air Force AC-130 provided air support. At 1615, this task force assaulted the medical school area and under intermittently heavy fire removed the students without casualties. The entire operation, from first landing after the fire preparation to the last departure, took only twenty-six minutes. That afternoon the first C-141s took off with student evacuees for the United States.

At 0700 the next morning, the 82d Combat Aviation Battalion (CAB) arrived at Salines to provide the infantry with their own air assault helicopters (UH-60s). An hour later, the marines seized Richmond Hill Prison and began clearing St. George's. The 82d Airborne Division received additional troops that morning and moved farther toward St. George's, drawing only scattered fire. At noon, Atlantic Command informed Metcalf that the JCS wanted Calivigny captured by nightfall. Twenty minutes later, Trobaugh received orders to assault the training camp located there and directed the 2d Battalion, 75th Infantry, to conduct the operation. After one-half hour of preparatory fire, at 1645 the Rangers assaulted Calivigny in Army UH-60s and quickly secured the area.

At 0800 on 28 October elements of the 82d Airborne and 22d MAU linked up at Ross Point, followed two hours later by the CPF establishing liaison with the marines in St. George's. At the same time, soldiers of the 505th Infantry (Airborne) encountered American citizens on the Lance aux Epines peninsula, and the 82d Combat Aviation Battalion evacuated

them. The Rangers departed Calivigny at 1400 and returned to Salines, where they assembled with other members of the 75th and returned to the United States. Meanwhile, the CPF arrived at Queen's Park Race-course north of St. George's to guard prisoners captured by the marines.

On 29 October, Trobaugh and Maj. Gen. H. Norman Schwarzkopf, Deputy Commander of CJTF 120, discussed a captured Grenadian military map that identified arms caches in the southern part of the island. They agreed to establish a task force at 1500 to search for and recover the arms and ammunition. Task Force Newman, composed of the scout platoon and an infantry platoon from the 2d Battalion, 508th Infantry, and the scout platoon from the 3d Battalion, 325th Infantry, set out in gun jeeps and civilian dump trucks. During a nearly twenty-seven hour operation, Task Force Newman discovered and brought back to Salines substantial quantities of Soviet-manufactured weapons and ammunition.

On 30 October, the marines began securing other major population centers on the island, clearing Sauteurs by 0915, Gouyave at 1745, and Victoria at nightfall. In the morning, the 1st Battalion, 505th Infantry, cleared the Calivigny peninsula, and the 3d Brigade, 82d Airborne, secured the adjacent Fort Jeudy peninsula at 1400.

The next morning the 2d Battalion, 325th Infantry, landed at Grand Etang and swept the deserted training area. That afternoon, Trobaugh assumed responsibility for St. George's, and, eight hours later, the 22d MAU's ground units returned to their ships. At 0530 on 1 November, these Marine elements conducted an amphibious and heliborne assault on Carriacou Island north of Grenada. They were relieved by members of the 2d Battalion, 505th Infantry, the following morning. At 1500 on the same day Metcalf declared hostilities at an end and the 22d MAU resumed its interrupted voyage to the Middle East. On 3 November at 1000, McDonald dissolved CJTF 120 and named Trobaugh Commander, U.S. Forces, Grenada. Later that evening the Atlantic Command informed him that the Cubans would be repatriated, beginning on the following day.

The following Army units participated in Operation URGENT FURY:

HHC, XVIII Airborne Corps
HHC, 82d Airborne Division
HHC, 2d Brigade, 82d Airborne Division
HHC, 3d Brigade, 82d Airborne Division
2d Battalion (less Company C), 325th Infantry
3d Battalion, 325th Infantry
Company A, 2d Battalion, 504th Infantry
1st Battalion, 505th Infantry
2d Battalion, 505th Infantry
1st Battalion, 508th Infantry
2d Battalion, 508th Infantry
HHC, 82d Airborne Division Artillery
1st Battalion (less Battery C), 319th Field Artillery
1st Battalion (less Battery A), 320th Field Artillery
HHC, 82d Airborne Division Support Command
782d Maintenance Battalion (less Companies B and E)

407th Supply and Service Battalion (less Detachment B and Company E)
307th Medical Battalion (less Company B)
182d Airborne Division Materiel Management Center
82d Military Police Company

1st Squadron (less Troop C), 17th Cavalry
3d Battalion (less Battery D), 4th Air Defense Artillery
82d Aviation Battalion
307th Engineer Battalion (less Company B)
313th Intelligence Battalion (less Company C)
HHC, 82d Signal Battalion
1st Battalion, 75th Infantry
2d Battalion, 75th Infantry
118th Military Police Company
618th Engineer Company
HQs, 1st Special Operations Command
1st Psychological Operations Battalion
4th Psychological Operations Group
96th Civil Affairs Battalion
101st Chemical Company
248th Medical Detachment
57th Medical Detachment

In addition detachments of the following units also took part:

HHC, 1st Support Command
HHC, 2d Support Center
5th Surgical Hospital
8th Ordnance Company
14th Data Processing Unit
HHC, 16th Military Police Brigade
HHC, 18th Personnel and Administration Battalion
19th Replacement Detachment
21st Military Police Company
HHC, 20th Engineer Brigade
HHC, 24th Transportation Battalion
29th Service Company
27th Engineer Battalion
30th Engineer Detachment
32d Medical Unit
HHC, 35th Signal Brigade
36th Medical Company
38th Ordnance Detachment
HHC, 44th Medical Brigade
HHC, 46th Support Group
48th Ordnance Detachment
50th Signal Battalion
58th Maintenance Company
65th Military Police Company
107th Finance Section
110th Quartermaster Company
119th Transportation Company
126th Transportation Company

146th Ordnance Detachment
155th Medical Detachment

155th Transportation Company
249th Supply Company
264th Engineer Detachment
285th Engineer Detachment
319th Military Intelligence Battalion HHC,
327th Signal Battalion HHD,
330th Transportation Center
364th Supply and Service Company
358th Transportation Company
403d Transportation Company
406th Supply Company
429th Medical Company
491st Transportation Detachment
503d Maintenance Company
517th Transportation Company
519th Military Intelligence Battalion HHD,
525th Military Intelligence Group HHD,
530th Supply and Service Battalion
546th Transportation Company
548th Engineer Battalion
567th Transportation Company
542d Ordnance Detachment
600th Quartermaster Company
612th Quartermaster Company
676th Transportation Company
714th Medical Detachment

Overall, Operation URGENT FURY was a success. American forces, primarily from the Army, defeated opposing forces, evacuated the medical students and other U.S. nationals, and opened the door to a reinstitution of democratic government. Members of Combined Joint Task Force 120 killed 45 soldiers of the PRAF and wounded another 337, capturing 146. The remaining PRAF soldiers discarded their weapons and uniforms and merged with the general population. American forces also killed 24 Cubans, wounded 29, and captured 600. American losses during the operation were 19 killed and 113 wounded in action. Furthermore, the task force evacuated 662 U.S. and 82 foreign nationals from the island. The Armed Services accomplished their mission with minimal damage to Grenada and few civilian casualties. Immediately after the intervention, 500 Army engineers arrived in Grenada to repair buildings, roads, schools, and hospitals as a part of the island's rebuilding process. A three-member team from the U.S. Army Corps of Engineers' Mobile District traveled to Grenada during November and December to determine the amount of compensation due Grenadians whose property was used or damaged by U.S. forces during the subsequent occupation. Various Army Reserve units also performed humanitarian missions for Grenadians, such as collecting and distributing books to the country's schools.

Governor-General Sir Paul Scoon assumed power after the cessation of hostilities and ruled, with an appointed council, until elections were

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held in December 1984. The people of Grenada elected Herbert Blaize Prime Minister and gave his party fourteen of the fifteen seats in the country's House of Representatives. Blaize requested that American troops remain on the island, but the last peacekeeping unit left on 11 June 1985. A thirty-man Special Forces detachment did remain behind to provide military training to Grenadian forces.

Operation URGENT FURY demonstrated the Army, Air Force, Navy, and Marine Corps' ability to execute a joint contingency operation on short notice with minimal planning time. Although problems in coordination, communication,

and interservice doctrine did arise, most were wholly or partially solved on the ground, once again demonstrating the American soldier's ingenuity and flexibility. Furthermore, the Army employed in combat several new additions to their inventory, such as the UH-60 Black Hawk helicopter, REMBASS, and the kevlar helmet. All performed superbly under combat conditions. Operation URGENT FURY proved that the Army's new training philosophy, "train as you will fight," worked.

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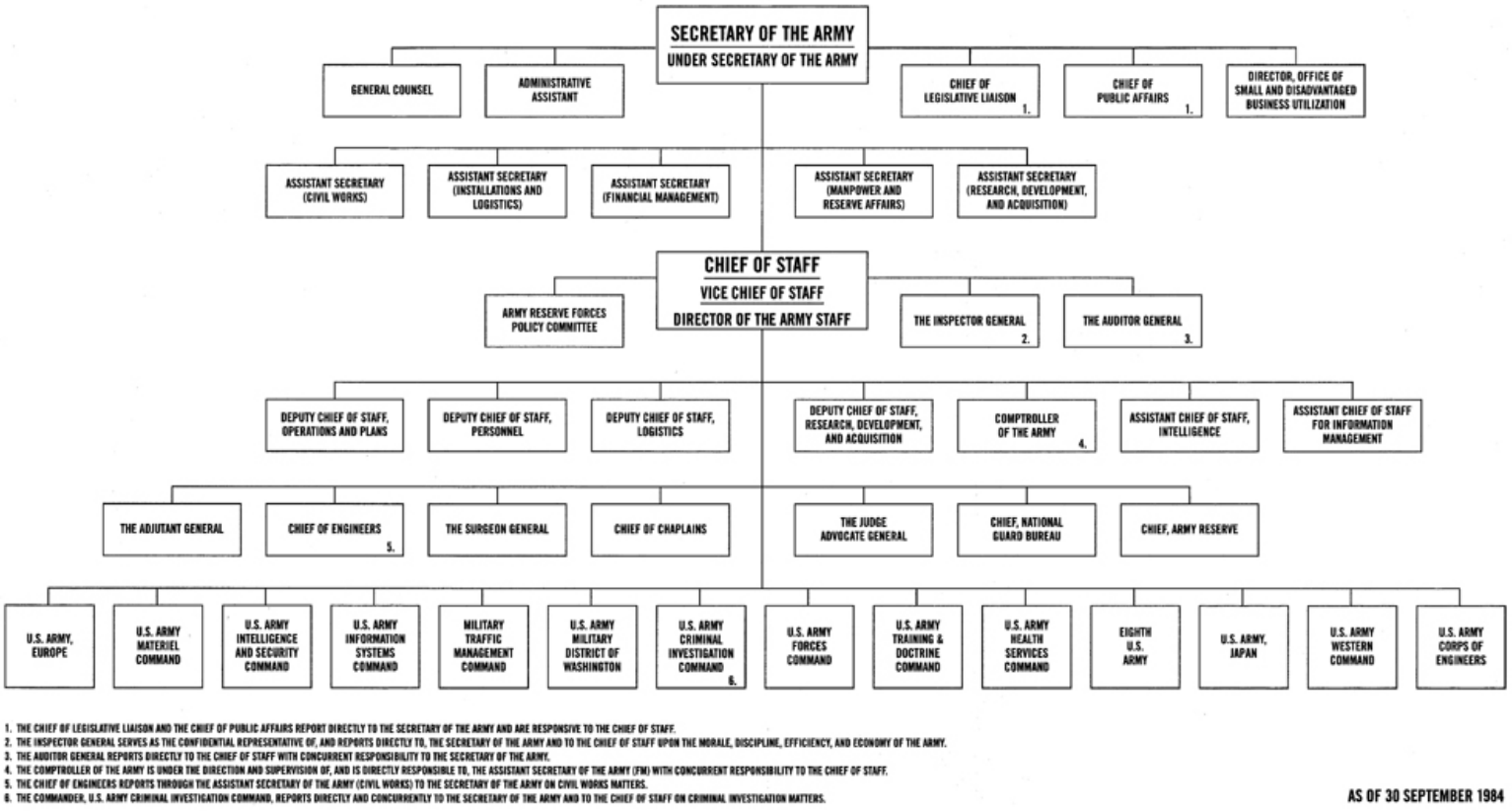
Appendix C

Organization of the Department of The Army



1. THE CHIEF OF LEGISLATIVE LIAISON AND THE CHIEF OF PUBLIC AFFAIRS REPORT DIRECTLY TO THE SECRETARY OF THE ARMY AND ARE RESPONSIVE TO THE CHIEF OF STAFF.
2. THE INSPECTOR GENERAL SERVES AS THE CONFIDENTIAL REPRESENTATIVE OF, AND REPORTS DIRECTLY TO, THE SECRETARY OF THE ARMY AND TO THE CHIEF OF STAFF UPON THE MORALE, DISCIPLINE, EFFICIENCY, AND ECONOMY OF THE ARMY.
3. THE AUDITOR GENERAL REPORTS DIRECTLY TO THE CHIEF OF STAFF WITH CONCURRENT RESPONSIBILITY TO THE SECRETARY OF THE ARMY.
4. THE COMPTROLLER OF THE ARMY IS UNDER THE DIRECTION AND SUPERVISION OF, AND IS DIRECTLY RESPONSIBLE TO, THE ASSISTANT SECRETARY OF THE ARMY (FM) WITH CONCURRENT RESPONSIBILITY TO THE CHIEF OF STAFF.
5. THE CHIEF OF ENGINEERS REPORTS THROUGH THE ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS) TO THE SECRETARY OF THE ARMY ON CIVIL WORKS MATTERS.
6. THE COMMANDER, U.S. ARMY CRIMINAL INVESTIGATION COMMAND, REPORTS DIRECTLY AND CONCURRENTLY TO THE SECRETARY OF THE ARMY AND TO THE CHIEF OF STAFF ON CRIMINAL INVESTIGATION MATTERS.

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Glossary

AALPS	Automated Air Load Planning System
AAWS	Advanced Antitank Weapon System
ABGD	Air base ground defense
ACATT	Aviation combined team training
ASA (CW)	Assistant Secretary of the Army (Civil Works)
ACE	Armored Combat Earthmovers
ACP	Asset Capitalization Program
ACTEDS	Army Civilian Training, Education and Development System
ADAPCP	Alcohol and Drug Abuse Prevention and Control Program
ADEA	Army Development and Employment Agency
ADEWS	Air Defense Electronic Warfare System
AFATDS	Advanced Field Artillery Tactical Data System
AFQT	Armed Forces Qualification Test
AGS	Armored gun system
AHIP	Army helicopter improvement program
AIF	Army Industrial Fund
ALO	Authorized Level of Organization
ALOs	Air Liaison Officers
AMC	Army Materiel Command
AMEDD	Army Medical Department
AMEDD PAS	Army Medical Department Property Accounting System
AMHA	Army Management Headquarters Activities
AMT	Army Modernization Training
AOA	Airborne Optical Adjunct
AOE	Army of Excellence
APG	Aberdeen Proving Ground
APRT	Advanced Physical Readiness Test
ARJS	Airborne Radar Jamming System
ARNG	Army National Guard
ARPERCEN	Army Reserve Personnel Center
ARTBASS	Army training battle simulation system
ARTEP	Army Training and Evaluation Program
ASAS	All Source Analysis System
ASF	Army Stock Fund

ASLs	Authorized Stockage Lists
ATM	AntiTactical Missile
AUSA	Association of the United States Army
AWIS	Army Worldwide Military Command and Control System Information System
ASARC	Army Systems Acquisition Review Council
ASD (MRA&L)	Assistant Secretary of Defense (Manpower, Reserve Affairs, and Logistics)
BAI	Battlefield Air Interdiction
BAST	Board on Army Science and Technology
BCE	Battlefield Coordination Element
BCS	Battery Computer System
BDO	Battle dress overgarment
BFTA	Bulk Fuel Tank Assembly
BFVS	Bradley fighting vehicle system
BMAR	Backlog of Maintenance and Repair program
BMDATC	Ballistic Missile Defense Advanced Technology Center
BMDO	Ballistic Missile Defense Organization
BMDPO	Ballistic Missile Defense Program Office
BMDSCOM	Ballistic Missile Defense Systems Command
BMO	Ballistic Missile Office
BOIP	Basis of Issue Plans
C3	Command, Control, and Communications Systems
C3/BM	Command, Control, and Communications/Battle Management
CAA	Conference of American Armies
CAF	Combined aviation force
CALFES	Combined arms live-fire exercise
CAMIS	Continental Army Management Information System
CAS	Close air support
CAS3	Combined Arms and Services Staff School
CDIP	Combined Defense Improvements Projects
CECAP	Corps of Engineers Correction Action Program
CERL	Construction Engineering Research Laboratory
CFC	Combined Forces Command
C-FLEX	Cobra Fleet Life Extension program
CFVs	Cavalry fighting vehicles
CHAMPUS	Civilian Health and Medical Program of the Uniformed Services

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CICH	Interallied Central Identification Laboratory, Hawaii
CIOR	Confederation of Reserve Officers
CJTF	Combined Joint Task Force

CMAOC	Casualty and Memorial Affairs Operations Center
CMMS	Congressionally Mandated Mobility Study
COE	Corps of Engineers
COHORT	Cohesion, Operational Readiness and Training
CONUS	Continental United States
CPF	Caribbean Peacekeeping Force
CPMC	Capital Purchases and Minor Construction
CPX	Command post exercise
CRAF	Civil Reserve Air Fleet
CRREL	Cold Regions Research and Engineering Laboratory
CTSWG	Consolidated Training Support Work Group
CW/CBD	Chemical Warfare/Chemical Biological Defense
CSS	Combat Service Support
CENTAG	Central (European) Army Group
DA	Department of the Army
DAHSUM	Department of the Army Historical Summary
DAMMS	Department of the Army Movements Management System
DAMMS-R	Department of the Army Movements Management System-Redesigned
DARCOM	Army Material Development and Readiness Command, U.S.
DAS3	Decentralized Automated Service Support System
DASE ROTC CO-OP	Department of the Army Scientific and Engineering Reserve Officers' Training Corps Cooperative Program
DASPS	Department of the Army Standard
DASP-E	Department of the Army Standard Port System-Enhanced
DATP	Detroit Army Tank Plant
DCII	Distributed Command, Control, Communications, and Intelligence
DCSRDA	Deputy Chief of Staff for Research, Development and Acquisition
DAMPL	Department of the Army Master Priority List
DEA	Drug Enforcement Administration
DEERS	Defense Enrollment Eligibility Reporting System

DEPMEDS	Deployable Medical Systems
DID	Defense-in-Depth concept
DIVAD	Division Air Defense
DLA	Defense Logistics Agency
DMZ	Demilitarized Zone
DNA	Defense Nuclear Agency
DOD	Department of Defense
DOMS	Director of Military Support
DSCS	Defense Satellite Communications System
DCSPER	Deputy Chief of Staff for Personnel

DCSLOG	Deputy Chief of Staff for Logistics
DEW	Distant Early Warning
DT	Development Test
DSARC	Defense Systems Acquisition Review Council
DS4	Direct Support Unit Standard Supply System
EAC	Echelons Above Corps
EAD	Echelons Above Division
ECCM	Electronic Counter Counter-Measure
EDM	Engineering Development Model
ENNK	Endoatmospheric Nonnuclear Kill program
EPA	Environmental Protection Agency
ERIS	Exoatmospheric Reentry-vehicle Interceptor Subsystem
ESG	Environment Support Group
ETL	Engineer Topographic Laboratory
ETS	Expiration of Term of Service
FAA	Functional Area Assessment
FACs	Forward Air Controllers
FANS	Friendly/Allied Nation Support
FAO	Foreign Area Officer
FAV	Fast attack vehicle
FC	Field Circular
FCXs	Fire coordination exercise
FEMA	Federal Emergency Management Agency
FIST	Fire Integration Support Team
FISTV	Fire Integration Support Team Vehicles
FLIR	Forward Looking Infrared
FM	Field Manual
FMC	Fully Mission Capable
FMMP	Force Modernization Master Plan

FMPS FLIR	Mission Payload System or Forward Looking Infrared Mission Payload System
FMS	Foreign Military Sales
FOA	Field operating agency
FOIA	Freedom of Information Act
FORSCOM	Forces Command, U.S. Army
FRG	Federal Republic of Germany
FSS/FST	Fire Support System/Fire Support Terminal
FTX	Field training exercise
FTCA	Federal Tort Claims Act

FY	Fiscal year
GEMSS	Ground Emplaced Mine Scattering System
GLOM	Ground-launched cruise missile
GPO	Government Printing Office
G/VLLD	Ground/Vehicular Laser Locator Designators
HEDI	High Exoatmospheric Defense Interceptor
HEDS	High Endoatmospheric Defense System
HEMTT	Heavy Expanded Mobility Tactical Truck
HLPS	Heavy Lift Pre-positioning Ship
HOE	Homing Overlay Experiment
HMMWV	High Mobility Multipurpose Wheeled Vehicle
HNS	Host nation support
HQ,DA	Headquarters, Department of the Army
HQ USEUCOM	Headquarters, United States European Command
IAP	Issue Assessment Process
ICBM	Intercontinental Ballistic Missile
IFF	Identification Friend or Foe
IFVs	Infantry Fighting Vehicles
IG	Inspector General
IHFR	Improved High Frequency Radio
IMA	Individual Mobilization Augmentee
IMET	International Military Education and Training Program
INF	Intermediate Nuclear Force
IPDS	Inland Petroleum Distribution System
IPM1	Improved M1
IPR	In-Process Review
ISB	Installation Support Book
ITV	Improved TOW Vehicle
JCS	Joint Chiefs of Staff

JECS	Joint Exercise Control System
JEDS	Jet exhaust decon system
JFDP	Joint Force Development Process
JLSP	Joint Logistical Support Plan
JOINT STARS	Joint Surveillance and Target Attack Radar System
JSTARS	Joint Surveillance and Target Attack Radar System
JSA	Joint Service Agreement
J-SEAD	Joint Suppression of Enemy Air Defenses
JTACMS	Joint Tactical Missile System

JTF	Joint Task Force
JTFP	Joint Tactical Fusion Program
JTLS	Joint theater-level simulation
KMR	Kwajalein Missile Range
LACV	Lighter, Air Cushioned Vehicle
LATP	Lima Army Tank Plant
LCC	Logistical Coordination Cell
LCX	Logistics coordination exercise
LDS	Lightweight decontamination system
LHX	Light helicopter program
LOC	Lines of Communications
LOGAMP	Logistics and Acquisition Management Program
LOTS	Logistics Over the Shore
LRI	Logistics Readiness Rating Report
LSV	Logistics Support Vehicle
MACOMs	Major commands
MAPS	Modular Azimuth and Positioning System
MARKS	Modern Army Recordkeeping System
MAU	Marine Amphibious Unit
MCX	Movement coordination exercise
MEDSOM	Medical supply, optical and maintenance
MELIOS	Mini-Eyesafe Laser Infrared Observation Set
MENS	Mission Elements Need Statement
MFO	Multinational Force and Observers
MICAF	Measuring Improved Capability of Army Forces
MICOM	Missile Command
MILES	Multiple integrated laser engagement system
MILPERCEN	Military Personnel Center
MLRS	Multiple launch rocket system

MOS	Military occupational specialty
MPI	Master Priority Integration
MPL	Mandatory parts list MS-3
MSC	Major subordinate commands
MSE	Mobile Subscriber Equipment
MTMC	Military Traffic Management Command
MTM/D	Million-ton-miles-per day
MTOE	Modified Table of Organization and Equipment
MWR	Morale, Welfare, and Recreation
NAF	Nonapproriated Funds

NAFI	Nonapproriated Funds Instrumental
NAIRA	Nuclear accident and incident response and assistance program
NATO	North Atlantic Treaty Organization
NBC	Nuclear, biological, and Chemical
NET	New Equipment Training
NJM	New Jewel Movement
NMS	New Manning System
NNBIS	National Narcotics border Interdiction System
NSNFS3	Nonstratic Nuclear Forces Safety, Security, and Survivability
NTC	National Training Center
NTV	Nontactical vehicle
NDI	Nondevelopmental item
NTPF	Near-Term Prepositioning Force
NCO	Noncommissioned officer
NORTHAG	North (European) Army Group
OACSIM	Office of the Assistance Chief of Staff for Information Management
DAMP	Optical Aircraft Measurements Program
OCE	Office of the Chief of Engineers
OCONUS	Outside Continental United States
ODCSLOG	Office of the Deputy Chief of Staff for Logistics
ODCSOPS	Office of the Deputy Chief of Staff for Operations and Plans
OECS	Organization of Eastern Caribbean States
OMB	Office of Management and Budget
OPDS	Offshore Petroleum Discharge System
OPF	Official personnel folder
OPM	Office of Personnel Management
OPMD	Officer Personnel Management Directorate

OSD	Office of the Secretary of Defense
OSD	PIF Office of the Secretary of Defense Productivity Investment Funding
OSUT	One-Station Unit Training program
OTSG	Office of The Surgeon General
O&M	Operations and maintenance
OPLAN	Operational Plan
OT	Operational Test
OPA	Other Procurement Army
OMA	Operations and Maintenance, Army
OTRA	Officers Other than Regular Army
PACOM	Pacific Command
PAD	POMCUS Authorization Document

PAD	Point air defense
PADS	Position and Azimuth Determining System
PCMT	Platoon combat mission trainer
PDSK	Petroleum Distribution System Korea
PECIP	Productivity Enhancing Capital Investment Program
PLLs	Prescribed load lists
PLRS	Position Location Reporting System
PLSS	Precision Location Strike System
POI	Program of instruction
POIQT	Performance-Oriented Infantry Qualification Test
POM	Program Objective Memorandum
POMCUS	Pre-positioned material configured to unit sets
POST	Passive Optical Seeker Technique
PNVS	Pilot Night Vision Sensors
PRAF	People's Revolutionary Armed Forces
PRP	Personnel reliability program
PWAAS	Passive Wide Area Alerting System
PAM	Pamphlet
POL	Petroleum, Oils, and Lubricants Project Manager
QRIP	Quick Return on Investment Program
QRMC	Quadrennial Review of Military Compensation
Q&A	Question and Answer
RAM-D	Reliability, availability, maintainability, and durability
RAOC	Rear Area Operations Center
RCPAC	Reserve Components Personnel and Administration Center

RCRPL	Reserve Component Personnel and Administration Center
RDA	Research, development, and acquisition
RDF	Rapid Deployment Force
RDJTF	Rapid Deployment Joint Task Force
REDFRAM	Redistribution From Army Materiel
REMBASS	Remotely Monitored Battlefield Sensor System
RETO	Review of Education and Training for Officers
RMP	Reprogrammable Microprocessor
ROK	Republic of Korea
ROPMA	Reserve Officers Personnel Management Act
ROTC	Reserve Officers' Training Corps
RPMA	Real Property Maintenance Activities
RPV	Remotely piloted vehicle
RDTE	Research, Development, Test, and Evaluation

SACEUR	Supreme Allied Commander, Europe
SACS	Structure and Composition System
SAM	Surface-to-air missile
SAR	Search and Rescue
SARSS	Standard Army Retail Supply System
SCAT	Scout/attack configuration
SCOTT	Single Channel Objective Tactical Terminal
SDAF	Special Defense Acquisition Fund
SDD	Systems Development Directorate
SDI	Strategic Defense Initiative
SDIO	Strategic Defense Initiative Organization
BEAD	Suppression of Enemy Air Defenses
SEMA	Special electronic mission aircraft
SETAF	Southern European Task Force, U.S. Army
SFG	Special Forces Group
SHMA	Segmented Housing Market Analysis
SHORAD	C2 Short Range Air Defense Command and Control System
SIDPERS	Standard Installation/Division Personnel Support Systems
SINCGARS	Single Channel Ground and Airborne Radio System
SLAC	Support list allowance card
SMART	Supply and Maintenance Assessment and Review Team
SOCOM	Special Operations Command

SOCSE	Special Operations Communications Support Elements
SOCS	State Officer Candidate School
SOF	Special Operations Forces
SOUTHCOM	Southern Command, U.S. Army
SPD	Systems Projects Directorate
SPRINT	Spare Parts Review Initiatives
STARC	State Area Command
STRAC	Standards in Training Commission
SRHIT	Small Radar Homing Intercept Technology program
STX	Situational training exercise
TAADS	The Army Authorization Documents System
TAC	Tactical Air Command
TACFIRE	Tactical Fire Direction System
TACP	Tactical Air Control Party
TACSATCOM	Tactical Satellite Communications
TASS	Tactical Air Support Squadron
TADS	Target Acquisition Designation Sights

TAEDP	Total Army Equipment Distribution Program
TAFFS	The Army Functional File System
TAGO	The Adjutant General's Office
TC ACCIS	Transportation Coordinator Automated Command and Control Information System
TDA	Table of Distribution and Allowances
TIR	Terminal Imaging Radar
TLC	Tactical Leadership Course
TOE	Table of Organization and Equipment
TRACE	Total risk assessing cost estimates
TRADOC	Training and Doctrine Command, U.S. Army
TRIMIS	Tri-Service Medical Information System
TRI-TAC	Joint Tactical Communication program
TTS	Tank Thermal Sight
UCMJ	Uniform Code of Military Justice
UCOFT	Unit conduct-of-fire trainer
ULL	Unit level logistics system
USAAA	U.S. Army Audit Agency
USAAVNC	United States Army Aviation Center
USACA	U.S. Army Correctional Activity
USACGSC	U.S. Army Command and General Staff College
USAFRED	U.S. Air Force Forces, Readiness Command

USAISC	U.S. Army Information Systems Command
USARCENT	United States Army Forces CENTCOM
USAREUR	United States Army, Europe
USCENTCOM	United States Central Command
USDA	United States Department of Agriculture
USDB	United States Disciplinary Barracks
USDRE	Under Secretary of Defense for Research and Engineering
USPS	United States Postal Service
USSOUTHCOM	United States Southern Command
USREDCOM	United Stares Readiness Command
VA	Veterans Administration
VE	Value Engineering
VECP	Value Engineering Change Proposals
VIABLE	Vertical Installation Automation Baseline Project
VIGS	Videodisc gunnery simulator
VISTA	Very Intelligent Surveillance and Target Acquisition
VCSA	Vice Chief of Staff, Army
WES	Waterways Experiment Station

WESTCOM	Western Command, U.S. Army
WHNS	Wartime Host Nation Support
WRAP	War Reserve Automated Process
WWMCCS	Worldwide Military Command and Control System

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Last updated 8 March 2004