CHAPTER 5
CONVENTIONAL FORCES

Conventional forces provide the bulk of the nation's military capability. Consisting of four elements—land, naval, aviation, and mobility—these forces conduct the full range of military missions, with the exception of special operations, nuclear deterrence, and space operations. As such, they play a crucial role in executing the defense strategy, which focuses on shaping the international environment and responding to a broad variety of crises. Toward this end, conventional forces perform forward presence missions, engage in a range of smaller-scale contingencies, and conduct combat operations up to and including major theater wars.

The defense program provides resources to sustain and modernize the nation's forces in both the near and far terms. This chapter describes the capabilities required for executing conventional force missions and the investments vital to maintaining and enhancing those capabilities.

The United States routinely deploys forces abroad to support its international interests. Historically, forward deployments of troops have been concentrated in three regions:

- Asia-Pacific—One Army mechanized division, one Marine expeditionary force, 2.2 Air Force fighter wing-equivalents, one Navy carrier battle group, and one amphibious ready group with an embarked Marine expeditionary unit. Additionally, forward-based forces in the Pacific region include one light infantry division in Hawaii and 1.25 fighter wing-equivalents in Alaska.

- Europe—The major elements of one Army armored and one Army mechanized infantry division, 2.2 Air Force fighter wing-equivalents, one carrier battle group, and one amphibious ready group with an embarked Marine expeditionary unit.

- Southwest Asia—One Army heavy battalion task force and one attack helicopter battalion, Air Force fighter/attack and support forces, one carrier battle group, and one amphibious ready group with an embarked Marine expeditionary unit.

As needs arise elsewhere, all four Services periodically deploy forces to forward locations. These deployments involve both active and reserve component units. U.S. equipment and material prepositioned ashore and afloat in selected regions contribute substantially to overseas deployments.

THREATS

As potential regional aggressors expand their technological capabilities and modify their doctrine, they will pose increasingly lethal threats to military operations. The proliferation of modern defense technologies means that U.S. forces must maintain a substantial advantage over potential adversaries to

ensure quick and decisive victory with minimum casualties. U.S. forces simultaneously must be prepared to operate in the face of asymmetric threats, such as nuclear, biological, or chemical (NBC) weapons; ballistic or cruise missiles; terrorism; and information warfare.

AVIATION THREATS

Although threats to U.S. air forces are below levels that would put air superiority at risk in the near term, the proliferation of advanced systems in the future could make the capability of U.S. forces to establish air superiority in future conflicts more problematic. U.S. air operations during Operation Allied Force demonstrated the effectiveness of legacy systems against older air defense technologies. However, intelligence estimates project that adversaries could field significant numbers of improved surface-to-air missiles or new generations of fighter aircraft, potentially limiting the employment of U.S. air power against vital target sets at the outset of a conflict.

While the chief current regional adversaries—Iraq and North Korea—have done little over the past decade to augment their capabilities against U.S. air forces, they—or other possible future adversaries—may be able to exploit a wide range of advanced air-to-air and surface-to-air technologies and systems available on the international market. Aviation systems and weaponry currently being offered for sale include fighter aircraft, air-to-air missiles, and air defense systems. Properly employed, these systems could pose a difficult challenge to U.S. forces in combat. The further proliferation of advanced weapon systems could drive up U.S. losses in a future conflict, making continued improvements in the nation's military capability imperative.

Given the current U.S. preeminence in air combat capability, potential adversaries are likely to emphasize ground-based air defenses and deception measures, such as the camouflage of ground targets. Adversaries probably will also further harden ground targets and exploit ground mobility, where possible. Accordingly, the defeat of enemy ground-based air defenses has a high priority in aviation force planning. Improved capabilities for destroying camouflaged and hardened targets also are being sought through a number of research and development efforts.

Several countries of concern to the international community are making serious efforts to move important military and industrial facilities underground. The secrecy surrounding these projects compounds the difficulty of planning the neutralization of such targets in wartime. Enemy use of dummy targets and decoys also can work effectively to dilute or confuse air attacks if not countered by the adoption of sophisticated information-gathering and targeting systems. Finally, the use of unconventional approaches, such as the dispersal of troops or weapons in densely populated urban areas, can limit the application of strike systems like missiles and air-delivered bombs. Tactics of these kinds were widely employed against NATO forces during Operation Allied Force. While quite effective in limiting enemy losses, these measures also constrained the ability of enemy forces to deploy, mass, or maneuver. Once enemy ground units massed in the open, where they could not conceal their location, they became vulnerable to air attacks.

The lessons of Operation Allied Force concerning potential threat capabilities are particularly important in comparison with the experience of the Gulf War and the continuing air patrols being flown over Iraq in support of Operations Northern Watch and Southern Watch. Serbian exploitation of ground terrain and foliage cover, combined with the use of decoy targets, points to the need for continued improvements in

several aspects of future air attack operations, with emphasis on integrating intelligence, surveillance, and reconnaissance assets with targeting systems. Such improved targeting support also would help deal with important mobile targets, such as vehicle-mounted surface-to-surface missile launchers, which proved hard to destroy during the Gulf War.

MARITIME THREATS

Potential threats to U.S. forces conducting operations in littoral areas include antiship cruise missiles (ASCMs), naval mines, and diesel-electric submarines. Antiship cruise missiles—launched from the air, land, or sea—are becoming increasingly available throughout the world. The limited time available to react to them, once airborne, could pose difficulties for existing antiair defenses, particularly in littoral operations where naval forces may be patrolling very close to the shore. A number of countries in regions vital to American interests possess advanced ASCMs.

Diesel-electric submarines also constitute a growing threat. Employing the latest advances in propulsion and armament, these forces can be difficult to detect and counter in shallow waters. Many navies now operate advanced diesel subs, and additional countries could well follow suit.

Naval mines are inexpensive, easy to store, and rapidly deployable. These systems provide a potentially effective way to delay, or even deny, accomplishment of U.S. maritime objectives. They range in type and capability from primitive moored contact mines to sophisticated bottom and rising warhead mines, which are difficult to detect and neutralize and are triggered by acoustic and/or magnetic signatures of passing ships. Most littoral nations possess at least a rudimentary mining capability, raising the possibility that U.S. forces could encounter a significant mine threat in future contingencies.

GROUND THREATS

The threat of coercion and large-scale, cross-border aggression by hostile states with significant military power continues to pose a danger to the vital interests of the United States, its allies, and regional security partners. Several highly capable weapon systems are available and affordable to regimes that are unstable or hostile to U.S. interests. Examples include lightweight antiaircraft and antitank missiles, tactical ballistic missiles with improved guidance and payload technologies, modern battle tanks with day-and-night optics, passive defense systems capable of interfering with precision-guided munitions, active defense systems that redirect or destroy incoming projectiles, advanced antitank guided missiles capable of top attacks against tank turrets, and advanced artillery munitions.

Increasingly capable and violent terrorist groups, drug traffickers, and international crime organizations directly threaten the lives of American citizens and undermine U.S. policies and alliances. Although irregular forces will be unable to match the combat power of heavy U.S. weaponry, they could still pose difficult challenges to U.S. forces. The proliferation of modern light arms, a fighting style that could necessitate operations in dense urban environments, and the ability of indigenous forces to conceal themselves within civil populations could negate some of the advantages of U.S. heavy weaponry.

NUCLEAR, BIOLOGICAL, AND CHEMICAL WEAPONS

The threat of hostile nations or terrorists using NBC weapons against U.S. military or civilian targets, or against U.S. friends and allies, has been growing. More than 20 countries currently possess or are

developing NBC weapons and the means to deliver them. It is therefore increasingly important that U.S. forces be able to operate effectively despite the presence, threat, or use of chemical and biological weapons by an adversary. Toward that end, the Department has doubled its expenditures on chemical and biological defense programs over the past five years, and now commits approximately $1 billion annually to such initiatives. Details on these programs are provided in Chapters 2, 6, 7, and 9.

FORCE STRUCTURE

Key elements of the conventional force structure are shown in Table 5-1.

Table 5-1
Conventional Force Structure Summary, End–FY 2001

Army	
Active Corps	4
Divisions (Active/National Guard)	10/8
Active Armored Cavalry Regiments	2
Enhanced Separate Brigades (National Guard)	15
Separate Brigades (National Guard)	3
Navy	
Aircraft Carriers	12
Air Wings (Active/Reserve)	10/1
Amphibious Ready Groups	12
Attack Submarines	55
Surface Combatants (Active/Reserve)	108/8
Air Force	
Active Fighter Wings	12+
Reserve Component Fighter Wings	7+
Reserve Component Air Defense Squadrons	4
Bombers (Total Inventory)	208
Marine Corps	
Marine Expeditionary Forces	3
Divisions (Active/Reserve)	3/1
Air Wings (Active/Reserve)	3/1
Force Service Support Groups (Active/Reserve)	3/1

AVIATION FORCES

Aviation forces of the Air Force, Navy, and Marine Corps—composed of fighter/attack, conventional bomber, and specialized support aircraft—provide a versatile striking force capable of rapid employment worldwide. These forces can quickly gain and sustain air superiority over regional aggressors, permitting rapid air attacks on enemy targets while providing security to exploit the air for logistics, command and control, intelligence, and other functions. Fighter/attack aircraft, operating from land bases and aircraft carriers, establish air superiority and attack ground and ship targets. Conventional bombers supplement tactical air forces by providing an intercontinental capability to strike surface targets on short notice. The specialized aircraft supporting these operations perform functions such as surveillance, airborne warning and control, air battle management, suppression of enemy air defenses, reconnaissance, and combat search and rescue. In addition to these forces, the U.S. military operates a variety of transport planes, aerial-refueling aircraft, helicopters, and other support aircraft. Descriptions of those systems are provided in the sections on mobility and land forces.

FIGHTER/ATTACK AIRCRAFT

The Air Force, Navy, and Marine Corps keep a portion of their tactical air forces forward deployed at all times. These forces can be augmented, as needs arise, with aircraft based in the United States. The Air Force is capable of deploying significant forces on an expeditionary basis to locations where runways and limited support are available. Navy and Marine air wings similarly can be employed in distant contingencies on very short notice; these forces provide a unique ability to carry out combat operations independent of access to regional land bases. In addition, the Marine Corps has the ability to establish limited basing facilities for fighter/attack aircraft at unprepared sites, employing lightweight metal matting, catapults, and arresting gear.

The aviation combat force structure consists of 20.2 Air Force fighter wing-equivalents (FWEs) with 72 aircraft each; 11 Navy carrier air wings, operating 46 fighter/attack aircraft apiece; and four Marine air wings, which are task organized and include varying numbers and types of aircraft. Tables 5-2, 5-3, and 5-4 show the composition of Air Force, Navy, and Marine Corps air wings programmed for the end of FY 2001.

Table 5-2

Composition of Air Force Wings, End–FY 2001 (Fighter/Attack Aircraft)

Aircraft Type	Mission	Active FWEs	Reserve Component FWEs	Total FWEs
F-15A/B/C/D	Air superiority	3.4	0.6	4.0
F-15E	Multirole[a]	1.8	0	1.8
F-16A/B	Multirole[b]	0	0.4	0.4
F-16C/D	Multirole[b]	5.8	5.2	11.0
F-117	Attack	0.5	0	0.5
A-10	Close air support	1.0	1.4	2.4
Total [c]		12.6	7.6	20.2

NOTE: Numbers may not add to totals due to rounding. FWE quantities are based on the combat-coded primary mission aircraft inventory (PMAI) of each unit, which consists of aircraft allocated for the performance of wartime missions. FWE quantities exclude aircraft assigned for other purposes, such as training, testing, and attrition replacement.

[a] Oriented primarily to the air-to-ground role, but also can be used in air-to-air operations.

[b] Can be used in the air-to-air or air-to-ground role.

[c] Excludes OA-10 forward air control aircraft and F-15/16 aircraft assigned to the North American Air Defense Force.

Table 5-3

Composition of Carrier Air Wings, End–FY 2001 (Fighter/Attack Aircraft)

Wing Type	Aircraft Type (PMAI per Wing)	Number of Air Wings
Active	F-14 (10/11), F/A-18 (36)	10
Reserve	F/A-18 (48) [a]	1

NOTE: PMAI counts include only Navy F-14s and F/A-18s. The Marine Corps will maintain sufficient active F/A-18 squadrons to ensure 36 F/A-18s per deployed carrier air wing. (Actual numbers based on operating tempo requirements of each Service as determined by the Department of the Navy Tactical Aircraft Consolidation Plan.)

[a] Includes three Naval Reserve squadrons (36 aircraft) and one Marine Corps Reserve squadron (12 aircraft).

Table 5-4

Composition of Marine Aircraft Wings, End–FY 2001 (Fighter/Attack Aircraft)

Aircraft Type	Mission	Active PMAI (Squadrons)	Reserve PMAI (Squadrons)	Total PMAI (Squadrons)
F/A-18A/C	Multirole	8	4	12
F/A-18D	Multirole	6	0	6
AV-8B	Close air support	7	0	7
Total		21	4	25

NOTE: Plans call for one Marine F/A-18 reserve squadron to operate as part of the Navy Reserve carrier air wing.

The Air Force will complete its transition to the new expeditionary deployment concept in FY 2001. In October 1999, the Air Force began to recast its operational deployment planning for the majority of its nonnuclear forces. Under this new approach, fighter/attack aircraft and selected additional force elements have been grouped into 10 Aerospace Expeditionary Force (AEF) packages for deployment planning purposes. The goal is to enhance the predictability of deployments and to improve the quality of life for Air Force personnel by minimizing unexpected contingency deployments. Each AEF unit is prepared to deploy for a 90-day period on a fixed, 15-month cycle. Although a given unit may not actually be called on to deploy, it will remain ready to move on short notice throughout its designated period of availability.

Although individual AEFs may differ in composition, each is intended to provide comparable combat power to theater commanders. Each AEF will provide air superiority, ground attack, command, control, intelligence, surveillance, and reconnaissance capabilities for sustained operations. Additional AEFs would be deployed in the event a contingency escalated into a major theater war.

Through the expeditionary concept, the Air Force will be able to substantially improve the way it packages forces for deployment. This gain will be realized without corresponding changes in force levels or force structure. No new command structure has been created. Unit identities, basing locations, and readiness levels remain as before. While there may be some adaptations in training sequences, such adjustments will be identified and refined as the concept is put into practice and evaluated.

As noted above, each AEF unit is made up primarily of fighter/attack and selected support elements. Although airlift, tanker, and low-density/high-demand forces (such as command and control aircraft) have not been designated as AEF components, the Department is evaluating possible future options to limit deployment pressures on these forces. In particular, further initiatives to better manage E-3 Airborne Warning and Control System deployments are being examined.

CONVENTIONAL BOMBERS

Conventional bombers perform missions spanning the full spectrum of operations. For example, during Operation Allied Force, B-2 bombers were used to deliver precision munitions against sensitive ground targets. B-1 and B-52 bombers also were employed throughout the operation.

In a major theater war, bombers would deliver large quantities of unguided general-purpose bombs and cluster munitions against area targets, such as ground units, airfields, and rail yards. Bomber forces also would play a key role in delivering precision-guided munitions (including cruise missiles) against point targets, such as command and control facilities and air defense sites.

The ability of these forces to have an immediate impact on a conflict by slowing the advance of enemy forces, suppressing enemy air defenses, and inflicting massive damage on an enemy's strategic infrastructure will expand dramatically as new munitions are deployed. More advanced weapons now entering the inventory or in development will enable bomber forces to bring a wider range of targets under attack, while taking advantage of the bombers' large payloads. The rapid-response, long-range capability provided by bombers could make them the first major U.S. weapon system on the scene in a fast-breaking crisis. For remote inland targets, bombers could be the only weapons platform capable of providing a substantial response.

The bomber inventory currently includes 208 aircraft—94 B-52s, 93 B-1s, and 21 B-2s. Of these, 44 B-52s, 52 B-1s, and 16 B-2s are primary mission aircraft, fully funded in terms of operations and maintenance, load crews, and spare parts, and ready for immediate deployment. An additional 12 B-52s are held ready for nuclear missions. All B-52s and B-1s in the inventory, including those in attrition reserve, will be kept in flyable condition and will receive planned modifications. B-1 primary mission aircraft are slated to increase in number over the next several years; the entire B-1 force will be able to employ the increasingly capable conventional weapons entering the inventory in the near future. Bombers will be an integral part of the expeditionary air force, with both B-1s and B-52s available for AEF deployments.

SPECIALIZED AVIATION FORCES

Specialized aviation forces play a critical role in most military operations. Three of their most important missions are suppression of enemy air defenses (SEAD); aerial intelligence, surveillance, and reconnaissance (ISR); and combat search and rescue (CSAR). Airborne SEAD forces locate and neutralize enemy air defenses, thus permitting a wide range of friendly air operations to be conducted. Airborne ISR forces provide critical information on enemy air and surface forces and installations. These forces bridge the gap in coverage between ground- and space-based surveillance systems and the targeting systems on combat aircraft. Airborne reconnaissance systems fall into two categories: standoff systems, which operate outside the range of enemy air defenses; and penetrating systems, which operate within enemy air defense range. Combat search and rescue forces are used to recover downed combat aircrews and other isolated personnel from hostile territory and return them to friendly control. Table 5-5 summarizes force levels for these aircraft programmed for the end of FY 2001.

Table 5-5

Specialized Aviation Forces, End–FY 2001

Electronic Warfare	
EA-6B	104
EC-130H	13
Airborne Reconnaissance and Surveillance Systems	
Standoff	
E-2C[a]	61
E-3[a]	24
E-8[b]	11
U-2[b,c]	27
RC-135 S[d]/U[e]/V[c]/W[c]	21
EP-3[c]	12
RC-12 Systems[c]	4
RC-7 (ARL)	7
Penetrating[b]	
F-14 (TARPS)	46
F-16 (TARS)	20
F/A-18D (ATARS)	24
Pioneer UAV Systems[f]	4
Predator UAV Systems[f]	10
Shadow Tactical UAV Systems[f]	3
Hunter Tactical UAV Systems[f]	1
Global Hawk UAVs (ACTD residual assets)[f]	4
Combat Search and Rescue[g]	
HH-60	72[h]
HC-130	32[i]

NOTE: Force counts represent PMAI totals.

[a] Performs airspace surveillance, early warning, and fighter control.

[b] Performs ground reconnaissance.

[c] Conducts signals intelligence. Each RC-12 system consists of eight or more aircraft and associated ground support personnel and equipment.

[d] Conducts measurement and signature intelligence (three aircraft).

[e] Conducts electronic intelligence (two aircraft).

[f] Each UAV system contains three or more air vehicles.

[g] Forces shown are specialized Air Force units. Other Air Force, Navy, and Marine aviation forces are allocated temporarily to CSAR tasks as required.

[h] Includes 36 reserve component aircraft.

[i] Includes 21 reserve component aircraft.

AVIATION WEAPONS

The decades-long promise of precision munitions is being realized. U.S. aviation forces can now hit, precisely, any set of coordinates, thus putting at risk most identifiable targets. (Some hardened or mobile targets will remain a challenge.) The enhanced attack capability provided by precision munitions places a premium on ISR assets, including communication and targeting support for strike operations. The operational benefits afforded by these munitions include:

- Neutralization or reduction of the effectiveness of enemy antiaircraft systems. This helps reduce aircraft losses and speeds the follow-on use of direct attack weapons, which are less expensive than standoff munitions.

- The ability to attack highly defended targets from the outset of hostilities, without having to sequentially destroy a series of peripheral defenses.

- The extension of the effective reach of combat aircraft, enabling attacks to be launched from positions well beyond enemy air defense range.

Inventories of air-to-air munitions also are benefiting from the introduction of upgraded systems. New variants of existing missiles, now in production or under development, incorporate significant improvements in lethality and range, making these weapons more effective across a larger engagement area.

NAVAL FORCES

The diverse roles played by naval forces in support of the defense strategy drive their overall size and structure. Forward presence requirements and peacetime and crisis response operations, in particular, are major determinants of naval force needs.

The key components of the maritime force structure are aircraft carriers, amphibious ships, attack submarines, surface combatants, mine warfare ships, and ballistic-missile submarines (discussed in the Nuclear Forces chapter). In addition, the force includes maritime patrol aircraft and sea-based helicopters, as well as ships that perform support and logistics functions.

The maritime force numbers 317 ships (see Table 5-6). Included within this total are 12 aircraft carrier battle groups (CVBGs), 12 amphibious ready groups (ARGs) comprising 38 active-force ships, 116 surface combatants, 55 attack submarines, and associated logistics and support forces. Together, these forces provide a diverse mix of sea-based capabilities for conducting peacetime, crisis-response, and major contingency operations.

Table 5-6

Naval Force Levels, End–FY 2001

Ballistic-Missile Submarines	18
Aircraft Carriers	12
Attack Submarines	55
Surface Combatants	108/8
Amphibious Ships	38/1
Mine Warfare Ships	12/6
Logistics Force Ships/Support Force	59
Total Battle Force Ships	*317*
Selected Maritime Aircraft	
Maritime patrol aircraft squadrons	12/7
LAMPS helicopter squadrons	12/1
NOTE: Entries with two numbers separated by a slash give active and reserve force counts.	

Carrier battle groups typically consist of a carrier, its air wing, surface combatants, attack submarines, and combat logistics support ships. Each ARG nominally comprises a large-deck amphibious assault ship, a transport dock ship, a dock landing ship, and an embarked Marine Expeditionary Unit (Special Operations Capable), or MEU(SOC). Until late 1998, the Navy deployed a CVBG and an ARG about 75 and 80 percent of the time, respectively, in the Mediterranean; about 75 and 50 percent of the time, respectively, in the Indian Ocean; and on a nearly continuous basis in the western Pacific. Since 1999, a CVBG has been deployed in the Southwest Asian region on a nearly continuous basis to support contingency operations. Maintaining a continuous presence in that theater has been accomplished by adjusting CVBG deployments in other regions. Plans call for a CVBG to remain on continuous deployment in Southwest Asia in the near term, thus obviating the need for the Air Force to provide AEFs to fill any gaps in CVBG presence. In the other two theaters, where a CVBG or ARG is not constantly on patrol, one of those forces is located within a few days' transit time of the region and can be dispatched promptly if circumstances require.

AIRCRAFT CARRIERS

In addition to their presence and crisis-response capabilities, aircraft carriers provide a forward base for conducting air operations in littoral areas. Operating independent of land-basing restrictions, carriers provide support facilities for joint operations. Their presence in a conflict theater enables attack, surveillance, air defense, and electronic warfare missions to be conducted against naval, air, and ground targets from points well beyond the shore. The defense program supports an aircraft carrier force structure of 12 fully deployable units. The carrier force currently consists of nine nuclear-powered vessels—eight CVN-68 Nimitz-class ships plus the Enterprise (CVN-65)—and three conventionally-powered units. The newest Nimitz-class carrier, the Ronald Reagan (CVN-76), will join the fleet in FY 2003, replacing the

Constellation (CV-64). At that point, two conventionally-powered carriers—Kitty Hawk (CV-63), stationed in Yokosuka, Japan, and the John F. Kennedy (CV-67)—will remain in the fleet. The Kitty Hawk is slated to be retired in FY 2008, when CVN-77 enters service. The first of the Nimitz-class follow-on ships, designated CVNX, will enter construction in FY 2006 and join the fleet around FY 2013, replacing the Enterprise (CVN-65). The second CVNX will replace the John F. Kennedy about five years later.

AMPHIBIOUS FORCES

Forward-deployed naval expeditionary forces with embarked Marines provide joint capabilities for presence, crisis-response, humanitarian relief, peacekeeping, and major contingency operations. Amphibious forces are typically employed in three-ship ARGs. A vital component of the maritime force structure, ARGs provide the ability to project forces into littoral regions rapidly from points over the horizon, utilizing both air and surface platforms.

The defense program sustains a 12-ARG force (plus additional ships in reduced operating status). Together, these vessels are capable of supporting three forward-deployed Marine expeditionary units in peacetime and lifting the equivalent of 2.5 Marine expeditionary brigades (MEBs) in wartime.

ATTACK SUBMARINES

The attack submarine (SSN) force plays a vital role in maritime operations. The increased emphasis on regional contingencies has shifted the focus of SSN missions from open-ocean antisubmarine warfare (ASW) to intelligence and surveillance, power projection, support of special operations, and ASW in littoral environments. SSNs are uniquely suited to littoral operations by virtue of their ability to gather surveillance data, perform crisis response missions, conduct strike operations, and protect carrier battle groups and amphibious forces in forward areas. The SSN force currently includes 55 submarines.

SURFACE COMBATANTS

Surface combatants provide multimission capabilities for operations in littoral environments. The surface combatant force comprises modern cruisers and destroyers equipped with standoff strike weapons, antiair missiles, guns, and ASW torpedoes, as well as older frigates and destroyers with many of these capabilities. Surface combatants protect carrier battle groups and ARGs, and sustain a presence in areas where full battle groups may not be available. They also provide naval surface fire support, long-range strike capability (using Tomahawk cruise missiles), and integrated theater air defense capabilities.

The defense program maintains a surface combatant force of 116 ships, including 108 ships in the active inventory and eight in the reserves.

COMBAT LOGISTICS FORCE

The combat logistics force provides extensive at-sea replenishment for ships deployed in forward areas. The force includes station ships, which support in-theater operations, and shuttle ships, which ferry material continuously from shore to sea. The station-ship force consists of AOE-1-class and AOE-6-class fast combat support ships. The shuttle-ship force comprises a civilian-manned Military Sealift Command (MSC) fleet of oilers (T-AO), dry stores ships (T-AFS), and ammunition ships (T-AE). Advanced Dry Cargo Ships (T-ADC(X)), planned for deployment around the middle of the decade, will replace aging

T-AE and T-AFS vessels on a less than one-for-one basis. When teamed with a T-AO, the T-ADC(X) will provide dry-cargo capability equivalent to that of an AOE-1-class vessel.

MARITIME PATROL AIRCRAFT

Maritime patrol aircraft (MPA) conduct antisubmarine, antiship, and other surveillance missions, as well as mining operations, in support of task groups at sea and forces ashore. The MPA force comprises 228 P-3C aircraft, organized into 12 active and seven reserve squadrons. The defense program continues the transition of this land-based force from open-ocean to littoral operations, while employing MPA capabilities to offset reductions in S-3 force levels and missions.

Carrier-based fixed-wing S-3B aircraft conduct antiship, surveillance, and refueling missions in support of CVBGs. Plans call for F/A-18E/F fighter/attack aircraft to provide carrier-based refueling capability after the S-3Bs are retired.

LIGHT AIRBORNE MULTIPURPOSE SYSTEM

Light Airborne Multipurpose System (LAMPS) MK III SH-60B helicopters, operating from surface warships, provide extensive antiship and antisubmarine capabilities for maritime engagements. Increased reliance is being placed on these helicopters as the ASW mission of the fixed-wing S-3 force is assumed by other CVBG assets. LAMPS helicopters are used to deploy torpedoes, sonobuoys, and antiship missiles; to process magnetic anomaly detector information; and to conduct reconnaissance missions.

LAND FORCES

The diverse and complementary mix of capabilities provided by the Army and Marine Corps gives military commanders a wide range of options for conducting ground missions. The Army provides forces for sustained combat operations on land, as well as for power projection and forcible-entry operations. The Marine Corps, as an integral part of the nation's naval forces, provides expeditionary forces capable of projecting combat power ashore and conducting forcible-entry operations in support of naval campaigns or as part of joint task forces. Operationally, joint force commanders employ land forces in close coordination with aviation and naval forces.

ARMY

The Army maintains four active corps headquarters, 10 active divisions (six heavy and four light), and two active armored cavalry regiments. Light forces—airborne, air assault, and light infantry divisions—are tailored for forcible-entry operations and for operations on restricted terrain, like mountains, jungles, and urban areas. Heavy forces—armored and mechanized divisions equipped with Abrams tanks, Bradley fighting vehicles, Apache attack helicopters, and the Paladin field artillery system—are trained and equipped for operations against armies employing modern tanks and armored fighting vehicles. Light and heavy forces can operate independently or in combination, providing the mix of combat power needed for specific contingencies.

Through the force transformation initiative, introduced in 1999, the Army is undertaking a major modernization of its force structure and equipment, with a goal of fielding more mobile and lethal forces in both the near and long term. The transformation schedule calls for the immediate creation of new, more responsive brigades. Off-the-shelf medium armored vehicles, to be procured beginning in FY 2001, will

equip these brigades until technology allows for the development of a new family of combat vehicles. The long-term goal is to erase the distinction between traditional heavy and light forces, thereby creating a standard force (termed the Objective Force) for the entire Army that is both more responsive and more capable.

Implementation of redesigned heavy Army divisions has resulted in the following changes: one less combat company per combat battalion, a dedicated reconnaissance troop assigned to each brigade, a shift of organic combat service support assets from combat battalions to forward support battalions, and an increased emphasis on command, control, and information support structures. The Total Army Analyses for FY 2003 and FY 2005 identified adjustments to the support needed to sustain Army combat forces across the range of military operations. As a result, the Army is taking steps to convert lower-priority support and combat units to higher-priority support units. Furthermore, through the FY 2007 Total Army Analysis and other ongoing initiatives, the Army continues to refine reserve component roles and missions in support of the National Military Strategy.

The Army National Guard comprises 350,000 soldiers, organized into 15 enhanced separate brigades, eight combat divisions, three separate brigades, and various support units for divisions, corps, and theaters. The Army Reserve numbers 205,300 soldiers, assigned primarily to combat support and combat service support units. Table 5-7 summarizes the Army force structure programmed for the end of FY 2001.

Table 5-7

Army Force Structure and End-Strength, End–FY 2001

Active Component	
Divisions	10
Armored cavalry regiments	2
End-strength	480,000
Army National Guard	
Divisions	8
Separate brigades[a]	18
End-strength	350,088
Army Reserve	
End-strength[b]	205,300

[a] Fifteen are enhanced separate brigades.

[b] Includes all functional areas of combat, combat support, and combat service support.

MARINE CORPS

Marine units are employed as part of Marine Air-Ground Task Forces (MAGTFs) consisting of four elements: command, ground combat, aviation combat, and combat service support. A Marine

Expeditionary Force (MEF) is the largest MAGTF organized for combat, comprising one or more divisions, aircraft wings, and force service support groups. The Marine Corps maintains three MEFs in the active force, headquartered in California (I MEF), North Carolina (II MEF), and Okinawa (III MEF). Embarked on amphibious ships, MEU(SOC)s—consisting of about 2,200 Marines and sailors apiece—are task-organized and deployed continuously in or near regions of vital U.S. interest. These forces provide a swift and effective means of responding to fast-breaking crises and can remain on station for extended periods of time, ready to intervene or take action if needed. Over the past several years, the Marine Corps has closely integrated its reserve force with the active component, providing specific units to augment and reinforce active capabilities.

In addition to these general-purpose forces, the Marine Corps has formed and employed a significant special capability in its Chemical/Biological Incident Response Force (CBIRF). The CBIRF is designed to provide a rapid initial response to chemical/biological incidents.

Table 5-8 summarizes the Marine Corps force structure programmed for the end of FY 2001.

Table 5-8

Marine Corps Force Structure and End-Strength, End–FY 2001

Active Component	
Divisions	3
Wings	3
Force service support groups	3
End-strength	172,600
Reserve Component	
Division	1
Wing	1
Force service support group	1
End-strength	39,209

MOBILITY FORCES

Mobility forces—airlift, sealift, and land- and sea-based prepositioning—move military personnel and materiel to and from operating locations worldwide. These forces include transport aircraft, cargo ships, and ground transportation systems operated by the Defense Department and commercial carriers. By relying on commercial resources to augment military mobility systems, the Department maximizes the efficiency with which it can deploy and support forces abroad, while avoiding the prohibitive cost of maintaining military systems that duplicate capabilities readily attainable from the civil sector.

Airlift aircraft provide for the rapid deployment of troops and materiel to overseas operating locations. Sometimes employed in conjunction with prepositioning, airlift delivers the forces needed in the critical early days of an operation. DoD has established an intertheater airlift objective of about 50 million ton-miles per day (MTM/D) of cargo capacity. Of that amount, about 20 MTM/D will be provided by

commercial aircraft, which contribute to military missions as participants in the Civil Reserve Air Fleet (CRAF). The remaining 30 MTM/D of intertheater airlift capacity will come from military aircraft, which are designed to perform missions that cannot be flown by commercial planes. The Department will have an organic strategic airlift capacity of 27 MTM/D at the end of FY 2001.

Sealift contributes primarily to the movement of combat equipment and other cargoes, delivering the majority of the materiel needed to sustain deployed forces over time. DoD will attain a surge sealift capacity equal to its goal of 9.6 million square feet by the end of FY 2001. Surge sealift capacity is provided by fast sealift ships, large medium-speed roll-on/roll-off (LMSR) vessels, and the Ready Reserve Force (RRF).

Prepositioning military equipment and supplies near potential conflict regions reduces response time in contingencies. With material stored on land or afloat at overseas locations, only personnel and a relatively small amount of equipment need be airlifted to a theater at the outbreak of a crisis. Objectives for prepositioning are based on those forces required very early in a conflict to halt an enemy's advance.

AIRLIFT FORCES

Military airlift forces provide a range of capabilities not attainable from civil aircraft. Features unique to military transport aircraft include the ability to land at austere or unimproved airfields; air drop cargo and personnel; unload cargo rapidly, even at airfields lacking materiel-handling equipment; and carry outsize loads, such as Patriot missile systems, tanks, or helicopters. Of the cargo that must be airlifted in the early stages of a conflict, more than half is too large to be accommodated by even the biggest commercial cargo planes and must therefore be transported by military aircraft. At the end of FY 2001, the military airlift fleet will consist of 58 C-17s, 88 C-141s, 104 C-5s, and 418 C-130s (all figures denote aircraft assigned for performance of their wartime missions). Active, Air National Guard, and Air Force reserve squadrons operate these aircraft.

Commercial aircraft augment military airlift forces in moving troops and standard-sized cargo. Through the CRAF program, the Department gains access to commercial passenger and cargo planes in times of crisis. In return for their participation in CRAF, carriers are given preference for the Department's peacetime passenger and cargo business. CRAF forces are mobilized in three stages, giving DoD access to approximately 60 percent of the passenger capacity in the long-range U.S. commercial fleet and nearly 75 percent of the cargo capacity. In the most demanding deployment scenarios, commercial aircraft would move nearly all of the personnel and more than one-third of the cargo airlifted to a conflict theater.

SEALIFT FORCES

Sealift forces carry the full range of combat equipment and supplies needed to support military operations abroad. These forces include three major types of vessels: containerships, used primarily to move supplies; LMSRs and other roll-on/roll-off (RO/RO) ships, which move combat equipment; and tankers, used to transport fuels.

Sealift capacity comes from three sources: government-owned ships supporting the prepositioning program or maintained in reserve status, commercial ships under long-term charter to the Defense Department, and ships operating in commercial trade.

- The majority of government-owned ships are maintained in the Ready Reserve Force. This 72-ship fleet is composed primarily of RO/RO vessels, breakbulk ships, and tankers held at various levels of readiness. More than half of the ships are able to get underway in four to five days; the remainder can be readied for service in 10 or 20 days.

- Augmenting the Ready Reserve Force are eight fast sealift ships and two hospital ships. The fast sealift ships can begin loading on four days' notice, while the hospital ships can be readied for deployment in five days.

- LMSRs support both the prepositioning program and surge sealift. Once the full 20-ship LMSR fleet is deployed, these vessels will provide nearly all of the afloat prepositioning space required for Army unit equipment and approximately one-third of surge sealift capacity. Fifteen LMSRs have been delivered to date, and five additional ships are scheduled for delivery over the next two years. One LMSR, slated for deployment with the Maritime Prepositioning Force (MPF), will be configured specifically to carry Marine Corps equipment.

- To support peacetime operations, the Department charters dry cargo ships and tankers from commercial operators. These ships transport military cargo to locations not normally served by commercial routes.

- The U.S.-flag commercial fleet contains 192 ships with military utility. These include 107 dry cargo ships, 84 tankers, and one passenger ship. Another 175 commercial vessels that could contribute to military missions—81 dry cargo ships, 84 tankers, and 10 passenger ships—are maintained in the Effective U.S. Control (EUSC) fleet. These ships are owned by U.S. companies or their foreign subsidiaries and are registered in nations whose laws do not preclude the ships' requisitioning for military operations.

A number of the commercial vessels listed above can be made available for military contingencies under the Voluntary Intermodal Sealift Agreement (VISA), maintained by the Departments of Defense and Transportation with commercial cargo carriers. VISA provides access to commercial shipping capacity and to the intermodal capabilities of commercial carriers, such as rail, truck, and pier facilities. As with the CRAF program for airlift, VISA is structured to make sealift available in three stages.

AERIAL-REFUELING FORCES

Aerial-refueling, or tanker, forces extend the range of military aircraft by enabling these planes to be refueled in flight. The long-range tanker force consists of 472 KC-135 and 54 KC-10 Air Force primary mission aircraft. In addition to operating in the tanker role, both the KC-135 and KC-10 can be employed as passenger or cargo transports, with the KC-10 possessing a significant capability to perform tanker and airlift missions simultaneously.

Operating from bases throughout Europe, U.S. tanker forces played a crucial role in refueling combat aircraft during Operation Allied Force. In addition, tankers formed an air bridge between the United States and Europe, enabling other military aircraft to fly nonstop from U.S. bases to destinations throughout the area of operations.

PREPOSITIONING PROGRAMS

The United States stores a variety of combat equipment and supplies at selected locations abroad. These stocks, maintained ashore and afloat, dramatically reduce the time required to deploy forces as well as the number of airlift sorties needed to move them.

Land- and sea-based prepositioning provide complementary capabilities for supporting military operations. Land-based prepositioning enhances crisis responsiveness in specific theaters and is the most economical way of maintaining materiel abroad. Afloat prepositioning, while more expensive, provides the flexibility to relocate stocks quickly within and between theaters to meet the demands of particular operations.

Land-Based Prepositioning. Land-based prepositioning programs are maintained in Europe, Southwest Asia, and the Pacific region. In Europe, the Army stockpiles equipment for three heavy brigades—two in central Europe and one in Italy. The Marine Corps stores equipment and 30 days of supplies for the lead echelon of a MEF in Norway. In addition, the Air Force maintains six air base support sets—temporary shelters for early-arriving air base personnel—at a site in Luxembourg.

In Southwest Asia, the Army stocks equipment for two heavy armor brigades. One brigade set is prepositioned in Kuwait, and the other set (which includes equipment to support a division headquarters) is located in Qatar. The Air Force stores air base operation sets in the region, many of which are being used to support contingency operations.

In Korea, the Army stockpiles equipment for a heavy armor brigade. The Air Force stores eight air base support sets in Korea to meet surge-billeting requirements.

Sea-Based Prepositioning. Sea-based prepositioning programs support all four Services. The Department uses a mix of government-owned ships and commercial vessels to stockpile materiel at sea. Army equipment and supplies are carried aboard a fleet of chartered vessels, LMSRs, and an RRF ship. Stationed in the Indian and Pacific Oceans, these ships provide materiel for an armor brigade and selected combat support and combat service support units. Additionally, the fleet carries Army watercraft for port-opening operations. Plans call for an additional Army brigade set to be prepositioned afloat in the near term.

Marine Corps equipment and supplies are carried on 14 vessels operating with the Maritime Prepositioning Force. The ships are organized into three squadrons, each capable of supporting a 17,300-person MEB for 30 days. The squadrons are stationed in the western Pacific, Indian Ocean, and Mediterranean Sea. Plans call for two new vessels to be added to the MPF in the near term. These ships, converted specifically for MPF operations, will be allocated between two MPF squadrons.

The sea-based prepositioning force also includes three chartered ships carrying Air Force munitions. Additionally, an RRF tanker and two RRF ships specially equipped to transfer fuel directly ashore are

maintained for use by all U.S. forces. Table 5-9 shows the projected inventories for key elements of the military mobility force structure at the end of FY 2001.

Military Mobility Forces, End–FY 2001 — **Table 5-9**

Airlift (Operational) [a]	
C-17	58
C-141	88
C-5	104
C-130 [b]	418
Aerial Refueling (Operational) [c]	
KC-135	472
KC-10	54
Sealift	
RRF Ships	72 [d]
Fast Sealift Ships	8
LMSRs	16
MPF (Enhanced) Ships	15

[a] The inventory levels shown reflect primary mission aircraft.

[b] Does not include 14 aircraft operated by the Navy.

[c] These aircraft also perform airlift missions.

[d] Excludes four RRF ships tendered to the Military Sealift Command for use in peacetime operations.

INVESTMENT

The aging of key elements of the U.S. force structure and the increase in asymmetric military threats underscore the need for continued defense modernization. Consistent with this requirement, the defense program:

- Emphasizes acquisition of advanced capabilities in support of *Joint Vision 2020*.
- Maintains annual procurement funding at or above $60 billion.
- Continues substantial investments in research and development and in science and technology programs in order to incorporate new technologies and techniques that could revolutionize U.S. warfighting capabilities.

Equipment modernization programs, described in the sections below, will be funded in part through cost-saving initiatives being pursued across the Department. Such initiatives include:

- Opening more than 200,000 billets to public-private sector competitions.
- Aggressively pursuing infrastructure reductions.
- Fully implementing acquisition reform initiatives.
- Pursuing business process reengineering, including labor-saving technologies.

AVIATION FORCES

Aviation force modernization is an important part of the Department's overall investment program, constituting more than 10 percent of the funding budgeted for FY 2001.

To realize its full potential, the combat force structure depends upon specified levels of personnel, equipment, and other support. The defense program continues to reinforce these supporting factors. Aircraft maintenance data indicate that the readiness decline of the past decade may have been arrested; more time is needed, however, to identify longer-term trends. Nonetheless, the force continues to grow in average age. Flight training is programmed at levels consistent with goals of the Air Force's Ready Aircrew Program, initiated several years ago to help meet critical readiness needs.

The Air Force continues to implement new measures to bolster recruiting and retention. The goal is to increase the number of enlisted personnel in the three most senior grades, permitting qualified candidates to be promoted to positions offering greater responsibilities. Funding for enlistment and reenlistment bonuses likewise will increase. Expanded bonuses will help not only in retaining today's highly trained personnel but also in attracting the highly qualified service members needed in the future.

The Navy also is taking steps to improve the readiness of its aviation forces. It is placing increased emphasis on F/A-18C/D maintenance and modifications, as well as providing Global Positioning System (GPS) guided weapons capability and additional targeting pods for selected fighter/attack aircraft.

FIGHTER/ATTACK AIRCRAFT

Joint Strike Fighter (JSF). The JSF is the Department's largest acquisition program and one of the most ambitious in concept. This project is intended to provide a family of aircraft for use by the Air Force, Navy, and Marine Corps, produced in variants configured to reflect the Services' individual needs. The JSF will replace the F-16 in the Air Force, the F/A-18C in the Navy, and the F/A-18C/D and AV-8B in the Marine Corps. Through substantial commonality across the Service variants, JSF avoids the need for separate aircraft development programs that would be prohibitively expensive to conduct in parallel. Design commonality also offers the potential to reduce long-term logistics support costs.

The JSF is projected to combine substantial combat mission radius, high survivability against air defenses, and large payloads by capitalizing on technological advances in electronics, materials, and manufacturing processes. While not designed to match the unique capabilities of more specialized aircraft, the JSF will

provide a superior combination of multirole capabilities within affordable limits. Both technical engineering factors and cost control will be key to achieving these program objectives.

The JSF acquisition program comprises three phases—concept development, engineering and manufacturing development (EMD), and production. The concept development phase (CDP) began in 1996 and is scheduled for completion in fall 2001. CDP includes a variety of design and technology development activities intended to reduce program risk. As part of CDP, two contractors—Boeing and Lockheed Martin—are each building two demonstrator aircraft. Each firm will demonstrate the main features of the three JSF variants by reconfiguring one of its two demonstrator aircraft to represent the third variant. Flight tests of the competing designs are now underway; results from the test program will support the selection, later in 2001, of a single contractor to conduct the EMD phase.

The flight-test program will help refine aircraft propulsion integration and flight control design, while ensuring the JSF's suitability for shipboard operations. Construction of the demonstrators also will provide insights into the degree of commonality that can be achieved among JSF variants. Successful completion of the tests will give greater confidence in the subsequent EMD phase. A thorough analysis of alternatives (AoA), currently being conducted by the Department, will be used to support a decision on the aircraft's entry into EMD. Consistent with the revised acquisition profile adopted in 2000, procurement of the first eight JSF aircraft, for the Air Force and Marine Corps, will occur in FY 2006; the aircraft will be delivered in FY 2008. Initial procurement of aircraft for the Navy is planned for FY 2008.

The JSF has attracted significant interest from friendly nations considering potential replacements for their fleets of combat aircraft. The United Kingdom is a full collaborative partner, planning to replace its Royal Navy Sea Harriers and Royal Air Force GR-7 (Harrier variant) aircraft with the short takeoff and vertical landing (STOVL) version of the JSF. Three other nations that have become associate partners—the Netherlands, Norway, and Denmark—are determining whether the JSF could meet their future strike-fighter requirements. In addition, Canada and Italy are monitoring the system's initial development efforts as informed partners.

F-22. The F-22 will replace the F-15C/D in the air-superiority role and will possess substantial air-to-ground capability as well. The F-22 is expected to be even more effective than the F-15 due to its significantly lower radar signature, highly integrated avionics system (for situation awareness and targeting), and superior aerodynamic performance. The F-22's larger wing area, more powerful engines, and superior engine thrust control features all contribute to its improved maneuverability relative to the F-15.

Fight testing of F-22 aircraft continues at Edwards Air Force Base, California. A total of nine aircraft are being built as part of the EMD effort. Aircraft number one completed its aeropropulsion evaluation in 2000 and now is undergoing live-fire ground testing. Aircraft numbers two and three are being used for aerodynamic and propulsion performance testing. The remaining six aircraft joining the flight-test program will incorporate the majority of the F-22's planned avionics equipment and will support signature, avionics, and operational evaluations over the next three years.

Aerodynamic flight testing thus far has been very successful. Approximately 400 test flights have been conducted, totaling over 825 hours in the air. Demonstrated performance includes flight altitudes above

50,000 feet; supercruise capability (supersonic flight without afterburners) above Mach 1.5 speed; and excellent maneuverability. Successful launches of air-to-air missiles have been made from both the main and side weapons bays.

The Department revised the F-22 acquisition strategy in 1999 to reflect congressional action on the FY 2000 program. Beyond the nine EMD aircraft, two production-representative test vehicles (PRTVs) are being produced with FY 1998 and FY 1999 funds. These aircraft are scheduled for delivery in FY 2002. A second lot of six PRTVs will be acquired with research and development funding, as directed by Congress. Advance procurement funds in FY 1999 enabled initial work to begin on the second PRTV lot. About $723 million was devoted to the PRTV effort during FY 2000, and a further $704 million will be committed in FY 2001.

F-16s, A-10s, and F-15s. The Department's plan for Air Force fighter/attack aircraft calls for the F-16 multirole fighter force—which constitutes about 50 percent of the force structure—to operate beyond 2010, pending the delivery of replacements from the JSF program. Maintaining force readiness with aircraft whose ages are unprecedented for fighter systems has become an increasing challenge. The Air Force is initiating the Falcon Star program to facilitate the accomplishment of needed structural upgrades for F-16 C and D aircraft. Falcon Star will provide new, detailed assessments of potential F-16 structural problems for use in determining the scope and schedule of the upgrade program. The repair cost for those aircraft determined to need improvements will vary but is expected to be relatively modest, on the order of $250,000 to $500,000 a copy.

The Department expects to retain the sturdy A-10 attack force in service well into the 2020s, assuming some future life-extension efforts. As reported in past years, some F-16s and A-10s have been put into long-term storage as a hedge against a possible future need to refurbish operating aircraft. The first lot of 100 early-model F-16s has already been stored. A second lot of 100 aircraft was planned to enter storage in FY 2000, but some of these aircraft are being retained in operational Air National Guard units for a few additional years.

The Department initiated a program in FY 2000 to procure 30 new F-16C/D aircraft in an air defense suppression configuration. Acquisition of these aircraft serves several purposes, most importantly the provision of sufficient air defense suppression aircraft to allocate one squadron to each of 10 AEFs. The first ten aircraft were funded in FY 2000 and FY 2001. Foreign sales in 1999 and 2000, in combination with additional U.S. purchases, will sustain the F-16 in production well into this decade.

The F-15E inventory is being expanded consistent with Congressional direction. A contract was signed in May 2000 for the procurement of five F-15Es authorized in FY 2000. Two additional aircraft will be procured with FY 2001 funds. Current plans call for these aircraft to be added to the backup inventory, potentially extending the length of time that the F-15E force structure can be sustained.

F/A-18E/F. The F/A-18E/F is the Navy's principal fighter/attack aircraft acquisition program. The F/A-18E/F will replace older F/A-18 models and F-14s. In addition to providing improved survivability over earlier F/A-18 versions, the F/A-18E/F will have improved operational utility owing to its increased weapons payload and its ability to conduct carrier landings with heavier loads of unexpended weapons than previous F/A-18 models could accommodate. The E/F version will also increase carrier air-wing

flexibility through its ability to refuel other strike-fighters in flight. Additionally, the F/A-18E/F design provides significant growth potential above and beyond that afforded by older F/A-18 models. The aircraft will incorporate advanced electronic countermeasure systems and significant radar signature reductions and will have the capacity to support a helmet-mounted cueing system and an advanced electronically scanned array radar.

The F/A-18E/F entered procurement in 1997. The first training squadron of 12 aircraft became fully operational in January 2000. Initial operational capability is planned for FY 2001, with the first carrier-based overseas deployment scheduled for FY 2002. Full-rate production will commence in FY 2001. F/A-18E/F support funding provides allowances for targeting systems and electronic countermeasures equipment, as well as sufficient lesser ancillary equipment (such as fuel tanks and bomb racks) for squadrons on overseas deployments and for testing and training.

The F/A-18E/F acquisition plan calls for procurement of between 548 and 785 aircraft, depending on the introduction date and associated production rate of the JSF.

F/A-18C/D. The Department's plan for Navy fighter/attack aircraft calls for the F/A-18C/D force—which constitutes roughly 50 percent of the Navy and Marine fighter/attack force structure—to operate until about 2010. At that point, the aircraft would be phased out of the force, with the last retirement occurring around 2020. Over the past year, however, new structural problems have been identified in F/A-18C/D aircraft. These problems, combined with other structural concerns previously identified, will make it necessary to conduct a comprehensive service life extension program (SLEP) for the F/A-18C/D fleet to sustain the naval aviation force structure. Two factors underlie this situation. First, operating tempo has been increasing faster than projected. Second, analytical models employed during aircraft development failed to fully predict some fatigue problems.

To deal with this challenge, the Navy is implementing two major initiatives. First, it will replace the center fuselage section (the so-called center barrel) as part of the SLEP for the F/A-18C/D fleet. Second, the Navy will conduct a detailed analysis of all fatigue risk areas (not just the center barrel) on F/A-18C/D aircraft. Results from this analysis, expected in late FY 2003, will be incorporated into the service life extension effort.

Current projections suggest that the Navy and Marine Corps will have to conduct SLEP and repair work on about 355 aircraft through FY 2012. Plans call for the equivalent of two to three F/A-18C/D squadrons to be refurbished annually, reflecting both the capacity of repair depots and the need to sustain adequate operational force levels. Aircraft being refurbished will be removed from service for about a year, meaning that force levels would drop without compensatory measures.

Accordingly, the Navy is extending the planned service life of some remaining F-14s, as well as reducing F-14 squadron size from 12 to 10 aircraft. Older F/A-18A/B models will be operated longer than originally planned, while some F/A-18E/F squadrons will be activated earlier than previously scheduled. Overall, the Navy expects to operate the same number of fighter/attack squadrons as previously planned.

AV-8B. The AV-8B remanufacturing program is nearing completion. The Congress added $52 million in FY 2001 to remanufacture two additional AV-8Bs, bringing the total number of upgraded aircraft to 74.

The remanufactured AV-8Bs will be used to equip seven squadrons. The remaining 118 AV-8Bs are not programmed for remanufacturing, given the pending introduction of replacement JSF aircraft.

Other Marine Corps Fighter/Attack Aircraft. The Marine Corps plans to replace the F/A-18C/D, as well as the AV-8B, with the Joint Strike Fighter. Pending the initial delivery of Marine JSFs near the end of this decade, some Navy F/A-18Cs will be transferred to the Marine Corps. In addition, 24 Marine F/A-18As will be equipped with new computers and sensors, which will enable them to carry modern air-to-air and air-to-ground ordnance. This will leave a balance of 76 Marine F/A-18s in the earlier configuration; these aircraft will be capable of carrying laser-guided (but not GPS-aided) munitions and Sparrow (rather than AMRAAM) medium-range air-to-air missiles.

TRAINER AIRCRAFT

T-2/T-45. The Navy operates a mix of T-2 and T-45 aircraft for advanced training. T-45s are being procured as replacements for some T-2s. The T-6 primary trainer is expected to replace other T-2s in selected training roles in the future.

T-6A. The Air Force and the Navy will continue to acquire the Joint Primary Aircraft Training System (JPATS) and associated T-6A aircraft. JPATS will replace Air Force T-37 and Navy T-34 primary trainers and ground-based training systems. Initial operational capability for the Air Force aircraft will be attained in FY 2001; the Navy aircraft will enter service in FY 2003.

T-38C. The Air Force will continue to modernize its T-38 advanced trainer aircraft through both the Avionics Upgrade Program (AUP) and the Propulsion Modernization Program (PMP). The AUP will update the T-38's 1960s-vintage avionics suite with a system representative of the aircraft for which student pilots are being trained. The PMP will provide improvements in reliability, safety, efficiency, and performance. Structural modifications extending the T-38's service life into the 2020s are nearly complete.

CONVENTIONAL BOMBERS

B-52. The B-52 has both conventional and nuclear missions. Upgrades for the B-52 force will keep it capable of employing the latest munitions and communicating with other forces. B-52s already are capable of carrying the Joint Direct Attack Munition (JDAM), the Wind-Corrected Munitions Dispenser (WCMD), the Sensor-Fuzed Weapon (SFW), and the Joint Standoff Weapon (JSOW). The Joint Air-to-Surface Standoff Missile (JASSM) will also be added to the B-52 weapons suite. The existing ALR-20 radar warning receiver on the B-52, which provides information on enemy electronic emissions, will be replaced with a system capable of recognizing the latest threat signals.

B-1. The B-1 will be the backbone of the future conventional bomber force. Upgrades completed in 1999 provided the B-1 with an advanced navigation system and an improved communications suite. ALE-50 towed decoys are now being fielded on the B-1 force; major enhancements to the aircraft's computers will also be incorporated. The existing ALQ-161 electronic countermeasures system will be maintained while research continues on the B-1 Defensive System Upgrade Program (DSUP), which is a candidate to replace the ALQ-161 over the long term. The B-1 can deliver the entire family of advanced cluster munitions (CBU-87/89/97) as well as MK-82 and MK-84 general purpose bombs, MK-62 mines, and the GBU-31 (JDAM), increasing effectiveness against area targets and vehicles in low-threat environments. WCMD, JSOW, and JASSM will be added to the B-1 weapons suite in the future.

B-2. The B-2 can be used in both the nuclear and conventional role. The stealth features incorporated in this aircraft make it difficult to detect, especially at night and in adverse weather; its ability to penetrate heavy defenses is further enhanced when it is employed with standoff jamming aircraft. All 21 aircraft in the programmed B-2 force have been delivered. The capability of these aircraft grew when they were upgraded from the test configuration and initial Block 10 and Block 20 configurations to the Block 30 design; these modifications were completed in July 2000. Block 30 aircraft incorporate improved stealth features and advanced avionics, and are capable of employing the JDAM, the 4,700-pound GBU-37, and JSOW. JASSM will also be added to the B-2 weapons suite. Planned future upgrades to the B-2 force include the addition of extremely-high frequency (EHF) satellite communications capability, a smart bomb rack, and more robust stealth coatings that require less maintenance.

SPECIALIZED FORCES

Continuing trends of the last several years, the Department's fleets of specialized aircraft remain in high demand, and efforts to expand and enhance these fleets are underway.

Joint Surveillance Target Attack Radar System (JSTARS). The JSTARS system, operated by the Air Force and the Army, locates, identifies, and tracks enemy targets on the ground in support of air and ground operations. The system consists of two primary elements: large transport-class aircraft (E-8s) carrying a powerful multimode radar and systems operators, and mobile Army Common Ground Stations (CGSs) that receive and further exploit the radar data. The FY 2001 budget provided funds to procure a fifteenth production E-8C and to continue the Computer Replacement Program (Block 20) upgrade. The satellite communications (Block 30) development program will be completed in the near term. The previously planned Radar Technology Insertion Program (RTIP) has been restructured into a multi-platform RTIP program that will develop radar variants for E-8s, business jets, and the Global Hawk unmanned aerial vehicle (UAV). The newly structured RTIP program also will include a higher-capacity data link for E-8s and CGSs. The E-8 JSTARS acquisition profile will provide improved radars for five aircraft by FY 2013.

U-2. The Air Force high-altitude U-2 force is receiving several enhancements, most importantly an upgraded radar with greatly improved imagery and moving-target intelligence features. Additionally, the aircraft's electro-optical sensor is being upgraded. Sensor resolution at longer ranges will be improved, as will geolocation accuracy and area coverage. Due to cost growth and schedule slips in the signals intelligence development program, U-2s will not be upgraded with Joint Signals Intelligence Avionics Family (JSAF) equipment. In view of the Global Hawk UAV's successful test program, as well as planned improvements to the Global Hawk system, further upgrades to the U-2 fleet are expected to be modest. U-2s are programmed to continue in service while additional experience is gained with Global Hawk.

UAVs. The Air Force Global Hawk UAV will soon transition from an Advanced Concept Technology Demonstration (ACTD) to a major DoD acquisition program. Global Hawk will carry electro-optical and infrared (EO/IR) sensors, as well as a multimode radar providing both synthetic aperture radar coverage of fixed targets and a moving-target indicator for mobile targets. Global Hawk performed well during operational demonstrations in FY 2000, leading to a positive assessment of its prospective military utility from the joint-service users observing the demonstrations. The Global Hawk post-ACTD program now includes an EMD/low-rate initial production (LRIP) phase, commencing in FY 2001, as well as plans and funding for later improvements. Prospective future additions include JSAF-based signals intelligence

sensors and an advanced multimode radar. Drawing on lessons learned in Kosovo, Air Force Predator UAVs are being upgraded with EO/IR laser range-finder/designator packages.

The Army is funding the acquisition of 44 Shadow UAV systems, each comprising three UAVs. Each UAV will have an EO/IR payload and will be capable of remaining airborne for up to six hours. Programmed improvements include upgraded EO/IR payloads, new data links (Tactical CDL, or TCDL), and Tactical Control System (TCS) software. To compensate for projected attrition, nearly 200 replacement UAVs will be procured. The Army will continue to operate its existing Hunter UAVs until the Shadow system enters service.

The Navy's Fire Scout program will provide vertical-takeoff-and-landing (VTOL) UAVs for employment on ships with small decks and for operation ashore in locations with limited landing facilities, including urban areas. Each UAV will have a combined EO/IR/laser-designator payload and will be capable of undertaking missions of up to seven hours. Each system will incorporate TCDL data links and TCS software. The Navy and Marine Corps will continue to operate the Pioneer UAV until the VTOL UAV enters service.

Standard TCS software and TCDLs, programmed for both Army and Navy UAVs, also are being considered for retrofit on Predator endurance UAVs operated by the Air Force. This addition would enhance the interoperability of UAV systems in joint engagements.

RC-135, EP-3, and Aerial Common Sensor (ACS). The Air Force Rivet Joint (RC-135) fleet, having just been expanded to 16 aircraft, will be provided with an additional training aircraft to permit expanded overseas operations. Due to cost growth and schedule slips in the avionics development program, existing RC-135s will not receive all of the Joint Signals Intelligence Avionics Family equipment upgrades. The Department will continue to pursue development of the JSAF, however, to permit any follow-on program to take advantage of its improved capabilities.

The Navy's land-based EP-3 fleet will grow to 14 aircraft with the projected future delivery of aircraft being converted from the P-3C ASW configuration. The entire EP-3 fleet is slated to receive JSAF equipment. Requirements for an EP-3 follow-on program (or a service life extension) are being evaluated as part of the Navy's Broad-Area Maritime and Littoral Armed Intelligence, Surveillance, and Reconnaissance AoA. Similarly, requirements for a follow-on to the Army's RC-12 Guardrail and RC-7 airborne reconnaissance programs are being examined in analyses for an Army Aerial Common Sensor (ACS) program. The ACS also is anticipated to employ JSAF equipment and, if approved for acquisition, would be fielded later in this decade. Coupled with UAVs, these new manned Army and Navy systems could ease the personnel operating tempo concerns that the airborne ISR fleet now faces.

E-3 and E-2C. Installation of upgrades—radar improvements and new passive emitter detection systems—on Air Force E-3 Airborne Warning and Control System (AWACS) aircraft will continue well into the next decade. New E-2Cs for the Navy will be produced initially at a rate of three per year under a multiyear contract extending from FY 1999 through FY 2003. Beginning with FY 2001 deliveries, E-2Cs will be equipped with Cooperative Engagement Capability (CEC) subsystems to improve targeting of missiles and aircraft. Plans call for procurement of 21 CEC-capable E-2Cs, sufficient to support four carrier battle groups. Approaches for sustaining long-term E-2C force levels, considering both new

production and life-extension options, are being evaluated; a decision is expected in 2001. Both the E-3 and E-2C fleets are receiving reliability and maintainability improvements to keep them operating past the year 2010.

EA-6B. EA-6B tactical airborne electronic warfare aircraft will be receiving further capability enhancements, some as a result of experience in Operation Allied Force. The upgrades include provision of an improved avionics package (ICAP III). Plans also call for one additional EA-6B squadron to be formed. Drawing from the existing aircraft inventory through reassignment of selected test aircraft and benefiting from the activation of all previously stored aircraft, the new unit is slated to become operational in FY 2003. Its addition will bring the total number of Navy and Marine Corps EA-6B squadrons to 20; five of the Navy squadrons will be earmarked for land-based expeditionary deployments. Combined with the capability upgrades discussed above, the creation of the new unit will enhance the contribution of the EA-6B force to combat operations. Given the planned retirement of the EA-6B force beginning in 2010–2015, the Department has initiated a joint effort to determine the capabilities that should be developed for a successor system or systems.

HC-130 and HH-60. HC-130 combat search and rescue aircraft are being upgraded with improved defensive, radar, and communications systems. Additionally, the HC-130 force is being expanded to 15 aircraft through the conversion of four WC-130H weather aircraft to the CSAR configuration. HH-60G CSAR helicopters are being modernized through the addition of improved defensive systems and communications gear.

AVIATION FORCE WEAPONS

Advanced Medium-Range Air-to-Air Missile (AMRAAM). The Air Force and Navy will continue procurement of AMRAAM missiles. Performance is being enhanced in a number of areas, including kinematics and lethality.

AIM-9X. The AIM-9X is a new short-range air-to-air missile under development by the Air Force and the Navy. An advanced version of the AIM-9 Sidewinder missile, it combines the AIM-9M's motor, fuze, and warhead with a new seeker and airframe. Other enhancements incorporated in the AIM-9X design include the ability to be cued to a target by a helmet-mounted sight that can align the missile's seeker head with targets well outside the aircraft radar's field of view. The combination of improved missile performance and the new helmet-mounted sight will recover an advantage in close-in combat that was lost several years ago when advanced new foreign systems, such as the Russian AA-11, were deployed. Affordability and growth potential are key tenets of this program. Early testing led to some improvements in component design and production quality that are being proven as flight tests proceed. The system will enter low-rate production during FY 2001; a decision on full-rate production is anticipated in FY 2004.

Joint Air-to-Surface Standoff Missile (JASSM). The JASSM is a new long-range missile designed to have excellent autonomous navigation capability and an autonomous terminal seeker. JASSM's standoff capability will enable U.S. aviation forces to hold highly defended targets at risk while minimizing aircraft attrition. A key goal in the system's development is achieving desired performance while maintaining low unit cost. This Air Force-led joint program is currently in EMD. Initial flight tests revealed a minor design problem (a wing-opening actuator failed), leading to a thorough review of program plans and a subsequent decision to add 10 months to the EMD phase to ensure an acceptable level of risk. Assuming

successful test results, low-rate production will commence in FY 2002. While no Navy procurement for the F/A-18E/F is currently planned, the missile will be considered for future use on both the JSF and F/A-18E/F.

Joint Direct Attack Munition (JDAM). Under the JDAM program, existing general-purpose bombs are being upgraded with an inertial navigation system (INS) coupled to satellite GPS data. INS/GPS guidance will improve bombing accuracy from medium and high altitudes, permitting the delivery of these free-fall munitions in adverse weather. Low-rate production of JDAM tail-kits for MK-84 and BLU-109 warheads began in FY 1997 and FY 1999, respectively; MK-83 tail-kits entered production in FY 2000. The Air Force and Navy are currently developing a variant that incorporates the 500-pound MK-82 warhead. Additionally, under a product improvement program, the Navy and Marine Corps are pursuing development of a JDAM variant with improved accuracy.

Joint Standoff Weapon (JSOW). JSOW is a long-range glide weapon with autonomous navigation ability. Capable of employment in adverse weather, it provides an accurate standoff method of delivering tactical munitions at a relatively low cost. The baseline variant, which entered production in FY 1997, carries combined-effects bomblets for use against area targets. To provide standoff antiarmor capability, the Department began procurement in 1999 of a follow-on version carrying a BLU-108 payload derived from the Sensor-Fuzed Weapon (described next). A third JSOW variant, incorporating a unitary warhead and autonomous seeker for target discrimination, is in development. The unitary variant was redesigned in 1999, enabling a significant reduction in acquisition costs without a decrease in overall effectiveness. Production of the unitary variant is slated to begin in FY 2003.

Sensor-Fuzed Weapon (SFW). Designed for top attacks on enemy armor, the SFW is a tactical munitions dispenser containing 10 BLU-108 submunitions, each with four Skeet warheads. This weapon is capable of achieving multiple kills against armored vehicles during day or night and in adverse weather. Production of an improved BLU-108 submunition will commence in FY 2001. The improved submunition (also planned for use on JSOW) will be much more effective than earlier versions at only a small increase in cost. Enhancements include the addition of an active sensor, a multimission warhead, and expansion of the weapons pattern over the ground by more than 50 percent. These changes will reduce the system's susceptibility to countermeasures and improve its soft-target lethality and coverage, while reducing the impact of target location errors.

Standoff Land Attack Missile (SLAM). The Navy SLAM is a modified Harpoon antiship missile incorporating a GPS receiver, an AGM-65 Maverick imaging infrared seeker, and a Walleye datalink for man-in-the-loop control. An upgraded version of the missile, designated SLAM-ER, provides an approximately 100 percent increase in range over the baseline SLAM system. The ER version also incorporates enhancements in accuracy, anti-jam guidance capability, and hard-target penetration. Improvements in the SLAM-ER's mission planning system will enhance the weapon's ease of employment. SLAM-ER Plus, a variant further enhanced by an automatic target acquisition capability, entered production in FY 1998. Approximately 450 SLAM/SLAM-ER missiles are slated for conversion to the SLAM-ER Plus configuration.

Wind-Corrected Munitions Dispenser (WCMD). The WCMD is a modification kit for advanced cluster bomb dispensers that inertially guides the units to compensate for high-altitude winds, thus improving

delivery accuracy. This modification will be made to the CBU-87 (Combined Effects Munition), CBU-89 (Gator), and CBU-97 (SFW). Delivery of production units began in FY 2000.

NAVAL FORCES

The defense program sustains a broad range of modernization initiatives for naval forces. Programmed investments will add the capabilities needed to counter emerging threats, while providing the mix of ships and supporting systems required for 21st century operations.

The average age of the fleet is currently at an acceptable level. Programmed ship deliveries, combined with deactivations of aging vessels, will keep the fleet's age within acceptable bounds well into the future.

AIRCRAFT CARRIERS

The defense program sustains a force of 12 deployable aircraft carriers. CVN-76, the final Nimitz-class carrier, was funded in FY 2001. CVN-77 will serve as a bridge to the next generation of aircraft carriers, designated CVNX. More than $200 million of the approximately $5 billion programmed for CVN-77 through FY 2001 will be used to develop technologies for incorporation into the CVNX class. Some of these technologies also will be considered for backfit into existing Nimitz-class carriers to reduce life-cycle costs.

Funds will be provided in later years for continued research and development, advanced planning and design, and advance procurement of CVNX components. CVNX carriers will be nuclear powered and will each be capable of supporting an air wing of 75 aircraft.

The Navy is developing the new CVNX class through an evolutionary, multicarrier process. Initial technology efforts and new design features, such as a new island and warfare system, will be incorporated into CVN-77. CVNX-1, slated to begin construction in FY 2006, will retain the existing Nimitz hull, while adding a new nuclear power plant and an improved electrical generation and distribution system incorporating major technological advances that facilitate the integration of other capability improvements. For example, a new Electromagnetic Aircraft Launch System is planned for CVNX-1. A new hull design and other, more substantial system changes are being considered for CVNX-2, which is planned for procurement in FY 2011. Through this evolutionary approach, the Navy seeks to develop a class of carriers that will provide improved warfighting capabilities at affordable acquisition and reduced longer-term ownership costs.

AMPHIBIOUS SHIPS

Amphibious lift forces play increasingly important roles in joint operations, reflecting the growing emphasis on regional contingencies, a broader range of peacetime operations, and the rapid-deployment requirements of naval expeditionary forces. The defense program continues a robust modernization of the amphibious force, supporting a long-term goal of maintaining 12 ARGs comprising 36 ships.

The key to modernizing the amphibious force in the near term is the new amphibious transport dock ship, the LPD-17. The addition of 12 of these ships to the fleet will alleviate the current shortfall in vehicle space. The LPD-17 is designed to carry approximately 700 troops and two Landing Craft Air Cushion (LCACs), while providing 25,000 square feet of vehicle stowage space, 36,000 cubic feet of cargo space,

and the capacity to accommodate four CH-46 helicopters or a mixed load of AH-1/UH-1, CH-46, and CH-53E helicopters and MV-22 tilt-rotor aircraft. Four LPD-17s have been procured to date. The lead ship is slated to enter the fleet in FY 2003.

The amphibious assault force is being modernized through the acquisition of LHD-class vessels. Seven of these ships have been procured to date. In preparation for construction of an eighth LHD, design work has begun on a new gas-turbine propulsion system. LHD-8 will replace the first ship of the LHA class. Studies currently underway within the Navy are examining new large-deck amphibious assault ship designs to replace the remaining four LHAs, which will reach the end of their 35-year service lives in 2012–2015.

The defense program continues a service life extension of the LCAC fleet. The SLEP will increase the LCAC's originally planned 20-year operational life to 30 years. A high-speed, fully amphibious landing craft, the LCAC is capable of carrying a 60-ton payload at speeds greater than 40 knots over a range of approximately 200 nautical miles. Carrying equipment, troops, and supplies, the LCAC transits at high speed over the sea and across the beach, quickly offloads its cargo, and then returns to its home ship to take on additional sorties. LCACs provide amphibious task force commanders flexibility in selecting landing sites. Capable of delivering cargo directly onto dry land, they afford access to more than 70 percent of beaches worldwide.

SUBMARINES

The defense program maintains a force of attack submarines sufficient to meet 21st century challenges. Investments in this force focus on acquisition of the new Virginia (SSN-774) class submarine. Incorporating new technologies, including those developed for the Seawolf program, Virginia-class SSNs will be highly effective in performing traditional open-ocean ASW and antisurface missions as well as littoral and regional operations, which will be their primary emphasis. Such operations include standard SSN missions plus mine warfare, special forces insertion/extraction, battle group support, and intelligence-gathering. The Virginia class has been designed to adapt easily to evolving mission requirements.

Virginia-class SSNs are being constructed under an innovative teaming agreement between the nation's two builders of nuclear-powered submarines, Electric Boat Corporation and Newport News Shipbuilding. Under this arrangement, the two firms are alternating assembly of the ships.

Virginia-class submarines will provide affordable replacements for the older 688 SSN class. Their deployment will enhance the operational flexibility of the SSN force, while helping to compensate for scheduled retirements of 688-class submarines. To help maintain the overall force at desired levels until the Virginia class is fully deployed, the defense program anticipates either refueling additional 688-class SSNs or converting as many as four retiring ballistic-missile submarines to a conventional (SSGN) configuration. A decision on this element of the program awaits completion of analyses by the Navy.

SURFACE COMBATANTS

The defense program sustains a modern force of 116 surface combatants. Continued deliveries of new Arleigh Burke-class guided-missile destroyers (DDG-51s) carrying the Aegis weapons system will more than offset the capabilities of older surface combatants programmed for deactivation.

DDG-51 destroyers are equipped with the Aegis weapon system and the SPY-1D multifunction phased-array radar. The DDG-51 combat system includes the Mk-41 Vertical Launching System, advanced antisubmarine and antiair systems and weapons, and Tomahawk cruise missiles. New DDG-51s, starting with the ships delivered in FY 2002, will provide improved land-attack capabilities as well as area defenses against ballistic and cruise missiles. They will be able to operate independently or as part of carrier battle groups, surface action groups, or ARGs, or in support of underway replenishment groups. The first Flight IIA variant, commissioned in FY 2000, incorporates facilities to support two embarked SH-60 LAMPS helicopters. In addition to bolstering the fleet's sea control capabilities, LAMPS-equipped DDG-51s will provide a highly capable platform for conducting ASW and surveillance missions upon the retirement, later in this decade, of the Navy's carrier-based force of fixed-wing S-3 aircraft. The defense program anticipates procuring the remaining six DDG-51s under a multiyear contract during FY 2002–2005.

The defense program also supports development and procurement of the new DD-21 land-attack destroyer. The DD-21 will provide firepower at long ranges in support of joint operations ashore. With its state-of-the-art information technologies, it will operate in close coordination with other battle group elements, as well as with U.S. ground and land-based air forces. The emphasis on sensor-to-shooter connectivity will provide naval or joint task force commanders the flexibility to counter any maritime threat and destroy a variety of land targets. Moreover, the DD-21 will be difficult to detect by potential adversaries.

The defense program sustains an initiative to gain additional capabilities at low cost from selected CG-47-class cruisers (CG-52 and subsequent ships). Planned modifications include the addition of the Area Air Defense Commander system and area theater ballistic missile defense capability. The upgraded ships also will be capable of employing the new Extended-Range Guided Munition (discussed in the Naval Surface Fire Support section).

COMBAT LOGISTICS

The defense program continues procurement of T-ADC(X) dry-cargo ships. These new multiproduct vessels will replace aging T-AE and T-AFS ammunition and dry cargo ships and AOE-1 fast combat stores ships. They will carry both dry and refrigerated products as well as ammunition and a limited amount of fuel. To improve affordability, the ships are being procured using commercial business and construction practices to the maximum extent possible. A total force of 12 T-ADC(X)s is planned.

COMMAND SHIPS

The Navy is examining alternatives for a new class of joint command ships, designated JCC(X). These ships would replace the current four-ship command fleet, which is nearing the end of its service life. In evaluating designs for a successor system, the Navy is seeking a platform that will be capable of performing joint command and control functions in forward areas. Initial results from internal analyses show that a dedicated at-sea platform could best meet projected operational requirements. The Navy is now determining the most cost-effective approach for implementing the JCC(X) concept.

P-3C MARITIME PATROL AND RECONNAISSANCE AIRCRAFT

Near-term investments in the maritime patrol and reconnaissance (MPR) force focus on sustaining the current fleet of land-based P-3C aircraft, pending deployment of a successor system in the next decade.

Accordingly, the defense program supports a P-3C service life extension as well as a weapon system upgrade (the Antisurface Improvement Program). These enhancements will enable the P-3C fleet to remain operational into the next decade.

An analysis of alternatives for a follow-on MPR capability is underway. Options being investigated for the replacement system include manned aircraft, UAVs, reconnaissance satellites, or some combination of these or other platforms. The MPR follow-on would be deployed around 2015. Funding for an MPR successor system awaits completion of the AoA.

MINE COUNTERMEASURES

The Navy continues to operate dedicated mine countermeasure (MCM) ships, helicopters, and explosive ordnance disposal forces, while developing systems that will be assigned to battle groups and amphibious ready groups and deploy routinely with them. These new organic mine warfare systems will provide airborne, surface, and sub-surface MCM capabilities, allowing the fleet to avoid—or reduce to manageable proportions—mine threats in regional contingencies more quickly than is possible with today's dedicated forces.

WEAPON SYSTEMS

Tomahawk. The Tomahawk cruise missile enables surface combatants and submarines to launch attacks against land targets from long ranges in all types of weather. As demonstrated in Operation Allied Force, Tomahawk missiles provide force commanders with a versatile precision strike capability. To maintain adequate inventories and replenish missiles used in recent operations, the Navy is converting 624 older Block IIC, Block IID, and Tomahawk antiship missiles to the Block IIIC configuration. For the longer term, it is developing an advanced, more affordable version of the Tomahawk system, called Tactical Tomahawk. Enhancements incorporated in the Tactical Tomahawk's design include in-flight retargeting, the ability to loiter over the battlefield and attack emerging targets, and target identification and damage assessment capabilities. In addition, the missile will employ GPS guidance. Plans call for procurement of 1,353 Tactical Tomahawk missiles.

Standard Missiles. The Standard Missile (SM) is one of the primary air defense weapons deployed on U.S. surface ships. The newest variant of the Standard system—the SM-2 Block IVA—has the dual mission of defeating both advanced antiship cruise missiles and theater ballistic missiles. The defense program continues procurement of SM-2 Block IIIB missiles to meet antiair warfare requirements.

Ship Self-Defense Systems. Modernization of ship self-defense systems continues under the Maritime Force Protection program. This program includes the Evolved Sea Sparrow Missile (ESSM), the Rolling Airframe Missile (RAM), and the Re-architecture NATO Sea Sparrow Missile System. The defense program continues procurement of the ESSM and RAM systems. Reflecting the results of analyses of ship-based radar systems conducted in recent years, the program also supports the development of multifunction and volume search radars, to be installed initially on CVN-77 and the DD-21. These systems are also being considered for backfit on LPD-17 amphibious ships during the next decade.

Cooperative Engagement Capability (CEC). The CEC system collects radar data from multiple ships and aircraft and distributes this information among ships in a battle group. By enabling cruise missiles to be targeted at ranges well beyond ships' radar horizons, CEC significantly enhances sea-based defenses

against advanced cruise missile threats. A series of land-based tests conducted over the past year has explored solutions to problems encountered in integrating CEC with other ship defense systems. The Navy has been fixing interoperability and software maturity problems. CEC is slated for deployment initially on battle group ships; future plans call for the system to be carried by E-2C command and control aircraft as well.

Light Airborne Multipurpose System (LAMPS). The defense program supports initiatives to extend the service life of SH-60B LAMPS helicopters and equip them with improved sensors and weapons. The upgraded helicopters, renamed SH-60Rs, will incorporate a modern dipping sonar, a multimode radar, and other improvements, enhancing their effectiveness and survivability in littoral environments.

The defense program also provides for continued procurement of CH-60S helicopters. A derivative of the SH-60, the CH-60S is primarily a logistics support aircraft. Beginning in FY 2005, the mission of the CH-60S force will be expanded to include mine countermeasures support of battle groups, for which testing is now being conducted.

Naval Surface Fire Support (NSFS). NSFS capabilities are being modernized in order to expand support for the Marine Corps' Expeditionary Maneuver Warfare concept and for joint land-attack operations. The defense program supports development of the Extended-Range Guided Munition (ERGM), which will be able to operate over ranges exceeding 60 nautical miles. The program also continues development of the Advanced Gun System, a 155mm weapon with a range of 100 nautical miles, slated for fielding on DD-21s. In addition, the program anticipates procurement of a 5"/62mm gun capable of employing the ERGM; Aegis cruisers as well as DDG-81 and later Aegis destroyers will carry the 5" gun. Finally, the program supports development of the Land-Attack Standard Missile as a near-term NSFS upgrade for Aegis ships. To meet longer-term NSFS requirements, the Advanced Land-Attack Missile (ALAM) is planned for deployment on DD-21s and is being considered for incorporation on Aegis ships as well.

Information Technology 21st Century (IT21). Under the IT21 program, the Navy is accelerating the fielding of shipborne computer networks supporting warfighting and other requirements. The networks provide secure, unclassified Internet protocol access for naval forces through satellite and other communications means, using commercial hardware and software. As ships implement IT21, battle groups will be better able to coordinate their actions by sharing a common tactical picture. A Navy-Marine Corps Intranet, linking shore-based IT systems within a common network, also is planned.

LAND FORCES

Army. The defense program supports a major transformation of the Army, designed to realize the Army's vision for fielding a more versatile, lethal, and survivable force. The Army will accomplish this transformation by combining digitization initiatives that have been a key part of its modernization program for several years with accelerated development of advanced technologies for propulsion, protection, and direct and indirect fire. Overall, the Army's program will create a more responsive force; accelerate procurement of weapon systems that make light forces more lethal; accelerate procurement of computerized logistics systems to facilitate deployment and sustainment of Army forces; and sustain key elements of the existing force until the transformation is complete.

A major near-term element of the transformation effort has been the establishment of an initial force of two brigades at Fort Lewis, Washington. These units, which are using off-the-shelf loaned equipment, will develop tactics, techniques, and doctrine associated with the operational employment of redesigned forces. In FY 2001, the Army will begin procuring off-the-shelf Interim Armored Vehicles (IAVs) for the interim force. The IAVs will be used first to replace the loaned equipment at Fort Lewis and subsequently to equip other brigades within the Army. Plans call for the interim brigades, called Interim Brigade Combat Teams, to be fielded at a rate of about one per year beginning in the near term. The units participating in this phase will come from both the active and reserve components. Concurrently, the Army will develop, for introduction around FY 2010, a family of related systems providing full-spectrum ground capabilities.

The transformation plan calls for the accelerated procurement of weapons to make lighter forces more lethal. Examples of such systems include the lightweight 155mm howitzer, the Line-of-Sight Antitank (LOSAT) weapon, and the High-Mobility Artillery System (HIMARS). Additionally, the Army will sustain key legacy systems pending completion of the transformation initiative by continuing modernization of the M1 tank, accelerating procurement of the CH-47F cargo helicopter and the UH-60M Blackhawk helicopter, continuing the Heavy Expanded Mobility Tactical Truck Extended Service Program, and procuring the Heavy Equipment Recovery Combat Utility Lift and Evacuation System (Hercules).

To improve strategic responsiveness, procurement of key logistical command and control systems will be accelerated. These systems will facilitate preparation and execution of movement plans, ensure integration with joint logistical systems, and provide a capability to track shipments in transit. Programs to be accelerated include the Global Combat Support System–Army, the Combat Service Support Control System, and the Movement Tracking System.

The Army is proceeding with its plan to equip the first digitized corps (III Corps) by 2004. Digitization entails the incorporation of state-of-the-art computers, software, and digital radios throughout the force structure and in key warfighting platforms, such as the M1 Abrams tank and the M2 Bradley fighting vehicle. Initiatives in this area will enable critical, time-sensitive information to be disseminated rapidly throughout the battlefield, thus permitting overwhelming combat power to be brought to bear rapidly at the right time and location. Anticipating the enhanced capability that digitization will provide, the Army is redesigning its mechanized divisions, reducing their size and making them more deployable while maintaining their combat capabilities.

Marine Corps. Marine Corps modernization programs are driven by the Expeditionary Maneuver Warfare concept. Executing this concept will require adaptive and agile forces able to rapidly reorganize and reorient across a broad range of missions and operational environments. The result will be a force organized, trained, and equipped to conduct expeditionary operations in joint and combined environments across the full spectrum of 21st century operations. The force will be capable of moving directly from positions relatively far offshore through the littoral battlespace to objectives relatively deep ashore. In conjunction with the Navy, Marine forces will continue to provide flexible, early forcible-entry capabilities. Major ongoing Marine Corps equipment replacement and modernization programs include the Advanced Amphibious Assault Vehicle, the Joint Strike Fighter, and the MV-22 Osprey tilt-rotor aircraft.

GROUND COMBAT SYSTEMS

Abrams Tank Upgrade. Three versions of the Abrams tank are currently in service—the original M1 model (dating from the early 1980s) and two newer versions, designated M1A1 and M1A2.

The Army is pursuing two programs—the M1A1D and the M1A2 System Enhancement Program (SEP)—to provide Abrams tanks with digital command and control capabilities. The M1A1D adds an applique computer to existing M1A1 tanks to provide the processor and memory necessary for digital command and control. The M1A2 SEP will upgrade M1 and early M1A2 tanks to the latest M1A2 configuration. SEP enhancements include second-generation forward-looking infrared (FLIR) sensors, improved armor, and computer processor and memory upgrades required by the Army's future command and control software. All tanks in III Corps will be M1A2 SEPs.

Additionally, under the Abrams Integrated Management XXI program, the Army is overhauling its remaining M1A1 tanks to reduce their operating and support costs.

Bradley Fighting Vehicle Upgrade. The A3 upgrade to the Army's Bradley fighting vehicle is a major component of the Army digitization initiative, designed to complement M1A2 SEP capabilities while incorporating additional enhancements needed to meet future requirements. Upgraded Bradleys will be fielded to units with M1A2 SEP tanks, and will be able to share battlefield data with those units. Digitization upgrades will improve both situational awareness and sustainability through automated fault reporting and diagnostics. The A3 upgrade will also increase the Bradley's lethality by adding an improved fire control system and a commander's independent thermal viewer with a second-generation FLIR. Approximately 1,100 earlier-model Bradleys will be remanufactured into A3s. All Bradley infantry fighting vehicles in III Corps will be A3s.

Crusader. This new system consists of a self-propelled howitzer and resupply vehicles. Fully automated, computerized, and designed for use on the digital battlefield, the Crusader offers substantial improvements in lethality, range, and mobility over existing artillery systems. It is slated to replace the M109A6 Paladin self-propelled howitzer and the M992 field artillery ammunition supply vehicle. The Army has restructured the Crusader program in order to reduce the system's weight and increase its deployability. Weight reduction will be attained primarily through changes to the suspension and power plant and through the use of wheeled as well as tracked ammunition supply vehicles. The acquisition objective has been reduced to 480 units, sufficient to equip III Corps.

Advanced Amphibious Assault Vehicle (AAAV). The AAAV remains the Marine Corps' number one ground acquisition priority. It will be used to replace the existing fleet of AAV7A1 amphibious assault vehicles, which are well beyond their originally projected service life. The AAAV will allow Marine forces to launch assaults from points over the horizon, move rapidly to the beach, and continue the attack inland. It also will provide armor-protected transport and direct fire support to Marine infantry forces ashore. The AAAV will have much greater mobility in the water than the AAV7A1, and will have the speed and cross-country mobility to operate with the Marine Corps' M1A1 tanks. A total of 1,013 vehicles are planned for procurement. To bridge the gap until the AAAV's deployment, the Marine Corps is extending the service life of a portion of the AAV7A1 fleet. The service life extension will equip the AAV7A1 with the engine and suspension of the Bradley fighting vehicle and replace many aging components, thereby increasing reliability and maintainability while reducing maintenance and repair costs.

Lightweight 155mm Howitzer. This new towed cannon system is programmed for fielding by both the Army and Marine Corps. Substantially lighter than the M198 howitzer that it will replace, the LW155 will significantly enhance ship-to-shore mobility, while increasing the survivability and responsiveness of artillery support for ground operations. The howitzer will incorporate an Army-developed digital fire control system with a self-locating capability, further enhancing operational effectiveness. The LW155 is currently in engineering and manufacturing development. Plans call for procurement of 686 howitzers.

Future Combat System (FCS). The Army's transformation initiative has as its cornerstone a medium-weight combat vehicle designed to be more strategically mobile than current systems, while remaining highly lethal and effective. To accelerate development of key technologies, the Army has partnered with the Defense Advanced Research Projects Agency to design, develop, and test FCS in tandem with the development and fielding of the redesigned force. In the near term, off-the-shelf IAVs will be procured for the initial and interim force. These vehicles will be in the 20 to 25-ton weight class and will be deployable by C-130 aircraft.

In November 2000, the Army announced its decision to procure the eight-wheeled Light Armored Vehicle 3 (LAV-3). The nine LAV-3 variants planned for production will fill a capability gap in the force by providing strategically responsive combat power as well as increased mobility and agility. For the longer term, the Army will develop a family of FCS vehicles for the transformed force. FCS will be designed to conduct direct combat, deliver line-of-sight or near-line-of-sight munitions, perform reconnaissance, and transport personnel and material.

AIRCRAFT

Comanche Helicopter. The Comanche is a key component of the Army modernization program. Designed for armed reconnaissance and incorporating the latest in stealth, sensors, weapons, and advanced flight capabilities, Comanche helicopters will be electronically integrated with other components of the digitized battlefield. They will provide the operational capabilities essential for a smaller, joint integrated force structure. Enhancements incorporated in the Comanche system will give these helicopters greater mobility, lethality, versatility, and survivability than predecessor systems at lower operating and support costs. The program entered engineering and manufacturing development in FY 2000.

V-22 Osprey. This tilt-rotor aircraft, being developed to replace the Marine Corps' aging fleet of CH-46E and CH-53D helicopters, represents a significant advance in technology for providing tactical mobility to ground combat forces. The V-22's combination of range, speed, and payload is a critical enabler for the modernized force. The Marine Corps plans to procure 360 MV-22 aircraft. Separate acquisition programs include 50 CV-22s modified for Air Force special operations and up to 48 HV-22s for the Navy. The V-22 is expected to achieve initial operational capability and begin full-rate production in FY 2001.

Apache Longbow and Longbow Hellfire Missile. The remanufacture of the Apache system is providing ground commanders with a long-range helicopter capable of delivering massed, rapid fire in day or night and in adverse weather. Longbow's target acquisition system can automatically detect and classify targets. The target acquisition system incorporates a fire control radar that uses millimeter-wave technology to direct the Longbow Hellfire missile. The fire-and-forget capability of the Longbow system provides an enhancement that is critical to the survivability and effectiveness of the launch platform.

UH-1Y/AH-1Z Upgrade. The Marine Corps is making extensive improvements to its aging fleets of UH-1N utility and AH-1W attack helicopters. A total of 280 aircraft—100 UH-1Ns and 180 AH-1Ws—will be remanufactured. The upgraded systems, redesignated UH-1Ys and AH-1Zs, will incorporate significant improvements in operational capability. The remanufacturing program also will reduce life-cycle costs (through reliability and maintainability enhancements), while extending the aircraft's service life. The program is currently in engineering and manufacturing development.

MISSILES AND MUNITIONS

Army Tactical Missile System (ATACMS). The ATACMS is a surface-to-surface guided missile capable of striking targets beyond the range of existing Army cannons and rockets. This advanced weapon and the Multiple-Launch Rocket System are fired by the M270 delivery platform. A total of 1,650 ATACMS Block I missiles were procured through 1997. An improved version, designated ATACMS Block IA, will offer greater range and, with an embedded GPS receiver, greater accuracy as well. A total of 552 of these missiles are planned for production. Block II ATACMS missiles, carrying the Brilliant Antiarmor Submunition (BAT), are slated for fielding in the near term.

Brilliant Antiarmor Submunition. The BAT uses advanced acoustic and infrared sensors to seek, identify, attack, and destroy armored vehicles. ATACMS will deliver a single warhead carrying 13 BAT submunitions deep into enemy territory. The submunitions will autonomously disperse to attack their targets, allowing multiple engagements by a single missile. A preplanned product improvement program will add stationary targets—including multiple-rocket launch systems and Scud missile transporters—to the basic BAT target set through seeker and warhead enhancements. Together, the BAT and ATACMS systems will provide superior deep-strike capability to Army forces.

Javelin. The Javelin is a medium-range, man-portable, fire-and-forget missile with day-and-night capability and an advanced tandem warhead capable of defeating modern main battle tanks, including those with reactive armor. The system includes two major components: a reusable command launch unit (CLU) sight system and the missile. Other enhancements incorporated in the Javelin's design include the ability to fire the missile safely from covered fighting positions and to use the CLU sight separately for battlefield detection and surveillance. The Army plans to procure 21,897 missiles through FY 2005.

Predator Short-Range Assault Weapon. The Predator is a short-range, man-portable, disposable fire-and-forget antitank weapon. It can engage moving targets at ranges from 17 to 200 meters and stationary targets at distances of 17 to 600 meters. The system will enter production in FY 2001. Procurement of a total of 5,700 Predator weapons is planned through FY 2007.

Line-of-Sight Antitank (LOSAT) Weapon. This system consists of kinetic-energy missiles (KEM) and a second-generation FLIR acquisition sensor mounted on a High-Mobility Multipurpose Wheeled Vehicle (HMMWV) chassis. The KEM is designed to defeat all projected future armored vehicles as well as hardened targets, such as bunkers and reinforced urban structures. It will be readily deployable and capable of being air-dropped or slingloaded for helicopter transport.

High-Mobility Artillery Rocket System (HIMARS). The HIMARS is a C-130-transportable version of the Multiple Launch Rocket System (MLRS) launcher, mounted on a 5-ton truck chassis. This highly

deployable, lethal fire support system will provide early-entry forces MLRS firepower capability. HIMARS will be capable of firing all current and future MLRS munitions and ATACMS variants.

SUPPORT SYSTEMS

Digitization. The Army is continuing plans to field advanced information technologies throughout the force. Key initiatives include procurement of platforms (upgraded M1 tanks and Bradley fighting vehicles and other types of vehicles) with built-in digital information-exchange capability, add-on information systems for platforms without built-in digital capability, and interoperable digital command and control systems for all echelons of the Army command structure.

The core of the digitization initiative is the Army Battle Command System and communication network. Critical communication networks include the improved Single-Channel Ground-Air Radio System, the Enhanced Position Location Reporting System, the Warfighter Information Network, the Global Broadcast Service, and the Joint Tactical Radio System (which will be used by all four U.S. Services and is expected to be interoperable with allied equipment).

Modernization initiatives for command, control, communication, computer, intelligence, surveillance, and reconnaissance (C4ISR) systems include nearly 100 programs with an aggregate annual cost of approximately $3.4 billion. Of that amount, about $500 million will be spent on hardware and software associated with system integration and experiments.

Digitization is a key component of the Army's transformation initiative. The hardware, software, and doctrinal changes supporting digitization are being evaluated in advanced warfighting experiments. Building on a series of tests conducted in 1996–1998, a Digitization Capstone Exercise is scheduled for 2001. The exercise will be conducted in two phases over the spring and fall. The insights gained from warfighting experiments continue to guide Army digitization efforts.

Family of Medium Tactical Vehicles (FMTV). Under this program, the Army is fielding a complete family of medium tactical trucks and companion trailers. The vehicles share a common cab and chassis as well as common engines and transmissions, fuel systems, suspensions, and steering systems. With their off-road mobility and other performance enhancements, FMTV vehicles offer a significant improvement over the older 2 1/2-ton and 5-ton trucks they replace. Their modern design likewise affords improved crew visibility, safety, and comfort relative to previous truck systems. The FMTV will be produced in six models—cargo, tractor, wrecker, shop van, expandable van, and dump—with companion trailers. The high degree of commonality among the variants will reduce production costs and operations and maintenance expenditures.

Medium Tactical Vehicle Replacement (MTVR). Under the MTVR program, the Marine Corps is replacing its medium tactical truck fleet with new trucks. MTVRs will be used to move troops, equipment, and supplies. Each truck will be capable of carrying more than 7 tons off-road and up to 15 tons on the road. Built for a service life of 22 years, the MTVR fleet will incorporate numerous enhancements, including an electronically-controlled engine/automatic transmission, an independent suspension, a central tire inflation system, antilock brakes, traction control, and improved safety/ergonomic features. Plans call for the production of 6,854 trucks.

Logistics Command and Control Systems. In support of its transformation effort, the Army is accelerating the acquisition of selected logistical command and control systems. The Combat Service Support Control System (CSSC) will provide access to logistical information from echelons above corps to the tactical level. It is one of the systems that constitute the Army's interface with the Global Command and Control System. The CSSC will provide an automated means of supporting logistical, medical, financial, and personnel planning and decision making. The Movement Tracking System will provide visibility into all cargo shipments, enabling two-way communication and the redirection of in-transit material. The Transportation Coordinators Automated Information for Movement System II will facilitate the preparation and execution of movement plans at the unit level. These systems are either being fielded now or will enter the inventory over the next several years.

MOBILITY FORCES

The Department has undertaken an ambitious modernization program for mobility forces. The program is designed to replace obsolete equipment with more capable and efficient systems, while adding capacity in selected areas to meet mobility objectives.

AIRLIFT AND AERIAL REFUELING

C-17. Investments in airlift focus on replacing the aging fleet of C-141 intertheater aircraft with state-of-the-art C-17s. The current multiyear acquisition contract will result in procurement of 120 C-17s by FY 2003, with the last of those aircraft projected for delivery in FY 2005. The Department plans to purchase additional C-17s in subsequent years to ensure that U.S. mobility forces possess the operational flexibility to respond to the full spectrum of crises.

C-5. Current investments in the C-5 force focus on avionics modernization and selected engine modifications. The incorporation of technological advances in cockpit avionics will improve the C-5's operational capability, while enabling the force to meet more restrictive airspace management criteria slated to take effect in future years. For the longer term, the Air Force has initiated a program to improve C-5 reliability, availability, and performance and to reduce operating costs.

KC-135. The KC-135 tanker force also is being modernized. All KC-135 aircraft will receive avionics upgrades, allowing a reduction in cockpit crew size from three to two persons. In addition, 45 KC-135s will be reconfigured to accommodate one of 33 multipoint refueling pod sets, enhancing their ability to refuel Navy, Marine Corps, and allied aircraft.

C-130J. The C-130 force is being modernized through the acquisition of upgraded J-model aircraft for the Air Force and KC-130J tanker aircraft for the Marine Corps. Enhancements incorporated in the C-130J include a redesigned flight station allowing a reduction in the size of the cockpit crew, a modern-technology engine and propeller system, and an integrated digital avionics subsystem.

Large Aircraft Infrared Countermeasures. The military airlift fleet will be provided with a new countermeasure system designed to foil heat-seeking surface-to-air missiles. This program will enhance the survivability of large aircraft operating in high-risk environments.

PREPOSITIONING

The defense program sustains investments in Air Force prepositioning of air base operation sets in Southwest Asia. In addition to reconstituting sets that have been used to support contingency operations, the Air Force is accelerating procurement of additional sets to enhance responsiveness in crises.

INFRASTRUCTURE AND SUPPORT

Numerous airfields, ports, and other transportation facilities support the movement of U.S. military personnel and equipment to destinations worldwide. The Army's Strategic Mobility Program funds improvements to U.S. military installations, ports, and airfields and to the military fleet of railcars. In addition, DoD maintains airfield facilities overseas for refueling, maintenance, and other en route support. Today, DoD operates about one-third the number of overseas airfields that it did a decade ago. Therefore, it is imperative that these facilities be kept in good operating order and, in some cases, be enhanced to increase their capabilities. Complementing these improvements are continued investments in the Global Transportation Network and in materiel-handling equipment. The defense program strengthens command and control capabilities, thus facilitating the tracking of personnel and cargo and enhancing the utilization of transportation resources.

CONCLUSION

U.S. conventional forces continue to evolve to meet 21st century requirements. The defense program sustains a strong emphasis on operational readiness, maintenance and repair of critical facilities, and modernization of key platforms. The Department's modernization programs and associated operational initiatives for conventional forces emphasize and, where possible, accelerate high-payoff programs that will ensure U.S. dominance over any potential military threat.

Table 5-10

Web-Based Resources

For additional information on systems described in the Investment and Force Structure sections, please visit the Web sites for the respective Services at the addresses listed below:	
Army Weapon System Handbook	http://www.sarda.army.mil/sard-zs/saal_zs_public_docs/wsh.html
Navy Fact File	http://www.chinfo.navy.mil/navpalib/factfile/ffiletop.html
Air Force Fact Sheets	http://www.af.mil/news/indexpages/fs_index.html
Marine Corps Fact File	http://www.hqmc.usmc.mil/factfile.nsf/