

Concepts and Issues

1990



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1990

Marines: The Decade of the '90's Begins

This, the eighth edition of **Concepts and Issues**, explains to those interested in the Marine Corps, **how** Marines fit into our national security strategy, **what** particular capabilities the Marines provide, and **how** the Corps is organized, trained and equipped to meet the challenges of the next decade and beyond.

As the conclusion of the 20th Century approaches the Corps is found to be in a high state of readiness, manned by many of this nation's finest young men and women and well organized to respond to the most probable taskings. The clear guidance and determined support of the Secretary of the Navy, coupled with our traditionally strong bond and shared common objectives with the Chief of Naval Operations and the men and women of the U.S. Navy, have enabled the Corps to sustain those qualities of a formidable force-in-readiness which for years have been our legacy. The enduring assistance and wise counsel of the Secretary of Defense, and the Chairman and members of the Joint Chiefs of Staff, have furthered the advance towards development of Marine forces ideally suited to fulfill the most likely obligations of the decade.

Explained in this booklet is both past and prologue. You will be made aware of the relevance of the forces, their substantial capability in existence today and the course we are embarked upon to preserve and protect those capabilities desired as a consequence of the considerable investment that our Commander-in-Chief and the Congress have made in the Marines.

The world is in a state of change and Marines are adapting. There may never before have been a time in the history of this Nation when Naval Forces have been as important or germane to the national defense. The necessity to be highly capable and well prepared to project power from the sea is a precious asset now available that must be preserved. What follows is an explanation that describes in some detail how we intend to protect this most relevant capability. As in the past we shall take whatever resources are allocated and prudently convert them into combat power. Should there be a need to apply this power it will be done smartly with the tenacity, zeal and sense of purpose that have been our hallmark for over 200 years.



A. M. GRAY
GENERAL, U.S. MARINE CORPS
COMMANDANT OF THE MARINE CORPS

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Appendix A

Glossary

The Decade of the '90's Begins

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"A Marine Expeditionary Unit (Special Operations Capable), as part of a Naval Task Force, stands off shore in international waters ready to evacuate U.S. citizens during a coup overseas. It also can provide training assistance to a struggling democracy if required. A Fleet Anti-terrorism Security Team company, as part of a Marine air contingency force, deploys via strategic lift to reinforce a U.S. Embassy during a period of instability in a foreign country. At the same time other specialized units focus their unique skills to gather intelligence against terrorist groups and drug smugglers or assist a developing nation help itself. At home, Marines assist in fighting a forest fire or are on scene to provide hurricane disaster assistance. In or out of uniform, Marines work to spread the concept of a drug free society. These are but a few of the tasks performed by Marine Air-Ground Task Forces around the globe today."

The rapid series of changes in the Soviet Union and Europe has once again underscored the need to reassess fundamental assumptions about our national security posture. Our security requirements reflect a dynamic relationship between enduring national interests, the world environment, and our military strategy. While the international environment has changed dramatically in the past year, certain realities about U.S. national interests remain unchanged. The U.S. remains an island nation dependent upon the seas with global interests that must be protected.

These interests extend beyond our own territorial boundaries. They will be challenged at a great distance from our shores. The U.S. must retain the ability to project military force to critical regions of the world to protect these interests. This capability will deter potential adversaries, support the favorable resolution of crises, demonstrate the Nation's commitment to allies and friends abroad, help carry on the fight against the scourge of drugs and terrorism, and maintain access to the oceans which are the commercial highways essential to our economic system.

National Security Overview

Unlike our national interests, which have remained relatively constant for many years, the world environment is in flux. We face an era of dramatic social and economic challenge. The population ratio between the industrialized and developing nations has shifted, and will continue to shift toward the lesser developed countries. By the year 2000, four-fifths of the world's population will live in these countries. More and more of this population growth is centered in cities within a few miles of the world's oceans and seas.

Economic developments indicate a similar change in focus. Increasingly, our economic opportunity and required resources are found in the western Pacific. The Pacific economies provide the majority of our imports. By the year 2000, trade with Pacific partners will more than double our gross trade with our traditional European allies. In both political and economic terms we will become increasingly tied to our new trading partners. We will be required to match these new alliance relationships with the ability to protect our interests and those of our regional allies. Our focus should also incorporate our allies of the future in Latin America.

Given that our industrial base in the 21st century is going to be dramatically different than the past half-century, this country will rely upon its maritime power to ensure its access to these markets and resources to assure our own economic security.

Technology plays a major role in the changing world security environment. Every year the weapons of war become more destructive, accurate, transportable, numerous, and available. Qualitative differences between the military capabilities of the traditional powers and the Third World are steadily diminishing. The proliferation of mines, anti-aircraft arms, and chemical weapons in the Iran-Iraq War demonstrates the enhanced lethality of future conflict.

Nationalism will continue to have a profound effect on U.S. interests, including increased risk to U.S. citizens and property overseas, and reduced opportunities for overseas basing. Our national military strategy has been dependent on the availability of foreign bases for forward defense. A potential U.S. response is an increased dependence on forward afloat naval forces and **sea-based expeditionary** forces able to be rapidly moved to an area of crisis.

Terrorism and the international narcotics trade will be major national security issues in this decade. U.S. military forces may have to respond in a variety of ways to protect national interests at home or abroad. These may range from providing security for persons and property to conducting retaliatory strikes against sponsors of terrorism. The role of U.S. military forces in the war on drugs will continue to expand.

This Nation will continue to rely upon its alliance with our NATO partners. We will continue to maintain links and fulfill commitments to our traditional European allies, while recognizing the emerging challenges in other regions that will place great demands on our defense resources. This diverse variety of requirements will require strategies and forces heavily based on versatile, highly trained, and well-equipped, power projection forces.



Naval Forces

Naval forces are particularly suited for the commitments and challenges of the next century. Naval forces are America's "sword in a sheath," placed off shore in view of a potential adversary, they can influence the calculations of those who threaten our interests without having to commit U.S. forces to combat. Naval forces are a visible and tangible representation of America's resolve in a crisis. Our naval forces provide maximum flexibility by influencing a crisis diplomatically or militarily. They can be deployed, reconstituted, or withdrawn as the vagaries of the situation demand.

Nearly all of the conflicts in the past 40 years have occurred in the Third World, most with little or no warning. This trend is virtually certain to continue. Instability in the developing countries can lead to regional crises with major international consequences. Naval forces are traditionally employed in many of these conflicts. They are usually the "force of choice" since they are already nearby due to their forward deployed status, their ability to loiter in close proximity for long periods without infringing upon the sovereignty of another country, and their ability to independently sustain for long periods. The utility of naval forces has been demonstrated time and time again. A recent study of U.S. responses in crisis situations reported that naval forces were employed 80 percent of the time when U.S. forces were called to the conflict.

Naval forces continue to become more and more integrated as a Total Force. This consideration is driven by national strategy which in the face of an apparently reduced threat, limited resources, and increased warning time, causes us to rely more upon the Reserve component. A Total Force approach is critical to the achievement of national military objectives in the current environment. Given the increased warning time available against the major threat we have faced for the past four decades, an increased dependence on maritime forces will naturally result. These forces provide the ability to influence action prior to hostilities and provide the means to rapidly deploy to reinforce allies and friends. Credible maritime power means a naval force that can deploy immediately, stay for as long as necessary, and fight at whatever level of conflict the situation demands, and win. U.S. naval forces meet these criteria.

**FIGURE 1-1
SEA LINES OF COMMUNICATIONS (SLOCs) AND
STRATEGIC CHOKEPOINTS**



Role of the Marine Corps in National Security

Based upon the initial difficulties in responding with immediately deployable combat power to aggression in Korea, the Congress codified the minimum structure and roles of the Marine Corps in Title 10 U.S.C. 5063 in 1952. The intent of the Congress was to establish and maintain a balanced combined arms capability for the Nation. Subsequent reforms to public law have maintained this unique status and institutionalized the Corps as the country's force-in-readiness. The need for such a capability is particularly acute in the current and projected security environment.

Over the past decade, in response to the forecasted world security environment, the Marine Corps initiated a series of organizational, doctrinal, and training enhancements. These efforts have maintained the Marine Corps preeminence as a naval expeditionary force. The focus of these efforts have been sharpened in the past few years. The changes were adopted to provide options for the myriad challenges that face the Nation. The future places a premium on forces capable of adapting to certain geopolitical and economic situations. Multi-mission capable forces, flexibly sized to the mission, possessing the characteristics of speed and mobility have the highest probability of future employment. Changes in the international security situation necessitate that we be prepared for challenges across the conflict spectrum, but particularly in the low-to-mid intensity range.

The diversity of prospective missions and crises is virtually unlimited. This range of missions and tasks impacts the organization, training, and equipment of our mobile naval forces. No one combination of firepower and mobility is uniformly advantageous in all situations. That is why the Marine Corps does not provide specialized units that are only prepared for a single contingency. MAGTFs, through task organization and diversified training for special operations and low-intensity conflict, can provide Fleet and Unified CINCs versatility and balance in a single force. These MAGTFs are not merely general purpose forces. MAGTFs combine air, ground, and logistics forces under a single commander. They may be weighted toward ground, air, or logistics action, and they can be any size appropriate for the mission. This provides the combatant CINCs a flexible, self-contained force, ideal for independent operations or as part of a joint task force. The major CINCs have consistently expressed their support to maintain a strong naval expeditionary capability.

The Navy-Marine Corps team has adapted for the future by structuring, training, and equipping to enhance its ability to project power ashore where needed, as needed, and when needed. Continued investment in sea-based forces is appropriate given the geographic, political and technological realities facing us. Maintaining flexible, sea-based, expeditionary forces places us on the best possible footing for the challenges of the 21st century. Naval expeditionary forces, will continue to be the most responsive and versatile crisis response option. As the world political and economic picture evolves, the capability of projecting naval expeditionary forces over great distances and keeping them there will continue to increase in value.

This Nation has carefully developed and nurtured a credible naval expeditionary capability that represents a tremendous national asset. These forces are in being today. Were they not, the Nation would have to expend precious resources in order to adequately prepare for the coming challenges of the 21st century. Our national leadership has had the foresight to create a flexible military force to maintain a credible deterrent against major threats while providing for a wide variety of peacetime contingencies. These forces provide not only an expeditionary capability but a true and robust forcible entry capability. These forces are fully integrated into all CINCs requirements.

Marines Preparing for the 21st Century

This Nation retains responsibilities and obligations as one of the world's superpowers. Dramatic shifts and adjustments are taking place around the globe. A reshaping of U.S. military power will naturally follow. Unlikely to change however, are a multitude of threats to our national interests and to friendly and allied countries. U.S. interests often affected by these problems must be protected. Today, as in the past, Marine forces assigned to the Unified Commanders shall frequently be the organization best suited for the task of restoring order or influencing the outcome of the confrontation. This is because Marines are:

- Trained in combined arms warfare and prepared to fight in any climate and terrain under any condition of intensity.
- Deployable by either amphibious shipping, maritime prepositioning, strategic airlift or combination thereof for crisis response.
- Organized as **reservoirs of combined arms** to provide forces for peacetime contingencies such as security teams, mobile training teams, small independent action forces (SIAFs) as well as sea-based, assault-capable forces.
- Structured and equipped to act as the nucleus of a joint or combined task force.
- Capable, in partnership with the Navy, of tremendous staying power due to substantial organic sustainability (60 days of supply).
- Capable of loitering at sea indefinitely and maintaining that afloat posture via sea-basing until action ashore is required.



The Marines are an in existence crisis response force, strategically mobile, tactically flexible, and logistically sustainable. Marine Air-Ground Task Forces (referred to as MAGTFs) are capable of immediate response, able to project and demonstrate the presence of naval power to distant points. This naval power and influence can be projected and sustained deep inland against potential adversaries or in support of developing nations. As the international security picture evolves in the next few years, the capability to project naval forces over great distances and keep them there is an attribute that must endure.

In anticipation of this requirement, the Marine Corps has implemented a series of initiatives to maintain our aggregate utility across the spectrum of conflict. Building upon a solid and carefully designed foundation, the Marine Corps is sharpening its focus and accelerating its preparation for the next century. This focus remains consistent with the high expectations of excellence and preparedness that the American people have of their Marines. With the foregoing in mind, the Marine Corps of the 21st century is presented in the remainder of this chapter.

How the Marines are Organized

As an expeditionary, combined arms, force-in-readiness the Marine Corps must provide forces that can be rapidly deployed for contingency missions in support of national security objectives. The Marine Corps primary mission is to provide Fleet Marine Forces of combined arms, including integrated aviation and logistical components, for service with the U.S. Navy fleet as part of a naval expeditionary force. This mission is consistent with the United States position as a maritime nation with worldwide interests. It supports a national strategy that is global in nature with assets that are equally global and responsive. These two dimensions -- the expeditionary focus and the combined arms concept -- make the Marine Corps a unique military organization.

The MAGTF Concept

The Marine Corps organization for combat exploits the synergy inherent in closely integrated air and ground operations. Based on the combined arms concept, Marine Corps doctrine provides that Marines will be employed as integrated Marine Air-Ground Task Forces. MAGTFs are tailored, i.e., task organized, to accomplish specific missions. A MAGTF is most effective in battle when employed as a strategically mobile, combined-arms, air-ground-logistics combat force all under a single commander. The commander must have the necessary command and control assets to direct this force.

FIGURE 1-2

MAGTF CHARACTERISTICS CHART

- | | |
|--|--|
| ● Maritime Expeditionary Forces | ● Trained for all regions |
| ● Special Operations Capable | ● Employs combined arms and maneuver |
| ● Configured for most likely threats | ● Interoperable with joint and allied forces |
| ● May be quickly reinforced or withdrawn | ● Sustainable |
| ● Strategically mobile | |
| ● Capable of forcible entry | |

The Marine Corps has developed MAGTFs that are trained and prepared to be deployed to any part of the world on short notice. A MAGTF will include four major components:

- | | |
|-------------------------------|---|
| ● Command Element (CE) | ● Aviation Combat Element (ACE) |
| ● Ground Combat Element (GCE) | ● Combat Service Support Element (CSSE) |

There are four basic types of MAGTFs that may be formed in support of national strategy and combatant CINC crisis response requirements. They range in size from very powerful Marine Expeditionary Forces (MEFs) capable of prosecuting operational campaigns against the most capable potential adversarial threat, through rapidly deployable and employable Marine Expeditionary Brigades and routinely forward-deployed Marine Expeditionary Units (MEUs) to small special purpose forces formed for specific missions or contingencies.

FIGURE 1-3 MAGTF ORGANIZATIONS

Marine Expeditionary Force (MEF):

A MEF is the largest (30,000-60,000 Marines and Sailors) and most powerful of the MAGTFs. It may range in size from less than one to multiple infantry divisions and aircraft wings, together with a force service support group. It is normally commanded by a Lieutenant General. It is capable of conducting a wide range of expeditionary and amphibious operations, and with its 60 days of support, is capable of sustained operations ashore in any geographic environment. Each MEF has the capability to task organize special operations capable forces to execute specific missions supporting combatant CINC contingencies.

Marine Expeditionary Brigade (MEB):

The MEB, with 4,000-18,000 Marines and Sailors, is normally built around a reinforced infantry regiment, an aircraft group, and a brigade service support group. It is commanded by a general officer and is capable of rapid deployment and employment in expeditionary, amphibious, and reinforcement roles as required. MEBs may be forward deployed on amphibious shipping, deployed by strategic or tactical airlift to fall in on prepositioned equipment and sustainment, or deployed by air as required. As with the MEF, the MEB has special operations capabilities derived from the enhanced training and equipment possessed by its subordinate units. The MEB deploys with up to 30 days of sustainment.

Marine Expeditionary Unit (MEU):

The MEU is a MAGTF of 1,000-4,000 Marines and Sailors, normally comprised of a reinforced battalion, a helicopter squadron reinforced with deployed and CONUS on-call fixed-wing assets, and a service support group. The MEU is commanded by a colonel and is routinely forward-deployed as the immediately responsive, on-scene, sea-based Marine component of the Fleet Commander's amphibious and power projection forces. The MEU is task organized, trained, and equipped to conduct a wide variety of conventional and specialized operations. Foremost is its capability to conduct long-range amphibious raids from over-the-horizon, without electronic emissions, during periods of darkness, and under adverse weather or sea conditions. For sustained operations ashore, the MEU may serve as the forward element of a MEB. The MEU can also deploy on short notice by a mix of tactical and strategic airlift for contingencies in support of fleet and combatant CINCs. MEUs deployed in amphibious shipping normally carry 15 days of sustainment.

Special Purpose Forces:

These forces are small, task organized MAGTFs configured to accomplish missions for which the MEF, MEB, and MEU are not appropriate. They can be configured, trained, and equipped to conduct a wide variety of conventional and other operations. Recent special purpose forces have been employed in Panama, the Persian Gulf, and on the southwest border of the U.S. in counternarcotics operations. They can be deployed by a variety of means, to include amphibious or commercial ships, tactical or strategic airlift, or by organic Marine Corps aviation assets. These forces are normally composed of Marines highly trained in day/night operations to include insert/extract, raid, and strike operations. They may possess extensive surveillance and reconnaissance capabilities to include Unmanned Aerial Vehicles, radio reconnaissance, and counterintelligence assets, as required. These forces can be employed in a variety of missions to include Mobile Training Teams, security assistance operations, and Small Independent Action Forces.

Special Operations Capabilities

All MAGTFs have inherent special operations capabilities. For example, the forward deployed MEUs, after a demanding and comprehensive training and certification process, are formally designated special operations capable. Their constantly expanding capabilities are the end product of intense and realistic specialized training conducted in coordination with the Amphibious Ready Group and selective procurement of special equipment. Skills acquired through training and the use of specialized equipment are complemented by an operational philosophy which emphasizes rapid execution under time-compressed planning. At a minimum, each MAGTF is expected to commence mission execution signified by launch of surface means or aircraft within six hours of receipt of a warning or alert order.

Prepositioning

Other significant MAGTF capabilities are found in the maritime and geographic prepositioning programs. The Maritime Prepositioning Forces (MPF) program represents a major leap forward in strategic mobility. It gives Marine expeditionary forces assigned to the Unified CINCs a new dimension in mobility, readiness, and global responsiveness. The MPF program involves a total of 13 ships, organized in three squadrons. The first squadron (MPS-1) deployed in 1984, and operates in the Eastern Atlantic. MPS-2 deployed to Diego Garcia during December, 1985. The final squadron, MPS-3, was activated and deployed to the Western Pacific in 1986.

The maritime prepositioning concept reduces Marine deployment response time by prepositioning the bulk of the equipment for a MEB aboard specially designed ships placed in strategic locations throughout the world. Each vessel is loaded with tanks, artillery, vehicles, supplies, food, fuel and water to support a 16,500-man brigade for up to 30 days. A MEB can be quickly airlifted with the use of only 250 C-141 sorties from the U.S. to an objective area to marry-up with its pre-positioned equipment at a secure site. Having this equipment already embarked aboard ship and forward deployed during crisis situations greatly reduces the response times of our MEBs to major crisis areas from weeks to days.

MAGTF closure times will be reduced to enhance the responsiveness of Marine Corps expeditionary forces in crisis response and during the initial phases of a conflict. FMF commanders are revising MPF load plans, deployment and employment options. This reexamination incorporates today's changing political and military circumstances in order to maximize the potent capabilities of the MAGTF concept in a low-intensity conflict (LIC) environment. MPS load plans will be incrementally reconfigured to support the immediate use of a single MPS ship or in pairs in support of a variety of contingencies for MAGTF employment in the most likely regions for future conflict. The use of a single MPS ship or a pair in closure packages will provide the warfighting CINCs an inherently flexible and sustainable contingency MAGTF for regional crisis response.

Another program that enhances responsiveness is the geographic or Norway prepositioning program. This program also provides the supplies and equipment for a Marine air-lifted MEB. The majority of the brigade's materiel is stored in protected sites in Norway. Like the maritime prepositioning program, the Norway air-landed MEB enhances both responsiveness and flexibility. Both the maritime and Norway programs offer options to our national leadership and the CINCs by enabling the rapid movement of forces to a designated area prior to hostilities, thus transmitting a strong signal of national resolve without the risk of initiating direct military involvement. Both MPF and the Norway positioning program are fully operational. Further details on the prepositioning program are provided in chapter 5.

Marine Corps Organization

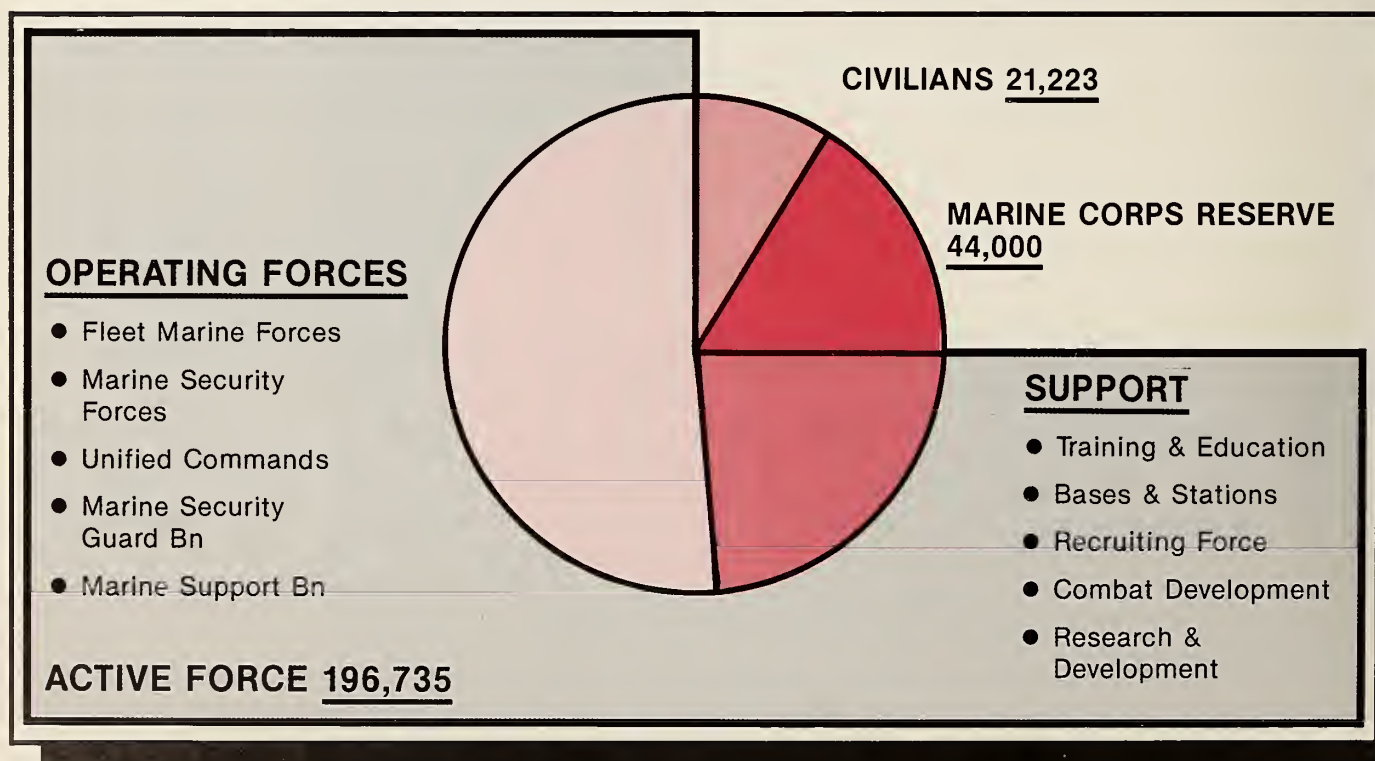
The overall organization of the Marine Corps divides into two broad categories: Operating Forces and the Supporting Establishment. The Operating Forces, considered the heart of the Marine Corps, further constitute the fighting power allocated to CINCs. Major elements include the Fleet Marine Forces, Marine Corps Security Forces at naval installations and ship-board detachments, and the Marine Security Guard Battalion with its detachments at embassies and consulates around the globe. Sixty-eight percent of all active duty Marines are assigned to the operating forces, an extremely efficient “tooth-to-tail ratio.”

The Supporting Establishment includes Headquarters Marine Corps, various bases and air stations, training and formal school activities, the recruiting force, the Marine Corps Combat Development Command (MCCDC) and Marine Corps Research, Development and Acquisition Command (MCRDAC). The Supporting Establishment is lean yet vital to the overall day-to-day activities of the Marine Corps.

Both the Operating Forces and Supporting Establishment are manned by young men and women of the highest caliber. Figure 1-4 depicts the entire Marine Corps Total Force Family including the Selected Marine Corps Reserves and our civilian personnel resources.

FIGURE 1-4

MARINE CORPS TOTAL FORCE — FY-90 AUTHORIZATIONS



Operating Forces made available to the CINCs are provided from Fleet Marine Force, Atlantic (FMFLant) and Fleet Marine Force, Pacific (FMFPac). Both of these command elements are closely aligned with their respective Fleet CINC.

FMFLant is located in Norfolk, VA. The major combat force in FMFLant is II Marine Expeditionary Force or II MEF, located in the Carolinas. II MEF forces train at sites throughout the U.S. and overseas. II MEF continually maintains a forward deployed MEU(SOC) in the Mediterranean, highly trained and prepared for contingencies.

The headquarters of FMFPac is sited at Camp Smith in Hawaii. This Force is composed of two MEF's. One MEF is based in California with operational linkage for employment to Unified CINCs. For example, I MEF provides a forward-deployed MEU(SOC) for service as an element of the Seventh Fleet. The other major combat force in FMFPac is III MEF which is forward based in the Pacific. Approximately two-thirds of the force is found in Japan, the remainder in Hawaii. Again, these forces are available for employment by the designated CINC.

In addition to our active forces, force expansion during general war is made possible by the activation of the Marine Corps Reserve. The Marine Corps Reserve maintains the same high standards of performance and readiness as the active forces. The Marine Corps Reserve consists of the 4th Marine Division (reinforced) and the 4th Marine Aircraft Wing with their headquarters in New Orleans, LA. The 4th FSSG in Atlanta, GA provides combat service support to the 4th Division/Wing team. Units of these commands are located in 194 training centers in 46 States, Puerto Rico and the District of Columbia.

FIGURE 1-5

LOCATIONS OF MAJOR MARINE CORPS OPERATING FORCES



Marine Corps Security Forces (MCSFs) protect 28 key locations throughout the world. In addition, separate detachments provide specialized security capabilities aboard 24 major naval combatants and flagships throughout the fleets. Highly trained Marine security specialists serve as Deputy Security Officers and anti-terrorism trainers at 89 naval installations around the globe. MCSF Battalion command elements at Norfolk, Virginia, and Mare Island, California, oversee security force operations. They provide extensive specialized instruction and training facilities to prepare these rapidly deployable, highly skilled Marine Infantrymen to carry out security and anti-terrorism missions worldwide. Each MCSF Battalion contains a

Fleet Anti-terrorism Security Team (FAST) Company. FAST Marines rapidly deploy to reinforce high threat locations, provide security for nuclear fueling operations, and respond to myriad other crises and contingency situations. To effectively carry out these demanding missions, FAST units train exhaustively in a full range of Close Quarter Battle Techniques. The mettle of our MCSF Marines has been tested. The reinforcement of our embassy in the Philippines during the coup attempt and in both security and combat operations in Panama are but two recent examples.

FIGURE 1-6
MARINE CORPS SECURITY FORCE LOCATIONS



Warfighting Enhancements

The current capabilities of the Marine Corps are impressive, but being complacent can be dangerous in today's rapidly changing security environment. The Marine Corps strives to tailor and fine tune our Total Force for projected requirements. The central aim is to improve and tailor our current force for its expeditionary mission. While the Total Force will retain the capability to field powerful MEFs to fulfill the CINC's warfighting plans, we have shaped and enhanced our active Fleet Marine Force to maintain a rapidly deployable and capable expeditionary force. This force is responsive to the entire range of threat scenarios while retaining the ability to respond rapidly to global war if it becomes necessary.

While fiscal constraints have forced the cadre of three infantry battalions and a lower overall manning level than desired, we have been able to develop an optimal and flexible infantry battalion structure as the building block for all further force structure and manpower initiatives. The infantry battalion has been enhanced. Selective additions improved its mobility, firepower, and sustainability. A fourth letter company has been added to increase the flexibility and reconnaissance ability of our MAGTFs. These adjustments have greatly improved the ability of our expeditionary forces to control and influence larger areas of operation and employ a number of tried and true Marine tactics that are relevant to today's low- to mid-intensity threat environment.

Combat service support units have been tailored to fulfill support requirements of the adjusted ground combat forces. Such streamlining actions have resulted in the transfer of selected heavy general support into the Reserves. This has permitted the application of limited active manpower resources to higher priority MAGTF needs and to meet end strength reductions dictated by budget constraints. The precise realignment of the CSS element will not affect the balance in the FMF. Our MAGTF's retain the ability to effectively conduct the fight.

Light armored units have been improved by the addition of 168 scout-infantrymen and a fourth maneuver company to each Light Armored Infantry Battalion. Future plans seek to add an assault gun variant (LAV-105) to the battalion. The LAV-105 will satisfy a lethality and mobility requirement.

The command element of each MEF was enhanced by the activation of a Surveillance, Reconnaissance, and Intelligence (SRI) Group. Now MAGTF commanders will have intelligence planning, collection and dissemination assets available in an integrated unit. Included in the SRI Group is a radio intercept capability, a deep reconnaissance capability, imagery interpretation and linguistic experts, communications, a sensor employment unit, and remotely piloted vehicles. The ability to integrate the entire range of intelligence acquisition and processing functions is critical to success on the modern battlefield. These changes provide the warfighting commander the means to quickly acquire and analyze intelligence data from multiple sources essential for success on the battlefield.



Aviation capabilities have also been subjected to study and enhancement. Marine Wing Support Squadrons have been resized and two former Marine Aircraft Group headquarters have been consolidated into one. The first AV-8B Harrier Night Attack squadron was activated during September 1989. Within the Marine Corps Reserve, introduction of the new F/A-18 "Hornet" has begun.

The foregoing initiatives preserve the ability of the Fleet Marine Force to fulfill all immediate general war commitments without mobilizing Reserve forces. The ability to task organize MAGTFs provides the CINCs with a flexibility that is key to success in today's uncertain world. Special operations capabilities within the MAGTF will continue to be expanded. Interoperability, including the capability for a MAGTF to serve as the nucleus of a joint task force, will be retained and enhanced. Finally, speed of employment will be further improved through load adjustments to the MPF and the continued judicious use of strategic projection assets.

Training/Operational Initiatives

The Marine Corps will place increased emphasis on wargaming as perhaps the most efficient, economical, and viable means available to maintain and improve combat readiness. With the prospect of large-scale exercises being reduced in an era of overall diminished resources, wargaming will play a vital role in challenging operational leaders to think about all aspects of future warfare. Wargaming can provide valuable benefits when examining the potential employment of MAGTFs around the globe. Such benefits include providing an environment for decision-making, encouraging risk-taking and innovative thinking, providing insight into issues, enhancing the training and education process, and reinforcing principles of strategy, campaign planning and the operational art.

The newly established Marine Corps Wargaming and Assessment Center (MCWAC) is responsible for wargaming policy and direction for the Corps. This center is pursuing three functional tracks - manual, seminar, and automated wargaming systems. The latter providing the format for conducting multiple simulations in order to assess future options for the Corps. MCWAC will develop each of these tracks thereby providing the Fleet Marine Force with the most meaningful war game product and experience possible.

In addition to wargaming, MCWAC provides support in the form of simulation, modeling and assessment for the Operating Forces and Supporting Establishment. This involves the application of computer models, automated data bases, and war games to produce analyses of force structure, doctrine, and equipment alternatives. This type of analysis and data, coupled with professional military judgment, will support the development and evaluation of options to increase the overall warfighting capability of the Marine Corps. MCWAC has been aggressively exploring a variety of computer support applications, has continued to oversee wargaming programs and resources, and has sponsored a series of general officer-level war games and seminars that have included representation from Government, the other Services, and academia. Harnessing the training and assessment value from the present array of sophisticated gaming and modeling techniques will greatly improve the education and development of Marine leaders of today and tomorrow.

Another initiative is the activation of the Marine Corps Intelligence Center, at Quantico, VA. Like the Wargaming and Assessment Center, the Intelligence Center exists to support the operational commander in the Fleet Marine Force. The Center is charged with developing a baseline Marine Corps capability for mid- and long-term intelligence. This capability, previously lacking, is vital to Service doctrine, force structure, training, materiel acquisition plans and programming, and for contingency planning for expeditionary missions. This center has a critical role of ensuring that the collection and production activities of others is exploited and tailored to Marine Corps mission needs. It will be a model fusion center for all-source intelligence focusing on low- and mid-intensity conflict without duplicating the effort of others.

Doctrinal publications reveal the MAGTF to be a force that employs combined arms, mobility, and decisive tactics. The diversity of threats and conflict environments requires a broad doctrine that encompasses the range of situations that the MAGTF commander faces. Mission success is the product of understanding the nature and the theory of war. This common understanding, recently published in a Fleet Marine Force Manual titled *Warfighting* (FMFM-1), is the guiding force behind our preparation for war.

Although all warfare uses both fire and movement, these components provide the foundation for two distinct styles of warfare: an attrition style, based on firepower, and a maneuver style, based on movement. Warfare by attrition seeks victory through the cumulative destruction of the enemy's materiel assets by superior firepower. This results in a methodical approach to war. Victory becomes more dependent upon sheer mass of men and equipment than military skill and competence.

In contrast, warfare by maneuver stems from a desire to circumvent a problem and attack it from a position of advantage rather than meet it straight on. Successful maneuver depends on the ability to identify and exploit enemy weakness, not simply on the expenditure of superior might. This doctrine is appropriate given our mission as a force-in-readiness. An expeditionary force must be prepared to win quickly, with minimal casualties and limited external support, against a physically superior foe.

The Marine Corps concept for winning under these conditions is a warfighting doctrine based on rapid, flexible, and opportunistic maneuver. Maneuver warfare is a warfighting philosophy that seeks to shatter the enemy's cohesion through a series of rapid, violent, and unexpected actions which create a turbulent and rapidly deteriorating situation with which he cannot cope. Maneuver warfare is a way of thinking in and about war that shapes our every action in peacetime and in conflict. In short, maneuver warfare is a philosophy for generating the greatest decisive effect at the least possible cost to ourselves, a philosophy for "fighting smart."



Training and Education

Training is the key to combat effectiveness and therefore is the focus of effort in a peacetime military. Basic individual skills are an essential foundation for combat effectiveness and receive heavy emphasis in the Marine Corps. All Marines, regardless of occupational specialty, are trained in basic combat skills.

Our training programs reflect practical, challenging, and progressive goals beginning with individual and small-unit skills and culminating in a fully combined-arms MAGTF operating in a Joint environment. Exercises are designed to train units and individuals in tactics under simulated combat conditions. Exercises approximate the conditions of battle as nearly as possible; that is, they are designed to introduce friction in the form of uncertainty, stress, disorder, and opposing wills. This last characteristic is most important; only in opposed, free-play exercises can we practice the art of war.

Marine Battle Skills Training

We have changed the direction and content of our training, particularly at entry level, to make it more combat oriented. The next war will have no front or rear areas. All Marines must be proficient in combat techniques. Our response to the requirement that Marines be able to defend themselves and effectively contribute to their units' defense has been an initiative known as Marine Battle Skills Training (MBST). MBST is a comprehensive training process, designed to develop and sustain basic combat skills throughout a Marine's career; focused on extensive firing of individual and crew-served weapons, basic knowledge of field skills, rugged battle drills, and combat oriented physical conditioning. A pragmatic program, MBST is organized into four progressive, mutually supporting stages that cover the spectrum of combat training as displayed in Figure 1-7:



FIGURE 1-7

MARINE BATTLE SKILLS TRAINING PROGRAM

Stage I
Basic Warrior
Training (BWT)

Implemented at both recruit depots in February 1988, BWT increased the amount of training in aggressive, field-oriented combat tasks to the recruit training curriculum. While recruit training still provides its traditional transformation of civilians into Marines, BWT focuses on individual tasks, combat skills, small arms, and marksmanship.

Stage II
Marine Combat
Training (MCT)

MCT is a 28-day training package at the Schools of Infantry at Camp Lejeune and Camp Pendleton. MCT was fully implemented in June 1989. It focuses on collective combat tasks, offensive combat skills, and employment of crew-served weapons. MCT is conducted in an austere, field environment, building upon skills learned during BWT, and giving our Marines the baseline infantry skills required on today's battlefield.

Stage III
Marine Leader
Training (MLT)

MLT encompasses 17 locally-established NCO schools and 3 SNCO academies. This part of the program provides noncombat-arms NCO's and SNCO's with the skills they need to lead Marines in battle. The SNCO academies have implemented the MLT program, and the NCO schools are in the process of incorporating it. We have developed a common core curriculum emphasizing combat skills without shortchanging professional military education.

Stage IV
Unit Sustainment
Training (UST)

Still in the development stage, UST is essential to the long-range success of the MBST effort, and will translate the earlier parts of the program into higher unit-level combat readiness. UST will mold our existing Essential Subjects Training, the Marine Corps Combat Readiness Evaluation System, and specific unit/mission requirements into a cohesive whole. Marines will have to achieve specific levels of proficiency based upon their unit's mission and probability of combat employment.

In conjunction with MBST the Marine Corps has made major improvements in combat marksmanship, close combat, combat water survival, and physical training. The combat marksmanship program translates basic shooting ability acquired on the traditional Known Distance range into an effective shooting ability in offensive and defensive operations. Close combat training provides our Marines with basic and advanced skills in bayonet, knife, and unarmed fighting which builds confidence and enhances survivability. The combat water survival program has revolutionized the Marine Corps approach to dealing with an integral aspect of the amphibious mission, water obstacles. This program provides all Marines with the techniques and confidence to survive in the water and enables them to maintain the capability to effectively fight after negotiating an obstacle. The Marine Corps focus on physical training has changed from preparing to pass a fitness test to preparing all Marines to meet the rigors of combat. Current physical training emphasizes forced marches, combat conditioning courses, and increased use of obstacle and confidence courses.

All training, either directly or indirectly, must contribute to our success in combat. MBST is a vital warfighting initiative, an investment in the individual Marine, and the single most important training program in the Marine Corps today.

Professional Military Education

Professional military education (PME) in the Marine Corps is designed to develop creative, thinking leaders. We have recently re-invigorated our education program. The new program will encompass structured self-study (to include correspondence courses), professional reading, symposia, formal schools, and experiences gained in duty assignments. In contrast to specific specialty training or billet-related skills, our educational program is designed to assist **all** Marines in fulfilling their personal responsibility for achieving operational competence. Our program will enhance the operational proficiency of our leaders and develop a corps of commissioned and noncommissioned officers who better understand the enduring requirements of warfare.

Marine Corps University

The Marine Corps University was activated at Quantico on 1 August 1989 and marks a major step forward in military education. It has cognizance over all Marine schools to include the 17 NCO schools, our SNCO academies, The Basic School, Amphibious Warfare School, and the Command and Staff College. Staffing the University with top notch practitioners of the operational art of war and a first-rate civilian faculty is a major priority.

Plans for the University include a new research and library facility to enhance these educational objectives. The research facility will be a state-of-the-art building that will provide library and research services in support of the University's mission. It will serve as a major repository of historical records, studies and analyses of expeditionary and amphibious warfare. The challenging curricula will focus on the operational art and the use of military history to advance the professional judgment of military leaders. All of our Marines will read about leadership, history and the profession of arms under a new comprehensive and career-long professional reading program we have initiated.

A further initiative undertaken in education involves two new courses slated to begin in FY-90. The **School of Advanced Warfighting** will be offered to selected graduates of the Marine Corps Command and Staff College in preparation for key billets in Joint headquarters and MAGTF command elements. The school will consist of an extensive 9-month course emphasizing the operational art of war and the dynamics of Joint and Combined warfare. The second program, the **Art of War Studies Program**, will be a Top Level School course designed to educate selected Officers on the theory and nature of war across the spectrum of conflict. The school will employ integrated case studies, symposia, observation and research as instructional strategies. Graduates of this selective program will be assigned follow-on tours as teachers at the Command and Staff College.

In addition to Officer PME, we are in the process of revitalizing our NCO and SNCO education programs. An initiative to consolidate our 17 NCO schools into seven regional sites is underway. A new Program of Instruction has been developed and implemented that standardizes instruction and incorporates Phase III of the MBST program. We plan to open a fourth SNCO academy at Camp Butler, Okinawa. By 1993, we plan to be able to formally train each newly promoted Staff Sergeant in the Corps. Phase III of MBST has been incorporated into all SNCO Academy courses. Permeating the entire PME program for our enlisted Corps is the structured self-study program which consists of the Professional Reading program, selected Marine Corps Institute courses, other service extension courses and selected precursor courses for each resident PME course.

We are currently examining the possibility of consolidating a number of NCO and SNCO combat and professional skills schools at a single location at Quantico, VA. This plan envisions a multi-school complex housing a broad spectrum of NCO/SNCO training and education functions.

The Corps must be prepared for a fluid and violent environment. We are training for a high-tempo, around the clock, combined arms, maneuver oriented conflict. Our competitive advantage in future conflicts will not rest on superior numbers or the high quality of our weapon systems. Our advantage will be based on our excellence in tactics and the operational art of war. We will stress professional education at all ranks. We will emphasize the development of mental skills and adaptability as well as our traditional physical prowess. Our exercises replicate the chaos and uncertainty of the modern battlefield to prepare Marines to respond to the myriad tasks and missions involved in anticipated contingencies in the developing areas of the world.



Current Operations

The capabilities of Marine forces have been demonstrated in the past several years, most notably in the Persian Gulf, the Philippines, and just recently in Panama. These incidents provide credence to the projected requirement for rapidly deployable, sea-based forces that can quickly stabilize a crisis situation either by their mere presence or by the application of sustainable combat power. The MAGTF is capable of numerous other contingencies short of combat operations. These capabilities have been recently demonstrated in ongoing counter-drug and Latin American initiatives.

In response to national attention towards Latin America, the Marine Corps has focused significant effort on a series of initiatives and programs that support U.S. foreign policy in the area. In concert with DoD and regional CINC programs, we have strengthened our military-to-military contacts; increased the numbers and frequency of mobile training teams to both Central and Latin America, and sought ways to exercise and operate with local Marine Corps recognized under CMC's Sponsorship Program.

Marine commanders have continued efforts to refine their plans and programs to support the bread and butter of the Corps-contingency operations. Preparations for these evolutions include increased emphasis on knowing the language, culture and politics of the region, as well as travel by key commanders and staffs to gain a first-hand comprehensive understanding of the region.

In addition to our traditional roles and missions in support of foreign policy, we have supported numerous other federal programs and agencies in the fight against the twin threats of narco-terrorism and counterinsurgency. Marines have made major contributions in these efforts and have gained valuable experience that enhances our readiness.

An example of this support has been Marine participation in Joint Task Force 6 in the Southwest U.S.. In compliance with the President's National Drug Control Strategy, the Marine Corps is helping to combat the flow of drugs from the Caribbean and across the southern U.S. border. Marine units have been deployed to complement the counter-narcotics actions of law enforcement agencies and cooperating foreign governments. The Marine Corps and the U.S. Border Patrol have begun conducting joint training in selected areas in the Southwest. Training will be conducted in scouting, patrolling, communications, emergency medical treatment, and helicopter operations.

This initiative furthers training objectives while helping to stem the supply of illegal drugs from abroad. This cooperative program provides superb areas for Marine small unit training. Additionally, the Border Patrol is providing reciprocal training that will be of benefit. Marines involved will have no authority to search or arrest civilians. These Marines will be employed per Title 10, U.S. Code, Section 371(b) to consider "the needs of civilian law enforcement officials for information in the planning and execution of military training or operations."

In addition to these peacetime activities, the Marine Corps provided significant support during relief operations after Hurricane Hugo and after the Oakland-San Francisco area earthquake. We were equally responsive in providing a MAGTF, weighted with combat service support assets, for the Alaskan oil spill clean up effort. These are examples of capabilities employed countless times every year.



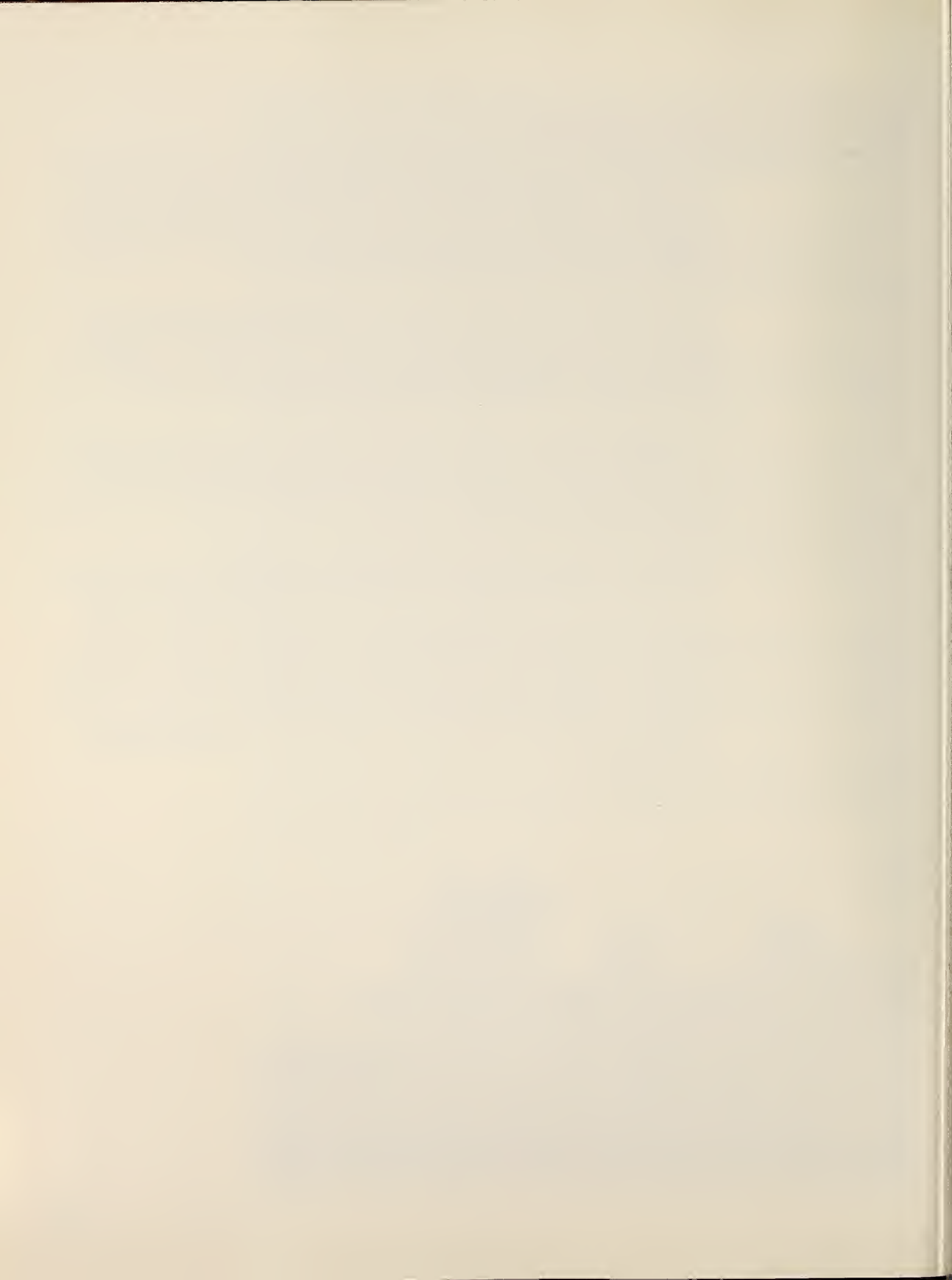
Conclusion — The Corps in the 21st Century

The Marine Corps is and will continue to be prepared to respond immediately to the Nation's call whenever and wherever needed. In the last decade the Corps was modernized from the bottom up to prepare for the most likely conflicts of the future. As the Nation enters the 21st Century, your Marine Corps will remain sharply focused on preparing for the most probable conflicts to ensure that the needs of the Nation are met.

Multi-mission capable forces, flexibly sized to the mission, possessing the characteristics of speed and mobility, have the highest probability of future employment. The ability to task organize an integrated air-ground-logistics force appropriate to the situation, is a current capability of the U.S. Marines and our partners on the sea, the U.S. Navy. Such a naval force will be responsive, unencumbered by requirements for basing or overflight rights, and inherently capable of providing its own essential logistical support.

This capability is provided at a minimum cost to the taxpayer. Our lean "tooth-to-tail" ratio provides more fighters for each dollar provided. This efficiency will be enhanced where feasible. The Marine Corps will continue to provide a multi-mission capability that serves the needs of the Nation. Even in the austere budget environment, we will convert each and every dollar into credible combat power.

The events of the past few years in El Salvador, Panama, the Philippines, and the Persian Gulf underscore how quickly challenges can emerge and how difficult it is to influence events at a time and place of our choosing. As access to overseas bases becomes more restricted, power projected from the sea increases in importance. This capability has been continually refined over the past two years. Maintaining this current capability, even in an era of constrained fiscal resources, provides the Nation with vital alternatives in the form of tested and flexible forces. The very existence of these forces deters potential troublemakers by the ability to respond and win when called into action. Your Navy-Marine Corps team intends to remain prepared to carry out these enduring missions in defense of U.S. interests wherever they may be threatened. We will remain focused on the future to ensure our aggregate usefulness is second to none.



Manpower and Reserve Affairs

2

Part 1

Manpower Overview

Part 1 of this chapter provides an overview of the contribution that the Marine Corps active duty military, reserve military, and civilian manpower programs make to our Total Force and to the Nation's defense. Included are manpower levels requested for 1990/1991 and key manpower trends. Part 2 reviews various programs which contribute to readiness by enhancing the quality of life for Marines and their families.



The greatest of our Nation's strategic advantages lies in its ability to control the seas. Our freedom, the economic bounty we enjoy, and our position as a major maritime nation are directly related to our unimpeded ability to utilize the earth's oceans. That strategic advantage has been a major contributor to the maintenance of stability and balance in an uncertain world. Its contribution in the future will be equally vital.

A second key national advantage which must be maintained is one that complements our ability to control the seas, our quality Marines and the Sailors serving at their side. This advantage is resident in the highly trained, highly dedicated men and women who are the heart and soul of the Navy-Marine Corps team. This advantage must be maintained in the future.

The underpinnings for this notable advantage are individual Marines. Quality Marines, in both the active and reserve components are vital to the preparedness, versatility, and utility of the Marine Corps to the Nation. Accordingly, the main effort of our manpower programs and activities will continue to be fixed on accessing, training, retaining, developing, and safeguarding quality Marines and ensuring the welfare of their families.

To stay in step with the requirement for quality Marines, we must continually search for new ways to preserve and improve the productivity and effectiveness of manpower management tools. Imaginative, flexible, responsive programs are essential to preserve total force quality. The continuing manpower challenge is to design and manage programs which contend aggressively with intensifying recruiting/retention competition, shrinking budgets, and encroachments on quality of life programs. This chapter will discuss in more detail the status of the key factors and programs which impact our total force.

After reading this chapter, one can quickly understand why all equations for success in today's Marine Corps include quality Marines. This publication addresses many program areas that will provide us with superior tools and technology. Without first-rate, bright Marines, the capability manifest in those tools will never be realized, the technology wasted. Marines are forward deployed in all parts of the world serving the nation in a multitude of missions. Our top-flight, quality Marines accomplish these missions with the verve and professionalism that the nation expects from its Marines. Even traditional Marine Corps training and professional development, long regarded as the most arduous, have been made tougher and more exacting. Better trained, forward deployed Marines mean greater preparedness for the nation at a time when great changes are unfolding.

One of the key pillars of the Corps' warfighting philosophy is the importance of the Marine, both as an individual and as a member of the total force. The imperative to access, retain, promote, and safeguard Marines, and their families, is vital to the overall readiness of the Marine Corps. That imperative demands that our quality force be managed with balanced, effective manpower programs.

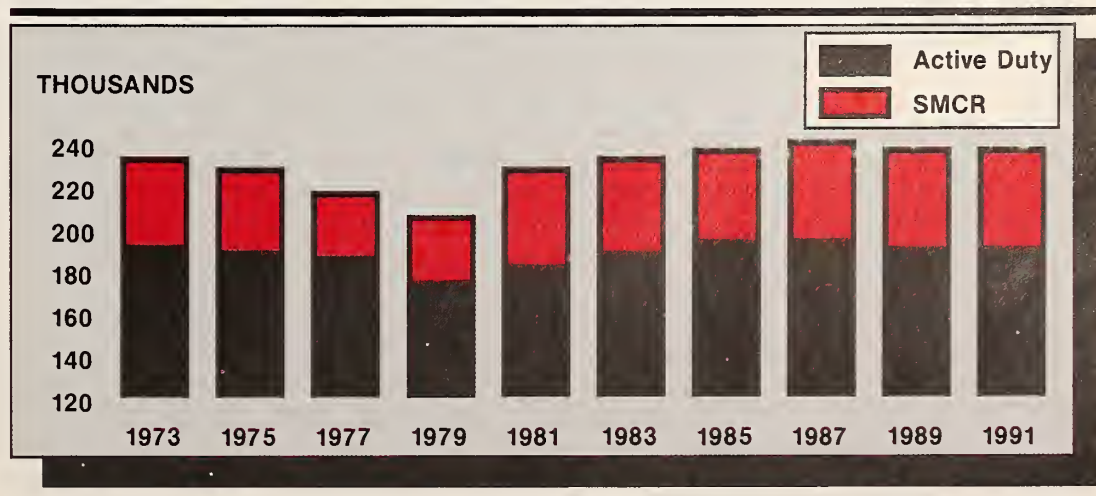
End Strength

The overall Fleet Marine Force structure is based on the approved national strategy and the Defense Planning Guidance. Force structure changes and direction for enhancements to the FMF are promulgated through the MAGTF Master Plan. The MAGTF Master Plan also includes recommended manning levels that set manpower requirements for the FMF which are translated into the requested end strength requirement. This includes both Active and Reserve forces. The Supporting Establishment Master Plan documents the ancillary tasks required of the Marines who operate the bases, air stations, training installations, recruiting activities, and Reserve support activities.

In recognition of existing fiscal constraints, this planning force is further reduced to the force levels required immediately for war. Such force levels comprise the programmed structure and provide the specific requirements for program development as well as for measuring immediate readiness for war. The FY-90 defense authorization included the resources to support a Marine Corps end strength of 196,735 on active duty and 44,000 in the Selected Marine Corps Reserve (SMCR). This end strength enables the Marine Corps to perform all missions assigned. Our FY-91 request for 196,500 on active duty and 43,900 in the SMCR reflects consideration of the wide range of missions and capabilities that we offer the Nation as well as the current budgetary situation.

A summary of Marine Corps end strength (every other year) over the last 18 years is presented below:

FISCAL YEAR END STRENGTH DATA



Recruiting

The Marine Corps is succeeding in the effort to commission and enlist high quality young Americans who want to serve. Thanks to the committed effort of our recruiting force we again enjoyed unqualified success in FY-89. As officer strengths remain relatively stable, only 1,631 new officers will be required in FY-90 and 1,625 in FY-91. Similarly, about 42,238 new Marines, active and reserve, will need to be enlisted in FY-90 and 42,973 in FY-91.

During FY-89, 1,698 lieutenants and warrant officers were accessioned into the Marine Corps. We have maintained the highest levels of quality for all officer accessions. In FY-89, we enlisted over 42,103 young men and women into our active and reserve ranks. Once again, we achieved our number requirements, while accomplishing all quality goals.

We enter FY-90 well prepared to maintain our regular and reserve forces. Over 55 percent of the total enlisted force requirements are in the Delayed Entry Program (DEP). In addition, over 99 percent of those in the DEP are high school graduates or seniors. An increase in accession requirements, coupled with a decrease in Qualified Military Applicants (QMA) will demand a renewed dedication and commitment to ensure our continued success in the 1990's.

Reserve Training and Support of the Active Forces

The international security environment and resource availability require a high quality and highly trained Reserve component to defend freedom here and abroad. The Marine Corps Reserve is prepared for this challenge. The readiness and professionalism of the Marine Reserve has been demonstrated time and time again "in every clime and place." Since its establishment, the Marine Reserve has served as a full and active partner in our Total Force.

The organization of the Selected Marine Corps Reserve (SMCR) as a Division, Wing and Force Service Support Group capable of providing trained units to the Active Force provides unparalleled flexibility in employing Reserve assets. Similarity of Reserve and Active Force structures greatly enhances and streamlines the process of integrating reservists into the Active Force during mobilization.

Aggressive and extensive training programs are conducted within the Marine Corps Reserve for the purpose of enhancing its warfighting capability. Training is directed at both the SMCR and Individual Ready Reserve (IRR) to ensure trained units and individuals are available upon mobilization.

Significant programs included in the FY-90/91 Reserve budget are funding to support the recently activated KC-130T and AH-1J squadrons, 4th LAAD and 4th LAAM anti-air defense units, and Full-Time Support strength increases of 356/100 for FY-90/91, respectively, including instructors to support Marine Battle Skills Training.

Participation in unit exercises is critical to mobilization readiness. These exercises are a culmination of MOS training, professional education, and small unit training conducted throughout the year. Exercise participation (including those overseas) affords Reservists the same type of opportunities as their regular counterparts to develop and maintain combat skills.



The 4th MarDiv, 4th MAW and 4th FSSG maintain an active exercise cycle which each year includes two combined arms exercises (CAXs) and battalion or larger size cold weather, mechanized, amphibious landing, mountain and artillery fire exercises. Emphasis is placed on maximum participation in integrated exercises; i.e., those which involve both Active and Reserve component units, in order to increase the integration and interoperability of both components. A 5-year plan has been developed by the SMCR in conjunction with the force commanders to increase SMCR unit participation in Active component exercises.

During 1989 over 25,000 selected reservists participated in major exercises within CONUS and abroad. Active and Reserve training integration will continue to increase as the Designated Augmentation Unit program is implemented. This program features 16 Reserve infantry companies assigned for mobilization purposes to Active component infantry battalions in order to provide a fourth maneuver company.

The Marine Corps Reserve is a vital dimension of the Corps' Total Force. High morale and the dedication of its Marines are major strengths. Requirements to improve present and future capabilities have produced some crucial objectives, primarily in manpower and equipment. The approach towards achieving these objectives can be summarized in a three-pronged strategy:

- First, to continue with substantial efforts in recruiting, training, and retaining quality Marines.
- Second, the momentum of force modernization must continue. State-of-the-art equipment and modern training facilities are extremely important.
- A final key to enhancing Reserve capabilities is continued emphasis on Active/Reserve integration.

Total Force, with integrated and complementary Active and Reserve contributions, is an established reality in the Marine Corps.



Civilian Manpower Resources

Marine Corps military and civilian manpower resources are integrated to maximize efficiency and avoid duplication of effort. Key billets staffed with civilian personnel are used to meet the requirements of supporting activities to the maximum extent practicable and to permit more effective manning of operational forces with Marines. This enhances training, readiness and sustainability. It also ensures continuity in operations. Our civilian personnel are employed in a wide variety of professional, technical, trade, and administrative functions.

The Marine Corps actively seeks means to use civilian manpower more economically and efficiently. Through the Efficiency Review (ER) program and the Manpower Requirements Determination Program (MRDP) the Marine Corps has begun to satisfy these goals. The FY-90 request for 21,223 and the FY-91 request for 20,869 civilians is essential to continue mission responsibilities while minimizing the requirement for military personnel.

As directed by DoD, we have linked the Efficiency Review, Position Management, and Manpower Requirements Determination Programs. The Position Management Review process will assist in determining the most effective and efficient mix of number of staff and appropriate grade levels developed during the Efficiency Review process. MRDP is the process used by the Marine Corps to establish staffing standards for functions in the Supporting Establishment.

Removal of statutory civilian personnel end-of-year number constraints permitted Marine Corps activities to adjust their work force to workload fluctuations. That flexibility allowed management to increase productive output for urgent, high priority requirements while maintaining scheduled production on routine workload. Without an end-of-year constraint, limited civilian personnel resources can be used more effectively. Temporary employees can be hired to support short-term needs, and to support workload requirements that do not warrant full time permanent employees.

The Marine Corps has been able to fill the majority of its civilian positions without undue difficulties. Problems continue to exist, however, in recruiting personnel to fill clerical positions in some labor markets and professional engineering positions in almost all labor markets.

Executive Order 12615 requires each executive agency to reflect savings to their budget in anticipation of completed Commercial Activities (CA) studies. This order also requires each agency to complete CA studies annually which represent a minimum of 3 percent of their total civilian positions. In compliance with this Order, the Marine Corps is scheduled to complete CA studies in FY-90 which affect 225 civilian positions and 548 military positions.

Manpower readiness and the well-being of our Marines are inseparable. The Marine Corps' high state of manpower readiness can be directly related to its long tradition of caring for its own. The term quality of life is a popular way to express all of those factors that contribute to a quality working and living environment for our Marines and their families. Quality of life programs enhance morale, help retain Marines, and lead to increased personnel and operational readiness.

Marine quality of life efforts feature concerned leadership, realistic training, sound education, discipline (including self-discipline), unit cohesion, a strong sense of taking care of our own, and *esprit de corps*.



The Marine Corps philosophy of leadership fosters a high quality of life and instills values and attitudes that will transcend past each Marine's actual period of enlistment. In the words of General John A. Lejeune, the 13th Commandant of the Marine Corps, "these men are in the formative period of their lives, and officers owe it to them, to their parents, and to the nation, that when discharged from the service they should be far better men physically, mentally, and morally than when they were enlisted."

Morale, Welfare, and Recreation

Morale, Welfare and Recreation (MWR) functions will complete consolidation early 1990. This action is a result of the capping of appropriated fund support to MWR and the Congressional requirement to operate more like a commercial private sector operation. The MWR consolidation enables the Marine Corps to plan, manage, and deliver MWR programs in a more responsive, patron-oriented, and cost effective mode.

As of 31 August 1989, the MWR activities had achieved an overall 6.81 percent sales increase, with an increase in the operational net profit by 13.65 percent over the prior year's pre-consolidation period. Profits are recycled for Marine support in morale, welfare and recreation programs.

Family Programs

We continue to expand and improve family programs emphasizing our support for quality of life issues affecting Marines, Sailors and their families. We have more professional, credentialed service providers for all family programs: Family Advocacy, Child Care, Information, and Referral, and Employment Assistance. Wider and more standardized programs and services are being offered to Marines, Sailors and their families, world-wide. The range of responsive family programs serves to enhance readiness and retention. Our recent initiatives include relocation assistance programs, and a program identifying family members with special needs. The Family Service Centers have assisted 285,845 military and family members in the past year. Child Care Centers have served 5,000 children with an additional 2,500 children in the Family Day Care program. The Marine Corps is providing better and more timely services to all Marines whether single, dual career, single parent or married.



***Military
Construction
(MCON)***

In FY-90, the Marine Corps Military Construction fund budget is \$178.1. A total of \$142.0 million is requested for FY-91. The funding reflects a balanced program with projects distributed as follows:

	FY-90	FY-91
Operations and Training	26%	18%
Maintenance	35%	29%
Quality of Life (BEQs, community facilities)	28%	19%
Other (Supply and storage, Admin, Utilities and Real Estate)	11%	34%

In FY-90, maintenance projects represent the largest single category in the MCON program. This category is split between aviation maintenance hangers and ground equipment maintenance shops with most of the dollars invested in the latter.

Emphasis on quality of life projects remains high. In FY-90 this category includes a BEQ, two child development centers and two messhalls. In FY-91 there are two more BEQs, another messhall and a clothing issue building.

Security consciousness in the Marine Corps is a key factor in protecting both Marines and our physical assets. As such, there are four flightline security improvement projects in FY-90. These projects are located at MCAS Pendleton, MCAS Cherry Point, MCAS New River and MCAS Tustin. These projects will improve security for the aircraft assigned to these activities.

***Bachelor Enlisted
Quarters (BEQs)***

The Marine Corps follows the DoD policy of providing suitable accommodations for all bachelor military personnel required to reside aboard the activity for military necessity, and for those personnel who reside aboard the activity when suitable accommodations are not available in the local community.

To implement this policy, we have programmed approximately 18.2 percent of our FY-90/FY-91 MCON budget for BEQs. Upon completion of the FY-89 BEQ construction program, our bachelor housing inventory will include approximately 76,000 adequate enlisted billeting spaces. Displayed below is the planned profile for this program:

	FY-90	FY-91
Number of Adequate Spaces Planned to be Added During Year	1,478	900
Construction/Modernization (\$ M's)	37.6	20.1

Family Housing

CMC has management responsibility for approximately 22,000 family housing units and 948 mobile home spaces throughout the United States and Japan. We are continually building new units where deficits exist, particularly in southern California. During the period 1981-1989, 3,371 new family housing units were constructed, under construction or have been approved. The construction program includes 112 housing units at MCB Camp Pendleton in FY-90 and 116 units at MCB Camp Pendleton in FY-91.

The major repair program has tremendously effected our homes by renovating our existing inventory. Whole house rehabilitation for over 8,000 homes has been conducted since FY-81. Plans exist for an additional 5,000 whole house rehabilitations through the FY-95 program. We are embarking on a plan which would renovate all existing housing on a twenty year cycle. We are programming for the renovation of 6,800 units between FY-95 and FY-02. At that time those units which were constructed in the early 1980's would be reaching the age where renovation will be required.

The family housing improvement program also improves quality of life. Through this program, patios, storage areas, sidewalks, driveways and air conditioning are being added to homes.

Based on current known deficits, the new construction has been programed for MCB Camp Pendleton and MCAS, El Toro. The numbers of units planned for each year and the associated new construction costs are identified below. Also displayed is the total currently budgeted for and requested for major repairs and improvement programs.

ACTIVITY	FY-90	FY-91
New units	312	116
Construction Costs (\$M's)	40.2	11.8
Major Repair (\$M's)	24.0	32.0
Improvements (\$M's)	4.6	3.9

Religious Programs

Religious program support to the Marine Corps is provided by the U. S. Navy Chaplain Corps. Chaplains consistently contribute to the quality of life in the Marine Corps by implementing traditional ecclesiastical practices, rites, services, and by developing creative contemporary expressions of religious and spiritual faith. Every command in the Marine Corps relies upon its religious program to provide Marines and their families with required support and services. The command religious program is a vital component of any commander's overall mission as well as part of those capabilities that contribute to the overall combat readiness of the unit.

299 chaplains, supported by 229 Religious Program Specialists and 53 Marine Chaplain Assistants make religious ministry a living reality at 55 chapels throughout the Marine Corps on a daily basis. Additionally, chaplains and their enlisted assistants serve throughout the FMF in every major operational unit in the MAGTF. Their support is provided wherever the Marines are serving: at sea, in the field during training exercises, and during deployments. 235 different chaplains were deployed for an cumulative total of 10,229 days in FY-89. Marine Corps chaplains accounted for almost 300,000 direct ministerial functions to Marines and their dependents worldwide.



During the 1990's, Marines will rely more heavily upon their command religious programs and chaplains to take care of their deepest human needs, to provide understanding and perspective about life's ultimate purpose, and to offer them spiritual comfort and stability through the global changes ahead. The clergymen and women of the Marine Corps are prepared to address the religious, spiritual, moral, and ethical demands of their ministry. The profession of arms generates special needs for Marines and their families. The command religious program provides the unit commander with unique capabilities to address these needs. The stress and pressure of a highly demanding and mobile lifestyle create extraordinary family and inter-personal conflicts. In addition to helping Marines and their families deal with the day-to-day stress of life, the chaplain assists the commander in preparing for the ultimate challenge, the chaos of armed combat.

Programs for Improved MAGTF Capabilities

3

MAGTF Command, Control and Intelligence

Part 1

T

his chapter provides background information regarding specific programs being pursued by the Marine Corps to enhance the capabilities of the MAGTF. The chapter is divided into four separate sections that correspond with the four elements of the MAGTF.

The essence of the successful exercise of MAGTF Command, Control and Intelligence (C2I) is the capability to exchange information with senior, adjacent, subordinate, and supporting commands during both Marine Corps unique and Joint/combined operations. MAGTF C2I is achieved through the fielding of C2I deployed under the umbrella concept termed "Marine Tactical Command and Control Systems" (MTACCS). MTACCS will provide the capability to combine desired data from various functional systems into usable information in support of the MAGTF commander and staff.

MTACCS consists of component C2I systems, some of which are now deployed, others well along in development, while others are in concept state of development. These systems are used to support each element and function within the MAGTF. The following systems comprise the MTACCS concept:

- **MAFTF C2**
Tactical Combat Operations
- **Ground C2**
FIREMAN and FIREFLEX
- **Aviation C2**
Marine Air Command and Control System
- **Combat Service Support C2**
Marine Integrated Personnel System
Marine Integrated Logistics System
- **Intelligence**
Marine Air-Ground Intelligence System

This section is composed of several MTACCS programs and complementing communications systems that are currently in development.



Automated Data Processing Support

The Marine Corps stands poised on the verge of a new technological decade. Past projects have positioned us to transition to a new era of productivity. While Marines have become accustomed to automated support for maintenance, supply, fiscal and manpower; developments are underway to apply automation in new and innovative ways. We have laid the groundwork for that effort and are rapidly moving to make the concept a reality.

Our online user base has expanded from approximately 2,100 to over 5,000 in the last year. The number of potential users (those with personal computers) exceeds 20,000 and our goal is to reach out and give each of them the connectivity and capability to share data with Marines around the globe. The backbone of such connectivity is the worldwide Exelectronic Library and Mail System (ELMS), which has been in full service since December 1988. This system allows users around the world to connect electronically to exchange mail, documents, or data.

We are automating the Marine Corps Research Library, at the MCCDC, Quantico, VA, to provide easy access to historical data. We have acquired a world class card catalog system which is functional and will be fully loaded by January 1990. As a follow-on to that project, we intend to acquire Optical Storage for the thousands of documents in the Library and provide online user access. This will allow archived documents to be easily accessed by a Marine in the operating-forces who needs to gain knowledge or learn from the experience of others.

Our goal is not to merely allow users to send notes or messages around the world. We will provide timely communication and interchange of data between commands. We are seeking to leverage existing capabilities against realtime needs to ensure that the data and information required to fight the next conflict is readily available. We will be able to compare Lessons Learned information to Marine Corps Combat Readiness Evaluation System (MCCRES) data. We are endeavoring to provide the Marine on the ground with the best possible support in communications and applications to give him the force multiplier he will need to succeed.

Global Positioning System (GPS)

Description:

The GPS is a space-based radio navigation system that will provide precise user location, less than 16 meters spherical error probability (SEP), accurate velocity, and reference time anywhere on or near the earth. Signals are received from four satellites, processed, and displayed to the operator in Military Grid Reference System (MGRS), Universal Transverse Mercator (UTM), or any of 45 datums in latitude and longitude. Small units, vehicles, ships and aircraft will be able to rapidly determine their positions and navigate to their destination during periods of reduced visibility and in featureless terrain. The Marine Corps emphasis is on the development/procurement of the manpack/vehicular variant which will be used by air, ground, and combat service support elements.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO*
Quantity				858

* Acquisition Objective

Why Is It Important?

With the capabilities provided by GPS, units operating outside of the Position Location Reference System (PLRS) network will not have to use manual navigation methods (map/compass). It will greatly enhance the establishment of the PLRS network, and the emplacement of radars, artillery and missiles where accuracy will be improved significantly since reference points will not have to be surveyed manually.

Program Status:

The Navstar GPS is a joint service program with the USAF as lead. The Defense Acquisition Board (DAB) IIIB is scheduled for 4th Quarter FY-90.

Developer/Manufacturer:

At the present time there are three manufacturers under contract with the GPS Joint Program Office to produce various man-portable receivers. They are Rockwell-Collins, Texas Instruments and Trimble Navigation.

Unit Level Circuit Switch (ULCS)

Description:

ULCS is a family of TRI-TAC digital telephone equipment consisting of AN/TTC-42 (150 line), SB-3865 (30 line), Digital Telephone (TA-954) and multiplexer-combiner that provide for an automatic secure telephone switching capability in the field. The ULCS system will be deployed at all echelons throughout the Marine Corps. The ULCS system will replace current analog switching and terminal equipment including: AN/TTC-38 SB-3082.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity				
AN/TTC-42	61			61
SB-3865	329	92		425
TA-954	6020	2158	2975	17,004
TD-1234	549	75	66	752

Why Is It Important?

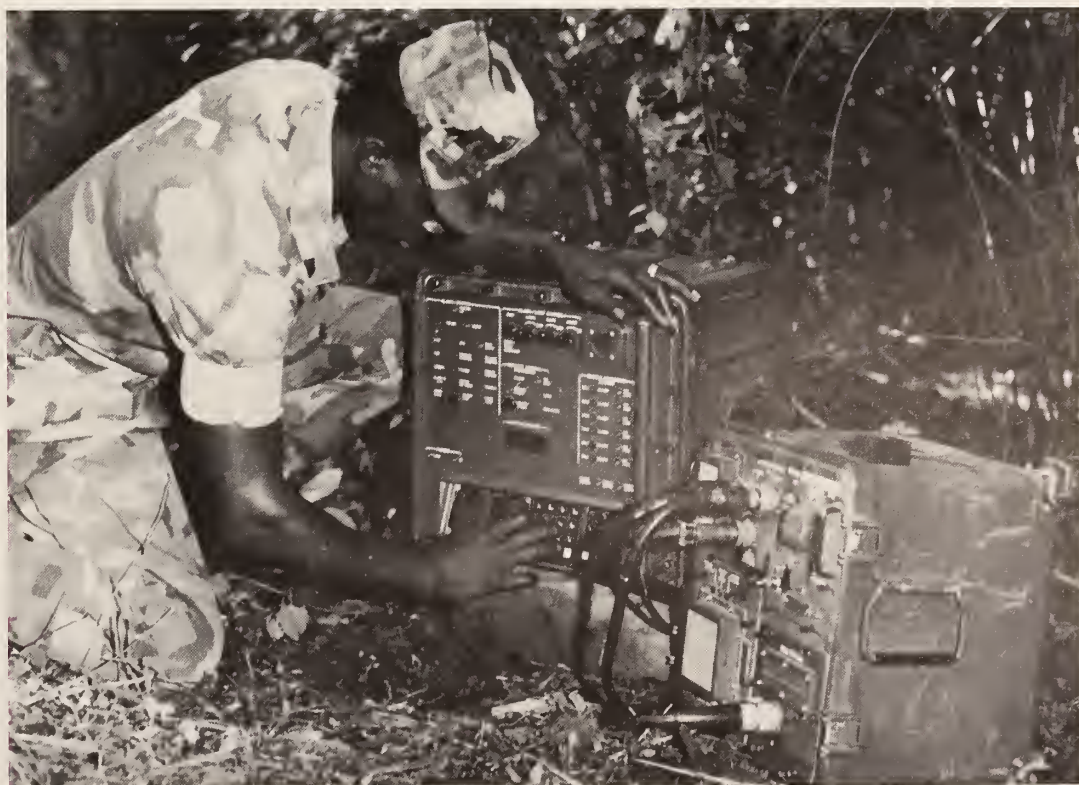
Digital systems provide a host of capabilities including speed and security not available over older analog systems. This program is necessary for Marine Corps tactical units to be interoperable with other Services' systems.

Program Status:

The final options for ULCS AN/TTC-42 have just been signed. SB-3865 will be bought out in 1990. 3000 TA-954s were procured from Air Force stock earlier and a production contract was signed in August of 1989. TD-1234 contract was awarded in July 1989.

Developer/ Manufacturer:

AN/TTC-42 & SB-3865 - ITT
TA-954 - SCI Technology Inc.
TD-1234 - Group Technology Inc.



Digital Wideband Transmission System Line-of-Sight Radio Subsystem, AN/MRC-142

Description:

The Line-of-Sight Radio Subsystem will provide line-of-sight trunking between lower level command posts which are in relative close proximity (20-35 miles). The AN/MRC-142 will be used at MEF, Division, Marine Aircraft Wing, and FSSG levels to provide intra-MAGTF linking of digital telephone and data switches. The AN/MRC-142 has a transmission capability of up to two 144, 288, or 576 kbps digital trunk groups and a secure orderwire.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity		27	114	499

Why Is It Important?

The current analog AN/MRC-135A radio system is inadequate to support the digital switching systems (ULCS). The capability of these switches will be severely limited without the AN/MRC-142. Additionally, the AN/MRC-135A having been fielded in the late 1960's, is becoming increasingly more difficult to maintain as it exceeds its projected service life.

Program Status:

Two contracts were awarded in October 1987 for engineering development models (EDM). Operational Testing (OT) was conducted and completed during June 1989. Contract awarded in December 1989. Initial Operational Capability (IOC) for this system is scheduled for FY-93.

Developer/ Manufacturer:

Loral Terracom, San Diego, CA.

Troposcatter Radio, AN/TRC-170(V)3

Description:

The troposcatter radio will provide the capability for super high frequency (SHF) transmission and reception of multichannel digital voice and data traffic. It will be used at MEF, Division, Wing, and Force Service Support Group levels, providing intra-MAGTF communications, replacing the AN/TRC-97 and AN/GRC-201 radios. The AN/TRC-170(V)3 provides a significant increase in the capacity of bulk-encrypted voice and data traffic.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity		28	19	134

Why Is It Important?

Current systems cannot adequately accommodate the expected volume of traffic to be generated within an all digital communications system. The new command and control equipment being procured will exceed the capacity of existing multichannel equipment.

Program Status:

The Marine Corps is participating in this joint program with the Army and Air Force. The initial production contract was awarded in April 1982 and the equipment is now being used by the Air Force and Army. Marine Corps IOC is scheduled for FY-93.

Developer/Manufacturer:

Raytheon and UNISYS.



Digital Communications Terminal (DCT), AN/PSC-2

Description:

The DCT is a programmable, hand-held, input/output device that operates over tactical radio and wireline systems. The terminal enables the user to transmit and receive messages in short digital bursts which minimize detection risk by decreasing "on air" transmission time. The device weighs approximately 4.5 pounds and is approximately 100 cubic inches. The DCT allows the operator to rapidly compose, edit, transmit, receive, and display preformatted and free-text messages and graphic data. The DCT will expand and enhance command and control of direct air support, low altitude air defense, reconnaissance elements, and fire support with its speed and accuracy.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity	1687	174	519	3124

Why Is It Important?

The DCT represents a dramatic improvement in speed, accuracy, and reliability of USMC tactical communications.

Program Status:

A second source contract was awarded in FY-89. Full scale production contracts will be competed beginning in FY-90 and continuing until remaining Army, Air Force, Navy, and Marine Corps requirements are met. IOC planned for 2nd Quarter FY-89.

Developer/Manufacturer:

Litton Data Systems Division and
ITT Defense Communications Division (South)



Tactical Communications Center (TCC), AN/MSC-63A

Description:

The TCC is a semiautomatic (computer assisted) tactical message center to be used at Division, Wing, FSSG and MEF/MEB command elements. It provides for the receipt, storage, routing, distribution, reproduction and transmission of general service record traffic within a command post and to adjacent and higher headquarters. The TCC will terminate data/teletype circuits to AUTODIN, the Naval Telecommunications System, local (within the command post) teletypes or end user computer terminals. It has the capacity to operate at selectable data rates of 75-24,000 bits per second.

The TCC consists of two major components; The AN/MSC-63A Communications Central and the Reproduction/Distribution Facility (R/DF). Each component can operate independently and is being developed and procured separately. Both components are housed in an 8'x 8'x 10' container. The AN/MSC-63A consists of off-the-shelf hardware items such as computers, video displays, teletypes, disk units, tape units, modems, and Communications Security equipment. The R/DF contains two commercial reproduction machines, a safe, shredder and printer. The printer can be electronically connected to the AN/MSC-63A.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity		9	9	18

Why Is It Important?

Current tactical communications center equipment is over 20 years old and is slow, unreliable and increasingly difficult to maintain. It is heavy for expeditionary operations, will not interface with emerging digital transmissions systems and does not meet user throughput or maximum delay requirements for record traffic.

Program Status:

Initial fielding of the TCC is scheduled for the 4th Quarter FY-90.



Have Quick II Antijam Communications

Description:

Have Quick is a frequency hopping capability which is embedded in Marine Corps Ultra-High Frequency (UHF) radios. This system provides voice communications with antijam protection. There are two current versions of Have Quick (Have Quick I and Have Quick II) with the principal difference being the allowable frequencies on which the radio hops. A third version, Have Quick IIA, is being developed to counter a more sophisticated threat. Have Quick II compatible radio equipment includes the AN/PRC-113, AN/VRC-83, AN/GRC-171A(V)4, and the AN/GRC-XXX.

- **AN/PRC-113 and AN/VRC-83:**

These are standard manpack and vehicular UHF radios used for air-ground communications including close air support operations. All radios have been modified and presently have the Have Quick I and II capability.

- **AN/GRC-171A(V)4:**

This radio is used for voice communications between ground units and aircraft in flight. It supports Have Quick I and II operations and is the standard UHF radio for agencies within the Marine Air Command and Control System.

- **AN/GRC-XXX:**

Restrictions limited the procurement to only 64 of the 171A(V)4. The AN/GRC-XXX will complete fielding of a UHF Have Quick capable radio. This radio will provide the Active and Reserve Forces with an Air Force Standard Radio which is jam resistant, and designed for use in a shelter environment. This radio will also support digital exchange over TADIL-A or TADIL-C.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity				
AN/PRC-113	1184	290	69	1528
AN/VRC-83	427	113	103	643
AN/GRC-171A(V)4	64			64
AN/GRC-XXX				543

Why Is It Important?

Have Quick II provides reliable anti-jam UHF communications. Air to ground communications are essential for effective direct support of ground forces. Additionally, Have Quick II is the NATO standard and the Marine Corps must have it to be interoperable with Allied forces.

Program Status:

The Have Quick program is an Air Force lead program with participation from all U.S. Services. The modification of the AN/PRC-113 and AN/VRC-83 is being performed by Marine Corps Logistics Base, Albany and should be completed by FY-90. The AN/GRC-XXX is also an Air Force lead program with options for the Marine Corps to procure the required radios. Contract award for this program is scheduled for 1st Quarter FY-91.

Developer/Manufacturer:

Magnavox (PRC-113 and VRC-83)
Rockwell/Collins (GRC-171A(V)4)
TBD (AN/GRC-XXX)

AN/TSC-96 Product Improvement Program

Description:

The AN/TSC-96 Satellite Communications (SatCom) Central is a UHF SatCom terminal which provides a deployed MAGTF with access to the Naval Telecommunications System (NTS) using the Fleet Satellite constellations. The AN/TSC-96 provides access to the Common User Digital Information Exchange Subsystem (CUDIXS) net for record traffic, the Fleet Secure Voice Communications subsystem (Fleet SEVOCOM), Fleet Broadcast (FBCST) and a low speed teletype net. It is a dependable, mobile, high speed data system which is terrain independent. The AN/TSC-96 terminals have been used extensively since 1981 and consist of the Naval Modular Automated Communications Subsystem (NAVMACS) components installed in two shelters. The Navy is making improvements to the FLTSATCOM system and we are installing the necessary modifications as a PIP to maintain interoperability. Phase 1 (presently in prototype) includes the Demand Assigned Multiple Access (DAMA) Secure Voice modification, installation of AN/UGC-74 teletypes, and antenna replacement with a supportable and more efficient design. Phase 2 (FY-93/94) will include the CUDIXS/NAVMACS DAMA modification, computer replacement using the more efficient AN/UYK44 computer and refitting to a single shelter configuration.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity (Phase I)		6	4	10
(Phase 2)				10

Why Is It Important?

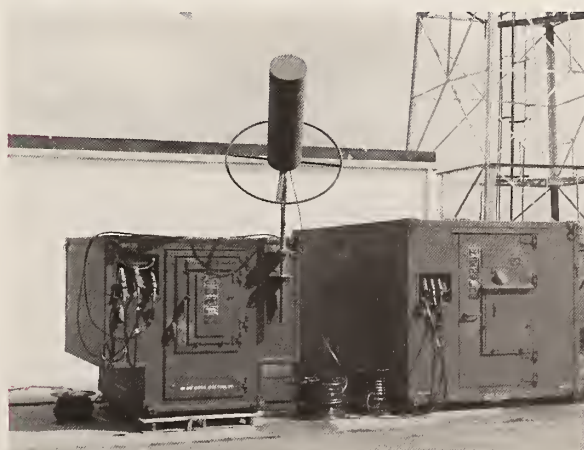
The AN/TSC-96 allows real time passage of critical information between command elements ashore and afloat. The Navy's schedule for full implementation of Secure Voice Dama in FY-92 and CUDIXS/NAVMACS DAMA in FY-96 make it imperative for the AN/TSC-96 to be modified in order to continue use of the Naval Telecommunications System by MAGTF CEs. Without the PIP, the terminal will not work as part of the NTS.

Program Status:

The developmental testing of the three Phase 1 modifications is in progress at the Navy's Advanced Electronics School in San Diego, CA and 9th Communications Battalion at Camp Pendleton, CA. All 10 systems will be completed in 3rd Quarter FY-91. Design engineering for Phase 2 modifications is 85 percent complete but has been suspended until 1st Quarter FY-92.

Developer/Manufacturer:

Naval Electronics Systems Engineering Center, Vallejo, CA



The AN/TSC-96 PIP will reduce the size of this system to a single shelter and upgrade the computer and antenna assembly"

Single Channel Ground and Airborne Radio System (SINCGARS)

Description:

The SINCGARS family of VHF radios will replace most VHF/FM manpack and mobile tactical radio communications currently in the Marine Corps. SINCGARS will provide anti-jam frequency hopping communications in the frequency range of 30.00 to 87.975 MHz with 25 KHz spacing. It is mission flexible for voice or data, plain or cipher text and remote control operation. Using the combination of low, medium or high power selections and a frequency hopping electronic counter-countermeasures (ECCM) capability, SINCGARS features a low electronic signature to elude current threat direction finding equipment.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity	2,318			25,717

Why Is It Important?

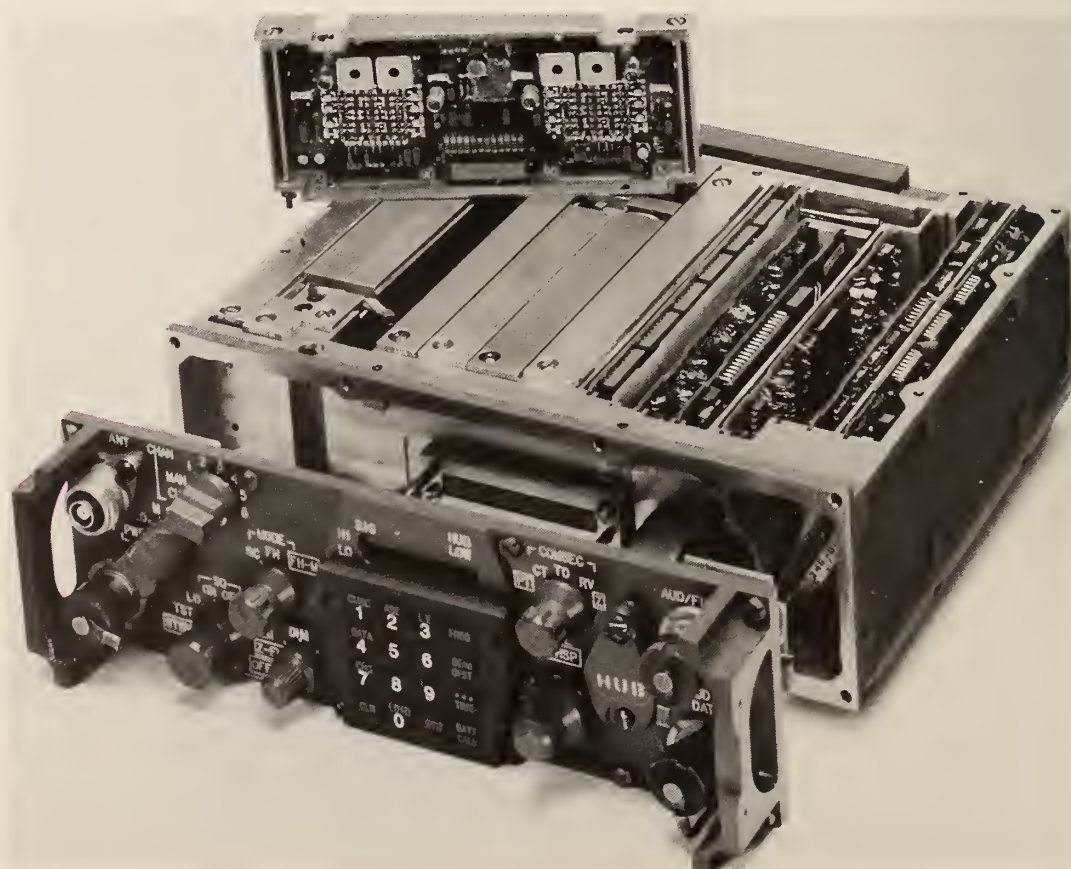
The Marine Corps is relying upon radio equipment which is over 20 years old and is difficult to support. The present VHF/FM radios are vulnerable to exploitation and interception and are severely degraded when operated in a jamming environment. SINCGARS will accommodate interoperability in joint and combined operations. The new model will offer optimum capability for secure voice communication with minimum weight.

Program Status:

The Marine Corps is buying the integrated Communications Security (ICOM) version of SINCGARS, an improved model of the current radio. Testing is scheduled for FY-90/91.

Developer/Manufacturer:

ITT and General Dynamics/Tadiran



Fiber Optics Cable System (FOCS)

Description:

FOCS is a lightweight, EMP-hardened tactical communications cable system developed to replace the copper cable system. FOCS will now be employed with TRITAC and non-TRITAC communications equipment. FOCS operates over distances of six kilometers without repeaters. A FOCS system typically consists of two converters and six 1-Km fiber optics cables. Test and Support equipment include the Test Set and a Cable Repair Kit.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity				
Fiber optics cable (1Km)	270	237	237	1,500
Fiber optics cable (.3Km)	152	1,032	1,088	4,376
Cable repair kit	24	24	24	126
Converters		910	1,660	3,325
Test set		123	170	347

Why Is It Important?

Communications cannot be compromised since optical signals on fiber optics cables cannot be intercepted or detected without physically penetrating a cable. FOCS are immune to noise and are not susceptible to extraneous signals. Transmission quality is improved four times over copper cable. Handling and deployment problems are significantly decreased due to weight reductions of 75 percent. Inventory of cable types is minimized. Large cable bandwidth (400 Hz) allows for future expansion (with improved hardware).

Program Status:

Currently in source selection. IOC 2nd Quarter FY-91.

Developer/ Manufacturer:

TBD



Fiber optic cable is much lighter and smaller. The three small rolls of fiber optic cable in the foreground replace the heavier copper cable carried by two and a half trucks.

Marine Flexible Fire Support System (FIREFLEX)

Description:

FIREFLEX will provide fire support command and control automation and digital communications connectivity to artillery personnel at battalion and higher Fire Direction Centers, Fire Support Coordination Centers, Supporting Arms Coordination Centers and Supporting Arms Special Staff within the MAGTF. FIREFLEX will expand this initial capability to include Close Air Support, Naval Gunfire and mortar functionality in an evolutionary manner. As a minimum, a suite of FIREFLEX equipment shall consist of two computer/communications terminals and printers for the execution of current operations and fire support planning functions.

Procurement Profile:

TBD

Why Is It Important?

FIREFLEX is required to network existing digital artillery automated command and control systems (i.e. Battery Computer System (BCS), TPQ-36 (counter-mortar radar) and Meteorological Data System). These existing systems have created an unprecedented increase in the volume and nature of fire support information available to MAGTF commanders during operational planning and combat decision-making at the battalion level and higher. FIREFLEX enables Marine commanders to use this fire support information in a timely manner while significantly enhancing the communications record-keeping functions required within fire support agencies.

Program Status:

The Marine Corps believes that a modified version of the Army's Advanced Field Artillery Tactical Data System (AFATDS) will meet USMC unique requirements as stated in the FIREFLEX ROC. To this end, the Marine Corps has established an FMF User Testbed utilizing currently fielded Army equipment (Modified BCT and Modified FIST) in order to refine, verify and define USMC digital fire support automation requirements so that it can more knowledgeably influence the AFATDS program. Additionally, the Army and Marine Corps have signed a Memorandum of Agreement (MOA) which defines USMC participation in AFATDS. It is the intent of the Army and Marine Corps that AFATDS be a single, multi-service system which uses Non-developmental item (NDI) common hardware. An IOC of 3rd Quarter FY-93 is desired.

Developer/Manufacturer:

Software - Magnavox
Hardware - TBD

Advanced Tactical Air Command Central (ATACC)

Description:

The ATACC replaces the current AN/TYQ-1 and AN/TYQ3A, as well as provides significant operational and logistics enhancements. The ATACC system consists of two identical suites of equipment housed in four 8' x 8' x 20' shelters. Two electrically or physically joined shelters support a MEB Tactical Air Command Center (TACC), referred to as a suite. Two suites are capable of being electrically jointed to support a MEF TACC. Each suite houses operator work stations, desktop communications units, data processors, computer programs, communications access devices, a large screen display, radios, and other equipment necessary to perform battlestaff functions. Utilizing NDI hardware and software, the ATACC will provide a state-of-the-art capability to command, supervise and coordinate tactical air operations, as well as automated mission planning, decision support and Air Tasking Order (ATO) processing and generation.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity				6

Why Is It Important?

The TACC is the senior Marine Aviation Command and Control System agency. The supervision and general control of all tactical air operations in the MAGTF area of responsibility are conducted in the TACC. The TACC also provides the Tactical Air Commander (TAC) with the facilities and means to direct and coordinate organic aviation assets with other services, and/or nations. Additionally, the current TACC, fielded in 1972, is logistically insupportable and does not provide the TAC with the needed automated mission planning, decision support and ATO processing for countering the threat of the 21st century.

Program Status:

The system has completed Milestone I and II, and contract award was made in December 1988. The system requirements analysis has been completed and the contractor has begun the system design process. IOC is scheduled for 1st Quarter FY-94.

Developer/Manufacturer:

Grumman Data Systems

Tactical Air Operations Module (TAOM), AN/TYQ-23(V)1

Description:

TAOM is a joint Marine Corps/Air Force program designed to develop and produce operations modules which, when employed independently or in groups of up to five, provide for air defense and air traffic control and coordination as required by the MAGTF during combat operations.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity	30	6	6	48

Why Is It Important?

The TAOM program will replace aging equipment which is logistically insupportable. The new equipment is modular and thus allows phased introduction of air control assets into a MAGTF area of operations. TAOM requires fewer technical personnel to operate and requires less strategic lift than the current air control system. It also offers training improvements at a reduced cost. Availability is increased due to improved system reliability and ease of repair. Each module will have the operational capabilities to perform all required air control functions on the modern battlefield. With the addition of identical modules, the MAGTF ACE can rapidly expand its capability to control and coordinate air operations.

Program Status:

Milestone III was passed in December 1986 and a fixed price contract awarded in May 1987. Based on demonstrated corrections of operational deficiencies noted during OT-II, additional systems have been purchased in FY-88 and FY-89. IOC is currently scheduled for May 1991.

Developer/ Manufacturer:

Litton Corporation, Data Systems Division



AN/PPN-19(V) Multifunction Radar Transponder Beacon-Target Data Communicator (RABFAC-TDC)

Description:

The PPN-19 is a replacement for the AN/PPN-18 RABFAC and UPN-32 Naval Gunfire Beacon Systems. The PPN-19 allows ground units to identify themselves to friendly radar-equipped aircraft and ships so these support forces can more accurately and safely provide Close Air Support and/or Naval Gunfire Support. The addition of a preplanned product improvement consisting of a Ground Middle Layer (GML) and Ground Remote Terminal (GRT) will provide an "up link-down link" data capability with compatible aircraft (future F/A-18 C/D) to a range of 100 nautical miles.

*Procurement
Profile:*

	PRIOR	FY-90	FY-91	AO
Quantity		154	139	359

*Why Is It
Important?*

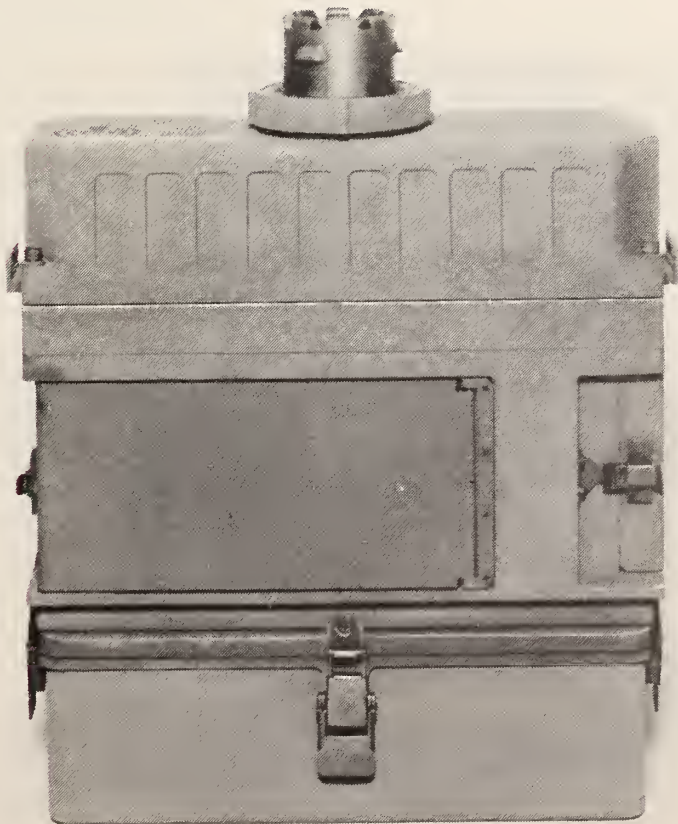
This capability is jam resistant, reduces reliance on voice communications and allows low altitude terrain masking and minimum exposure of aircraft to enemy ground threats. It improves upon the basic capability of the PPN-19. The improvement speeds up communication of mission data between controlling ground personnel and attacking aircraft, improving aircraft survivability and helping achieve mission success.

Program Status:

Contract for the P31 Modification Kits is to be awarded 2nd Quarter FY-90. Systems will be modified as kits are produced and delivered.

*Developer/
Manufacturer:*

Motorola Inc.



Fleet Marine Force End User Computing Equipment (FMF-EUCE), AN/UYK-83 and AN/UYK-85

Description:

The FMF-EUCE gives the MAGTF commander the ability to access and process his deployable information systems. The FMF-EUCE was initially fielded in October 1988, to replace the ADPE-FMF (Green Machine). Used both in garrison and deployed environments, these ruggedized, electro-magnetic interference (EMI) tested, TEMPEST certified microcomputers come in two sizes. The AN/UYK-83 is the larger of the two offering a larger disk storage capacity and greater expansion capability. The AN/UYK-85 is the smaller FMF-EUCE weighing 35 pounds, is self contained with a fold out display, and has the ability to operate with electrical power from a tactical vehicle.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity	2,420	1,420	1,286	5,126

Why Is It Important?

The FMF is increasingly dependent on automated data systems to reduce the burden of logistics and to enhance the performance of battlefield supply, maintenance, embarkation, and manpower systems. The AN/UYK-83 and AN/UYK-85 are important to this effort as the only deployable and fully supported automated data processing equipment available to the FMF commander. Without the FMF-EUCE, the FMF will have to rely on inefficient manual management systems.

Program Status:

The FMF-EUCE was procured directly through competitive contracting. IOC occurred in December 1988.

Developer/Manufacturer:

C3, Inc, Herndon, VA



AN/TYQ-19 Block Upgrade

Description:

The AN/TYQ-19 block upgrade is a response to an identified FMF requirement to improve the Intelligence Analysis Center (IAC), a MEF asset. The IAC is a vital component of the Marine Air Ground Intelligence System (MAGIS), processing information from imagery systems, signals intelligence, airborne electronic reconnaissance, Navy, other Service, theater and National assets, and from other sources internal and external to the MAGTF. The resultant intelligence is presented to the tactical commander and disseminated as required. The bulk of the IAC's information is stored in a data base—currently the Naval Intelligence Processing System (NIPS) data base. NIPS will transition to the Defense Intelligence Agency's Integrated Data Base (IDB) by the end of 1990. The block 2 upgrade will field LANbased microcomputer systems (Suite) at Regiment/Group/MEU and single workstations at Battalion/Squadron, while the block 3 upgrade will replace the existing IAC with a HMMWV-mounted shelter for the MEF/MEB. The resulting systems will comprise the Intelligence Analysis System.

Procurement Profile:

	PRIOR	FY-90	FY-91
Quantity	6		
Block 2 Upgrade:			
Suites			54
Workstations			177
Block 3 Upgrade:			12

Why Is It Important?

The IAC upgrade will allow the system to use data from the IDB, will give it a mobility commensurate with the assigned unit, and will extend selected automated intelligence capabilities to organizations below the MEF level. The IAC must be upgraded to retain a national and joint (Navy) data base capability following the implementation of IDB in 1990-91.

The current IAC is so large as to severely limit mobility, making it impractical for use with anything less than a full MEF deployment. The upgraded IAC will include versions which are deployable with the MEB and with the MEU. The IAC upgrade will automate portions of the intelligence cycle beyond simply maintaining a data base. For example, it will include the intelligence journal and workbook, two products which are pivotal to the daily function of the intelligence section at any level. It will also include a collection management capability.

Program Status:

Three Block 2 prototype systems are currently being evaluated by the three MEF's. The results of this evaluation will be used to develop an Block 2 Upgrade system for procurement and fielding in FY-92/93. The Block 3 Upgrade system will be developed for procurement and fielding in FY-93/95.

Tactical Remote Sensor System (TRSS)

Description:

TRSS is a suite of unattended ground sensor equipment that provides the MAGTF commander with a state-of-the-art electronic system capable of continuous, all weather detection, location determination and monitoring of activity in the Amphibious Objective Area (AOA). TRSS is comprised of hand and air-emplaced remote sensors and relays, and data storage and readout equipment. The remote sensor devices detect activity using seismic, magnetic, infrared and imaging technologies. The current set of sensor equipment, referred to as Phase III, is insupportable and no longer a viable combat asset. The Phase V suite of replacement equipment will be in service in the 1991 time frame. The goal of the modernization program is to upgrade the existing sensor capability with sensors that are smaller, lighter, and more cost effective by taking advantage of modern technology in micro-miniaturization and packaging techniques.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity (sets)		1	2	3

Why Is It Important?

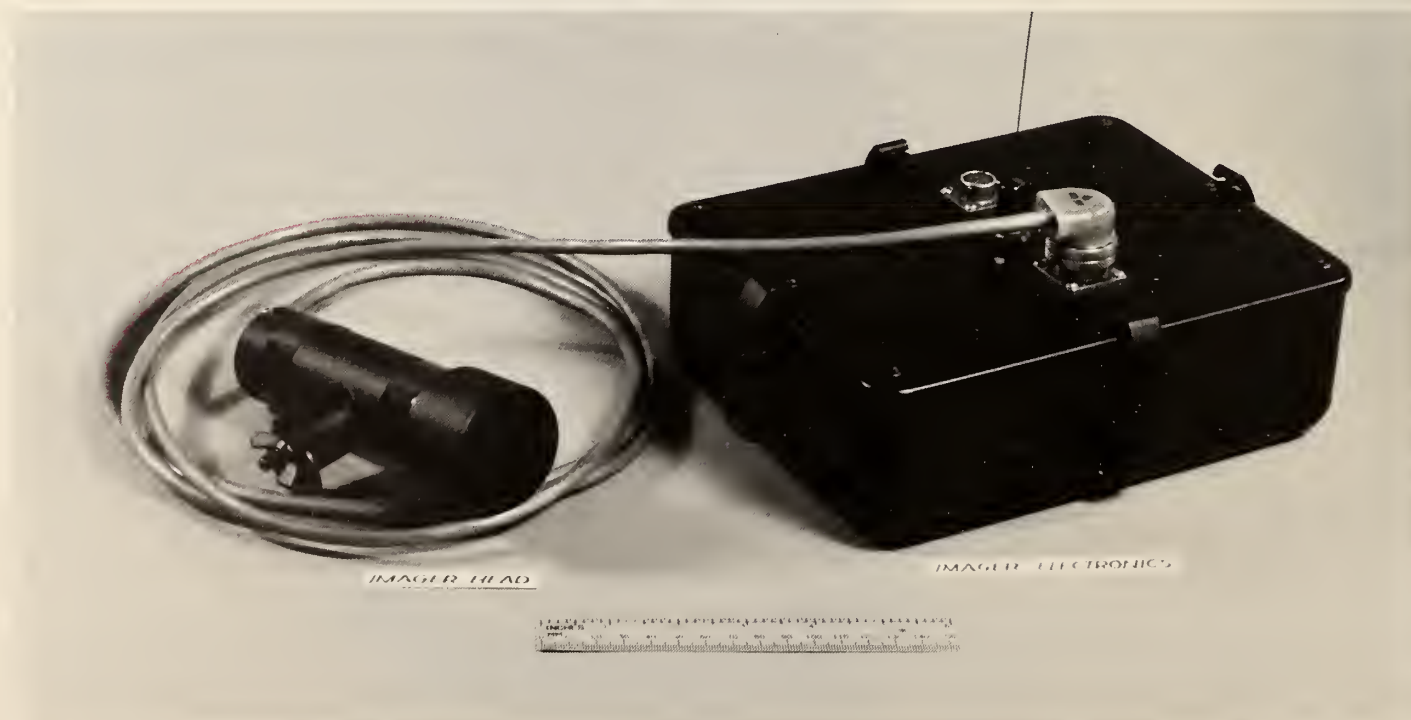
The TRSS Phase V PIP will sustain an existing combat capability by replacing obsolete and insupportable equipment.

Program Status:

Pre-production engineering and Low Rate Initial Production (LRIP) are concurrently being done by an in-house government facility. First Article Tests are scheduled for 3rd quarter FY-90, with an IOC of 1st Quarter FY-91. FOC is anticipated for FY-96, but is dependent on the budgeting process.

Developer/Manufacturer:

Sandia National Labs, Albuquerque, NM (Early R&D) Naval Avionics Center, Indianapolis, IN (Pre-Production and Production) Naval Air Development Center, Warminster, PA (Air certification of air-delivered components)



Joint Service Imagery Processing System (JSIPS)

Description:

The JSIPS is a mobile ground processing facility designed to receive and exploit softcopy Infrared (IR) and Electro Optical (EO) imagery from tactical aerial reconnaissance systems. It will also receive and exploit imagery from national and theater sources. Product improvement options include a Common Radar Processor to process both tactical and theater radars, and a Mapping, Charting, and Geodesy Processor.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity				6

Why Is It Important?

Current Marine Corps capability for processing and exploiting imagery is dedicated to hard copy (film based) products. The thrust of technology is to near-real-time, soft-copy, digital imagery, which is data linked from the sensor platform to the processing facility. Soft-copy imagery exploitation allows the imagery interpreter to extract much more information than is normally attainable from film-based imagery. Data-linked digital imagery, soft-copy, computer-enhanced image exploitation and the increasing digital imagery expected to be available in the future requires that the Marine Corps move forward in the acquisition of a processing facility capable of deploying with the MAGTF. The Marine Corps will purchase six systems to replace the Imagery Interpretation Facilities at the three Force Imagery Interpretation Units.

Program Status:

Contract signed 14 August 1987 with E-Systems, Garland, TX to produce an EDM for delivery in FY-91.

Developer/Manufacturer:

E-Systems, Garland, TX

Tactical Electronic Reconnaissance Processing and Evaluation System (TERPES) AN/TSQ-90D

Description:

TERPES is a segment of the Marine Air Ground Intelligence System (MAGIS). The system processes and identifies electronic intelligence (ELINT) data collected from the EA-6B aircraft and correlates it with ELINT from the Tactical Receive Equipment (TRE) system. This data is fused with the Electronic Order of Battle (EOB) to provide enemy radar locations to the command, control and intelligence (C2I) elements of the MAGTF. The data also provides electronic warfare (EW) strike mission intelligence support to the ACE.

Procurement Profile:

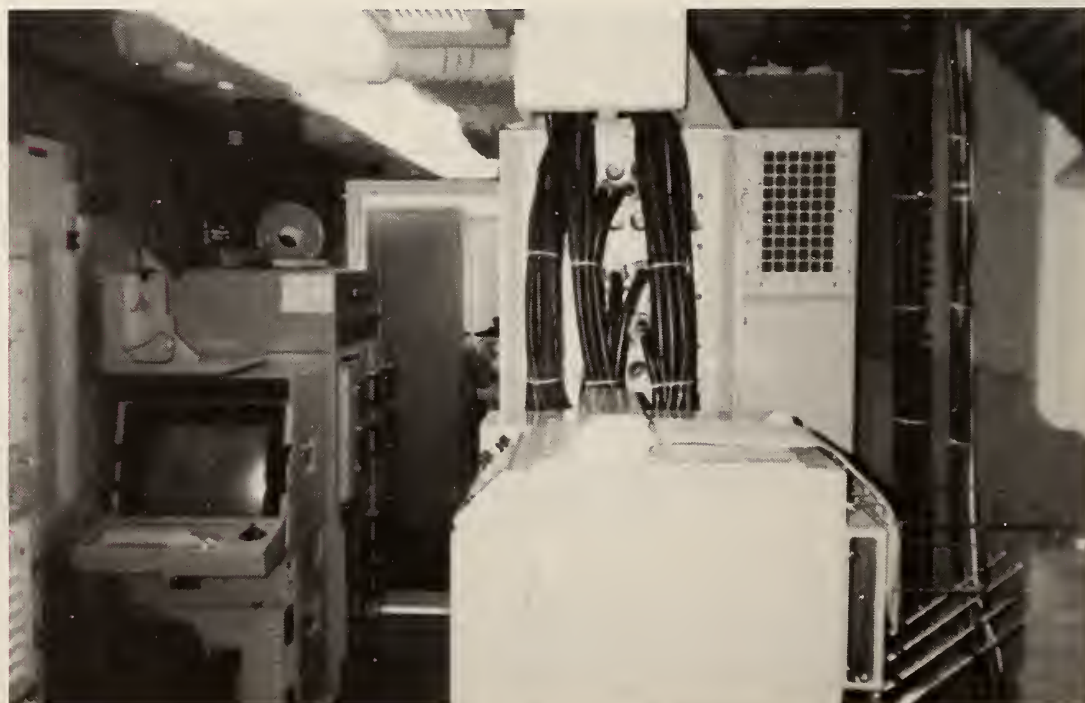
	PRIOR	FY-90	FY-91	AO
Quantity	5		5	5
Phase III upgrade			5	5

Why Is It Important?

The EA-6B/TERPES is the Marine Corps' organic asset for processing tactical ELINT data. This data provides the MAGTF with ELINT and EOB information required to perform successful strike and HARM mission planning. The planned upgrades will provide a near-real-time processing capability of time sensitive intelligence to C2I elements during the 1990's.

Program Status:

TERPES Phase III upgrade started in June 1989 and will be fielded in June 1991. This upgrade will fulfill the requirement to use the Military Integrated Intelligence Data System (MIIDS) provided by Defense Intelligence Agency (DIA). This product improvement will provide near-real-time communication data link capability with EA-6B and TRE. Further, using the Rapid Information Management System (RIMS) as the communications processor will allow the TERPES to interface with SSCC, TCC, IAC, TCAC and TAMPs.



Mobile Electronic Warfare Support System (MEWSS)

Description:

The MEWSS is an electronic warfare system capable of rapid mobility over all types of terrain. The MEWSS electronic suite consists of a direction finder set, a jammer, and intercept receivers installed in a LAV chassis. The system is designed to provide MAGTF commanders with the capability to detect, determine Line of Bearing (LOB), and degrade enemy tactical communications during the amphibious assault and subsequent operations ashore.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity	12			

Why Is It Important?

The Marine Corps currently has no light armored mobile electronic warfare capability. The MEWSS will provide the ability to support mobile operations, both in the AOA and during subsequent operations ashore. This system is critical to Marine Tactical SIGINT/EW support operations.

Program Status:

The basic AN/MLQ-36 will be fielded in FY-90. A product improvement program will be initiated to upgrade the system capabilities to conduct operations against Frequency Agile Threats.

Developer/Manufacturer:

TACOM/General Motors Company, Ontario, Canada. PIP—TBD.



Communication Electronic Countermeasures (CECM)

Description:

The CECM projects will provide upgraded ECM capabilities by replacing aging VHF ECM equipment and acquiring UHF and High Frequency (HF) ECM-capable systems for the FMF Radio Battalions. The VHF/UHF CECM system will be installed in either the HMMWV and/or UH-1/CH-46 helicopter to meet the MAGTF's requirements. The HF CECM system will be team or vehicle transportable.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity				
VHF/UHF/CECM				15
HF CECM				8

Why Is It Important?

The CECM systems will provide the MAGTF commander the ability to conduct ECM operations in a sophisticated signals environment and at extended frequency ranges beyond current system capabilities.

Program Status:

The VHF/UHF CECM contract was awarded during FY-89 and testing is scheduled for FY-91. The HF CECM will also be an NDI procurement, following evaluation of current and projected NATO HF ECM tactical systems.

Developer/Manufacturer:

VHF-Rockwell, Collins, Cedar Rapid IA, HF-TBD

Communications Collection Outstation (CCO)

Description:

The CCO is a modular, transportable, semi-automated collection and direction finding system that will give the MAGTF commander a modernized ground-based communications intelligence (COMINT) intercept and direction finding capability. The CCO is housed in transit cases and can be transported in the HMMWV. The CCO can be remoted up to 50 feet from the antenna subsystem. Information collected by the CCO will be transmitted via data link to the Technical Control and Analysis Center (TCAC).

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity	6	3	6	27

Why Is It Important?

The Marine Corps has a vital requirement to provide tactical signals intelligence (SIGINT) support to the MAGTF commander. The ever increasing usage of battlefield electronics coupled with an increased tempo of operations requires that future intercept and direction finding systems be computer-driven so that direct tactical SIGINT will be timely and responsive.

Program Status:

The CCO is currently in FSD. User testing is scheduled for 2nd Quarter FY-90.

Developer/Manufacturer:

TCI, Baltimore, MD

Team Portable Communications Intelligence System (TPCS)

Description:

TPCS is a modular scalable team portable SIGINT system providing collection, analysis, reporting, and communications functions.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity				17

Why Is It Important?

TPCS will be a logical continuation of current manpack receiver and DF system acquisition efforts and will fill a void in current SIGINT direct support efforts, especially in the initial phase of the amphibious landing. The radio battalions provide timely and accurate tactical SIGINT to the MAGTF commander. This support is currently performed by independent systems that are tied together via secure communications. TPCS will provide flexible intra/ intersystem communication and a microprocessor terminal that will enable the radio battalion to provide direct support to the MAGTF commander when larger systems are not available or appropriate.

Program Status:

Prototype integration of this NDI system began in 3rd Quarter FY-89. TPCS User testing (UT&E) is scheduled for 4th Quarter FY-90 with a production decision expected during 2nd Quarter FY-91.

Developer/ Manufacturer:

Harris Corp., Government Systems Sector, Melbourne, FL

Advanced Marine Airborne Signals Intelligence System (AMASS)

Description:

AMASS is an organic C-130 based airborne collection and direction finding SIGINT package purchased under the U.S. Air Force's SENIOR SCOUT procurement program. It will provide the MAGTF commander with the capability to detect, identify, locate and exploit, on a near real-time basis, enemy electromagnetic emissions that are a potential threat to air-ground combat operations which are normally beyond the range of current ground-based SIGINT sensor systems.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity				3

Why Is It Important?

The bulk of the cryptologic direct support to the MAGTF is provided by the ground based Radio Battalions. AMASS will fill a critical gap by providing integrated near real-time SIGINT beyond the ranges now possible with ground based SIGINT collectors. Additionally, for the first time AMASS will provide the capability to exploit certain special command and control signals of unique interest to the MAGTF commander.

Program Status:

As part of the Big Safari program the USAF is currently procuring four SENIOR SCOUT systems, the first of which has already been delivered. Utilizing the Air Force contract, the Marine Corps intends to buy two systems.

Developer/ Manufacturer:

Lockheed Aircraft Service Company, Ontario, CA.

Counterintelligence and Security Equipment (CI&SE)

Description:

The CI&SE program consists of two sub-projects: Technical Surveillance Countermeasures (TSCM) and the Counterintelligence Equipment Program (CIEP). Within the CIEP is a sub-project called the Counterintelligence Communication System (CCS). The CI&SE is designed to provide specialized material to FMF Counterintelligence Teams (CITs) to improve their capability to collect, analyze, and disseminate information, conduct counter-intelligence operations, carry out the anti/counterterrorist mission, and improve the quality of overall support to MAGTFs.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Funding (\$Ms)	0.41			

Why Is It Important?

CI&SE will substantially increase the ability of Marine CITs to prevent intrusion by threat intelligence collection efforts.

Program Status:

Test and evaluation of candidate items for procurement is ongoing. IOC for CCS scheduled for 1st Quarter FY-90.

Developer/Manufacturer:

CIEP: Various
CCS: Naval Air Development Center, Warminster, PA

Electronic Intelligence (ELINT) Support System (ESS)

Description:

The ESS is an omni-directional integrated ground and airborne based system to intercept, identify, analyze and locate hostile ground-based non-communications emitters. The system will provide the MAGTF elements with timely information pertaining to the disposition and status of hostile emitters within their tactical area of responsibility.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Ground				12
Air				8

Why Is It Important?

The FMF Radio Battalion presently does not possess the organic capability to perform collection and exploitation of battlefield non-communications threats. ESS will fill a critical gap in the Marine Corps ability to provide tactical ELINT direct support to the MAGTF commander.

Program Status:

The Marine Corps is currently evaluating the integration of NDI system components into an LAV variant for ESS ground and a UH-1N configuration for the ESS air variant.

Developer/Manufacturer:

Lockheed Missiles and Space Company Inc., Austin, TX.

Joint Tactical Information Distribution System (JTIDS)

Description: JTIDS will provide users with secure, jam-resistant, voice and data communications capabilities. Integrated with a host tactical data system, JTIDS will support high-capacity, near-real-time exchange of tactical information in support of MAGTF, NATO and Joint command and control operations. JTIDS is dependent upon its integration within a JTIDS module which will, in turn, interconnect with a host system. The TAOM has been identified as the initial host tactical system. This will fully exploit this technology into the Marine Air Command and Control System.

Procurement Profile:	PRIOR	FY-90	FY-91	AO
Quantity				66

Why Is It Important? Current data communications capabilities supporting tactical command and control information exchange are vulnerable to exploitation and interception and are severely degraded in a jamming environment. JTIDS and the Tactical Datalink (TADIL-J) will overcome these deficiencies and provide tactical decision makers with survivable, secure, high-capacity communications capabilities.

Program Status: This system has completed Milestone I, II and IIIA. Full Scale Development (FSD) terminals will be delivered during 3rd Quarter FY-91 for initial integration development with the host platform. IOC of 1st Quarter FY-96 is desired.

Developer/Manufacturer: Plessey Electronics Systems Corporation, Wayne, NJ

Ground Combat Element (GCE) Introduction

Part 2

The GCE of a MAGTF is a task organization tailored to accomplish a particular mission. It is constructed around an infantry unit and varies in size from a reinforced battalion to one or more reinforced Marine divisions. It includes the full range of ground combat systems to include combat support.

The ultimate object in war is the defeat of the enemy by the application of superior combat power at the decisive place and time. The GCE is instrumental to this objective. It is the GCE that usually executes maneuver against the enemy and is the focal point for the application of firepower. Maneuver involves the tactical movement of forces on the battlefield, in combination with firepower, to achieve a position of advantage against an enemy. Firepower provides the destructive force essential to defeating the enemy's ability or willingness to fight. The combination of maneuver and firepower is a synergistic relationship that can be exploited by the MAGTF commander.

This section is composed of those program areas associated with the mission area of ground combat.



Light Armored Vehicle-Air Defense (LAV-AD) Program

Description: The LAV-AD is being developed as a member of the LAV family of vehicles. The LAV family is a series of 8x8 wheeled, light armored vehicles that provide significant improvements in firepower and tactical mobility for combat units. USMC doctrine requires other LAV configuration or mission role variant (MRVs) such as the LAV-AD, to perform mission roles in an integrated combined arms team. All vehicle configurations have the same power plant, drive train, steering assemblies and similar ballistic hulls.

The LAV-AD is a ground-based, low altitude anti-aircraft weapon platform featuring a stabilized turret with a shoot-on-the-move capability mounted in a LAV chassis. The system will integrate a rapid fire 25mm automatic gun and four to eight Stinger surface-to-air missiles. The turret will also have the capability to incorporate the 2.75 inch Hydra 70 rocket system.

The LAV-AD fire control system will consist of a forward looking infrared (FLIR) sight, a laser rangefinder, a contrast autotracker, a vehicle navigation system, a fire control computer and various sensors. Target acquisition and tracking feature visual, sensor, and external sources integrated into manual and automatic modes.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity				125

Why Is It Important?

The mission of the LAV-AD is to defend maneuvering Marine Corps combat forces from airborne attack and provide ground defenses against light armored mechanized forces. The proliferation of sophisticated air assets throughout the world requires that rapidly moving light armored elements of the MAGTF be able to defend themselves against air attack.

Program Status:

The LAV-AD program is in Full Scale Development (FSD) with two contractors developing and integrating two prototype turrets into a LAV chassis. Developmental and operational testing occurs in FY-90/91 with production award to one contractor planned for FY-93 contingent upon successful testing. The Marine Corps' acquisition objective is 125 systems.

Developer/Manufacturer:

General Electric and FMC in FSD.

Light Armored Vehicle-105mm Gun (LAV-105) Program

Description:

The LAV-105 is being developed as a member of the LAV family of vehicles. The Marine Corps warfighting doctrine requires other LAV configurations, such as the LAV-105, to perform mission roles in an integrated combined arms team. All configurations have the same power plant, drive train, steering assemblies and similar ballistic hulls.

The LAV-105 is a large caliber gun system featuring a 105mm stabilized, auto-loading gun. The system will integrate a thermal sight, laser range finder and a fire control computer into a state-of-the-art fire control system.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity				154

Why Is It Important?

The LAV-105 will provide a highly mobile direct fire capability for the Light Armored Infantry (LAI) Battalion and other units of the MAGTF. The Marine Corps 105mm Gun requirement is for a quick fire/direct fire capability to destroy enemy command vans, bunkers, installations, and light armored vehicles consistent with the level of mobility/transportability designed into the LAV family of vehicles.

Program Status:

The LAV-105 program is in FSD. The LAV-105 acquisition strategy for FSD is to provide two qualified contractors with two chassis/guns each. The contractors will design and integrate a turret into the LAV chassis and deliver the prototype systems for Marine Corps testing. These systems will participate in development and operational testing during FY-92. Production contract award is scheduled for FY-94 with deliveries beginning during FY-95.

Developer/Manufacturer:

TBD



The basic LAV-25 (shown above) mounts an M242 25mm automatic cannon. The Air Defense and Assault Gun configurations will complete the LAV family which also includes Antitank, Mortar, Recovery, Command and Control, and Logistics variants.

Lightweight 155MM Howitzer (LW155)

Description: Fire support in maneuver warfare requires towed artillery with superior mobility to the M198 155mm howitzer which weighs 16,000 pounds, while retaining that weapon's 30 kilometer range and 155mm lethality. A Required Operational Capability (ROC) for a 9,000 lb LW155 details this requirement, including compatibility with Marine vertical assault support aircraft. The Marine Corps' artillery plan reduces our current inventory of five howitzer types to just two weapon systems: LW155 and the Multiple Launched Rocket System (MLRS).

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity				610

Why Is It Important?

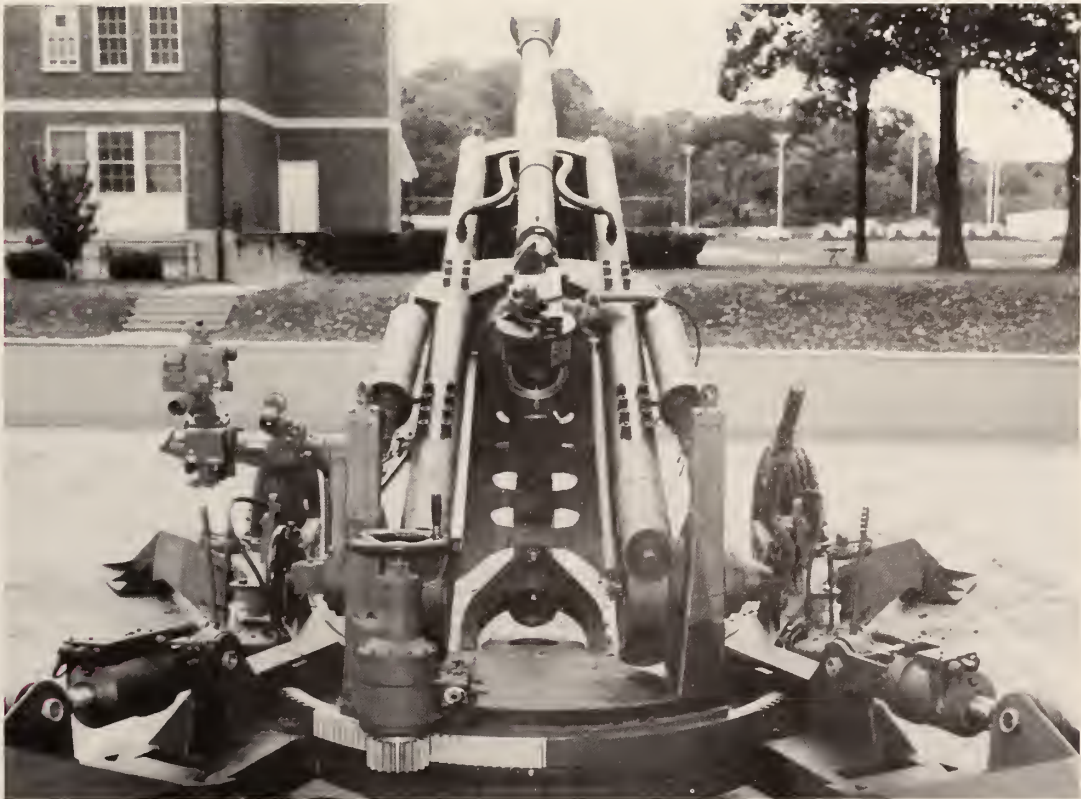
LW155 is key to implementing the Marine Artillery Plan's objective to provide the increased artillery mobility necessary for maneuver warfare in expeditionary operations. The MAGTF Master Plan establishes a requirement for the LW155 to replace not only the M198, but also all of the Marine Corps' costly, World War II-vintage 105mm howitzers currently being maintained for expeditionary contingencies requiring light, highly mobile artillery.

Program Status:

This weapon will undergo tests at Yuma and Aberdeen Proving Grounds during the 3rd Quarter FY-90. An operational demonstration will take place at Camp Lejeune in July 1990. An abbreviated Full Scale Development Phase is planned to follow using this, or another candidate system. Fielding is scheduled in FY-97.

Developer/Manufacturer:

TBD



Multiple Launched Rocket System (MLRS)

Description:

MLRS is a highly mobile free-flight rocket system that provides artillery fires in mass volume within a very short period of time. Highly automated, an onboard navigation system and fire control computer allows the three-man crew to accomplish a complete fire mission; communicating, loading, moving, navigating, computing firing data, aiming, and firing. Its rockets are fired individually or in ripples of 2-to-12 with great accuracy since the computer re-aims the launcher immediately after each firing. MLRS fires Dual Purpose Improved Conventional Munitions (DPICM; anti-personnel/anti-armor bomblets), practice rockets, and a growing family of developmental rockets (scatterable mines, anti-armor, and extended range). The major advantage of MLRS is its firepower; a single 12-rocket volley from the launcher above delivers as many DPICM bomblets as 40 8-inch howitzers.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity				77

Why Is It Important?

The Marine Corps requires a highly mobile, expeditionary fire support system which is capable of providing decisive, high volume, long range fire support against crucial, time sensitive targets during all stages of an amphibious assault and subsequent operations ashore. MLRS is key to implementing the Marine Artillery Plan's objective to provide the increased mobility and firepower necessary for maneuver warfare, while at the same time greatly reducing the artillery's footprint for expeditionary operations. MLRS's firepower is required to reinforce our towed artillery in low-, mid-, and high-intensity conflicts. It fulfills the requirement to suppress the massive indirect fire support and air defense assets resident today in potential Third World adversaries. In mid- and high-intensity conflicts, these fires are of even greater importance countering air defenses and armored forces.

Program Status:

MLRS is in production for the U.S. Army and 14 foreign countries. The Marine Corps will operationally test MLRS's amphibious compatibility and then order weapons from the existing production line with minor modifications, if required.

Developer/Manufacturer:

LTV



AAV7A1 Product Improvement Program (PIP)

Description:

The AAV7A1 PIP is a fully integrated package of reliability, survivability and combat capability improvements to the Marine Corps' current assault amphibious vehicle. The purpose of the AAV7A1 PIP is to extend the combat utility of the AAV7A1 until a successor is introduced during the period of 2000-2004. The major elements of the PIP include the Upgunned Weapons Station (UGWS), Enhanced Applique Armor Kit (EAAK), Bow Plane, Automatic Fire Sensing and Suppression System (AFSSS), Day/Night Range Sight (DNRS), Improved Transmission (I-TRANS), and Improved Suspension.

Procurement Profile:

	PRIOR	FY-90	FY-91
Funding (\$M's)	47.4	12.9	19.0

Why Is It Important?

The MAGTF requires the capability to execute the ship-to-shore movement of its assault elements against defended objectives. The amphibious force requires a vehicle that provides speed through the water, armor protection against indirect fire and an ability to transition to operations on land. The AAV7A1 fulfills these critical functions as the MAGTF builds up combat power ashore during the amphibious operation. The AAV7A1 is the product of the Service Life Extension Program of the LVT7 family of amphibious vehicles introduced in 1972. Full replacement for the Marine Corps' AAV7A1 fleet will not occur until early in the 21st century, over 30 years after the introduction of the vehicle. The achievement of this service life is possible only through a pre-planned product improvement program targeted at extending the mechanical life of the vehicle while providing the warfighting enhancements that will retain the vehicle's combat utility until its replacement is fielded.

Program Status:

The AAV7A1 PIP commenced with the initial fielding of the UGWS during 1987 and will continue through the mid-1990's. UGWS and Bow Planes will be fully fielded by 1990. The AFSSS will be fully fielded by 1991. EAAK and I-TRANS will be fully fielded by 1992. The Improved Suspension will be fully fielded by 1995, while the DNRS will be fully fielded by 1997.

Developer/Manufacturer:

The AAV7A1 was developed/manufactured by FMC. Each of the product improvements are developed/manufactured by separate contractors.



Advanced Amphibious Assault Program

Description:

The goal of the Advanced Amphibious Assault (AAA) Program is to provide the Marine Corps with an Over-the-Horizon (OTH), forcible entry, amphibious assault capability that replaces the AAV7A1. The product of the AAA Program will complement the Landing Craft Air Cushion (LCAC) and medium lift aircraft in providing amphibious lift and tactical mobility to the MAGTF.

Procurement Profile:

Procurement funding for this developmental program will commence in FY98.

Why Is It Important?

The AAA will satisfy multiple mission area needs by providing the mobility, firepower and armor protection to embarked personnel during the ship-to-shore portion of the amphibious assault as well as subsequent operations ashore. The Marine Corps' mission requires the continuous application of technology to improve the tactical mobility of Marine expeditionary forces. The AAA's inherent characteristics allow the uninterrupted movement of the surface assault forces from ships over the horizon to inland objectives. Its speed on land and in the water, firepower, and armor protection will permit, when the situation dictates, the forcible entry of Marine expeditionary forces against opposed landing zones. Fielding is expected to begin in 2000.

Program Status:

The AAA Program was approved by the Defense Acquisition Board (DAB) as a major new start and entered Concept Exploration during October 1989. RDT&E funding started in FY90. Milestone I is scheduled for the second quarter of FY91. The AAA Program is currently exploring the various system, concept and doctrine alternatives that may fulfill the Marine Corps' future amphibious assault requirements. A Milestone I review of the program is scheduled for April 1991, at which time the selected alternative will enter the Concept Demonstration/Validation Phase.

Developer/Manufacturer:

TBD. Among companies that have expressed interest in participating in the AAA Program are FMC, AAI, General Dynamics, BMY, Cadillac Gage and General Motors.

High Water Speed Technology Demonstrator (HWSTD)

Description:

The goal of the High Water Speed Technology Demonstrator (HWSTD) is to provide the means for determining the feasibility of a high water speed assault amphibian vehicle. This information will be used in the Milestone I decision process for the AAA Program.

Procurement Profile:

Not applicable, HWSTD is a technology demonstrator only.

Why Is It Important?

Development of the HWSTD is the first attempt to achieve high water speeds in a fully tracked amphibious vehicle. Possession of a self-deploying high water speed AAV would improve execution of the OTH concept by the year 2000.

Program Status:

The Amphibious Warfare Technology Directorate, MCRDAC (AWT) has program management responsibility for the HWSTD. The Principal Development Activity (PDA) for MCRDAC (AWT) is the David Taylor Research and Development Center. The project had as its goal the demonstration of achieving 20 knots over the water by a tracked amphibian. The HWSTD was in fact preceded by numerous component and subsystem developments. The HWSTD achieved speeds in excess of 25 MPH over the water on 10 August 1989 while undergoing Contractor Acceptance Tests at the Patuxent Naval Air Station, MD. Government trials were initiated in November 1989.

Developer/Manufacturer:

The HWSTD was fabricated by the AAI Corporation, Hunt Valley, MD.



Stratified Charge Rotary Engine (SCRE)

Description:

The goal of the Stratified Charge Rotary Engine (SCRE) Program is to develop a cost effective, extremely efficient, technically advanced power plant to fulfill the propulsion requirements of amphibious and land combat vehicles in the 1990's and beyond. The SCRE is a potential candidate as the propulsion system for the AAA Program.

Procurement Profile:

TBD

Why Is It Important?

The SCRE Program offers the opportunity to provide a multi-use family of internal combustion engines featuring highly efficient power/weight ratios and a wider range of fuel types as compared to state-of-the-art engines currently in use. The small package, high horsepower propulsion systems that will be derived from the SCRE Program are essential requirements of many future DoD combat vehicle programs, including the AAA Program.

Program Status:

The SCRE Program, since its inception in 1985, has progressed to the point where FSD (Milestone II) is scheduled to commence during the 1st Quarter of FY-92. The developer of SCRE is currently conducting contractor environmental and performance testing of prototype rotary engines.

Developer/Manufacturer:

John Deere Technologies International

Assault Amphibious Vehicle Mine Plow

Description:

The AAV Mine Plow consists of a track width mine plow mounted on an AAV7A1 and a control panel, located in the driver's compartment, enabling the driver to raise, lower and jettison the plow. Electro-Hydraulic valves for lift, depth control and quick release circuits are also located in the Mounting Assembly. The quick release cylinder located within the Mounting Assembly enables the plow to be secured to the towing eyes of the AAV7A1. The plow can be jettison from the operator's compartment. Electrical power for the system will come from the AAV. No vehicle modification is required to mount the plow. The plow can be mounted by the vehicle crew in one hour.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity				168

Why Is It Important?

This system provides the FMF with a mine proofing/clearing capability from the exit of the surf zone, across the beach, and inland in support of amphibious operations.

Program Status:

Developmental Testing (DT) is scheduled for 3rd Quarter FY-90, with Operational Testing (OT) scheduled for 4th Quarter FY-90. The system is scheduled for IOC during 1993.

Developer/Manufacturer:

The PDA is the Naval Coastal Systems Center, Panama City, FL. The DT and OT test plows are being fabricated by Caterpillar, Inc. Peoria, IL.

Catapult Launched Fuel-Air Explosive Land Mine Countermeasures System (CATFAE)

Description:

CATFAE is a rapid-response land mine countermeasures system capable of breaching enemy minefields in very shallow water and from the high water mark inland in support of lead echelons of the amphibious assault. The system will be employed by AAV units to provide a highly mobile quick-response capability for breaching single impulse pressure and tilt-rod antitank minefields. Breaching a 20m x 300m lane through a minefield can be accomplished in 90 seconds or less with vehicle speeds up to 6 knots afloat and 15 MPH ashore.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity				73

Why Is It Important?

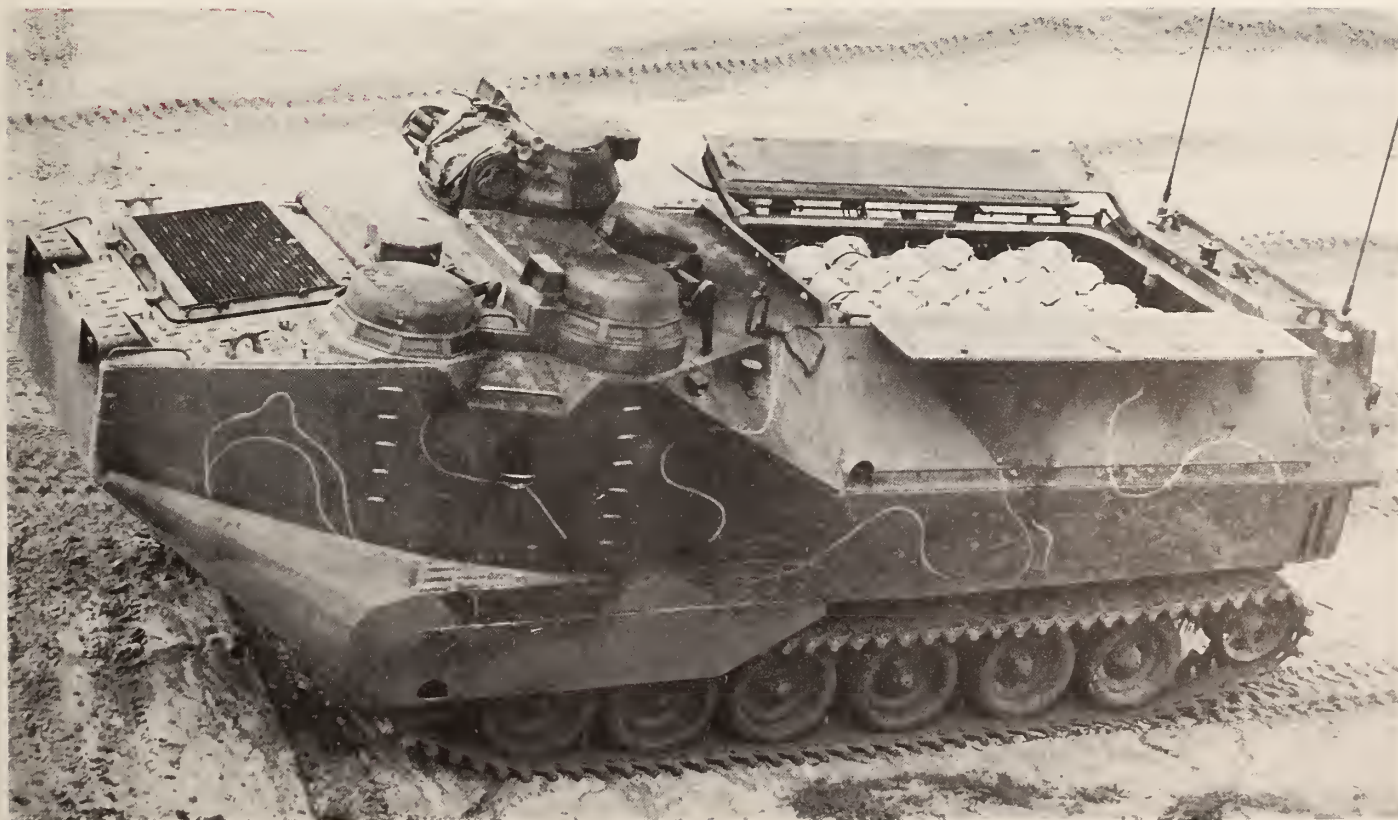
The CATFAE system will meet a substantial portion of the beach and inland countermine deficiencies that are of such great concern to both Navy and Marine forces. In addition to being able to clear a lane up to 300 meters long, CATFAE provides far greater accuracy, standoff distance and responsiveness than any system currently in service or under development. It also provides additional options with its ability to fire single rounds or volleys at point targets.

Program Status:

CATFAE transitioned into Full Scale Engineering Development (FSED) on 30 March 1989. IOC is scheduled for 4th Quarter FY-95.

Developer/ Manufacturer:

FSED Round: Chamberlain Manufacturing
Corporation Waterloo, IA.
FSED Launcher/Fire Control System: TBD



M1A1 Main Battle Tank (MBT)

Description:

The M1A1 is the most modern tank in the world today. It is armed with a 120mm smoothbore gun and incorporates a modern fire control system. Its survivability is enhanced by the use of an improved armor protection package, an NBC overpressure system, and other improvements. Beginning with the Marine Corps procurement, the U.S. Army and Marine Corps have agreed to produce a similar tank called the M1A1 Common Tank. The Common Tank will provide the capability to conduct operations in an amphibious environment, and will include such additional enhancements as a ship/Landing Craft Air Cushion tie-down capability and a Deep Water Fording Kit (DWFK).

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity	66	155		221

Why Is It Important?

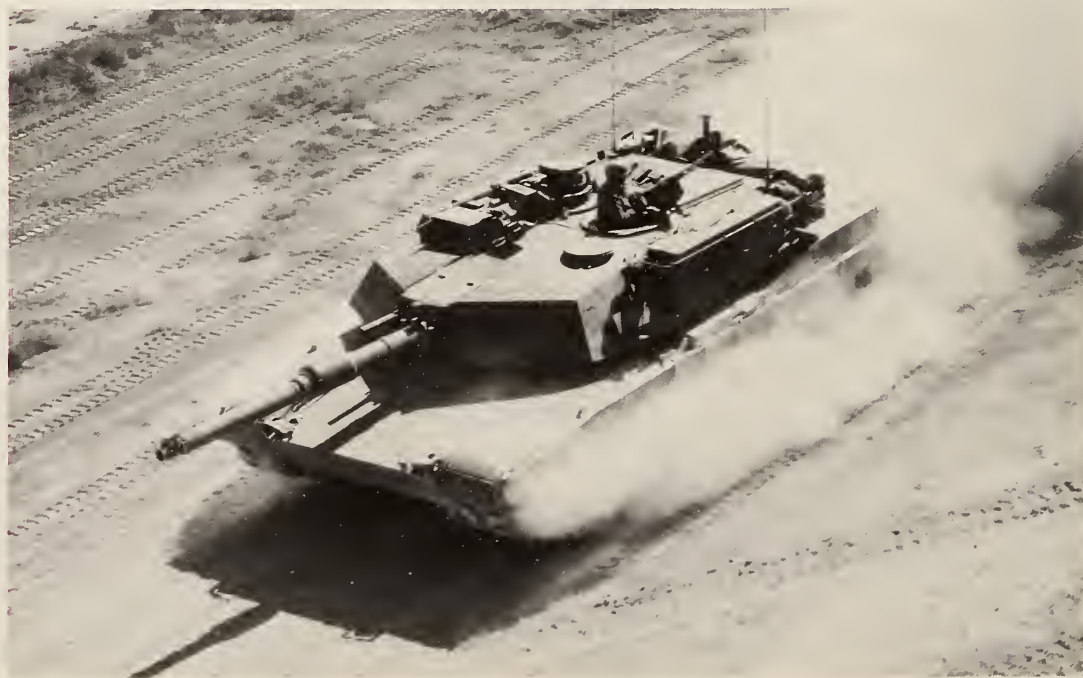
The M1A1 tank will significantly increase the capabilities of FMF armor units. The M1A1's increased survivability, lethality, and mobility will meet Marine Corps near and mid-term main battle tank (MBT) requirements against threat armor. The proliferation of Soviet Block tanks exported throughout the world requires Marine expeditionary forces to be prepared to face a modern armor threat. The M1A1 provides the MAGTF with a qualitatively superior offensive weapons system to match the threat's quantitative advantage. The M1A1 tank is a fully developed and supported system capable of conducting the full spectrum of armor operations in an amphibious environment and during subsequent operations ashore.

Program Status:

The Marine Corps approved the M1A1 MBT for service use and procurement in February 1985. The first tanks will be delivered in November 1990. IOC is scheduled for First Quarter FY-92.

Developer/ Manufacturer:

General Dynamics Land Systems Division



Advanced Anti-tank Weapons Systems - Medium (AAWS-M)

<i>Description:</i>	The AAWS-M is a medium range, manportable, "fire and forget" weapon system which will replace the Dragon. AAWS-M will satisfy an operational requirement to provide increased reliability, higher hit/kill probability, and greater effective range (2000m) against current and future armored threats.
<i>Procurement Profile:</i>	TBD
<i>Why Is It Important?</i>	The current manportable medium anti-tank weapon system, Dragon, is not effective against the improved conventional and reactive armor on threat vehicles in the field.
<i>Program Status:</i>	The AAWS-M, a joint USA/USMC program, is now in full scale development.
<i>Developer/Manufacturer:</i>	Texas Instruments and Martin Marietta.

Terminally-Guided Anti-Armor Mortar Projectile (TAMP)

<i>Description:</i>	The TAMP program will provide the Marine Corps forces with an indirect fire anti-armor capability for existing M252 mortars. TAMP is projected to be a non-developmental item (NDI). This round will give the Battalion Commander a capability to fire at tanks from a defilade position thereby increasing the gunners survivability. This round of ammunition is designed to hit a tank from the top where it is most vulnerable. TAMP will also fill in the range gap between Dragon/AAWS-M and TOW missiles.
<i>Procurement Profile:</i>	TBD
<i>Why Is It Important?</i>	TAMP will provide the Marine Corps with an indirect fire anti-armor capability. The infantry battalions have direct fire line of sight anti-armor weapons and are not able to engage armored vehicles they can not see. TAMP will augment these direct fire systems while increasing the gunners survivability and attack the most vulnerable part of a tank.
<i>Program Status:</i>	The TAMP Initial Statement of Requirement (ISOR) was signed by the Assistant Commandant of the Marine Corps in October 1989. IOC could be achieved by 4th Quarter 1992.
<i>Developer/Manufacturer:</i>	British Aerospace is the developer and Systems Planning Corporation (SPC) is the U.S. prime contractor for TAMP.

Short Range Anti-Tank Weapon (SRAW)

Description:

The SRAW program objective is to provide the Marine Corps with a disposable, lethal, accurate, lightweight, cost effective, "TANK KILLER". This system will fulfill the existing Marine Improved Light Anti-armor Weapon (ILAW) ROC. SRAW will be shoulder-fired and weighs less than 20 pounds.

Procurement Profile:

The R&D portion of this program is being funded by Balanced Technology Initiative (BTI) through FY-92.

Why Is It Important?

Currently the TOW 2A missile is the only weapon in our inventory that will destroy main battle tanks with reactive armor. The replacement for Dragon, AAWS-M, is not expected to reach IOC until FY-94. AT-4 is not an effective weapon against reactive armor. SRAW will provide all Marines with the capability to destroy all armored vehicles including main battle tanks.

Program Status:

Currently the SRAW program is finishing up the concept/exploration phase of the program. We currently have five contractors in the competition. During source selection we expect to pick three contractors to participate in a 30-month demonstration/ validation phase. IOC of FY-97 is being planned.

Developers/ Manufacturers:

Ford Aerospace, Hughes Aircraft Company, McDonnell Douglas, Physics International, and Honeywell

Airborne Mine Detection and Surveillance (AMDAS) System

Description:

AMDAS is an Advanced Technology Demonstration (ATD) program focused to provide the Marine Corps with the capability to find mines/minelfields and other obstacles in the very shallow water, surf zone, beach, and inland. It will provide real-time, day/night, high resolution, surveillance capabilities, thus, allowing commanders to make timely decisions on routes of assault and/or deployment of countermeasures. No stand-off mine detection capability currently exists in the FME.

Procurement Profile:

TBD

Why Is It Important?

The mine warfare threat is critical to the amphibious assault. Scatterable mines, emplaced by enemy air, rocket, or artillery assets, are projected to have the ability to stop an assault. This inability to detect the threat is a serious warfighting deficiency.

Program Status:

AMDAS started the ATD development in FY-90. This program is slated for demonstration and validation during FY-93. Pending program approval, full scale development is projected for FY-96.

Developer/ Manufacturer:

The Amphibious Warfare Technology Directorate, MCRDAC is managing the AMDAS Program with the Naval Coastal Systems Center, Panama City, FL acting as Technical Agent.

Distributed Explosive Mine Neutralization System (DEMNS)

Description:

DEMNS is an exploratory development program focused on providing the Marine Corps with the capability to breach mine fields containing hardened or advanced fuzed mines. The concept uses evenly spaced explosives that would effectively cover the area to be breached. The planar explosive wave caused by the detonation of DEMNS produces extremely high overpressures which does not experience a rapid loss of overpressure as do point explosive breaching systems.

Procurement Profile:

In development until FY-98.

Why Is It Important?

The current breaching systems, Line Charge and CATFAE, were designed to neutralize standard pressure mines. The current threat includes hardened mines which current breaching systems have difficulty neutralizing. DEMNS is being developed to neutralize mines regardless of the type of fuzing or mine type. It is effective against the hardened mine.

Program Status:

DEMNS is entering the ATD phase in FY-90. IOC is currently planned for FY-2000.

Developer/Manufacturer:

MCRDAC (AWT) is managing the development of DEMNS with Naval Ordnance Station, Indian Head, MD the performing laboratory.

Combat Excavator

Description:

The Combat Excavator is a highly mobile, tracked, armored earthmover designed for use by combat engineers in the forward area. This multipurpose vehicle requires a single operator and is equipped with a diesel engine, a hydrostatic transmission, a blade and a hydropneumatic suspension system which gives it excellent heavy digging and rough grading capabilities. The vehicle is capable of self-loading/unloading and transporting eight cubic yards of material. Dozing and scraping are accomplished by raising and lowering the entire front-loading scraper bowl and hydraulically operated apron. In addition, the vehicles' armor protects the operator and vehicle from small arms and artillery fragments. The operator is provided a smoke obscuration capability and chemical/biological protection. The vehicle is capable of high road speeds and can swim in calm water. It is configured for on/off loading in all present airlift aircraft (i.e., C130, C141, and C5) and is compatible with existing U.S. Navy amphibious shipping.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity				257

Why Is It Important?

The Marine Corps currently relies on commercial type construction equipment for its combat engineer battalions. This equipment is not responsive to the increased mobility of the ground combat element of the MAGTF. The Combat Excavator will provide a wide range of combat excavations such as: (1) enhancing mobility by creating roads, breaching obstacles, such as antitank ditches and other area denial obstacles and preparing river crossing sites; (2) preparing enemy countermobility obstacles, and (3) preparing hull defilade fighting positions for tanks and infantry fighting vehicles and protected positions for crew-served weapons and other critical battle systems to increase their survivability.

Program Status:

The Marine Corps will employ an off-the-shelf NDI acquisition strategy. The Marine Corps desires to take delivery of their first vehicles in early 1993 with an IOC of 2nd Quarter FY-94.

Developer/ Manufacturer:

BMY Corp., York, PA



Anti-Personnel Obstacle Breaching System

Description:

The two man portable anti-personnel obstacle breaching system (APOBS) will be employed to breach lanes through wire and anti-personnel mine obstacles. As a replacement for the Bangalore Torpedo Demolition Kit, APOBS can clear a 45 meter by .6 meter path, takes two Marines about 30 seconds to deploy and provides for 25 meters of safe stand-off distance. It can be fired with a standard 18 second delay fuze or electrically initiated in the command mode. Its rocket-propelled line charge assembly has 108 high explosive grenades spaced every 17 inches along a 45-meter length of detonating cord. Two small drogue parachutes deploy at the end of the line charge assembly to provide for the proper stand-off and breach distances. The system can be operated in all weather conditions and is suitable for any terrain.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity				10,835

Why Is It Important?

APOBS will significantly improve the stand-off breaching capability of infantry and engineer elements against mines, booby traps and barbed wire. The current bangalore torpedoes are extremely burdensome. One bangalore torpedo kit consists of 10 five-foot sections of explosive laden tubing which must be hand assembled, physically pushed into the desired breaching area and then detonated to clear the obstacle. APOBS will provide the same breach capability with two men in 30 seconds that the bangalore torpedo provides with a squad in 15 minutes, and it will enhance breach team survivability.

Program Status:

The Marine Corps will begin procuring APOBS during FY-93 with the system scheduled to be initial operations capable during FY-94. All systems will be delivered by the end of FY-98.

Developer/Manufacturer:

The PDA is the Naval Coastal Systems Center, Panama City, FL. The DT and OT test systems are being fabricated by the Naval Ordnance Station, Indian Head, MD.

Rigid Raiding Craft (RRC)

Description:

The RRC is a fiberglass boat with twin 70hp motors. It is 18' long and 7' wide with an empty weight of 2400 pounds without engines. The boat has a subdued color scheme and an internal fuel tank with a capacity of 56 gallons. It will carry 10 men and a coxswain in optimum sea states. The RRC is compatible with Navy shipping and can be stacked three high in a special cradle system, for purposes of embarkation.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity	164			164

Why Is It Important?

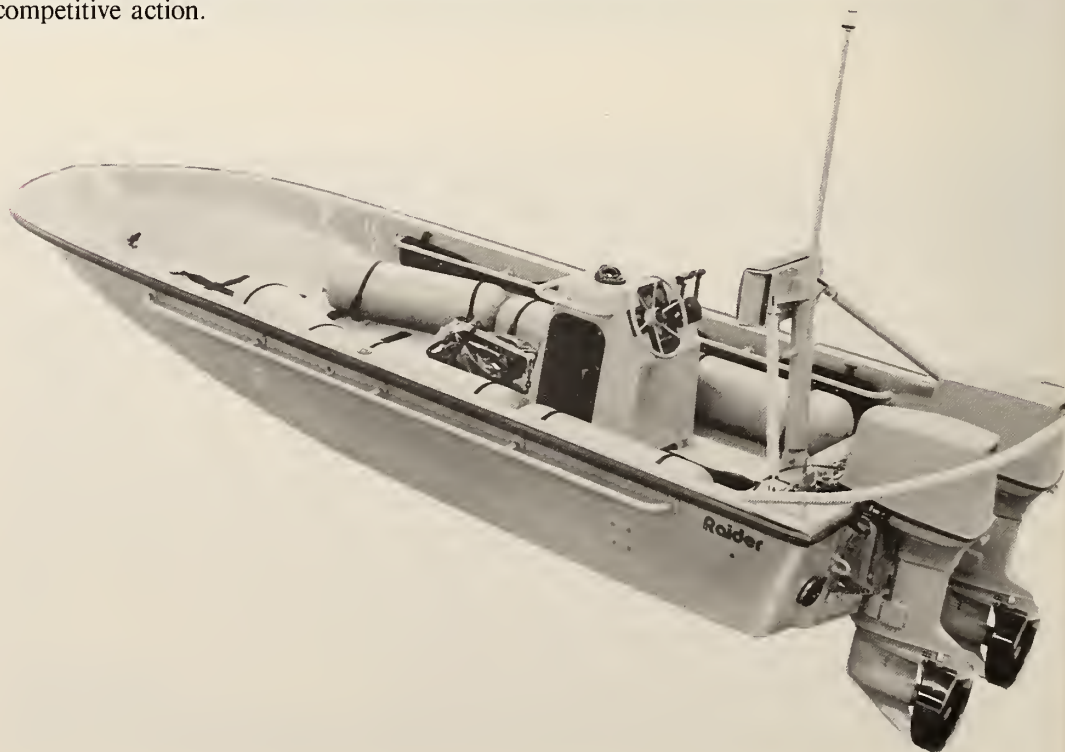
The threat to United States' interests by unconventional enemies has increased significantly. The ability to respond selectively and quickly without becoming committed to protracted operations requires special tactics and equipment. Except for a variety of slow small inflatable rubber boats, the Marine Corps did not have the capability to deliver units carrying out conventional or special missions in high speed, waterborne surface craft. Assault Amphibian Vehicles, Navy landing craft and helicopters have delivery capabilities, but also have disqualifying limitations such as weather, speed, noise, size, and radar signature. With the addition of the RRC, the Marine Corps will gain a high speed, surface, low signature, amphibious method for the insertion and extraction of small units. The RRC will be used for amphibious raids, clandestine recovery operations, limited objective attacks, security operations, and reinforcement operations.

Program Status:

RRC will be procured during FY-90 through a competitive process with delivery expected to commence during 1st Quarter FY-91.

Developer/Manufacturer:

Boston Whaler Company for the sole source procurement and an unknown source for the competitive action.



Unmanned Ground Vehicle (UGV)

Description:

This program provides the Marine Corps the ability to carry out surveillance, reconnaissance, target acquisition/ designation, control of supporting arms, security, Nuclear, Biological, and Chemical (NBC) reconnaissance, and direct fire missions while removing the Marine from the most hazardous areas of the battlefield. The Marine Corps has been actively involved in development of teleoperated vehicles for the past seven years.

Procurement Profile:

To be determined

Why Is It Important?

The MAGTF commander has the requirement to prosecute a battle beyond line of site in lethal environments. The projection of warfighting capabilities "over the hill" without the endangerment of valuable personnel will enhance his capabilities while preserving those human resources. A single robot that can perform tirelessly day and night for long periods without resupply requirements, even in contaminated areas, will serve as a significant force multiplier.

In an era of decreasing manpower, use of a system which carries its own sensors and communications and is expendable, when required, will allow the field unit commander the flexibility he needs to select the time and place of contact and to mass his forces appropriately.

Program Status:

Requirements for both the Marine Corps and Army have been drafted. A Master Plan for Robotics was sent to Congress in May 1989 and a Joint Program Office was formed in Quantico, VA to expedite acquisition of the first unmanned ground vehicle. Three current concept demonstration systems were very successfully demonstrated at Camp Pendleton, CA in September 1989.

Developer/ Manufacturer:

Concept demonstrators—Naval Ocean System Center, HI; Martin-Marietta, Baltimore, MD; Grumman Corporation, Bethpage, NY



Small Caliber Electromagnetic Gun (EMGUN)

Description:

EMGUN is an ATD program to provide the Marine Corps with the capability to defeat the most advanced infantry fighting vehicles and other light armor vehicles at longer range and with a higher probability of kill than possible with conventional gun technology in sub-cannon caliber. EMGUN uses the state-of-the-art in power generating, advanced materials, and hyper-velocity projected design.

Procurement Profile:

Funded by the Department of the Army.

Why Is It Important?

Current and projected threat light armored systems including the Warsaw Pact BMP's are formidably difficult targets, with the emerging vehicles virtually immune to all but the most sophisticated guided missiles and battle tank main guns. Because of our expeditionary nature, Marines must be able to defeat these vehicles at extended ranges with weapons organic to Assault Amphibious Vehicles (AAV's) and Light Armored Vehicles (LAV'S). EMGUN promises dramatic increases in range, lethality, accuracy and ammunition capacity, all in a relatively small and light weapon system.

Program Status:

FY-90 Exploratory Development
FY-91/3 ATD
FY-94 Commence Demonstration & Validation (DEMVAL)
FY-99 Milestone III
FY-00 IOC

Developer/Manufacturer:

MCRDAC, with Technical Agent ARDEC, Picatinny Arsenal, and University of Texas, Austin, Center for Electro Magnetics

Forward Observer Support Technology

Description:

A man-portable modular system comprising small, lightweight, rugged components to assist the forward observer (FO)/forward air controller (FAC) in detection, identification, location, and designation of tactical targets.

Procurement Profile:

TBD

Why Is It Important?

This system provides the FO/FAC with the ability to detect and identify targets at greater ranges with increased accuracy. It reduces the time necessary to determine target position, enter target description, and digitally transmit the call for fire to the Fire Support Coordination Center/Direct Air Support Center (FSCC/DASC). This increases the speed with which a target can be engaged, and the probability that it will be killed.

Program Status:

This project is being pursued by the Naval Surface Warfare Center in Dahlgren, VA. Breadboard components were produced in FY-89. Brassboard components will be produced FY-90.

Developer/Manufacturer:

TBD

Tactical Directed Energy Warfare (TACDEW) Protection

Description:

Various eyeshields and optical filters to enhance individual and optical system protection in a Directed Energy Warfare (DEW) battlefield environment.

Procurement Profile:

	PRIOR	FY-90
R&D Funding (\$M's)	3.6	5.3

Why Is It Important?

The advent of laser devices on the battlefield and the use of these devices as directed energy weapons has been documented. As the number, diversity and effectiveness of these weapons increases, we must provide protective measures to our optical systems and Marines. Systems are being developed to provide adequate protection against a wide variety of laser threats while not degrading the level of performance of the protected system or the ability of Marines to accomplish the mission.

Program Status:

The Ballistic Laser Eye Protection (BLEPS) System has been fielded against the first generation of threat lasers. The Marine Corps is participating in several joint-service development programs to provide useful multi-spectral protection systems for emerging laser weapons. IOC is currently scheduled for FY-2000.

Developer/Manufacturer:

MCRDAC

HMMWV NBC Recon System (HMMWV NBCRS)

Description:

HMMWV NBCRS is an ATD program which integrates a suite of advanced chemical agent detectors and associated NBC equipment on an M997, Maxi-Ambulance HMMWV chassis. The advanced onboard equipment will include a mass-spectrometer, stand-off IR detector, automated surface sampler and radiac detector. Additional systems will be integrated to provide local meteorological analysis, navigation, and automated warning/reporting capability. An autonomous control system will be tested with the HMMWV NBCRS for remote system operation using fiber optic link.

Procurement Profile:

Pending program approval.

Why Is It Important?

The HMMWV NBCRS ATD will provide a relatively inexpensive test bed for evaluation of future concepts for NBC detection, sampling, contamination marking, and warning and reporting. A validated HMMWV NBCRS concept will provide the MAGTF commander with a rapid NBC reconnaissance platform for reliable intelligence gathering and hazard prediction. Rapid and reliable NBC reconnaissance is a critical requirement for maneuver warfare in an NBC environment.

Program Status:

HMMWV NBCRS ATD was initiated in FY-89. Preliminary Design Review (PDR) was held September 1989.

Developer/Manufacturer:

MCRDAC(AWT) has program management responsibility for HMMWV NBCRS. The PDA is the U.S. Army, Chemical Research Development and Engineering Center (CRDEC).

Aviation Combat Element Introduction

Part 3

The MAGTF's Aviation Combat Element (ACE) provides the MAGTF commander with a force multiplier, ready for deployment and employment, that is capable of meeting the MAGTF's requirements for tactical air support across the spectrum of conflict. In meeting these requirements, the ACE performs the following six functions.

- 1 Anti-Air Warfare** permits MAGTF ground force operations uninhibited by enemy air forces.
- 2 Offensive Air Support** isolates the battlefield and provides timely and accurate close air support.
- 3 Assault Support** insures the rapid build-up of combat power ashore and provides the means to quickly maneuver ground forces on the battlefield.
- 4 Aerial Reconnaissance** provides the MAGTF commander with tactical information which can be used to influence MAGTF operations.
- 5 Electronic Warfare** neutralizes enemy radars in support of ACE operations and provides the MAGTF commander with tactical information which is used to update the enemy order of battle.
- 6 Control of Aircraft and Missiles** provides the MAGTF commander with the capability to effectively use the ACE assets to favorably influence combat operations.

The ACE provides the MAGTF enormous flexibility, mobility, and firepower. Aviation weapons systems are selected and designed to enhance and complement the Corps' expeditionary nature. Aviation's primary goal is to provide dedicated day/night air support to the MAGTF.

The aviation weapon system programs in this section take advantage of new technology to offer the MAGTF greater, more accurate firepower; faster, more versatile movement to battle; detailed, timely intelligence; and many other capabilities required of a modern expeditionary fighting force.



AV-8B "Harrier"

Description:

The AV-8B is a single seat, transonic, vectored thrust, light attack aircraft, capable of increased payloads, range, endurance, and improved reliability and maintainability over the AV-8A. The V/STOL design gives it the capability to operate from a variety of land and sea based air facilities. It is configured with the Angle Rate Bombing System (ARBS) which provides an extremely accurate first pass attack capability and high kill probability through the use of passive laser spot or TV tracking. AV-8B's delivered after September 1989 incorporate a greatly enhanced night capability with Night Vision Goggle compatible lighting, a digital moving map, and a Forward-Looking Infrared Sensor.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity	228	24	24	323

Why Is It Important?

An expeditionary force like a MAGTF has limited assets of organic heavy artillery and tanks relying instead on its ACE to provide the required fire support. The vertical/ short take off and landing (V/STOL) capability of the AV-8B is well-suited for providing dedicated close air support to Marine ground forces. Offensive air support aircraft requiring conventional airfields for take-offs and landings are limited by the proximity and availability of supporting facilities. The AV-8B offers a quantum leap forward in basing options. It can operate from ships as small as a LPH, from rapidly built expeditionary airfields, from forward sites like roads or temporary "V/STOL pads" as small as a 72 ft x 72 ft, and from conventional airfields. By forward siting and operating at shorter distances from the battle area, tactical air request response times are reduced.

Program Status:

Transition to an all V/STOL light attack force of eight operational squadrons and one training squadron is approximately 85 percent complete. Current plans envision eventual introduction of the AV-8B into the Reserves.

Developer/ Manufacturer:

McDonnell Douglas



F/A-18 "Hornet"

Description:

The F/A-18A is a twin-engine, single piloted, supersonic strike fighter aircraft. The Hornet fulfills both air-to-air and air-to-ground mission requirements and can be operated from conventional and expeditionary airfields or from aircraft carriers. The F/A-18 incorporates state-of-the-art technology such as digital fly-by-wire flight controls, multimode radar and lightweight composites. F/A-18C's delivered in FY-90 and future years will incorporate an increased night and marginal-weather capability, which includes a color digital moving map display, Night Vision Goggle-compatible lighting, and Forward-Looking Infrared (FLIR) sensors. A two-seat version, the F/A-18D, incorporates all the warfighting capabilities of the F/A-18C and will include a tactical reconnaissance capability.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity				
DON	746	66	66	
USMC	189	16	25	500

Why Is It Important?

The F/A-18 provides a modern multi-mission offensive and anti-air capability to the MAGTF. The F/A-18D will replace the RF-4B, OA-4/TA-4, and A-6E. The F/A-18D provides the MAGTF with a platform capable of tactical reconnaissance and tactical air control while retaining the offensive and defensive anti-air capabilities of the F/A-18A/C. Advanced avionics allow the pilot to accurately navigate to and strike or photograph enemy ground targets and to destroy enemy aircraft. The Hornet's versatility makes it deployable, sustainable, and effective across the spectrum of conflict. Increased operational reliability has improved the F/A-18 sortie rates while superior aerodynamic design, maintainability, and multi-mission capability make it particularly well-suited to an austere expeditionary environment.

Program Status:

The 12 active Marine F-4 squadrons and one Reserve squadron completed transition to the F/A-18 in FY-89. The first F/A-18D squadron will stand up during FY-90.

Developer/Manufacturer:

McDonnell Douglas



F/A-18 ATARS

Description:

The Advanced Tactical Reconnaissance System (ATARS) is a digital sensor suite designed to provide real-time tactical intelligence. The ATARS suite will be comprised of low and medium altitude electro-optical sensors, an infrared sensor, tape recorders, and data link. The ATARS will be carried on the reconnaissance capable F/A-18D.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity				31

Why Is It Important?

Timely, accurate intelligence is vital to a MAGTF commander. Since the MAGTF may be operating independently without access to other tactical, theatre or national intelligence gathering assets, it requires an organic tactical air reconnaissance capability. The ATARS equipped F/A-18D will allow day and night near real-time intelligence to be provided to the MAGTF commander. At this time, the RF-4B sensor suite accomplishes the reconnaissance mission but is becoming more difficult and costly to support as the F-4 is phased out of the Marine Corps' inventory. The F/A-18D equipped with ATARS provides the capability to accomplish reconnaissance taskings without dedicating an airframe solely to the reconnaissance mission. The Hornet, with ATARS installed, will still retain all its capabilities as a superior strike fighter with the exception of the nose gun, which will be removed for installation of ATARS during reconnaissance missions. ATARS digital imagery sensors significantly reduce the support required over film systems, thus reducing logistical and manpower burdens on the MAGTF.

Program Status:

Expansion of the active F/A-18D force from 48 to 72 aircraft has increased the requirement for F/A-18 ATARS to 48 systems. The ATARS program is currently funded to provide a total of 31 systems, the last two in FY-95. IOC is scheduled for FY-94.

Developer/Manufacturer:

Control Data Corporation

EA-6B "Prowler"

Description:

The EA-6B is a four-place, twin-turbojet aircraft with a fully integrated, computer-controlled electronic warfare system. The aircraft is deployable from austere shore bases or aircraft carriers. The EA-6B's ALQ-99 Tactical Jamming System consists of on-board receivers and up to five externally-mounted Electronic Countermeasure (ECM) pods. The Tactical Electronic Reconnaissance Processing and Evaluation System (TERPES) provides pre-mission intelligence and post-mission processing. The EA-6B is capable of employing the AGM-88 High-speed Anti-Radiation Missile (HARM).

Procurement Profile:

	PRIOR	FY-90	FY-91
Quantity			
DON	118		3*
USMC	18		

*Designates remanufacture vice new procurement. Distribution schedule of aircraft between Navy & USMC to be determined.

Why Is It Important?

The Marine Corps requires the EA-6B tactical electronic warfare (EW) aircraft to protect and screen USMC offensive air support aircraft. This aircraft denies the enemy effective use of early warning, ground control intercept, surveillance/acquisition and terminal threat (gun & surface-to-air missile) radars. In addition to tactical battlefield jamming support, the EA-6B is essential to aircraft survival on the modern electronically-dominated battlefield.

Program Status:

Procurement of new production EA-6B aircraft was discontinued in FY-89. Marine Reserves are scheduled to receive six DON EA-6Bs in FY-92/93 bringing the USMC total to 24 aircraft. Beginning in FY-91 existing inventory (estimated to be approximately 109 aircraft in DON) will be remanufactured into the next version of the EA-6B, the ADVCAP or Advanced Capability "Prowler". The ADVCAP will provide a significant increase in all capabilities that make this aircraft so vital to the Marine Corps today. Current force levels provide a meaningful warfighting capability. Lack of new production coupled with attrition may preclude the Reserve transition to EA-6Bs.

Developer/Manufacturer:

Grumman Aircraft



KC-130T "Hercules"

Description:

The KC-130T is a multi-engine, land-based tanker aircraft which satisfies the Marine Corps tactical air refueling requirement for both fixed-wing and rotary-wing aircraft. A more reliable and maintainable aircraft in comparison with its predecessors, the KC-130T is the newest model of the venerable KC-130 series and has much improved avionics, as well as a pylon-mounted fuel capacity of an additional 2,720 gallons of fuel.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity	14	2	2	

Why Is It Important?

A tactical air refueler, like the KC-130, increases the endurance and range of aircraft providing the MAGTF commander with greater flexibility in assigning aircraft to missions in support of the ground scheme of maneuver. The KC-130 has a secondary mission of assault support to include the air transport of personnel, equipment, and supplies into expeditionary airfields. The KC-130 is an important link in the overall air support the ACE provides to the MAGTF. As more MAGTF aircraft become self-deployable using air refueling, new KC-130s are required to keep pace with emerging deployment concepts and to meet the requirements of other expeditionary operations.

Program Status:

The Reserve KC-130T force modernization is contained in the FY-91 budget request.

Developer/ Manufacturer:

Lockheed Aircraft Corporation



Medium Lift Replacement (MLR) Aircraft

Description:

The "MLR" is the notional name which has been given to the aircraft which will replace the Corps' aging CH-46E and CH-53A/D force. The exact type aircraft is undetermined. During the April 1989 Defense Resources Board (DRB), the Secretary of Defense directed the development of the necessary replacement aircraft. Subsequently, Congress directed a formal Cost and Operational Effectiveness Analysis (COEA) to evaluate all reasonable alternatives including, but not limited to the CH-53E, BV-360, EH-101, CH-46E, and CH-60 aircraft or any combination thereof. The Institute for Defense Analysis (IDA) is conducting the COEA. The COEA is expected to be completed during March 1990.

Procurement Profile:

TBD

Why is It Important?

The MLR will be the backbone of the Corps' assault support force as it enters the 21st century. It provides the MAGTF with an assault support aircraft with the speed, endurance, and battlefield survivability needed to fight and win on tomorrow's battlefield. It will represent a significant improvement in tactical capability and will replace our current force of CH-46E's and CH-53D's. A replacement for this critical component of our air-ground fighting force is of the highest priority.

Program Status:

Efforts are underway to satisfy the requirements for this vital mission need.



A medium lift assault aircraft to replace the pre-Vietnam CH-46 helicopter shown above, is the Marine Corps number one aviation priority.

CH-53E "Super Stallion"

Description:

This 3-engine heavy lift helicopter is designed to lift 16 tons over a 50 nautical mile combat radius using a dual point pendant system. It has a seven blade 79-foot diameter main rotor head and a canted 20-foot diameter tail rotor. This shipboard-compatible assault support helicopter is employed for the movement of internal cargo, the recovery of tactical aircraft, and the external lifting of weapons and equipment. It is the free world's largest helicopter.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity	102	10	23	191

Why Is It Important?

The CH-53E is the Marine Corps' only heavy lift support helicopter. The CH-53E, along with the MLR and the LCAC, forms the cornerstone of an assault support force required for the tactical movement of heavy weapons and equipment during over-the-horizon amphibious assaults, subsequent operations ashore, or during expeditionary operations. The CH-53E provides the ground combat commander the operational flexibility to reposition artillery and LAVs, recover heavy equipment and aircraft, and deliver supplies and fuel to forward sites. The ability to self-deploy by use of air refueling enhances its deployment capability in support of expeditionary operations.

Program Status:

Future aircraft programming will address both heavy lift and MLR requirements. Additional procurement may be required for heavy lift to meet the Marine Corps' minimum heavy lift requirement of six operational squadrons of 16 CH-53E's, plus training, pipeline and attrition aircraft.

Developer/Manufacturer:

Sikorsky Aircraft



AH-1W "Super Cobra"

Description:

The AH-1W (formerly called the AH-1T +) is a two-place, tandem-seat, twin-engine attack helicopter capable of land or sea based operations. Its primary mission is to provide attack helicopter fire support and fire support coordination. Since initial procurement in 1968, improvements to the Sea Cobra include; Night Vision Goggle compatible cockpit, Heads Up Display, crashworthy fuel system, and the capability to fire a variety of weapons to include TOW/ HELLFIRE (anti-armor), SIDEWINDER (antiair), and SIDEARM (anti-radar). The aircraft incorporates two GE T-700 engines, which results in a quantum improvement in high/hot operations and safety of flight.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity	78	6		164

Why Is It Important?

The AH-1W is the only Marine Corps attack helicopter. It fulfills the mission requirement to provide enroute protection to the assault force embarked in assault helicopters. Further tasking requirements include: conduct armed and visual reconnaissance, provide point and limited area defense from threat fixed wing aircraft, conduct anti-helicopter operations, and conduct point target and anti-armor operations. The versatility of the Super Cobra provides the MAGTF Commander with a significant force multiplier in both offensive and defensive ground combat.

Program Status:

FY-89 appropriated funds provide for the completion of the program procurement of site support equipment to include: a flight simulator, maintenance training equipment, publications, software support, and peculiar ground support (maintenance) equipment. In addition to the AH-1W procurement shown, 35 AH-1Ts are being converted to the more capable AH-1W during FY-88 through FY-93, bringing the total Marine inventory to 113 aircraft to support seven active duty squadrons which includes one training squadron. Beyond the six AH-1W's in the FY-90 Authorization Act, additional procurement will be required to transition the two Reserve AH-1J squadrons to the AH-1W and meet requirements for attrition aircraft.

Developer/Manufacturer:

Bell Helicopter Textron



Hellfire

Description:

Hellfire is the primary stand-off anti-armor weapon system for the Marine Corps' AH-1W and the Army's AH-64. The 100 pound missile has a semiactive, laser terminal, homing seeker.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity	1,962	1,098	1,198	14,092

Why Is It Important?

The employment of Hellfire improves the survivability of the Marine Corps' AH-1 helicopter on the battlefield. Hellfire provides an increased standoff capability combined with a considerably improved kill potential over present antitank guided missiles. Hellfire's range of greater than 7,000 meters significantly exceeds TOW's maximum range of 3,750 meters. With the indirect fire and lock-on after launch firing modes, Hellfire does not expose the launch aircraft to the enemy during the missile launch and guidance sequence as TOW presently does. Hellfire's armor penetration/kill potential is greater than TOW.

Program Status:

The Hellfire missile program successfully completed OPEVAL and initial deliveries of 1,000 production missiles have been made to the FMF.

Developer/Manufacturer:

Rockwell International/Martin Marietta

Stinger

Description:

Stinger is a man-portable, visually-aimed, shoulder-fired, surface-to-air defensive weapon system designed to counter the low altitude air threat. The weapon can engage jet and helicopter aircraft from all firing aspects, including head-on. Stinger employs a passive infrared seeker and advanced guidance system which assures precision intercepts forward of the jet plume of high-speed aircraft. The Stinger system is designed to meet the air threat of the 1990s. It also incorporates an identification friend or foe (IFF) interrogator and advanced infrared countermeasures circuitry.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity	11,318			

Why is It Important?

Stinger is essential to the air defense of the MAGTF. It is the short range component of the MAGTF's air defense system. Stinger's portability and simplicity give the MAGTF a mobile, ground-based air defense capability in the early stages of an amphibious operation or during sustained combat operations ashore. Its effectiveness is well documented in recent regional conflicts.

Program Status:

The Marine Corps' goal is procurement of sufficient Stinger missiles to engage the assigned threat.

Developer/Manufacturer:

General Dynamics
Second Source: Raytheon

Lightweight Early Warning Detection Device (LEWDD)

Description:

LEWDD is a lightweight, man-portable, surveillance and detection device to alert and cue Stinger gunners to the approach of hostile aircraft. The Marine Corps seeks a non-developmental sensor which is simple and robust with the following capabilities:

- All-weather 20-kilometer coverage
- Man-portable subassemblies with a total combined weight of 340 pounds or less
- Vehicle or battery powered
- Setup time of five minutes or less

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity	10	10	26	46

Why Is It Important?

Stinger, while highly effective, is limited by the visual acuity of the gunner. LEWDD will correct this deficiency by allowing the detection of hostile aircraft beyond the eyesight of the Stinger gunner, thereby exploiting the inherent effectiveness of the Stinger missile itself.

Program Status:

Low rate initial production has been approved. Upon completion of Follow-on Test and Evaluation (FOT&E) a full scale production decision is expected in FY-91.

Developer/Manufacturer:

Lear Astronics



Aviator's Night Vision Imaging System (ANVIS), AN/AVS-6

Description:

ANVIS is a third-generation image intensifier designed specifically for aviators. The system provides lightweight design, "look-around" peripheral vision, easy installation, and enhanced safety during night flight operations.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity	3,589			

Why Is It Important?

The capability to fly at night is essential for combat operations on the sophisticated battlefield. ANVIS is the first night vision system designed specifically to provide helicopter pilots with the capability to fly at low altitude at night in a hostile threat environment. ANVIS will allow the MAGTF commander to employ helicopters more effectively in support of the MAGTF scheme of maneuver.

Program Status:

FMF introduction began in 1986. Full capability is expected during 1992.

Developer/Manufacturer:

ITT

Radar Warning Receiver, APR-39XE-2

Description:

The APR-39XE-2 is a joint Army/Navy/Marine Corps program to develop a lightweight, low cost radar warning receiver (RWR) for use on Army Special Electronic Mission (SEMA) aircraft and on all USMC Helo/OV-10/MLR platforms. The system will integrate multiple warning systems to provide one standard display.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity			109	621

Why Is It Important?

The APR-39XE-2 makes Marine helicopters, OV10s and MLR aircraft more survivable against current and future threat systems by providing timely threat identification and location and by integrating multiple EW system displays and functions.

Program Status:

The program is in full scale engineering development. The first two engineering development models (EDMs) have been delivered, and DT/OT is being conducted on the AH-1W.

Developer/Manufacturer:

Dalmo Victor

Laser Warning Receiver, AN/AVR-2

Description:

The AN/AVR-2 is an Army lead, multi-service program to develop a laser warning receiver, which receives, processes and displays warning to the crew of aircraft illuminated by threat laser systems.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity	—	42	99	330

Why Is It Important?

The number of lasers and guided weapons on the modern battlefield has continued to increase. The AVR-2 will interface with the APR-39XE-2 display to provide laser threat warning to Marine Corps helicopters and OV-10 crews, decreasing their vulnerability and increasing survivability.

Program Status:

Operational evaluation has been completed on the AH-1J. Follow-on test and evaluation will be accomplished on the UH-1 and OV-10. The Milestone III production decision was made in July 1989.

Developer/Manufacturer:

Perkin Elmer Optical Group

Missile Detection System, AN/AAR-47

Description:

The AN/AAR-47 detects incoming missiles and provides an automatic signal for ejection of expendable countermeasures (e.g., flares) to protect the aircraft. Aircrew are also provided indications of threat direction on existing aircraft warning displays.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity	484	226	242	836

Why Is It Important?

The AN/AAR-47 will provide all Marine rotary wing aircraft and the OV-10 with the necessary protection to operate more effectively in a hostile environment now populated by a wide variety of diverse infrared surface-to-air missiles.

Program Status:

Sufficient AN/AAR-47 systems have been programmed to meet USMC helicopter, OV-10, and MLR requirements. The applicability of the AN/AAR-47 for high performance, fixed-wing aircraft is presently under evaluation.

Developer/Manufacturer:

Honeywell

Portable Heliport Landing Set (PHLS)

Description:

The PHLS is a low-risk, streamlined acquisition program which integrates non-developmental items such as radio receivers, landing zone marker lights, and a glide angle indicator light to provide a visible/infrared capable landing aid for night vertical assault operations.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity				320

Why Is It Important?

The Portable Heliport Light Set is the terminal landing and guidance system which will assist helicopters and V/STOL aircraft in identifying and safely landing in designated landing zones. Increased capabilities such as infrared lights, remote control activation, and size reduction make this a highly flexible and effective system. The PHLS will replace equipment which is antiquated and no longer supportable.

Program Status:

System is in FSD phase. Expect final contract award (R&D with Production Option) 2nd Quarter FY-90. User test of pre-production PHLS slated to begin 4th Quarter FY-90. IOC during 1st Quarter FY-93 is planned.

Developer/Manufacturer:

Advanced Computer Systems, Inc.

Hawk Mobility/Survivability Enhancement

Description:

HAWK is a semi-active, radar guided surface-to-air missile. It is designed for particular effectiveness at low and medium altitudes. The HAWK Mobility/Survivability programs major elements include; launcher conversion to Phase III digital electronics, replacement of heavy data cables with field wire, and a digital capability to launch other air defense missiles. This program will provide an initial HAWK engagement capability in only two trucks. It also utilizes a stored energy hydraulic system that significantly reduces the tactical power required to operate the launcher, it also decreases setup time. The final piece is a tactical hand-held computer that will allow the HAWK system to operate without any cables using radio data links. This will allow the HAWK system to cover significantly more area than ever before and allow it to move forward to cover the Forward Edge of the Battle Area.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity				25

Why Is It Important?

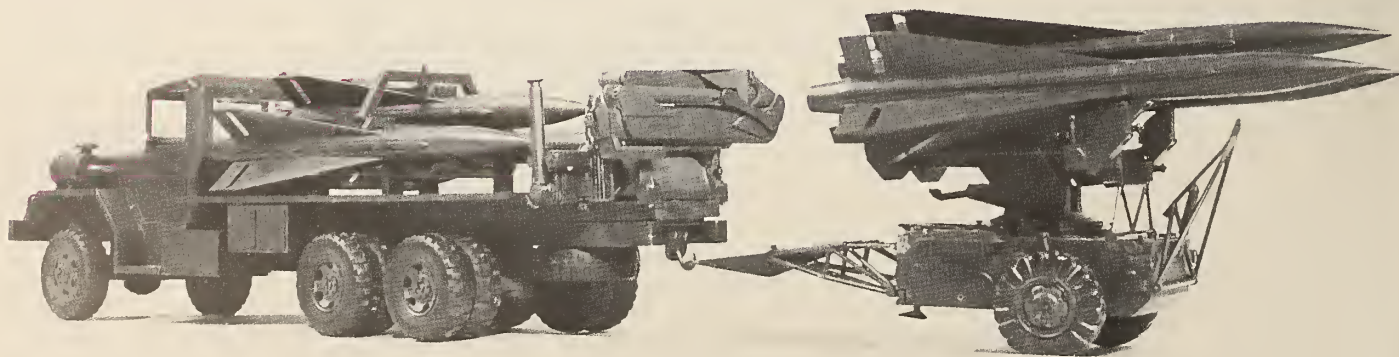
HAWK is essential to the air defense of the MAGTF. HAWK mobility/survivability will give us a digital state of the art launcher that can hold and fire other air defense missiles. It will also increase the mobility of the HAWK battery by reducing emplacement time. Using the new portable computer the HAWK equipment will be dispersed over many miles instead of grouped together this will increase our survivability against attack and allow us to cover more airspace.

Program Status:

This is a joint Army/Marine Corps program. We have programmed sufficient funds to complete R&D.

Developer/Manufacturer:

Raytheon Corporation



Pedestal Mounted Stinger (PMS)

Description:

Pedestal Mounted Stinger (PMS) consists of a fire control unit module which includes a rotatable turret with two missile launching platforms, each containing four ready-to-fire Stinger missiles, a predicted fire weapon .50 cal machine gun, and a gunners station mounted on a HMMWV. The system incorporates a FLIR sensor to provide for day/night and adverse weather target tracking. The laser range finder provides target range for the gun solution, and ensures missile engagements are conducted within the missile envelope. An operator's display and controls provide the man-machine interface to control engagements, monitor system status, and receive, display and transmit C2I data and information. A remote control unit allows operation of the system up to 50 meters from the system, enhancing crew survivability in a static employment. Stinger missiles may be reconfigured into a man-portable air defense system.

Procurement Profile:

	<u>PRIOR</u>	<u>FY-90</u>	<u>FY-91</u>	<u>AO</u>
Quantity				275

Why Is It Important?

PMS will fulfill the requirement for a mobile, low altitude, air defense system capable of rapid deployment and 24-hour operations. It will improve engagement time, increase firepower, reduce displacement time, and provide a night engagement capability. Its shoot-on-the-move capability will add a new dimension to short range air defense.

Program Status:

PMS currently in production for the U.S. Army as an NDI system. All testing completed with successful results. The Marine Corps has an approved ROC for PMS for a total procurement of 275 systems. An IOC of FY-93 is being planned.

Developer/ Manufacturer:

Boeing Aerospace Corporation



Combat Service Support Element (CSSE)

Introduction

Part 4

The CSSE is a task organization tailored to provide that combat service support to the MAGTF which is beyond the organic capability of the GCE and ACE. Depending on the assigned mission, it is task-organized to provide any or all of the following functions: supply, maintenance, deliberate engineering, medical/dental, automated data processing, personal services, food services, transportation, military police, disbursing and financial management. It is capable, to a limited extent, of providing smaller task organizations such as maintenance/supply contact teams for support of MAGTF operations as required.

The Marine Corps has several programs designed to improve the Marine Corps' capability to provide logistics support to the MAGTF commanders. A discussion of the most important of these programs follows.



Ground Ammunition Program

The Marine Corps' FY-91 ground ammunition budget request total \$284.7 million. The FY-90 and FY-91 program is broken down by ammunition category as follows:

ITEM	FUNDING REQUEST (\$MILLIONS)	
	FY-90	FY-91
Artillery (155mm/8 inch)	53.8	22.5
Tank (M1A1)	44.2	60.7
Mortar	29.1	32.2
Small Arms	33.3	62.4
Other *	88.8	106.9
Total	\$249.2	\$284.7

*Includes pyrotechnics, grenades, rockets, etc.

In keeping with DoD guidance, the Marine Corps program ensures readiness and sustainability. The current program provides for a balanced procurement of both war reserve and training ammunition to meet the needs of the Marine Corps within approved funding levels.

The M1A1 tank line consists of 120mm ammunition. The 120mm ammunition consists of a high explosive antitank (HEAT) round, an armor piercing fin stabilized discarding sabot (APFSDS) round and two target practice rounds.

The mortar line consists of the 60mm HE, illum and smoke WP rounds for the M224 LWCMS, and 81mm rounds for the new M252 improved mortar system.

The highlights of the artillery ammunition request are shown below:

Artillery Ammunition

ITEM	QUANTITY		\$ MILLIONS	
	FY-90	FY-91	FY-90	FY-91
155mm Baseburner	7,897	7,415	5.9	6.2
155mm Chg Prop WB	34,643	72,906	2.8	7.5
155mm Chg Prop GB	35,302	68,091	1.9	4.5
Fuze, ET M762	0	99,674	0	7.0
Fuze, ET M767	0	36,949	0	3.0
TOTAL			10.6	28.2

Electronic Maintenance Complex (EMC)

Description:

The EMC is a maintenance facility which provides an environmentally controlled work area for a variety of maintenance requirements. The EMC is comprised of an International Organization for Standardization (ISO) shelter, easily relocatable Internal Appointment Modules (IAM's) and a Standard Adaptation Package. The size of an ISO shelter may be 8'x 8'x 10' or 8'x 8'x 20'. The ISO shelter may be used as an electromagnetic base or as a rigid, general all purpose element. An EMC may consist of one shelter or two or more shelters complexed together to meet mission requirements.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity	492	223	362	1,303

Why Is It Important?

The increased sophistication of currently fielded systems requires sophisticated mission support capability. The EMC will replace existing antiquated/obsolete maintenance facilities and provide housing for new maintenance support capabilities (Marine Corps Automatic Test Equipment System, Electro-Optics Repair Facility, Artillery Repair Facility, Electronic Calibration Facility, Mechanical Calibration Repair Facility, Electronic Test Measurement Diagnostic Repair Facility).

Program Status:

The EMC is currently on contract. First Article Testing (FAT) has been completed. Delivery of production items began in October 1989.

Developer/Manufacturer:

Brunswick Corp.



Fuel/Water Storage and Pump Modules (SIXCONs)

Description:

SIXCONs provide the capability to store and transport up to 900 gallons of liquid in a single module. The SIXCON pump module provides the capability to pump fuel or water from SIXCON storage modules at a rate of 125 gallons per minute. Each module has forklift tineways on all sides and can be helo-lifted or transported on trucks or containerships. With the advent of these modules comes a greatly increased capability and flexibility. Both fuel and water can be transported to forward elements of a MAGTF in variable quantities by the most effective means available on land or by air.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity		F/W	F/W	F/W
Fuel/Water Storage	2516/2506	432/406	50/50	3015/2987
Fuel/Water Pump	553/ 402		29	553/ 431

Why Is It Important?

The SIXCON modules were designed and are expected to fill the void left by the reduction in specialized tankers (M49/M50). The SIXCONs can be used individually or in combination of up to six modules (5 storage and 1 pump). They can be connected so that six modules form an 8' x 8' x 20' container.

Program Status:

The first contract award was in 1985. All Fuel/Water Modules required for MPS are embarked. Water module IOC achieved in FY-89. Fuel modules scheduled for IOC in FY-90.

Developer/Manufacturer:

Isometrics, Sharman, Peabody-Barnes



NBC Defense Program Highlights

Description:

The **M40/42** series of field protective masks will replace the M17 (general purpose), M25 (vehicle crewman), and M9 (heavy duty) masks during FY-89. Principal changes include an external canister, additional voicemitter, and improved protection.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity	61,265	43,064	52,555	276,000

Description:

The **Chemical Agent Monitor (CAM)**, to be fielded in FY-92, is a hand held, man-operated device for monitoring blister and nerve agents and contamination on personnel and equipment.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity				2,060

Description:

The **Individual Chemical Agent Detector (ICAD)** will be a lightweight, battery-operated detection device employed to determine the presence of attack concentrations of chemical agent vapors and warn of the need to take appropriate protective measures.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity			618	2,774

Description:

The **Portable Collective Protection System (PCPS)** is a lightweight, expendable collective protection tent which will support small command and control units and will provide rest and relief for these units which must operate in a contaminated environment for extended periods. It is targeted for FY-90 fielding.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity		120	120	3,049

Description:

The **M21 remote sensor chemical agent alarm** can detect chemical agent clouds at a distance of up to five kilometers. We plan on fielding this device in FY-93.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity				198

Description:

The **M291 Decontamination Kit** will also be fielded in FY-91 to support the decontamination of a Marine's individual equipment.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity			100,000	300,000

*Why Is It
Important?*

The MAGTF requires an increased ability to survive and continue to operate in an NBC environment. Better protection and means which will minimize the operational and logistics impact of NBC defense are a must because the threat is formidable. Soviet and Warsaw Pact forces are better equipped, structured, and trained to conduct offensive and defensive chemical warfare than any other military forces in the world. Recent activities in the Iran-Iraq conflict suggest that chemical weapons are proliferating throughout the globe.

Program Status:

The equipment being fielded will support rapid decontamination either at or near the point of contamination, allowing the unit to continue to fight. New NBC protective overgarment suits provide increased protection for longer periods. All equipment is more easily maintained and more reliable than the equipment replaced. Marines will soon have the capability to conduct extended operations in an NBC environment.

*Developer/
Manufacturer:*

PDA Chemical Research, Development and Engineering Center (CRDEC), Edgewood, MD and USA Natick RD&E Center, Natick, MA.



Ribbon Bridge Transporter (MK-18)

Description:

The MK-18 is a rear body unit of the Logistics Vehicle System that is designed to provide a self-loading and unloading capability for the ribbon bridge, bridge boat, and all ISO-configured containers, shelters and modules in the field logistics system. The MK-18 is transportable by CH-53, C-141 and C-5.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity		100		530

Why Is It Important?

The Marine Corps requires the capability to transport, load and unload the ribbon bridge at river crossing sites. Additionally there is a serious shortfall to move, load and unload ISO-configured shelters, containers and modules within the AOA. The MK-18 will provide a reliable, fast and efficient way to accomplish the mission.

Program Status:

The system has finished extensive testing at both Aberdeen Proving Ground, MD, and the Motor Transport Test Site at Quantico. Contract award is expected during the 2nd Quarter of FY-90 with an initial allowance of 320. Long range plans call for the conversion of all the present MK-14 units in the fleet to self-loading MK-18's. IOC of FY-90 is planned.

Developer/Manufacturer:

T. T. Baughton and Sons LTD.



Training and Education

4

The Marine Corps has established the Marine Air-Ground Training & Education Center (MAGTEC) at the Marine Corps Combat Development Center (MCCDC), Quantico, VA to provide more effective management of Marine Corps training and education as a total system. The MAGTEC is chartered to develop policies and programs for the training and education of regular and reserve Marines. This responsibility includes:

- Management and direction of training and education programs and initiatives.
- Training analysis.
- Publication and evaluation of training standards for all categories of training conducted in Marine Corps units and institutions.
- Allocation and management of training resources to achieve maximum training effectiveness.

Marine Corps training programs continue to be realistic, innovative, and performance oriented. To accomplish this goal, the Marine Corps will participate in 190 joint, active and reserve exercises in FY-90.

The Marine Corps has increased the number of units participating in training exercises and made the scenarios more realistic. Commanders will be able to evaluate their unit's performance and the effectiveness of their contingency plans in realistic weather, terrain, and threat situations.

The Marine Corps Air-Ground Combat Center (MGACC), Twentynine Palms, CA has the mission to conduct realistic training in the integration of supporting arms and to evaluate the combined arms capabilities and readiness of all MAGTF elements.

The "Combined Arms Exercise" (CAX) has been developed to specifically support MCAGCC's mission. The standard scenario contains an enemy equipped with current Soviet weapons and employing Soviet doctrine. Although the sequence and circumstances vary, standard events for a CAX are: (1) command post displacements; (2) deliberate attacks on fortified positions requiring combined arms fire support; (3) a night helicopterborne assault of company size; (4) development of barrier and defensive fire plans; (5) the use of MILES gear for force on force training that aligns the CAX with combat situations; and (6) the use of "frag" orders after the first day to enhance realism and to increase the demands on the unit's command and control process.

Ten CAXs are conducted at MCAGCC each year. The Mojave Desert training site is a realistic maneuver area that permits the use of live ordnance of all types during the exercise. Lessons learned from CAXs are incorporated into doctrine, tactics and equipment development.

The Marine Corps Mountain Warfare Training Center (MCMWTC) in Bridgeport, CA provides instruction in the basic and advanced techniques of mountain warfare. Moreover it is an ideal location to train for our strategic roles in northern Europe and the western Pacific. 12,000 Marines are trained annually in mountain warfare and cold weather operations.

Each year, Marines participate in joint or combined training exercises around the world. These include Teamwork, Northern Wedding/Bold Guard, Bright Star, Big Pine, Team Spirit and Display Determination. These training exercises have been successful and have strengthened our joint and combined operations capability.

The Marine Aviation Weapons and Tactics Squadron-One (MAWTS-1) at Yuma, AZ provides standardized advanced training in all aspects of the employment of Marine Aviation. MAWTS-1 conducts the semiannual Weapons and Tactics Instructor (WTI) courses which provide extensive training for 140 aircrews and aviation command and control officers. These officers return to their units and establish a cadre for unit training programs. In addition, MAWTS-1 provides training for over 3,000 wing personnel in supplemental courses each year.

Recruit training remains the fundamental element of our success and is the first step in a program designed to develop the individual Marine. Recruit training provides a series of demanding but attainable performance requirements which each recruit can identify and master. We require the highest standards of performance and conduct from our drill instructors.

These are but a few of the items and support elements which make up our training system. This chapter presents several issues of importance to the development of the Marine Corps training and education program.



Precision Gunnery Training System (PGTS)

Description:

PGTS simulates DRAGON and TOW missile firing and tracking. It provides immediate feedback on the gunners performance and enhances proficiency when firing live missiles.

Procurement Profile:

	PRIOR	FY-90	FY-91
Quantity		98	155

Why Is It Important?

PGTS provides Marines the opportunity to develop shooting/tracking skills before transitioning to full task training with live DRAGON and TOW missiles. This approach allows Marines to practice firing procedures and target acquisition quickly and safely using realistic scenarios. Employment of training systems like the PGTS permit gunners to maintain individual proficiency without firing large quantities of live ammunition. While some live missile firing is required, PGTS is a cost effective complement.

Program Status:

A total of 253 PGTS will be fully fielded by FY-92.

Developer/ Manufacturer:

Loral Fairchild Systems

Remote Engagement Target System (RETS)

Description:

RETS is a computer-controlled system of moving and stationary personnel and anti-armor targets which provides target array and gunnery effect.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity	6			15

Why Is It Important?

RETS will allow Marines to develop specialized combat marksmanship and anti-armor skills using live ammunition in a variety of simulated combat environments. This approach enhances standard marksmanship and enables Marines to improve actual skills required on the battlefield.

Program Status:

The RETS have been procured and the systems are being installed.

Developer/ Manufacturer:

Unisys



Light Armored Vehicle (LAV-25) Training System

Description:

The LAV-25 training system consists of two devices, the Turret Trainer (TT) and the Substitute Firing Device (SFD). It trains Marines in precision gunnery skills and tactical distribution of fire at the School of Infantry, Camp Pendleton, CA.

Procurement Profile:

	PRIOR	FY-90	FY-91
Quantity	1 (TT) 3 (TT)* 4 (SFD)	3 (TT)	
	*USMCR		

Why Is It Important?

LAV-25 Permits Marines to develop precision gunnery skills in a simulated combat environment; and practice precision gunnery quickly and safely using realistic scenarios.

Program Status:

The system is installed and functioning at Camp Pendleton. Three TT have been delivered to the USMCR, and three additional TTs will be delivered to the FMF during FY-90.

Developer/Manufacturer:

Daedalan, Inc.

Combined Arms Staff Trainer (CAST)

Description:

An initial CAST was developed to support CAX fire support planning and coordination training at Twenty-nine Palms, CA. The CAST consists of a terrain board, a target designator (laser system), and a communication system which replicates MEB tactical communication nets. Four additional CASTs will be fielded to the FMF.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity	3	2	—	6

Why Is It Important?

CAST will provide the commander with methods of training and exercising his subordinate commanders and staffs in planning, controlling, and executing the fire support plan with the scheme of maneuver.

Program Status:

The fielding of the CAST is on schedule and will be ready for training at Kaneohe Bay and Camp Lejeune during the Spring of 1991; CAST will be ready for training at Camp Butler and Camp Pendleton during the Spring 1992. One CAST is projected for Quantico in FY-93.

Developer/ Manufacturer:

Southwest Research Institute



MAGTF Tactical Warfare Simulation (MTWS)

Description:

The Marine Corps continues to develop and field a variety of tactical decision making (TACDM) training materials and simulators to complement traditional unit and formal school training. MTWS is the follow on system to the former TWSEAS program. It will provide new software/hardware to more closely simulate the Command, Ground, Air and CSS elements of the MAGTF. MTWS will be much more reactive than TWSEAS and capable of simultaneous control of integrated field and command post exercises. Further, MTWS will provide enhanced capabilities for FMF, formal school and Reserve components. Upgraded with more capable hardware, the MTWS will provide remote usage capability for all potential users. Additionally, a fourth MTWS site will be provided for 3rd Marine Division.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity				4

Why Is It Important?

MTWS provides the commander with an alternative method of training and exercising his commanders and staffs in planning, controlling and executing critical combat functions.

Program Status:

The MTWS program has an IOC of FY-92.

Developer/Manufacturer:

System Exploration Incorporated

Weapons Models and Mockups

Description:

These are large scale working models of current ground weapons systems. These devices will be used to instruct Marines in the use, maintenance, functioning, and composition of the actual weapons.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity	21	42	18	121

Why Is It Important?

These devices provide realistic substitutes for actual equipment and weapons of NATO and Warsaw Pact nations. They very often represent the only contact Marines will have with specialized weapons they may encounter in actual combat situations. These devices will provide close familiarity with these weapons.

Program Status:

These items are procured on an annual basis as required.

Developer/Manufacturer:

Various manufacturers are used for these procurement actions.

Multiple Integrated Laser Engagement System (MILES)

Description:

MILES is a family of low-power, eye-safe lasers which simulate the direct fire characteristics of infantry assault, armor, anti-armor and mechanized weapons or weapons systems. MILES is designed to be used as an engagement simulation training system for the determination of hit, miss or near miss and should not be confused with gunnery training.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity	6			3*

* Battalion Set(s)

Why Is It Important?

Combat environment simulation devices add realism to force-on-force training and allow Marines to experience situations which closely resemble the conditions in which they will fight. Peacetime validation of doctrine, tactics and techniques is a natural consequence of using such devices.

Program Status:

The program goal is to complete the FMF training requirements for MILES equipment. Additionally, the constant improvements to, or replacement of our weapons or weapons systems requires the provision of updated MILES-type equipment in order to effect realistic, up-to-date training.

Developer/ Manufacturer:

Loral Optical



Naval Support Programs

5

Maritime and Geographical Prepositioning

The Marine Corps has enhanced its expeditionary readiness through an energetic prepositioning program that is now fully operational. The maritime prepositioning program consists of three fully operational maritime prepositioning forces (MPFs). The geographical program, referred to as the Norway Air-Landed MEB (NALMEB) program, achieved IOC in December 1989. This section summarizes the unique composition and tailoring of the two programs, contains information on equipment maintenance, and highlights a few of their deployment capabilities.

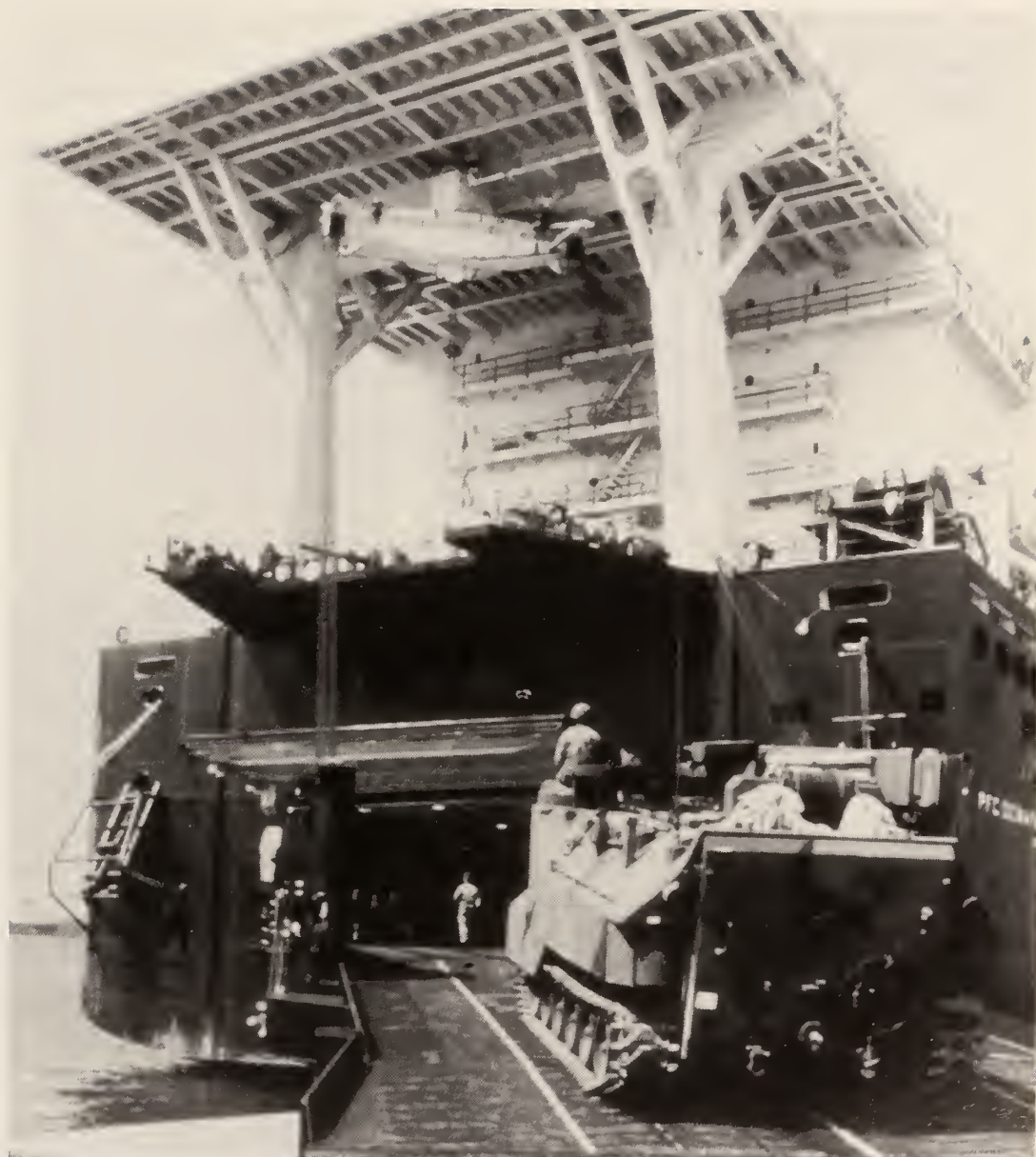
An MPF is comprised of a naval command element, a MEB, an MPS squadron—loaded with most of the MEB's combat equipment and about 30 days of supply—and a Navy Support Element. The MPF concept gives the Marine Corps a response capability unparalleled in the world. A 16,500-man, armor-heavy fighting force can deploy to vast reaches of the globe, offload its equipment and supplies, assemble and be prepared for combat in a matter of a few days. It triples the Fleet Commander's ability to employ Marine Forces—and does so with a modicum of strategic airlift and sealift.

With the Marine Corps' crucial role in defending NATO's northern flank, the Marine Corps is in its final year of filling six NATO-funded, Norwegian-built storage sites with a MEB's set of equipment and supplies. The cavernous, climate-controlled, in-granite facilities are located in central Norway. Norway has organized a Host-Nation Support Battalion which will assist in unloading the storage sites and perform many vital combat service support tasks in the re-deployment of the air-lifted MEB to its designated objective area.

These four sets of combat equipment and supplies have been tailored to meet MEB-sized combat requirements in various portions of the world. Specifically, camouflage patterns exist for arctic, desert, and Temperate-Zone environments for different sets. The MPS ships and the caves in Norway have been precisely loaded to meet the employment schemes of the designated MEB commanders. These brigades conduct exercises on an annual basis to hone their skills in offloading their ships or the Norwegian storage sites. These tasks include special functions which can best be accomplished by designated and trained brigade service support groups such as de-preserving the equipment and assembling for movement to combat.

To maintain these sets of equipment at a maximum readiness level, the Marine Corps conducts continuous maintenance activities on-board each of the 13 MPS vessels, at a permanent maintenance site on Blount Island near Jacksonville, Florida, and at the storage sites in Norway. Maintenance and modernization are performed by a commercial firm for the MPS sets of equipment and by the Norwegian Army under established agreements for the Norway set. This ensures prepositioned equipment is maintained and modernized on a scheduled basis without reducing the total prepositioned equipment available for the MEBs.

USMC prepositioning offers a potent and strategically flexible national capability. Among the numerous roles and missions which can be assigned to prepositioning forces, two are of particular note. By moving an entire MPF or the NALMEB to a designated area prior to the outbreak of hostilities, a strong signal of U.S. resolve is given which may serve to dissuade potential adversaries from initiating a military conflict. Also, an MPF can reinforce an amphibious operation by rapidly surging forces into a secured beachhead. With this immensely enhanced deployment capability, operational planners are now re-examining various operational plans to emphasize the rapid closure capabilities available in combining afloat-amphibious forces with MPFs and the NALMEB. For example, Allied Forces North has fully integrated the NALMEB into operational plans for securing the Norwegian Sea.



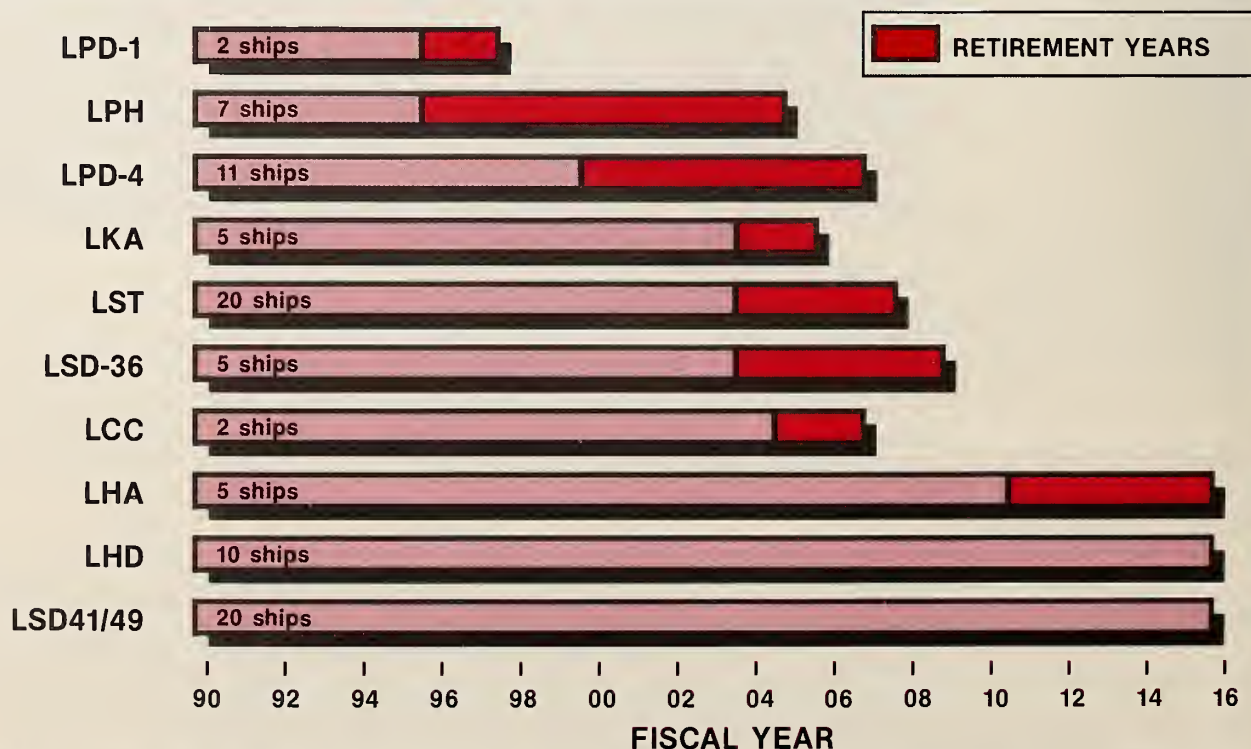
Once these expeditionary forces are assembled, they have nearly a month's supply of rations, munitions, and spare parts needed for waging combat operations. The self-sustainment aspects of the Marine Corps prepositioning forces is unmatched by any other U.S. air-lifted force. An equivalent force would require over 4,500 C-141 sorties to move the same amount of personnel, equipment, and supplies to a contingency area. Such a force could be assembled and deployed in matter of several weeks with non-stop surge aviation operations that could involve extensive logistics efforts and strain our employment options. The MPF can put the same force on the ground and be prepared for military operations in 10 days.

Another related initiative that will provide a significantly better expeditionary capability to Marine aviation units is the Aviation Logistic Support Ships (TAVB) concept. This program enhances the maintenance effort of our forward deployed aviation assets operating in contingency area. The USNS *Wright* (in the Atlantic) and USNS *Curtiss* (in the Pacific) will sustain and support the intermediate maintenance requirements of the ACE of a MEB. The *Wright* was delivered in June 1986, and the *Curtiss* was delivered in August 1987.

Amphibious Lift

Although the Marine Corps does not fund any portion of sealift, its role as an expeditionary force gives it a vested interest in the status of amphibious assault shipping. The Commandant has supported a program objective of the amphibious assault lift for the assault echelons (AEs) of a MEF and MEB. The assault echelons comprise only a portion of the total MEF or MEB force structure. The assault echelon comprises only those forces scheduled for the initial assault on the objective. Planning for the transportation and arrival of forces and sustainment in echelons facilitates control and scheduling of precious lift assets. The remaining portion of the force must be transported by air and by commercial-type shipping as part of the assault follow-on echelon (AFOE), which is required to support and sustain the operation. The Navy and Marine Corps have stabilized the stated AE lift requirements specified for the MEF and MEB in order to provide a basis for programming a balanced amphibious ship force.

The Marine Corps is concerned by the potential block obsolescence of amphibious shipping. Early in the 21st century over 30 ships are slated for retirement. This schedule could be affected by early retirements and reduced new construction due to fiscal constraints. While all aspects of naval forces are subject to reassessment and justification in the face of severe fiscal constraints, adjustments in amphibious ship levels will receive especially close examination by the leadership of the Department. Inventory reduction may reduce response times in crisis action scenarios where the Nation has no forward bases and curtails the deterrent impact of our conventional power projection forces. Reduction of the number of operational exercises in which the Navy-Marine Corps team participates would also be a product of major down sizing.



The current MEF(AE) lift capability is dependent upon the availability of all active and reserve amphibious ships. To attain and maintain a level of amphibious assault shipping sufficient to simultaneously lift a MEF(AE) and MEB(AE) requires new construction. An outgrowth of this coordinated effort to revitalize the amphibious force has been the development of a number of innovative proposals for improved ship-to-shore mobility that will support a wide range of operational concepts and ensure that a credible amphibious warfare capability exists through the end of this century and beyond.



"WASP" Class (LHD)

Description:

The "WASP" class (LHD) is a multi-purpose amphibious assault ship. The ship's primary mission is to embark, deploy, and land elements of a Marine landing force in an assault by helicopters, landing craft, amphibious vehicles, and by combinations of these methods. The LHD class has a secondary/convertible mission for sea control.

Procurement Profile:

	PRIOR	FY-90	FY-91
Quantity	4		1

Why Is It Important?

The swift, forcible projection of our afloat Marine forces in the seizure or defense of: 1) advance naval bases for further operations, 2) land areas dominating straits and narrow seas and 3) strategic islands/peninsulas, is of obvious importance to any naval campaign; hence, the requirement for amphibious forces. In order to be successful, however, our commanders must have not only the necessary amphibious lift but also the flexibility to land the landing force by air or surface means. The LHD class provides this flexibility. The LHD will significantly increase the total lift capability by providing a flight deck for both helicopters and V/STOL aircraft and offering a well deck for both air-cushion and conventional landing craft. LHD is key to obtaining our lift objective.

Program Status:

Contract awards for four LHD's have been awarded for construction. LHD 1 (USS WASP) was commissioned on 29 July 1989. LHD 2 (USS ESSEX) keel laying occurred in March 1989. The option to construct LHD 3 was exercised in November 1987 and fabrication began in early 1989. The option for LHD-4 (USS BOXER) was exercised in October 1988.

Developer/Manufacturer:

Ingalls Shipbuilding, Pascagoula, MS



WHIDBEY ISLAND" Class (LSD 41)

Description:

LSD 41 will provide well deck space and have a maintenance capability for both conventional displacement landing craft and LCAC. An LSD 41 cargo variant (CV) is designed with an LSD 41 basic hull, optimized for cargo.

Procurement Profile:

	PRIOR	FY-90	FY-91	AO
Quantity				
LSD 41	8			
LSD 41 (CV)	1	1	1	

Why Is It Important?

In 1967 there were 162 active amphibious ships. Today there are 63—including both active and reserve ships. The remaining three "Thomaston" (LSD 28) class ships will retire by FY-90. The LSD 41 construction program will replace the lost lift-capacity attributed to the LSD 28 class retirements. Procurement of the LSD 41 (CV) class of ships, to provide required lift for a MEF(AE) and a MEB(AE), particularly in cargo and LCAC carrying capacity, is essential.

Program Status:

LSD 41 (USS WHIDBEY ISLAND), LSD 42 (USS GERMANTOWN), LSD 43 (USS FORT McHENRY) and LSD-44 (USS GUNSTON HALL) have been commissioned. LSD 45 (USS COMSTOCK) is to be delivered in January 1990, and LSDs 46 through 48 have been launched. The contract award for LSD 49 (HARPERS FERRY Class) was awarded in June 1987. It includes options for LSD 50 through 53.

Developer/Manufacturer:

Lockheed Shipbuilding, Seattle, WA
Avondale Industries, New Orleans, LA



Landing Craft Air Cushion (LCAC)

Description:

The LCAC is a high-speed (40 + knots), over-the-beach, ship-to-shore amphibious landing vehicle capable of a 60-ton payload (75-ton overload). It is designed to lift all equipment organic to the MAGTF in an amphibious operation.

Procurement Profile:

	PRIOR	FY-90	FY-91
Quantity	48	12	12

Why Is It Important?

This air cushion craft will replace current pre-WWII technology landing craft, scheduled for retirement during the late 1990s, with modern landing craft that offer the following advantages over current landing craft:

- Exposes 70 percent of the world's beaches to amphibious operations vice the current 17 percent.
- Travels in excess of 40 knots, vice 9-11 knots.
- Craft characteristics provide OTH launch capability and decrease vulnerability of the force.
- Increases survivability in mined waters.
- Significantly increases build-up rate ashore, thus increasing probability of assault success.
- Improves operation in poor weather and sea conditions.

Six LCAC are the minimum needed to provide an operational capability for a MEU. A MEB requires 25 and a MEF notionally requires 78. Since the LCAC introduces the most significant improvement to amphibious warfare since the helicopter, LCAC procurement is strongly supported by the Marine Corps.

Program Status:

Twenty-four LCACs have been delivered and 24 are under contract. The first operational LCAC unit, Assault Craft Unit Five, is located at Camp Pendleton, CA. The second unit, Assault Craft Unit Four, is located at Little Creek, VA.

Developer/ Manufacturer:

Textron Marine System
Avondale Gulfport Marine



Naval Surface Fire Support (NSFS)

Description:

While evolving concepts for the conduct of the amphibious assault will exploit capabilities to land forces, in relatively unopposed areas from OTH wherever and whenever possible, circumstances may still require assaults against defended beaches and landing zones. Moreover, the landing force once ashore in the objective area must be prepared to face the type of violent counterattacks using highly mobile, mechanized forces that the projected threat espouses. This not only validates the continued requirement for NSFS to provide the responsive, close and continuous all-weather fire support required during the early phases of the assault until artillery is established ashore but, given the requirement to support helicopter-borne assault forces landed 15-20 nm inland, also establishes the range requirement for modern NSFS systems at 60 nm (allowing also for ship standoff distance). Reactivation of the four IOWA class battleships has helped, but the bottom line is that the current inventory of NSFS platforms is deficient in range and lethality due to heavy dependence on 5-inch guns and the lack of the ability to kill hard, point targets without an excessive expenditure of ammunition.

In light of the foregoing, the Marine Corps supports the following enhancements to NSFS capabilities:

- Early introduction of 16-inch improvements that include a shipboard gunfire control system for greater accuracy and an extended range submunition projectile to provide greater range and a dramatic increase in lethality.
- The 5-inch semi-active laser-guided projectile (SAL-GP), to provide the pinpoint accuracy needed to engage hard, point targets whether mobile or stationary.
- Procurement and stockage of sufficient NSFS ammunition to support the amphibious operations of a MEF and MEB for 60 days.
- Evaluation of the Army's Multiple Launch Rocket System (MLRS) for use at sea under the Assault Ballistic Rocket System (ABRS) concept.
- Development of follow-on payloads.
- Development of gun systems to combine with the ABRS system as a replacement for the 16-inch gun, when the battleships are eventually retired.



Navy Support Element (NSE)

Description:

The NSE performs tasks to support amphibious and MPF operations in addition to those accomplished by the crews of amphibious ships. Since these units are not permanently assigned to the ships, they occupy berthing, vehicle, and cargo space designated for troops. The total lift requirement for an amphibious operation must therefore include NSE requirements as well as the MAGTF. The NSE, which will be split between the AE and the AFOE, is composed of the following:

- Commander Amphibious Task Force (CATF) Staff
- Naval Beach Group
 - Beach Group
 - Amphibious Construction Battalion
 - Assault Craft Unit
- SEALs
- Explosive Ordnance Disposal (EOD) Unit
- Medical Augmentation Unit
- Mine Countermeasures Group
- Navy Mobile Construction Battalion (NMCB)
- Fleet Composite Readiness Group (FLTCORGRU)
- Search and Rescue (SAR) Unit
- Mobile Inshore Undersea Warfare (MIUW) Unit
- Navy Cargo Handling and Port Group (NAVCHAPGRU)

Why Is It Important?

The NSE is vital to the smooth off-load of the amphibious force. Made up of widely diversified units, the principal challenge involved in the NSE is the manning and training of the NAVCHAPGRU, which is instrumental in operating the off-load systems of MPS/AFOE ships, and of the Naval Beach Group units, who operate assault craft and lighterage for off-load of AE ships and control the flow of material on the beach to the high water mark.

Program Status:

The Marine Corps supports the ability to simultaneously deploy two MPF MEBs and two amphibious task forces. The Navy is programming to meet this goal using a preponderance of reserve forces in the NAVCHAPGRU and amphibious construction battalion.

Medical Support

The Marine Corps receives all of its medical support from Navy personnel and from a combination of organic Marine medical units and Naval Medical Facilities. The primary objective of the health service support system, during both peacetime and war, is to provide the necessary care to keep our Marines ready for their mission. This support extends to the dependents of our Marines as well.

The medical support provided to the MAGTFs spans across a continuum of care that begins with the individual Navy medical Corpsman that serves at the unit level. This continuum extends from emergency treatment facilities organic to the Medical Battalion of the CSSE, to specially designed Navy Hospital ships (discussed further below), and finally to first class hospitals in the theater of operations or in CONUS.

Because of the expeditionary nature of the Marine Corps, our medical support organizations must be equally mobile and responsive. This mandates that peacetime medical support units be maintained at a satisfactory level of readiness in terms of trained personnel and logistic preparation. This capability to support the MAGTF in global contingencies saves lives once the MAGTF has been engaged.

Each MEF must have the capability of caring for a total of 20,000 casualties in a 60-day period. To meet this requirement, advanced medical equipment and life-saving facilities have been added to our inventories. In addition, two hospital ships (TAH), the MERCY and the COMFORT, have been delivered. Each vessel is maintained in the Reserve Fleet in a 5-day recall status. One vessel is positioned on each coast. Both ships contain 1,000 beds and 12 operating rooms. The delivery of the two hospital ships and the programmed Fleet Hospital assets represent a significant step forward towards ensuring prompt and professional medical care for Marines.



Dental Support

Dental support for the Marine Corps is provided by Navy personnel assigned to Dental Battalions in the Fleet Marine Force and to Naval Dental Clinics located abroad Marine bases. The Dental Battalion, one of eight battalions of the Force Service Support Group, is organized and staffed to support a Marine Expeditionary Force. Each of the dental clinics is under the cognizant authority of the respective base commander. During peacetime dental treatment is provided at permanent fixed facilities with equipment procured and maintained by the Navy. During contingencies and during deliberate military operations, the Dental Battalion will deploy with the Marine Air Ground Task Force and continue its support throughout the duration of the operation.

The Dental Battalion has proven itself as an extremely effective organization capable of meeting all tasks expeditiously, while exhibiting the flexibility and mobility needed in expeditionary operations. The battalion is prepared for immediate deployment, is comprised of fully trained personnel, who are familiar with Marine doctrine, policy, concepts of operation, and tactics. The battalion, like the remainder of the force, can be quickly task organized to support any sized MAGTF for civic action operations and humanitarian assistance when required.

The Dental Battalion is fully integrated into all operational planning and training commitments. It is combat ready and prepared to execute a comprehensive dental support program in any environment or contingency. The dental support received by the Marine Corps makes a crucial contribution to overall combat readiness and represents a classic example of the Navy-Marine team in action.



Resource Allocation Overview

6

The DoD Planning, Programming and Budgeting System (PPBS) is the framework within which decisions are made that shape the character and capabilities of our forces. Marine Corps participation in the PPBS provides a vigorous process for requirements determination and validation, comparison of competing alternatives, continuous review and assessment of ongoing programs, and eventually the resources needed to execute approved programs. Plans emerge from operational requirements, formal guidance and policies. Planning determines the Marine Corps force structure and capabilities necessary to support assigned roles and missions in support of national security objectives.

Programs supply resources to the most essential capabilities contained in the plans. Programming connects the plans to the budget. Programming translates plans and their supporting requirements into specific and discrete components of personnel, materiel, systems and resources that permit execution of approved programs within expected fiscal limits. Through a variety of forums the programming process makes assessments of Marine requirements, establishes priorities, and allocates resources. The programs, as approved by the Secretary of the Navy and the Secretary of Defense, constitute the Service's input into the budgeting cycle. Budgets are submitted through a series of reviews and eventually form a portion of the Presidential Budget Submit. This proposed budget is then authorized and appropriated to finalize allocation of resources to these programs.

FIGURE 6-1:
OVERVIEW OF PLANNING, PROGRAMMING AND BUDGETING SYSTEM (PPBS)

- **Planning**
 - Assess the threat
 - Develop strategy and policy
 - Develop force planning guidance
 - Identify required capabilities in order of priority within and between mission areas
- **Programming**
 - Translate plans into achievable program packages
 - Apply resources
 - Develop the Six Year Defense Plan
- **Budgeting**
 - Translate program decisions into budget justification format
 - Review programs for executability and acquisition strategy

Marine Corps Planning and Programming

Marine Corps Planning:

The Marine Corps plans and programs within the DoD PPBS through development of documents comprising the Joint Strategic Planning System (JSPS), strong participation in the Navy program planning process, and development of internal Marine Corps long-range, mid-range, and short-range plans. Close and continuous coordination and active participation by all concerned maximize the Marine Corps contribution to national military strategy.

Listed below are Marine Corps internal plans required for Marine Corps program development. The Commanding General of the Marine Corps Combat Development Center is responsible for the following plans except where indicated otherwise.

The Marine Corps Campaign Plan (MCCP) is the foundation document for Marine Corps internal planning. The MCCP describes the contribution of the Marine Corps to national security, the probable missions of Marine forces, and the expectations and limitations for force employment. The plan gives specific direction to the FMF to achieve certain objectives within a definite time period. The MCCP also provides direction to supporting agencies on all relevant issues which reflect the Commandant's intent and his vision of the future Marine Corps. The plan provides the forum to capture innovative concepts and methodologies, and to institutionalize Marine Corps planning processes, CMC policies, and needed programming initiatives. The plan provides direction to the Concepts-Based Requirements System for changes to doctrine, training, force structure, and materiel.

The Campaign Plan also serves as an enduring statement of the central values, tenets, convictions, and doctrinal principles of the entire Marine Corps organization. In this last purpose, it serves as guidance for all Marines tasked to articulate overall Marine Corps goals and objectives.

The Marine Corps Long-Range Plan (MLRP) is an explanation of concepts and goals considered essential for the Marine Corps to accomplish its mission 10 to 20 years into the future. It is based upon the Commandant's guidance, the future threat, and technology research. The MLRP makes general assumptions and projections about the operational environment of the future. It describes future national strategies and how the Marine Corps supports those strategies through military capabilities. It presents, through classified annexes, future technologies with military potential, and a global threat assessment.

The MAGTF Master Plan (MMP) establishes the operational foundation for the organization, manning, equipping, training, and development of doctrine and operational techniques for MAGTFs. It addresses the mid-range period (to 10 years in the future) and provides resource allocation guidance. The MMP provides guidance for the development of detailed subordinate plans that identify in detail the actions needed in doctrine, training, organization, and equipment to ensure that MAGTFs have the capability described in the MMP. In this way, programming of new equipment and weapon systems initiatives will be directly linked to operational planning. The MMP and its subordinate plans identify prioritized MAGTF requirements for introduction into the PPBS. The MMP is published biennially by the CG MCCDC based upon the Commandant's guidance, and updated annually.

The Supporting Establishment Master Plan (SEMP) is the non-FMF counterpart to the MMP. Developed concurrently with the MMP, it ensures proper consideration of all non-FMF resources to achieve maximum possible support of the goals of the MMP. The non-FMF supporting establishment objectives detailed in the SEMP provide guidance for program development for the non-FMF and supporting establishment. The DC/S Installations and Logistics (I&L) is responsible for the SEMP.

Marine Corps Programming:

The Deputy Chief of Staff for Requirements and Programs (DC/S R&P) is responsible for development of the Marine Corps' input to the Department of the Navy Program Objective Memorandum (DON POM). The Marine Corps input is developed in response to the Defense Planning Guidance (DPG) and Marine Corps MAGTF Master Plan. In addition to these documents, the DC/S R&P incorporates the goals and objectives expressed during the Program development cycle by the Commandant of the Marine Corps and the Secretary of the Navy's DON Consolidated Planning and Programming Guidance (DNCPPG). The expressed needs of the CINCs are also carefully considered in the process.

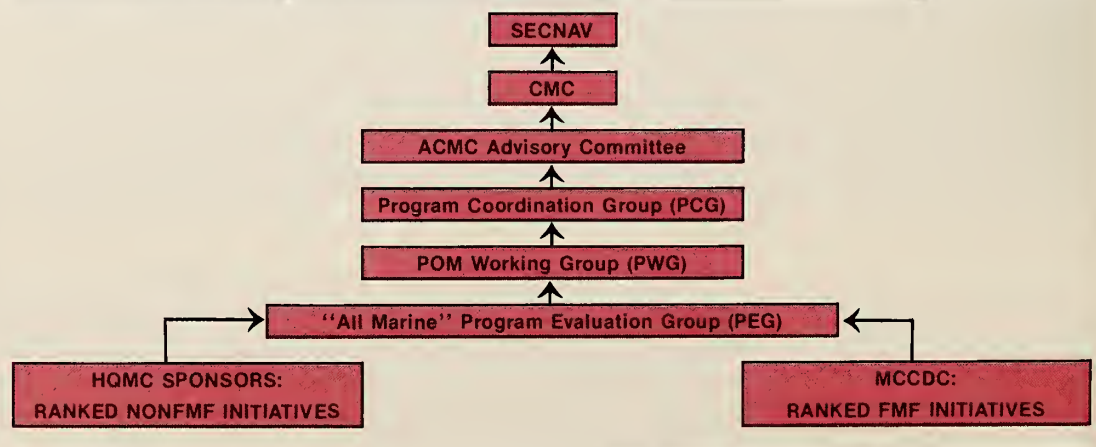
Close, continuous coordination with the Navy staff and vigorous participation in their program planning process by all commands and staff agencies is a vital ingredient of program development.

The essence of programming is fitting the demands and requirements of both plans within available resources in such a manner that produces the most capability. The full and energetic participation of all staff agencies and commands permits consideration of all factors, both internal and external, and develop the optimum program strategy for the Marine Corps.

When program initiatives are submitted into the PPBS/POM process, these initiatives are prioritized with respect to all other submitted program initiatives. Initiatives are considered over and above an artificially low funding level set for the "core" programs to force discrimination and identification of lower priority programs. These lower priority programs are then required to recompete for funding with all other identified deficiencies and new initiatives. Program priorities within the POM process are established using decision analytical tools, assessment of operational need, and cost-benefit analysis so that the programming committees can objectively establish priorities among unlike programs. The top programs from the initiative prioritization process that can be accommodated above the core and within the established funding ceiling form the new Marine Corps POM.

The result of this process is then submitted for consideration by the Secretary of the Navy and inclusion with the U.S. Navy input to what becomes the DON POM. The DON POM (and other service POMs) are then reviewed in detail by the Defense Planning and Resources Board (DPRB) and the Secretary of the Defense.

FIGURE 6-2
STRUCTURE FOR POM DEVELOPMENT AND REVIEW



The most mature 2 years of the POM then go through extensive reviews by the Navy Comptroller and Office of the Secretary of Defense (OSD) before they transition into the Marine Corps' portion of the President's Budget. At that time they become the management responsibility of the Fiscal Director of the Marine Corps and appropriation sponsors.

Financial resources are the funds that are programmed, budgeted, appropriated, obligated, and finally expended to cover service investment and operational requirements. Total Obligational Authority (TOA) refers to the total financial resources available to DoD. The Secretary of Defense allocates the DoD TOA to the three Military Departments. The Secretary of the Navy further divides resources between the Marine Corps and the Navy based on operational needs. Displayed below in Figure 6-3 is the TOA for all of DoD from FY-87 through the FY-91 Presidential Budget:

FIGURE 6-3

TOA FOR ALL DOD, FY-87—FY-91, PRESIDENTIAL BUDGET

	FY-87	FY-88	FY-89	FY-90	FY-91
\$ Billion	279.5	283.2	290.8	291.4	295.1

Directly following in figures 6-4 and 6-5 are charts which display the percentage of DoD funds budgeted by each service/agency. This TOA is subsequently divided into appropriations.

FIGURE 6-4

**DoD FY-90/1 TOTAL OBLIGATIONAL AUTHORITY
BY SERVICE**

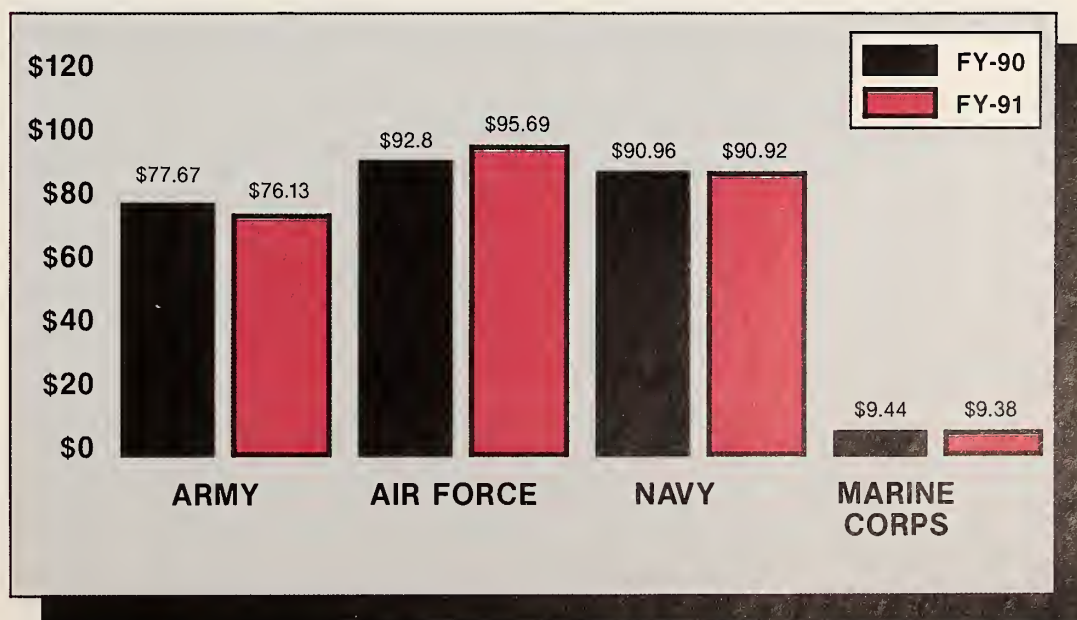
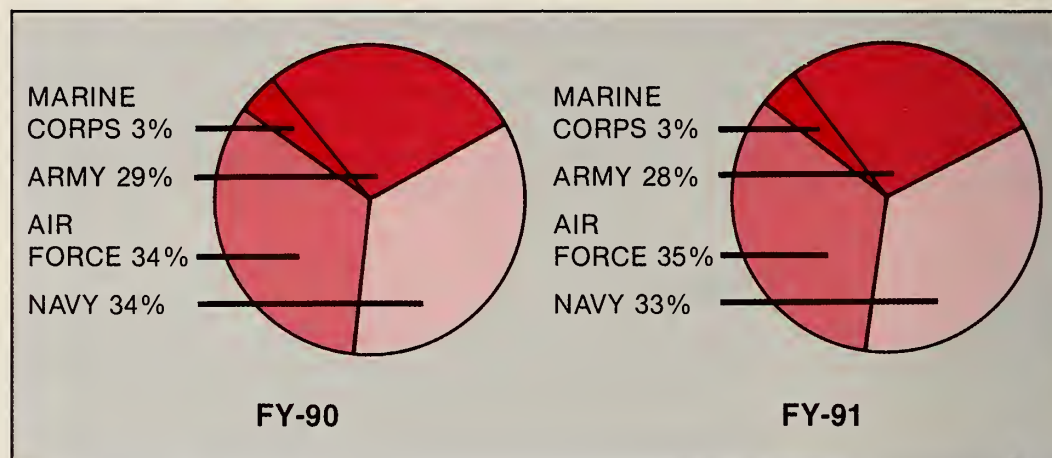


FIGURE 6-5

**DoD TOTAL OBLIGATIONAL AUTHORITY
BY SERVICE**



Appropriations:

An appropriation is the legal apportionment by an act of Congress to incur obligations for specified purposes and to make payments from the Treasury of the United States. Funds may be expended only for the purpose for which appropriated. Following are the USMC appropriation titles with a brief synopsis of what each provides:

● **Military Personnel, Marine Corps (MPMC)**

For pay, allowances, individual clothing, subsistence, interest on deposits, expenses for organization movements, and expenses of temporary duty travel between permanent duty stations.

● **Reserve Personnel, Marine Corps (RPMC)**

For pay, allowances, clothing, subsistence, gratuities, travel, and related expenses for personnel of the Marine Corps Reserve on active duty.

● **Operation and Maintenance, Marine Corps (O&MMC)**

For expenses necessary for support of the FMF, civilian employee pay, travel and transportation, training, consumable supplies, recruiting and advertising, base operations and base communications.

● **Operation and Maintenance, Marine Corps Reserve (O&MMCR)**

For expenses necessary for the operation and maintenance, including training, organization and administration of the Marine Corps Reserve; repair of facilities and equipment; hire of passenger motor vehicles; travel and transportation; and communications.

● **Procurement, Marine Corps (PMC)**

For expenses necessary for the procurement and manufacture of ammunition, weapons and tracked combat vehicles, guided missiles and equipment, communications and electronics, support vehicles, engineer and other equipment and spares for repair parts.

The following are Navy appropriations of which the Marine Corps programs its resources allocated by the Secretary of the Navy. These appropriations are divided into the blue/green (Navy/Marine Corps) split.

- **Military Construction, Navy (MCON)**

For acquisition, construction and installation of temporary or permanent public works, naval installations and facilities for the Navy and the Marine Corps.

- **Family Housing, Navy and Marine Corps (FHN&MC)**

For the construction, maintenance, repair and design of Navy and Marine Corps housing and ancillary facilities required by bases and stations.

- **Navy Stock Fund (NSF)**

For the procurement of stock funded War Reserve Materiel required to achieve a materiel support posture to provide war reserve asset levels and inventory objectives for combat-critical items. Examples include: supplies, minor items of equipment, and parts used in the manufacture, assembly or repair of items of equipment.

- **Military Construction, Navy Reserve (MCNR)**

For construction, acquisition, expansion, rehabilitation, and conversion of facilities for the training and administration of the reserve components of the Navy and Marine Corps.

A display of the TOA in millions of dollars allocated to each of these appropriations is displayed below:

FIGURE 6-6
MARINE CORPS TOA

	FY-88	FY-89	FY-90	FY-91
MPMC	5,563	5,679	5,794	5,919
RPMC	294	315	315	336
O&MMC	1,832	1,840	1,809	1,948
O&MMCR	70	77	77	86
PMC	1,276	1,292	1,075	782
NSF(MC)	21	33	20	26
FHMC	158	157	153	138
MCON	235	276	178	142
MCNR	27	5.0	16	9
TOTAL	9,476	9,674	9,437	9,386

FIGURE 6-7
USMC FY-90 TOA
BY APPROPRIATION

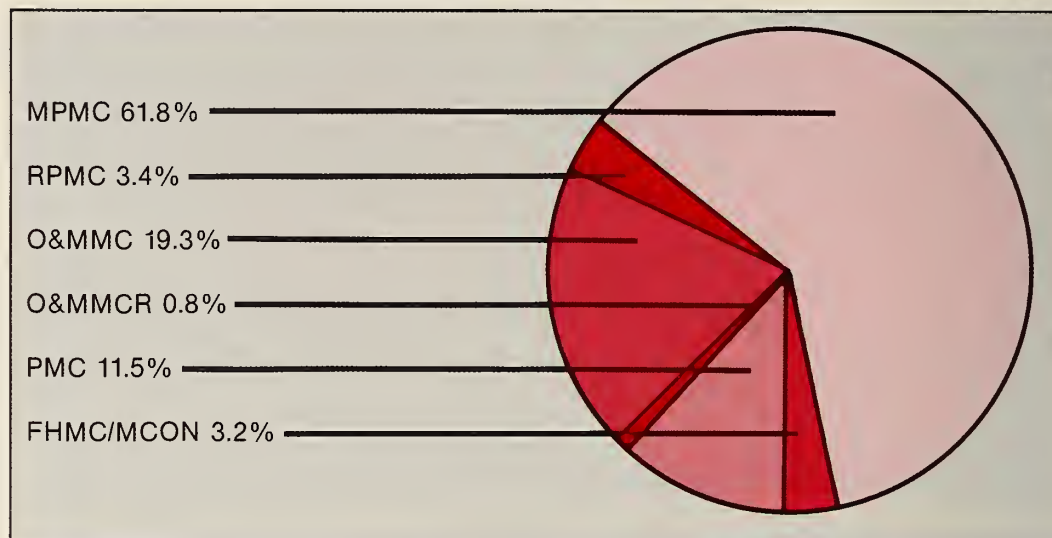


FIGURE 6-8
USMC FY-91 TOA
BY APPROPRIATION

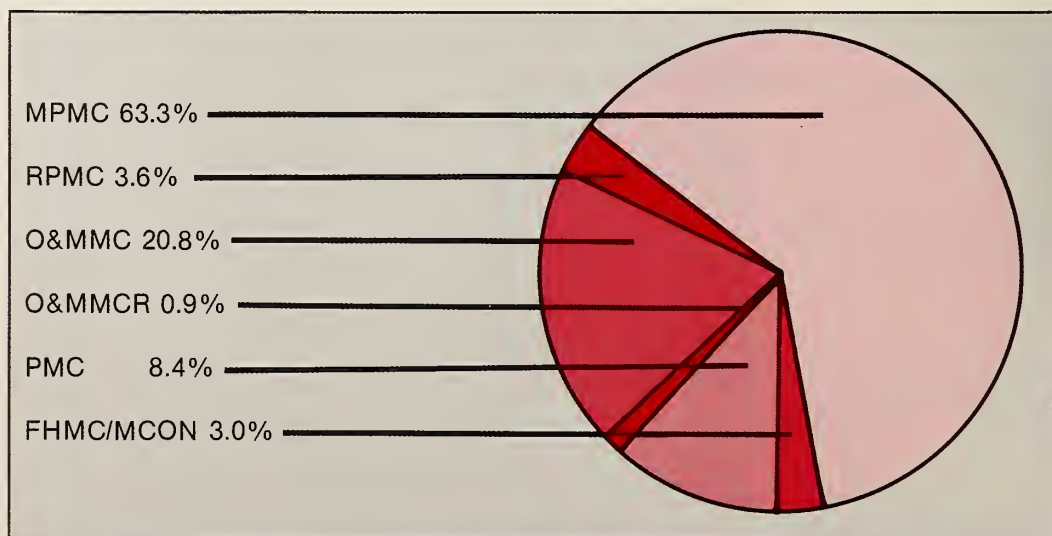
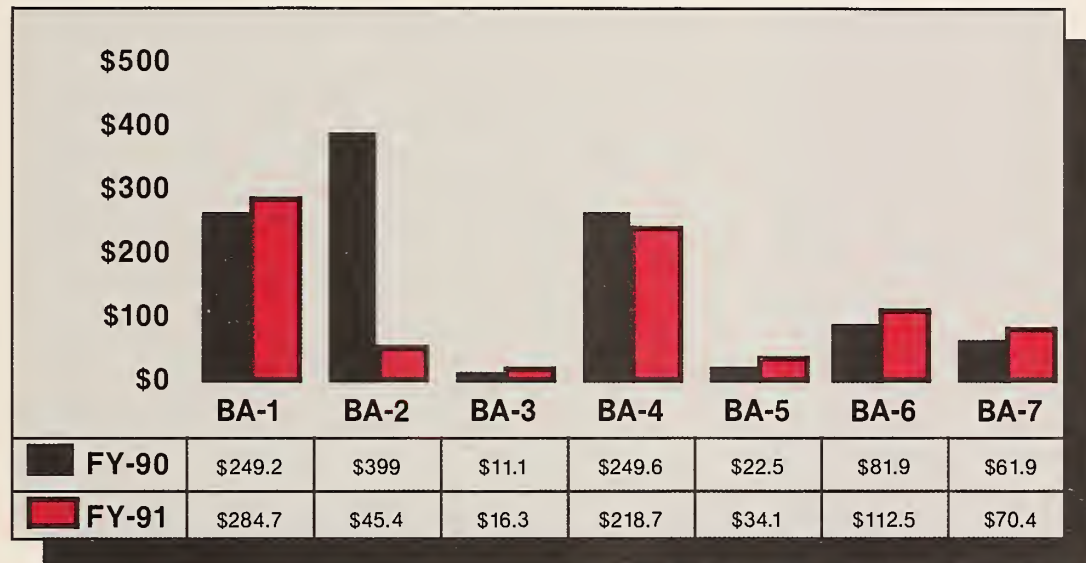


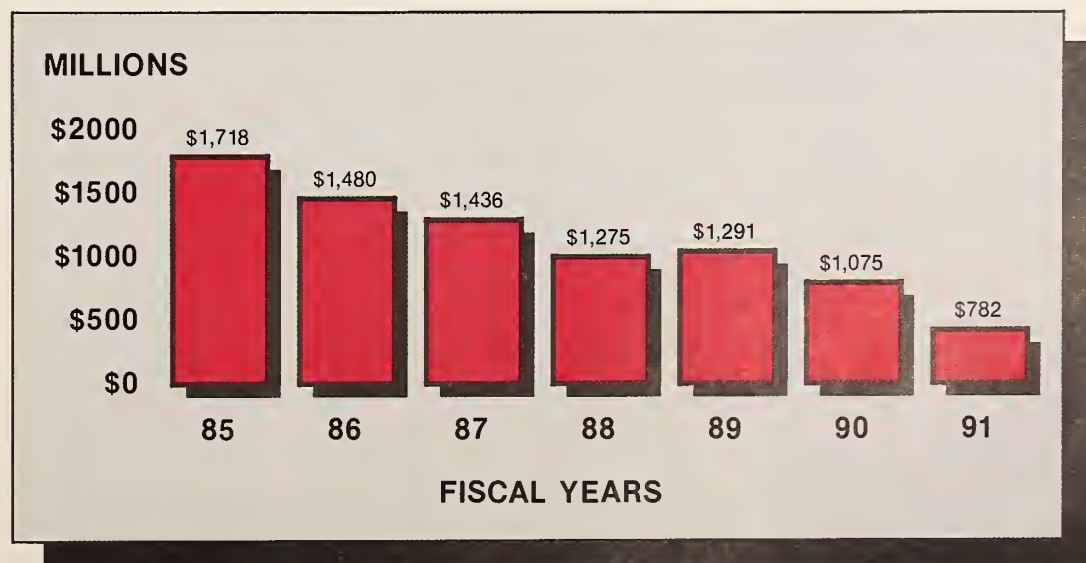
FIGURE 6-9
PROCUREMENT
BY BUDGET ACTIVITY



BUDGET ACTIVITY

- BA-1: AMMUNITION
- BA-2: WEAPONS AND COMBAT VEHICLES
- BA-3: GUIDED MISSILES AND EQUIPMENT
- BA-4: COMMUNICATIONS AND ELECTRONICS EQUIPMENT
- BA-5: SUPPORT VEHICLES
- BA-6: ENGINEER AND OTHER EQUIPMENT
- BA-7: SPARES AND REPAIR PARTS

FIGURE 6-10
MARINE CORPS PROCUREMENT RESOURCES
PMC APPROPRIATIONS BY FISCAL YEAR





Appendix A

Glossary

AAAV	ADVANCED AMPHIBIOUS ASSAULT VEHICLE
AAV	ASSAULT AMPHIBIOUS VEHICLE
AAWS-M	ADVANCED ANTITANK WEAPON SYSTEM-MEDIUM
ACE	AVIATION COMBAT ELEMENT
ACMC	ASSISTANT COMMANDANT OF THE MARINE CORPS
ADP	AUTOMATED DATA PROCESSING
AE	ASSAULT ECHELON
AFATDS	ARMY FIELD ARTILLERY TACTICAL DATA SYSTEM
AFOE	ASSAULT FOLLOW-ON ECHELON
AFSS	AUTOMATIC FIRE SENSING AND SUPPRESSION SYSTEM
AIS	AUTOMATED INFORMATION SYSTEM
AMDAS	AIRBORNE MINE DETECTION AND SURVEILLANCE SYSTEM
AMASS	ADVANCED MARINE AIRBORNE SIGNALS INTELLIGENCE SYSTEM
ANVIS	AVIATOR'S NIGHT VISION IMAGING SYSTEM
AOA	AMPHIBIOUS OBJECTIVE AREA
APFSDS-T	ARMOR PIERCING FIRE STABILIZED DISCARDING SABOT-TRACER
APN	AIRCRAFT PROCUREMENT, NAVY
APOBS	ANTI-PERSONNEL OBSTACLE BREACHING SYSTEM
APPN	APPROPRIATION
ARBS	ANGLE RATE BOMBING SYSTEM
ASIP	ALL SOURCE IMAGERY PROCESSOR
ATACC	ADVANCED TACTICAL AIR COMMAND CENTRAL
ATARS	ADVANCED TACTICAL AERIAL RECONNAISSANCE SYSTEM
ATD	ADVANCED TECHNOLOGY DEMONSTRATION
ATF	AMPHIBIOUS TASK FORCE
ATO	AIR TASKING ORDER
AVLB	ARMORED VEHICLE LAUNCHED BRIDGE
AVN	AVIATION
BCS	BATTERY COMPUTER SYSTEM
BEQ	BACHELOR ENLISTED QUARTERS
BLEPS	BALLISTIC LASER EYE PROTECTION SYSTEM
C2I	COMMAND, CONTROL AND INTELLIGENCE
C4	COMMAND, CONTROL, COMMUNICATIONS AND COMPUTER SYSTEMS
CA	COMMERCIAL ACTIVITIES
CAEMS	COMPUTER AIDED EMBARKATION MANAGEMENT SYSTEM
CAL	CALIBER
CAM	CHEMICAL AGENT MONITOR
CAST	COMBINED ARMS STAFF TRAINER
CATF	COMMANDER AMPHIBIOUS TASK FORCE
CATFAE	CATAPULT LAUNCHED FUEL-AIR EXPLOSIVE LAND MINE COUNTERMEASURE
CAX	COMBINED ARMS EXERCISE
CBTZ	COMBAT ZONE
CCO	COMMUNICATIONS COLLECTION OUTSTATION
CCS	COUNTERINTELLIGENCE COMMUNICATIONS SYSTEM
CE	COMMAND ELEMENT OR COMBAT EXCAVATOR
CECM	COMMUNICATION ELECTRONIC COUNTERMEASURES (CECM)
CEP	CIRCULAR ERROR PROBABLE
CG	COMMANDING GENERAL
CHG PROP WB	CHARGE PROPELLENT WHITE BAG
CI	COUNTERINTELLIGENCE
CIEP	COUNTERINTELLIGENCE EQUIPMENT PROGRAM

CINC	COMMANDER-IN-CHIEF
CINCLANTFLT	COMMAMDER-IN-CHIEF ATLANTIC FLEET
CINCPACFLT	COMMAMDER-IN-CHIEF PACIFIC FLEET
CI&SE	COUNTERINTELLIGENCE AND SECURITY EQUIPMENT
CITS	COUNTERINTELLIGENCE TEAMS
CMC	COMMANDANT OF THE MARINE CORPS
COEA	COST AND OPERATIONAL EFFECTIVENESS ANALYSIS
COMMCON	COMMUNICATIONS CONTROL
COMINT	COMMUNICATIONS INTELLIGENCE
COMMZ	COMMUNICATION ZONE
COMSEC	COMMUNICATIONS SECURITY
CONUS	CONTINENTAL UNITED STATES
CP	COMMAND POST
CSP	CONTINGENCY SUPPORT PACKAGE
CSSE	COMBAT SERVICE SUPPORT ELEMENT
CUDIX	COMMON USER DIGITAL EXCHANGE
CV	CARGO VARIANT
CVBG	CARRIER BATTLE GROUP
CY	CALENDAR YEAR
DAB	DEFENSE ACQUISITION BOARD
DAMA	DEMAND ASSIGNED MULTIPLE ACCESS
DASC	DIRECT AIR SUPPORT CENTER
DCS	DEFENSE COMMUNICATIONS SYSTEM
DC/S	DEPUTY CHIEF OF STAFF
DCT	DIGITAL COMMUNICATIONS TERMINAL
DE	DIRECTED ENERGY
DECM	DEFENSIVE ELECTRONIC COUNTER MEASURES
DEMVAL	DEMONSTRATION AND VALIDATION
DEP	DELAYED ENTRY PROGRAM
DF	DIRECTION FINDING
DI	DRILL INSTRUCTOR
DMA	DEPOT MAINTENANCE ACTIVITY
DNCPPG	DEPARTMENT OF THE NAVY CONSOLIDATED PLANNING AND PROGRAMMING GUIDANCE
DNRS	DAY/NIGHT RANGE SIGHT
DP	DUAL PURPOSE
DPG	DEFENSE PLANNING GUIDANCE
DPICM	DUAL PURPOSE IMPROVED CONVENTIONAL MUNITION
DOD	DEPARTMENT OF DEFENSE
DON	DEPARTMENT OF THE NAVY
DPRB	DEFENSE PLANNING AND RESOURCES BOARD
DT	DEVELOPMENTAL TEST
DTDMA	DISTRIBUTED TIME DIVISION MULTIPLE ACCESS
DWFK	DEEP WATER FORDING KIT
EAAK	ENHANCED APPLIQUE ARMOR KIT
ECCM	ELECTRONIC COUNTER-COUNTERMEASURES
ECM	ELECTRONIC COUNTERMEASURES
ECO	ELINT COLLECTION OUTSTATION
EDM	ENGINEERING DEVELOPMENT MODEL
ELINT	ELECTRONIC INTELLIGENCE
EMC	ELECTRONIC MAINTENANCE COMPLEX

EMGUN	ELECTROMAGNETIC GUN
EMI	ELECTRO-MAGNETIC INTERFERENCE
EO	ELECTRO-OPTICAL
EOB	ELECTRONIC ORDER OF BATTLE
EOD	EXPLOSIVE ORDNANCE DISPOSAL
ER	EFFICIENCY REVIEW
ESS	ELECTRONIC INTELLIGENCE (ELINT) SUPPORT SYSTEM
EUCE	END USER COMPUTING EQUIPMENT
EW	ELECTRONIC WARFARE
EWSM	ELECTRONIC WARFARE SUPPORT MEASURES
FAC	FORWARD AIR CONTROLLER
FAT	FIRST ARTICLE TESTING
FDC	FIRE DIRECTION CENTER
FEBA	FORWARD EDGE OF THE BATTLE AREA
FHN&MC	FAMILY HOUSING, NAVY AND MARINE CORPS
FIE	FLY-IN ECHELON
FLIR	FORWARD LOOKING INFRARED
FLTSAT	FLEET SATELLITE
FM	FREQUENCY MODULATION
FMF	FLEET MARINE FORCE
FMFLANT	FLEET MARINE FORCE, ATLANTIC
FMFPAC	FLEET MARINE FORCE, PACIFIC
FO	FORWARD OBSERVER
FOCS	FIBER OPTICS CABLE SYSTEM
FSCC	FIRE SUPPORT COORDINATION CENTER
FSO	FULL SCALE DEVELOPMENT
FSO	FULL SCALE ENGINEERING DEVELOPMENT
FSSG	FORCE SERVICE SUPPORT GROUP
FTS	FULL-TIME SUPPORT
FY	FISCAL YEAR
GCE	GROUND COMBAT ELEMENT
GCS	GROUND CONTROL STATION
GP	GENERAL PURPOSE
GPH	GALLONS PER HOUR
GPS	GLOBAL POSITIONING SYSTEM
GTRS	GROUND THREAT RADAR SIMULATOR
HARM	HOMING ANTIRADIATION MISSILE
HAW	HEAVY ANTIARMOR WEAPON
HEAA	HIGH EXPLOSIVE ANTIARMOR
HEAT	HIGH EXPLOSIVE ANTITANK
HEAT-MP-T	HEAT-MULTI-PURPOSE-TRACER
HEDP	HIGH EXPLOSIVE, DUAL PURPOSE
EMTT	HEAVY EXPANDED MOBILITY TACTICAL TRUCK
HFCC	HIGH FREQUENCY COMMUNICATIONS CENTRAL
HMMWV	HIGH MOBILITY MULTIPURPOSE WHEELED VEHICLE
HOW	HOWITZER
HP	HORSEPOWER
HQ	HAVE QUICK
HQMC	HEADQUARTERS MARINE CORPS
HUMINT	HUMAN INTELLIGENCE
IAC	INTELLIGENCE ANALYSIS CENTER

ICAD	INDIVIDUAL CHEMICAL AGENT DETECTOR
ICM	IMPROVED CONVENTIONAL MUNITIONS
IDASC	IMPROVED DIRECT AIR SUPPORT CENTRAL
IDB	INTEGRATED DATA BASE
IFF	IDENTIFICATION FRIEND OR FOE
ILLUM	ILLUMINATION
IMA	INTERMEDIATE MAINTENANCE ACTIVITY
IMC	INTEGRATED MANEUVER CONTROLLER
IMINT	IMAGERY INTELLIGENCE
IMS	INSTRUCTIONAL MANAGEMENT SYSTEM
INTEL	INTELLIGENCE
IOC	INITIAL OPERATING CAPABILITY
IR	INFRARED
IRR	INDIVIDUAL READY RESERVE
ISD	INSTRUCTIONAL SYSTEMS DEVELOPMENT
ISIS	INTEGRATED SIGNALS INTELLIGENCE SYSTEM
ISO	INTERNATIONAL STANDARDIZATION ORGANIZATION
ISOR	INITIAL STATEMENT OF REQUIREMENT
IU	INTERROGATION UNIT
JCS	JOINT CHIEFS OF STAFF
JINTACCS	JOINT INTEROPERABILITY TACTICAL COMMAND AND CONTROL SYSTEM
JSIP	JOINT SERVICE IMAGERY PROCESSING SYSTEM
JTIDS	JOINT UNIFORM MILITARY PAY SYSTEM/MANPOWER MANAGEMENT SYSTEM
KE	KINETIC ENERGY
KHZ	KILOHERTZ
LAAD	LOW ALTITUDE AIR DEFENSE
LAI	LIGHT ARMORED INFANTRY
LAAM	LIGHT ANTI-AIRCRAFT MISSILE
LAW	LIGHTWEIGHT ANTI-ARMOR WEAPON
LAV	LIGHT ARMORED VEHICLE
LEWDD	LIGHTWEIGHT EARLY WARNING DETECTION DEVICE
LCAC	LANDING CRAFT AIR CUSHION
LEASAT	LEASED SATELLITE
LHD	AMPHIBIOUS ASSAULT SHIP (MULTI-PURPOSE)
LIC	LOW INTENSITY CONFLICT
LLI	LONG LEAD ITEM
LOB	LINE-OF-BEARING
LPH	LANDING SHIP HELICOPTER
LRIP	LOW RATE OF INITIAL PRODUCTION
LVS	LOGISTICS VEHICLE SYSTEM
LWCMS	LIGHT WEIGHT COMPANY MORTAR SYSTEM
MACCS	MARINE AVIATION COMMAND AND CONTROL SYSTEM
MAG	MARINE AIRCRAFT GROUP
MAGIS	MARINE AIR-GROUND INTELLIGENCE SYSTEM
MAGTEC	MARINE AIR-GROUND TRAINING AND EDUCATION CENTER
MAGTF	MARINE AIR-GROUND TASK FORCE
MARDIV	MARINE DIVISION
MAW	MARINE AIR WING
MAWTS-1	MARINE AVIATION WEAPONS AND TACTICS SQUADRON-ONE
MBST	MARINE BATTLE SKILLS TRAINING
MBT	MAIN BATTLE TANK

MCAGCC	MARINE CORPS AIR GROUND COMBAT CENTER
MCAS	MARINE CORPS AIR STATION
MCB	MARINE CORPS BASE
MCCDC	MARINE CORPS COMBAT DEVELOPMENT COMMAND
MCCP	MARINE CORPS CAMPAIGN PLAN
MCCRES	MARINE CORPS COMBAT READINESS EVALUATION SYSTEM
MCLB	MARINE CORPS LOGISTICS BASE
MCMWTC	MARINE CORPS MOUNTAIN WARFARE TRAINING CENTER
MCON	MILITARY CONSTRUCTION, NAVY RESERVE
MCNR	MILITARY CONSTRUCTION, NAVY RESERVE
MCRDAC	MARINE CORPS RESEARCH, DEVELOPMENT, AND ACQUISITION COMMAND
MCSF	MARINE CORPS STOCK FUND
MEB	MARINE EXPEDITIONARY BRIGADE
MEF	MARINE EXPEDITIONARY FORCE
MEU	MARINE EXPEDITIONARY UNIT
MEU(SOC) CAPABLE	MARINE EXPEDITIONARY UNIT (SPECIAL OPERATIONS CAPABLE)
MEWSS	MOBILE ELECTRONIC WARFARE SUPPORT SYSTEM
MHZ	MEGAHERTZ
MILES	MULTIPLE INTEGRATED LASER ENGAGEMENT SYSTEM
MIUW	MOBILE INSHORE UNDERSEA WARFARE
MLR	MEDIUM LIFT REPLACEMENT
MLRP	MARINE CORPS LONG RANGE PLAN
MLRS	MULTIPLE LAUNCHER ROCKET SYSTEM
MM	MILLIMETER
MMP	MAGTF MASTER PLAN
MORDT	MOBILIZATION OPERATIONAL READINESS DEPLOYMENT TEST
MOS	MILITARY OCCUPATIONAL SPECIALTY
MOUT	MILITARY OPERATIONS IN URBAN TERRAIN
MPF	MARITIME PREPOSITIONING FORCE
MPMC	MILITARY PERSONNEL, MARINE CORPS
MPN	MILITARY PERSONNEL, NAVY
MPR	MANPOWER
MPS	MARITIME PREPOSITIONING SHIPS
MRDP	MANPOWER REQUIREMENTS DETERMINATION PROGRAM
MRV	MISSION ROLE VEHICLE
MSC	MILITARY SEALIFT COMMAND
MTCCS	MARINE TACTICAL COMMAND AND CONTROL SYSTEM
MTS	MOVING TARGET SIMULATOR
MTWS	MAGTF TACTICAL WARFARE SIMULATION
MULE	MODULAR UNIVERSAL LASER EQUIPMENT
NALMEB	NORWAY AIR-LANDED MEB
NATO	NORTH ATLANTIC TREATY ORGANIZATION
NAVCHAPGRU	NAVY CARGO HANDLING AND PORT GROUP
NBC	NUCLEAR, BIOLOGICAL AND CHEMICAL
NBCRS	NBC RECONNAISSANCE SYSTEM
NCA	NATIONAL COMMAND AUTHORITY
NCO	NONCOMMISSIONED OFFICER
NDI	NON-DEVELOPMENTAL ITEM
NDRF	NATIONAL DEFENSE RESERVE FLEET
NIPS	NAVAL INTELLIGENCE PROCESSING SYSTEM
NM	NAUTICAL MILE

NMCB	NAVY MOBILE CONSTRUCTION BATTALION
NOSC	NAVAL OCEAN SYSTEMS CENTER
NSA	NATIONAL SECURITY AGENCY
NSE	NAVY SUPPORT ELEMENT
NSF	NAVY STOCK FUND
NSFS	NAVAL SURFACE FIRE SUPPORT
NTS	NAVAL TELECOMMUNICATIONS SYSTEM
O&MMC	OPERATION AND MAINTENANCE, MARINE CORPS
O&MMCR	OPERATION AND MAINTENANCE, MARINE CORPS RESERVE
O&MN	OPERATION AND MAINTENANCE, NAVY
O&MNR	OPERATION AND MAINTENANCE, NAVY RESERVE
OPEVAL	OPERATIONAL EVALUATION
OPN	OTHER PROCUREMENT, NAVY
OSCC	OPERATIONAL SYSTEMS CONTROL CENTER
OSD	OFFICE OF THE SECRETARY OF DEFENSE
OT	OPERATIONAL TESTING
OT&E	OPERATIONAL TEST AND EVALUATION
OTH	OVER THE HORIZON
PAA	PROGRAMMED AIRCRAFT AUTHORIZATION
PALCON	PALLET CONTAINER
PCG	PROGRAM COORDINATION GROUP
PCPS	PORTABLE COLLECTIVE PROTECTION SYSTEM
PCS	PORTABLE CONTROL STATION
PDA	PRINCIPAL DESIGN ACTIVITY
PDR	PRELIMINARY DESIGN REVIEW
PEG	PROGRAM EVALUATION GROUP
PEI	PRINCIPAL END ITEM
PGTS	PRECISION GUNNERY TRAINING SYSTEM
PHLS	PORTABLE HELICOPTER LIGHTING SET
PIP	PRODUCT IMPROVEMENT PROGRAM
PLRS	POSITION LOCATION REPORTING SYSTEM
PMC	PROCUREMENT, MARINE CORPS
PME	PROFESSIONAL MILITARY EDUCATION
PMS	PEDESTAL MOUNTED STINGER
POL	PETROLEUM, OIL AND LUBRICANTS
POM	PROGRAM OBJECTIVE MEMORANDUM
PPBS	PLANNING, PROGRAMMING AND BUDGETING SYSTEM
PP&O	PLANS, POLICIES AND OPERATIONS
PSI	POUNDS PER SQUARE INCH
PWG	POM WORKING GROUP
QMA	QUALIFIED MILITARY APPLICANTS
QOL	QUALITY OF LIFE
QUADCON	QUADRUPLE CONTAINER
R&D	RESEARCH AND DEVELOPMENT
RB	RED BAG
R/DF	REPRODUCTION/DISTRIBUTION FACILITY
RDT&EN	RESEARCH, DEVELOPMENT, TEST AND EVALUATION NAVY
RETS	REMOTE ENGAGEMENT TARGET SYSTEM
RF	RADIO FREQUENCY
RFP	REQUEST FOR PROPOSAL
RHA	ROLLED HOMOGENEOUS ARMOR

RKT	ROCKET
RMP	REPROGRAMMABLE MICROPROCESSOR
ROC	REQUIRED OPERATIONAL CAPABILITY
RO/RO	ROLL-ON/ROLL-OFF
RPMC	RESERVE PERSONNEL, MARINE CORPS
RPN	RESERVE PERSONNEL, NAVY
RPPS	RETIRED PAY PERSONNEL SYSTEMS
RPV	REMOTELY PILOTED VEHICLE
RRC	RIGID RAIDER CRAFT
RRF	READY RESERVE FLEET
RWR	RADAR WARNING RECEIVER
SAAS	STAND ALONE ANALYSIS SYSTEM
SAL-GP	SEMIACTIVE, LASER-GUIDED PROJECTILE
SAR	SEARCH AND RESCUE
SARTS	SMALL ARMS REMOTE TARGETS
SATCOM	SATELLITE COMMUNICATIONS
SCN	SHIPBUILDING AND CONVERSION, NAVY
SCRE	STRATIFIED CHARGE ROTARY ENGINE
SE	SUPPORTING ESTABLISHMENT
SEAL	SEA-AIR-LAND
SECNAV	SECRETARY OF THE NAVY
SFD	SUB-FIRING DEVICE
SHF	SUPER HIGH FREQUENCY
SIGINT	SIGNALS INTELLIGENCE
SINGGARS	SINGLE CHANNEL GROUND AND AIRBORNE RADIO SYSTEM
SIXCONS	FUEL/WATER STORAGE AND PUMP MODULES
SLAR	SIDE LOOKING AIRBORNE RADAR
SLEP	SERVICE LIFE EXTENSION PROGRAM
SLOC	SEA LINES OF COMMUNICATION
SMAW	SHOULDER-LAUNCHED MULTIPURPOSE ASSAULT WEAPON
SMCR	SELECTED MARINE CORPS RESERVE
SMK	SMOKE
SOC	SPECIAL OPERATIONS CAPABLE
SOI	SCHOOL OF INFANTRY
SP	SELF PROPELLED
SPEED	SYSTEMS PLANNING, ENGINEERING, AND EVALUATION DEVICE
SRI	SURVEILLANCE, RECONNAISSANCE, AND INTELLIGENCE
SRAW	SHORT RANGE ANTI-TANK WEAPON
STA	SURVEILLANCE AND TARGET ACQUISITION
TACAIR	TACTICAL AIR
TACC	TACTICAL AIR COMMAND CENTER
TACDM	TACTICAL DECISION MAKING
TAOM	TACTICAL AIR OPERATIONS MODULE
TADIL-J	TACTICAL DIGITAL INFORMATION LINK-J
TAH	HOSPITAL SHIP
TAMP	TERMINALLY GUIDED ANTI-ARMOR MORTAR PROJECTILE
TAVB	AVIATION LOGISTICS SUPPORT SHIP
TBD	TO BE DETERMINED
TCAC	TECHNICAL CONTROL AND ANALYSIS CENTER
TCC	TACTICAL COMMUNICATIONS CENTER
TCO	TACTICAL COMBAT OPERATIONS

TDMA	TIME DIVISION MULTIPLE ACCESS
T/E	TABLE OF EQUIPMENT
TERPES	TACTICAL ELECTRONIC RECONNAISSANCE PROCESSING AND EVALUATION SYSTEM
TFS	TACTICAL FUEL SYSTEM
TLB	TRAILER LAUNCHED BRIDGE
TOA	TOTAL OBLIGATIONAL AUTHORITY
TOW	TUBE-LAUNCHED, WIRE-GUIDED, OPTICALLY-TRACKED MISSILE
TPCS	TEAM PORTABLE COMMUNICATIONS INTELLIGENCE SYSTEM
TPCSDS-T	TARGET PRACTICE CONE STABILIZED DISCARDING SABOT-TRACER
TP-T	TARGET PRACTICE-TRACER
TPSDS	TEST PROGRAM SET DEVELOPMENT SYSTEM
TRE	TACTICAL RECEIVE EQUIPMENT
TRI-TAC	JOINT TACTICAL COMMUNICATIONS OFFICE
TRNG	TRAINING
TRSS	TACTICAL REMOTE SENSOR SYSTEM
TT	TURRET TRAINER
TWSEAS	TACTICAL WARFARE SIMULATION EVALUATION AND ANALYSIS SYSTEM
UDP	UNIT DEPLOYMENT PROGRAM
UGWS	UPGUNNED WEAPON STATION
UHF	ULTRA HIGH FREQUENCY
ULCS	UNIT LEVEL CIRCUIT SWITCH
USA	UNITED STATES ARMY
VHF	VERY HIGH FREQUENCY
V/STOL	VERTICAL SHORT TAKE OFF AND LANDING
WB	WHITE BAG
WP	WHITE PHOSPHOROUS
WPN	WEAPONS PROCUREMENT, NAVY
WTI	WEAPONS AND TACTICS INSTRUCTOR





