crises and conflicts. The MAGTF is the Marine Corps' principal organization for all military operations. It is composed of forces task-organized under a single commander to accomplish a specific mission. These forces are functionally grouped into four core elements: a command element (CE), an aviation combat element (ACE), a ground combat element (GCE), and a combat service support element (CSSE). The MAGTF's flexible organizational structure allows for other Service or foreign military force(s) to be assigned or attached to it. The four core elements are not formal commands. The number, size, and type of forces that comprise each element is mission dependent. The ACE is task-organized to provide the specific capabilities required of Marine aviation to support the MAGTF. The ACE is not subordinate to the GCE; it is a co-equal combat arm of the MAGTF that provides the mobility, flexibility, coordination, and firepower required to successfully employ maneuver warfare.

An important part of the development of Marine aviation has been the concurrent development of the role of Marine aviation reserve forces. Since 1935, the Reserves have not only played an important role in conflicts but have often led the way in the development of aviation concepts and doctrine. The Reserves are organized, equipped, and trained as an integral part of Marine aviation. Marine aviation reserve units can provide the full spectrum of aviation support functions and individual aviation units to reinforce an ACE.

The end of the Cold War brought with it a period of crises and conflicts of increasing number, frequency, and variety, and the Marine Corps provides the National Command Authorities with the capability to rapidly respond to crises wherever they may occur. Crisis response requires a full spectrum of military capabilities, including forcible entry and military operations other than war (MOOTW). Defense of national interests requires an expeditionary crisis response force that is specifically organized, trained, and equipped to quickly project military power overseas. This rapid-response, general-purpose force must maintain itself in a continuous state of readiness and it must be prepared to adapt to a broad range of operating environments on short notice. It must possess a strategic mobility that allows it projection wherever it is required. By virtue of its naval character, expeditionary nature, and combined-arms organization, the MAGTF, with its ACE, is capable of responding to these requirements.

The ever-changing world security environment requires that Marine aviation continually anticipate and adapt to new challenges. Employing new technology with existing doctrine will not always provide the required operational capabilities. Constant refinement of aviation doctrine and a continuous exploration of innovative ideas are necessary. This proactive approach has been the hallmark of Marine aviation.

1002. Marine Aviation and the Levels of War

War is fought at three levels: strategic, operational, and tactical. Although Marine aviation is designed primarily as a tactical instrument, it can make significant contributions at all three levels.

a. The Strategic Level of War

In contrast to tactics, which is the art of winning engagements and battles, military strategy is the art of winning wars. Strategy is implemented by combatant commanders and is always joint in nature. The MAGTF makes a strategic contribution when it is used as an element of national power to accomplish national policy objectives. Since Marine aviation is bonded to the MAGTF by mission, organization, and employment, its strategic contributions are normally encompassed within the MAGTF support it provides. For example, a sea-based MAGTF strategically positioned near a world "hot spot" may be the ideal force to indicate U.S. political concern or resolve on a volatile issue. If the strategic objective is to show a U.S. presence in the area, Marine aviation operations become a visible show of force without physically landing U.S. troops ashore. In this case, Marine aviation's contribution to the strategic objective would be dominant, but it is still performed in

support of the MAGTF's mission and not considered an independent action.

Marine aviation's naval expeditionary character makes it a force of choice whenever political considerations preclude a deliberate build up of forces and their supporting infrastructure ashore. Marine aviation also has the collateral mission of participating as an integral component of naval aviation as directed by fleet commanders. Marine aviation has, in some cases, been tasked to conduct operations while not part of a MAGTF, this is the exception rather than the rule. For example, Marine aviation has been used against targets of strategic value in an air strike launched from a Navy aircraft carrier as part of a joint force. Another example is the use of Marine aviation assets in support of North Atlantic Treaty Organization (NATO) forces in Bosnia and Kosovo. Both examples are exceptions to the normal doctrinal employment of Marine aviation. Marine aviation is, first and foremost, an integral component of the MAGTF.

b. The Operational Level of War

The operational level of war links tactical results to strategic aims. The operational use of aviation relates to campaigning. Aviation at the operational level of war shapes events by deciding when, where, and under what conditions to engage the enemy in battle. At the operational level, the MAGTF commander uses aviation against targets of operational significance. These targets consist of enemy capabilities or resources whose destruction or neutralization are important to the prosecution of the campaign.

Marine aviation participates at the tactical and operational levels as part of a MAGTF. Doctrinally, this is Marine aviation's primary mission: to participate as the air component of the MAGTF in the seizure of advanced naval bases and to conduct land operations as may be essential for the prosecution of a naval operation. The capabilities provided by aviation allow the MAGTF commander to generate operational capability quickly at or near the location of any conflict. Aviation provides the resiliency and flexibility required to respond appropriately to developing situations by either expanding or reducing U.S. military presence as directed by the theater commander.

In most operations, the MAGTF serves as part of a joint task force (JTF) under the command of a joint force commander (JFC). Joint Publication (JP) 0-2, *Unified Action Armed Forces (UNAAF)*, establishes the doctrine, principles, and policies of a joint force. Marine aviation supports joint force operations as an integral part of the MAGTF. This ensures that the MAGTF retains its unique capability to generate combined-arms combat power. The MAGTF commander will retain operational control (OPCON) of the ACE during all joint operations. Any sorties in excess of the MAGTF's direct support requirements are normally made available to the JFC. The JFC uses the MAGTF's excess sorties to support other components of the joint force in pursuit of overall campaign objectives. The MAGTF commander also makes sorties available to the JFACC for air defense, long-range interdiction, and long-range reconnaissance. See JP 3-56.1, *Command and Control for Joint Air Operations*, and JP 3-09, *Doctrine for Joint Fire Support* for detailed information on command and control of joint air and fire support operations.

The capabilities of aviation, including its speed, range, and mobility, easily translate to the operational level of war. Because Marine aviation has significant range, the MAGTF commander can use air interdiction to strike deep within the enemy's rear areas and air reconnaissance to gather needed information. Air defense sorties can protect the MAGTF as well as contribute to the protection of a joint force, all of which are significant contributions to the JFC's operational goals.

The implications of an action taken at one level of war seldom remain confined to that level. Actions taken at the operational level may influence other actions across all three levels of conflict. This overlap between the operational and tactical levels of war must be understood if we are to maximize opportunities for success.

c. The Tactical Level of War

Operational goals give purpose to tactical actions. In turn, tactical actions may influence operational goals. The tactical-operational relationship is important when deciding the best way to employ aviation because aviation is uniquely capable of having an immediate impact at both the tactical and operational levels of war.

Success at the operational level can promote success at the tactical level. The employment of aviation at the operational level during Operation Desert Storm served to disrupt Iraqi command and control, degrade defenses, and demoralize troops. The success of Operation Desert Storm's operational goals contributed to tactical successes during the ground operations phase.

Success at the tactical level can foster success at the operational level; however, success at the tactical level can prove indecisive unless linked to operational goals. Aviation can play a significant role in turning a tactical success into an operational decision. This is illustrated by Allied efforts in the South Pacific during World War II.

Beginning in the Solomon Islands with Guadalcanal in 1942, naval aviation played a major role in the destruction of the best elements of the Japanese naval air forces. Defending their major base at Rabaul on the island of New Britain against Allied air attacks, the Japanese committed and lost all of their fully-trained naval air units, including those that survived the Battle of Midway. They also committed and lost a portion of their best-trained army air units. Subsequently, the Japanese never fully recovered from these losses.

The advantage gained by defeating a large portion of Japan's best-trained combat pilots in Guadalcanal and New Britain would prove vital to continuing Allied operations. The onslaught against Rabaul by Allied aircraft, over half of which were flown by Marine aviators, prevented Japanese aircraft from prohibitively interfering with American landings in the Solomons area, most notably at Cape Gloucester. The continued pressure of naval aviation against Rabaul eventually caused the withdrawal of Japanese aircraft from the island fortress. The combined effect of the tactical successes in the Solomons degraded Japan's combat power and the Allies were able to bypass Rabaul, an operational maneuver that isolated about 100,000 Japanese.

Operation Overlord, the great amphibious landing in Normandy during World War II, is an example of how the operational use of aviation determined the conditions of engagement. The operational role of aviation in Operation Overlord was to ensure that the enemy forces attacking the beachhead did not increase at a more rapid rate than the Allied forces defending it and extending it. Three air attacks were conducted on targets hundreds of miles from the contested ground and were timed to disrupt Nazi attempts to reinforce units engaged in Normandy. Allied aviation successfully delayed the movement of German reserves that could have countered the Allied landing. Operationally, the German army remained paralyzed. Field Marshal Erwin Rommel reported in his June 10, 1944 dispatch that practically all traffic on roads, tracks, and in open country was pinned down by powerful fighter-bomber and bomber formations. As a result, the movement of German troops on the battlefield was almost completely paralyzed, while the Allies maneuvered freely.

The Gulf War contains recent examples of tactical events that impacted the operational level of war. During the first 6 months of Operation Desert Shield, 1st Marine Division spent a great deal of time scrutinizing the 8-year Iran-Iraq war. Planners learned that Iraqi artillery was very effective in trapping Iranian soldiers in confined areas called firesacks, where thousands of Iranians perished. The firesack, like our engagement area, is an area along an enemy avenue of approach intended to contain and destroy an enemy force with the massed fires of all available weapons. Studies of the two obstacle belts in Kuwait and the positioning of more than 1,200 Iraqi artillery pieces behind those obstacle belts indicated that when the Marines attacked, the Iraqis meant to trap them in at least two firesacks. Marine planners also recognized that their available aviation ordnance was not sufficient to destroy the Iraqi

artillery during the first phase of Operation Desert Storm. Therefore, planners designed a series of combined-arms raids to defeat the Iraqis' plan before they even attacked into Kuwait.

Operation Desert Storm kicked off on January 17, 1991. On January 19th, Marine aircraft conducted their first raid. Coalition forces were going to move an artillery battery, escorted by a light armored infantry company, close to the Kuwaiti border at night. A Marine EA-6B Prowler EW aircraft was to be stationed inside Saudi Arabian airspace to jam the Iraqis' radars until after the entire artillery battery had fired on a designated target. As the artillery battery started to withdraw, EA-6B aircraft would stop jamming just long enough for the Iraqis to detect the battery's movement before it began jamming again. The intent was to cause the Iraqi artillery to respond to Marine indirect fires. Once the Iraqis began firing, a Marine forward air controller (airborne) (FAC[A]) in a Marine F/A-18 Hornet detected the Iraqis' muzzle flashes and directed a flight of Marine F/A-18s to roll in on the firing Iraqi artillery.

The plan's goal was to convince Iraqi artillerymen not to man their artillery pieces for fear that every time they did so Marine aircraft would attack them. By the third week in February, after a series of these raids, the plan's goal was achieved. UAVs showed Iraqi artillerymen abandoning their howitzers as Marine aircraft began attacking their positions.

These successful raids at the tactical level had dramatic effect at the operational level. The fear of an attack from aviation assets made Iraqi artillery ineffective in the final phase of the war. This undoubtedly saved many lives and contributed to the strategic success of Operation Desert Storm.

Another Gulf War example of the impact of aviation at the operational level took place the night of January 29, 1991. During the night, several battalion-sized Iraqi units attacked Coalition forces in and around the border town of Khafji. The Iraqis surprised the Coalition forces and occupied the town. However, Arab ground forces belonging to the Coalition quickly counterattacked and, with the aid of CAS, regained possession of Khafji 2 days later. This purely tactical event is, only part of the story. The night before the recapture of Khafji, farther to the north, Saddam Hussein amassed more than two divisions of armor and mechanized infantry to join the fight for the town. Because of technological advancements, the night no longer provided its traditional sanctuary. Within minutes, the joint surveillance, and target attack radar system (JSTARS) discovered the Iraqi force and began employing Coalition aircraft against it. Using precision-guided weapons, air strikes continued throughout the night and devastated the two divisions. They never reached their desired objective, and by morning, they were retreating in total disarray.

The Battle of Khafji was important for the Coalition. Tactically, the Pan-Arab forces defeated the Iraqis in a pitched battle, launching a difficult night counterattack against enemy armor. Operationally, the destruction inflicted on two Iraqi divisions by Coalition aircraft convinced the Iraqis that any force that left its defenses to conduct a mobile operation would be decimated. During the remainder of the war, the Iraqis never again attempted an offensive operation. The operational result was a paralyzed military force that was unable to interfere with Coalition maneuver operations.

Chapter 2

The Missions, Functions, and Organization of Marine Aviation

"Marine aviation units are an integral element of an air-ground combat system. They are not merely joined at the top when the time comes to fight. They are fully integrated from top to bottom, and they train that way full-time."[2]

—Gen Carl E. Mundy

Marine Corps aviation is organized, trained, and equipped to provide a task-organized ACE for any size MAGTF. The ACE is not a formal command. The term "ACE" categorizes the functionality of specific forces within the MAGTF. For any MAGTF, the ACE is composed of task-organized Marine aviation forces under a single commander. The ACE commander is the MAGTF commander's principal advisor and subject matter expert on all aviation activities.

The ACE must be prepared to support MAGTF expeditionary operations from both sea-based and shore-based facilities. The ACE's primary mission is to support the MAGTF during all phases of expeditionary operations as well as during sustained operations ashore.

2001. Functions of Marine Aviation

The tasks of Marine aviation fall into six functional areas (see fig. 2-1 on page 2-2): offensive air support, antiair warfare, assault support, air reconnaissance, electronic warfare, and control of aircraft and missiles. Planners initially consider the functional area, not the means (i.e., particular weapons systems), when analyzing the fundamental requirements of accomplishing any given objective.

a. Offensive Air Support

OAS involves air operations that are conducted against enemy installations, facilities, and personnel in order to directly assist in the attainment of MAGTF objectives by destroying enemy resources or isolating enemy military forces. Its primary support of the warfighting functions is to provide fires and force protection through CAS and DAS. The application of OAS can sometimes be decisive by directly or indirectly affecting an enemy's center of gravity. OAS allows the commander to influence the battle by projecting firepower to shape events in time and space. It also allows the commander to shape the battlespace by delaying enemy reinforcements, degrading critical enemy functions, and manipulating enemy perceptions, which ultimately results in protection of the force. Marine fighter/attack squadrons (VMFAs), Marine fighter attack (all weather) squadrons (VMFA[AW]s), Marine attack squadrons (VMAs), Marine light/attack helicopter squadrons (HMLAs), and Marine unmanned aerial vehicle squadrons (VMU) provide OAS during OAS missions. OAS includes two categories: CAS and DAS.

(1) CAS. CAS is an air action performed by fixed-wing and rotary-wing aircraft against hostile targets that are in close proximity to friendly forces. CAS requires detailed integration of each air mission with the fire and movement of friendly forces.

(2) DAS. DAS is an air action against enemy targets at such a distance from friendly forces that detailed integration of each mission with fire and movement of friendly forces is not required. Close coordination of the fire and maneuver of friendly forces is a qualifying factor for a DAS

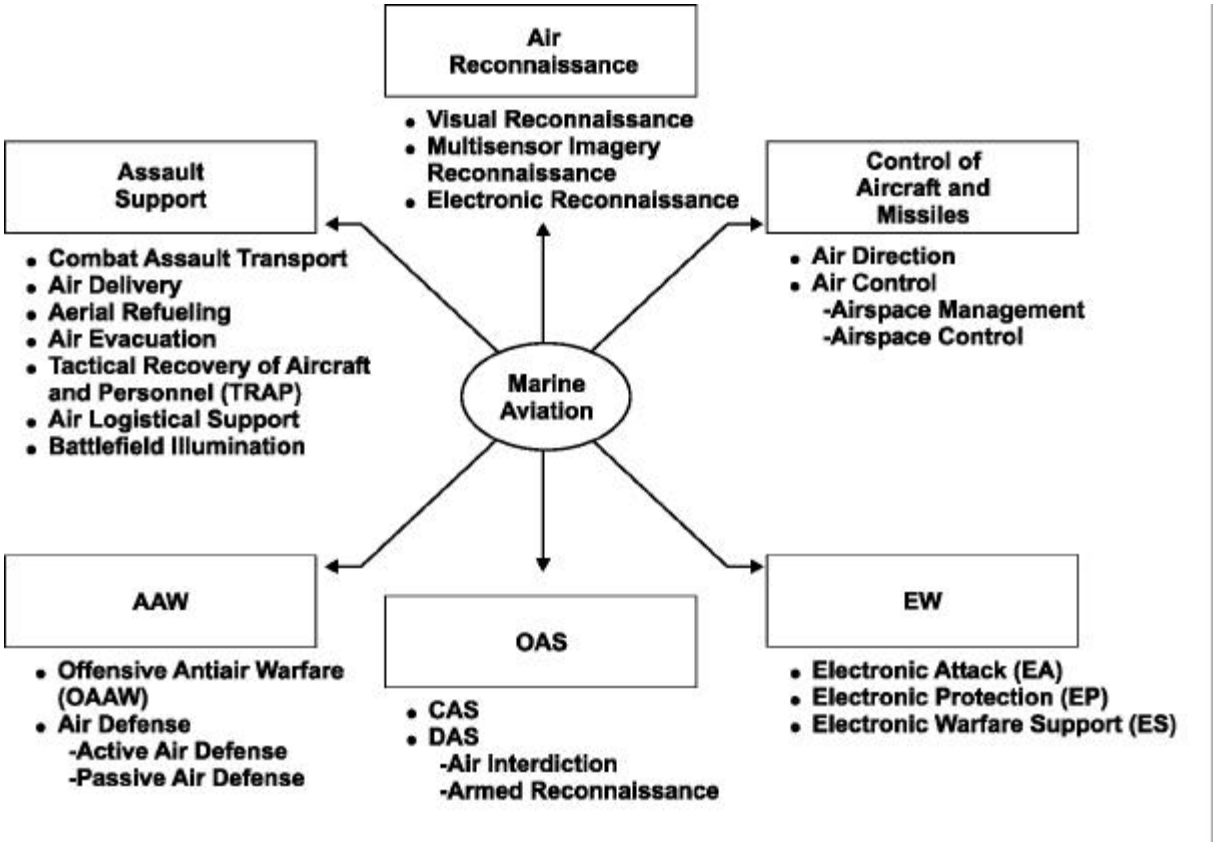

Figure 2-1. The Six Functions of Marine Aviation.

mission. DAS missions are flown on either side of the fire support coordination line. These missions include air interdiction and armed reconnaissance.

(a) Air Interdiction Operations. An air interdiction operation destroys, neutralizes, or delays the enemy's military potential before it can be brought to bear effectively against friendly forces. This type of operation is a response to a known target that is briefed in advance.

(b) Armed Reconnaissance Missions. An armed reconnaissance mission finds and attacks targets of opportunity (i.e., enemy materiel, personnel, facilities) in assigned areas. This type of operation is a response to targets that are not known or briefed in advance.

b. Antiair Warfare

AAW is the actions used to destroy or reduce the enemy air and missile threat to an acceptable level. It includes such measures as the use of interceptors, bombers, antiaircraft guns, surface-to-air and air-to-air missiles, and electronic attack and the destruction of an air or missile threat both before and after it is launched. Other measures used to minimize the effects of hostile air action are cover, concealment, dispersion, deception (including electronic), and mobility. The primary purpose of AAW is to gain and maintain whatever degree of air superiority is required; this permits the conduct of operations without prohibitive interference by opposing air and missile forces. AAW's other purpose is force protection.

AAW uses both offensive and defensive means to accomplish its objectives and to directly support the warfighting functions of fires and force protection. Self-defense against enemy air is a task for all rotary-wing aircraft. Additionally, the low-altitude air defense (LAAD) battalion, VMFA, VMFA(AW), VMA, and HMLA are all specifically tasked to perform AAW. The Marine air

control squadron (MACS) provides personnel and equipment for the operation of the tactical air operations center (TAOC). The TAOC's mission is to detect, identify, and control the interception of hostile aircraft and missiles.

(1) Offensive Antiair Warfare. Offensive antiair warfare (OAAW) are operations conducted against enemy air assets and air defense systems before they can be launched or assume an attacking role. OAAW operations in or near the objective area consist mainly of air attacks that destroy or neutralize hostile aircraft, airfields, radar, air defense systems, and supporting areas. OAAW also includes attacks against enemy theater missile operations and suppression of enemy air defenses (SEAD). Offensive counterair [OCA] is the joint term for an operation that destroys, disrupts, or limits enemy air power as close to its source as possible.

(2) Air Defense. Air defense includes all defensive measures designed to destroy attacking enemy aircraft or missiles in the Earth's atmosphere or to nullify or reduce the effectiveness of an enemy attack. Air defense involves both active and passive measures.

(a) Active Air Defense. Active air defense includes the use of aircraft, air defense weapons, supporting weapons (i.e., weapons not primarily used in an air defense role), and EW. The approved joint term for this is defensive counterair (DCA).

(b) Passive Air Defense. Passive air defense includes all measures other than active defense that are taken to minimize the effectiveness of hostile air action. These measures include the use of protective construction, concealment, camouflage, deception, dispersion, cover, and electronic protection. Passive air defense is a command responsibility of every unit commander.

c. Assault Support

Assault support contributes to the warfighting functions of maneuver and logistics. Maneuver warfare demands rapid, flexible maneuverability to achieve a decision. Assault support uses aircraft to provide tactical mobility and logistic support to the MAGTF for the movement of high-priority personnel and cargo within the immediate area of operations (or the evacuation of personnel and cargo). It also uses Marine aerial refueler transport squadrons (VMGRs) to provide in-flight refueling. Specific assault support tasks are discussed in the following subparagraphs. See MCWP 3-24, *Assault Support*, for additional information.

(1) Combat Assault Transport. Combat assault transport provides mobility and logistic support to the MAGTF. It is used to deploy forces efficiently in offensive maneuver warfare, bypass obstacles, or quickly redeploy forces. Combat assault support allows the MAGTF commander to build up his forces rapidly at a specific time and location.

(2) Air Delivery. Air delivery is the transportation of equipment and supplies to FOBs or remote areas. Delivery can be accomplished with helicopters or loads can be air dropped from fixed-wing aircraft such as the KC-130. Air drops are normally used when surface or helicopter transports cannot be used because of range, closed lines of communications, a lack of adequate airfields, a prohibitive ground tactical situation, high tonnage, or reduced response time.

(3) Aerial Refueling. Aerial refueling allows MAGTF aircraft, both fixed- and rotary-wing, to conduct flight-ferrying operations, extend time on station, and extend mission range.

(4) Air Evacuation. Air evacuation is the transportation of personnel and equipment from FOBs or remote areas. This includes flights from areas of operations to secure rear areas, medical evacuations, and extraction of forces. Transport helicopters and fixed-wing transport aircraft perform air evacuations.

(5) Tactical Recovery of Aircraft and Personnel. The tactical recovery of aircraft and personnel (TRAP) is performed by an assigned and briefed aircrew for the specific purpose of the recovery of personnel, equipment, and/or aircraft.

TRAP is a subcomponent of combat search and rescue (CSAR) and/or joint combat search and rescue (JCSAR) missions, but it is only executed once the location of survivors is confirmed. It does not involve dedicating aircraft assets to locating survivors. Tactical recovery occurs once the general location of survivors is confirmed. A TRAP mission may include personnel to conduct a local ground search if required. Marine Corps tactical aircraft are not normally equipped to conduct the search portion of CSAR or the over water portion of search and rescue missions. The composition of a tactical recovery mission may vary from a single aircraft and aircrew to an assault support mission package that consists of multiple fixed-wing and rotary-wing aircraft with an onboard compliment of security, ground search, and medical personnel.

(6) Air Logistical Support. Air logistical support operations are conducted by fixed-wing aircraft and provide assault support of MAGTF forces on the ground. Air logistical support delivers troops, equipment, and supplies to areas beyond helicopter range and lift capability or when surface transportation is slow or unavailable.

(7) Battlefield Illumination. Battlefield illumination can be provided by both fixed-wing and rotary-wing aircraft. Illumination may be visible to the naked eye or invisible (i.e., visible only with night vision equipment). Battlefield illumination can last for a few minutes or several hours.

d. Air Reconnaissance

Air reconnaissance employs visual observation and/or sensors in aerial vehicles to acquire intelligence information. It supports the intelligence warfighting function and is employed tactically, operationally, and strategically. The three types of air reconnaissance are visual, multisensor imagery, and electronic. All aircraft units constantly perform visual air reconnaissance. The Marine tactical electronic warfare squadron (VMAQ), VMU, VMA, VMFA, VMFA(AW), HMLA, and other air reconnaissance platforms can be equipped with sensors to conduct other than visual reconnaissance. For additional information, see MCWP 2-11, *MAGTF Intelligence Collection*, and MCWP 2-15.4, *Imagery Intelligence*, for more information.

(1) Visual Reconnaissance. Visual reconnaissance may be conducted by any airborne platform. It consists of an observer or pilot visually searching a route, point, or area. Visual aerial reconnaissance is frequently used in support of the delivery of offensive fires such as artillery support, naval surface fire support, or CAS.

(2) Multisensor Imagery Reconnaissance. Multisensor imagery reconnaissance includes photography from standard cameras, photograph and radar imagery from the advanced tactical aerial reconnaissance system (ATARS), and infrared imagery. Multisensor imagery reconnaissance is used to detect and pinpoint the location of enemy installations, facilities, and concentrations of forces. It is also used to support terrain analysis.

(3) Electronic Reconnaissance. Electronic reconnaissance is used to detect, locate, identify, and evaluate enemy electromagnetic radiation. Electronic reconnaissance is performed with passive interception equipment that recovers signals and determines signal direction, source, and characteristics. It gathers data that, when processed into intelligence, is used to update the electronic order of battle and technical intelligence.

e. Electronic Warfare

EW is any military action involving the use of electromagnetic and directed energy to control the electromagnetic spectrum or to attack the enemy. EW supports the warfighting functions of fires, command and control, and intelligence through the three major subdivisions: electronic attack, electronic protection, and electronic warfare support. Only the VMAQ is specifically equipped to perform all aspects of EW.

(1) Electronic Attack. Electronic attack is that division of EW that involves the use of electromagnetic energy, directed energy, or antiradiation weapons to attack personnel, facilities, or equip-

ment with the intent of degrading, neutralizing, or destroying enemy combat capability.

(2) Electronic Protection. Electronic protection involves the actions taken to protect personnel, facilities, and equipment from the effects of friendly or enemy employment of EW that degrade, neutralize, or destroy friendly combat capability.

(3) Electronic Warfare Support. Electronic warfare support is tasked by or under the direct control of an operational commander. It involves the actions needed to search for, intercept, identify, and locate sources of intentionally and unintentionally radiated electromagnetic energy for the purpose of immediate threat recognition.

f. Control of Aircraft and Missiles

The control of aircraft and missiles integrates the other five functions of Marine aviation by providing the commander with the ability to exercise command and control authority over Marine aviation assets. It enhances unity of effort and disseminates a common situational awareness. It involves the integrated employment of facilities, equipment, communications, procedures, and personnel. It also allows the ACE commander to plan operations and to direct and control aircraft and missiles to support accomplishment of the MAGTF's mission. The control of aircraft and missiles supports the warfighting function of command and control. The ACE commander maintains centralized command, while control is decentralized and executed through the Marine air command and control system (MACCS), which is described in chapter 4.

The Marine air control group (MACG) is responsible for providing, staffing, operating, and maintaining the principal MACCS agencies. These agencies include the TACC, TAOC with the early warning/control (EW/C) center, Marine air traffic control detachment (MATCD), DASC, and the direct air support center (airborne) (DASC[A]). All Marine aircraft have the capability to provide some form of airborne coordination and control during assault support missions, and HMLAs and VMFA(AW)s can provide FAC(A) or tactical air coordinator (airborne) (TAC[A]) services supporting the MACCS. The methods of aviation control are depicted in figure 2-2 and discussed in the following paragraphs.

(1) Air Direction. Air direction is the authority to regulate the employment of air resources (including both aircraft and surface-to-air weapons) to maintain a balance between their availability and the priorities assigned for their use. The purpose of air direction is to achieve a balance between the MAGTF's finite aviation resources and the accomplishment of the ACE's mission.

(2) Air Control. Air control is the authority to direct the physical maneuver of aircraft in flight or to direct an aircraft or surface-to-air weapons unit to engage a specific target. Air control includes airspace management and airspace control.

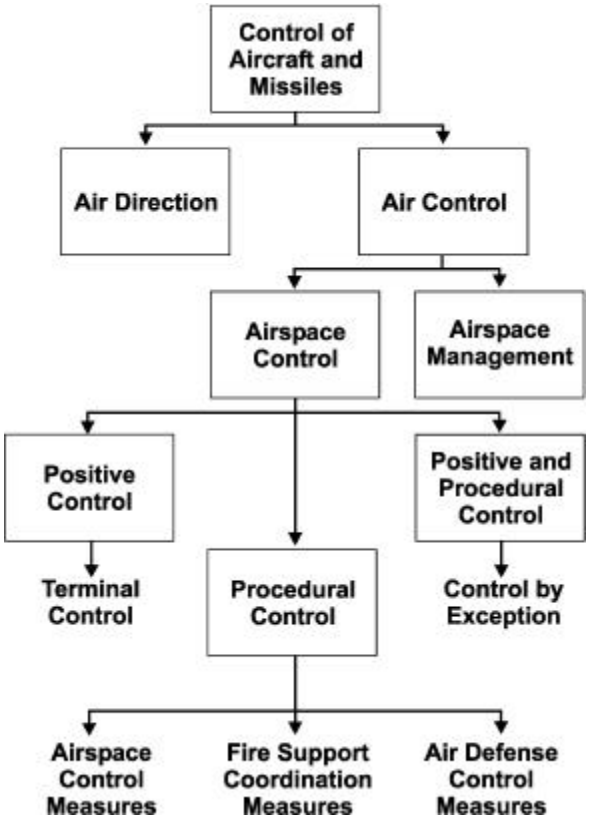

Figure 2-2. Categories of Air Control.

(a) Airspace Management. Airspace management is the coordination, integration, and regulation of the use of airspace based on defined dimensions. Commanders use airspace management to optimize the available airspace and to allow the maximum freedom consistent with the degree of acceptable operational risk. The MACCS provides the ACE commander with the ability to conduct airspace management.

(b) Airspace Control. Airspace control is the authority to direct the maneuver of aircraft so that the best use is made of assigned airspace. Airspace control provides for the coordination, integration, and regulation of the use of a defined airspace. It also provides for the identification of all airspace users. The authority to exercise airspace control is inherent to the commander whose unit is responsible for particular blocks of airspace, types of missions, or types of aircraft. Airspace control does not include measures to approve, disapprove, deny, or delay air operations. MACCS agencies accomplish airspace control through the use of positive control, procedural control, or a combination of the two. Positive control is a method of airspace control that relies on positive identification, tracking, and direction of aircraft within an airspace. It is conducted with electronic means by an agency with the appropriate authority and responsibility. Procedural control is a method of airspace control based on a combination of previously agreed and promulgated orders and procedures.

2002. Marine Aviation Organization

Administratively, Marine aviation is organized into three active duty and one reserve Marine aircraft wings (MAWs). MAWs are designed to provide units in support of MAGTF or other operations. Each MAW has a unique organizational structure (see app. A and fig. 2-3). The MAW may be reinforced with assets from other MAWs to provide the necessary assets to meet mission requirements. It is organized into a MAW headquarters, several Marine aircraft groups (MAGs), a MACG, and a Marine wing support group (MWSG).

The wing headquarters and subordinate groups are task-organized based on the assigned mission. When the MAW is deployed as the ACE for a MEF, the MAW headquarters becomes the ACE's command element. Each group consists of specialized squadrons and/or battalions that perform one or more of the six functions of Marine aviation. The MACG contains the bulk of the MAW's command and control assets. The MWSG contains the personnel and equipment that are necessary to provide direct aviation ground support to the MAW. The MAW is capable of performing all six functions of Marine aviation. Through task organization, a wing can provide deployable detachments that are capable of accomplishing any or all Marine aviation functions. Aviation organizations smaller than a wing normally task-organize to provide only a specific portion of the six aviation functions.

The following paragraphs provide a brief description of the MAW's subordinate units and how they relate to the functions of aviation. Table 2-1 contains a summary of aviation units and corresponding functions. MCRP 5-12D, *Organization of Marine Corps Forces*, contains a detailed discussion.

a. Marine Air Control Group

The MACG coordinates all aspects of air command and control, air reconnaissance, and air defense within the MAW. When deployed as part of the MAGTF ACE, it provides the command and staff functions for the MACG commander and coordinates the employment of aviation command and control equipment, facilities, and personnel in support of the ACE.

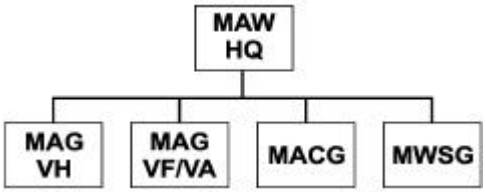

Figure 2-3. Notional Marine Aircraft Wing.

Table 2-1. Marine Aviation Units and Functions.

Type of Aviation Unit	AAW	Assault Support	OAS	EW	Air Reconnaissance	Control of Aircraft and Missiles
MAW	X	X	X	X	X	X
MACG	Support	Support	Support	Support	Support	X
MTACS						TACC
MASS		DASC	DASC		DASC	DASC
MACS	TAOC ATC	ATC	TAOC ATC	ATC	TAOC ATC	TAOC ATC
LAAD	X	Support			Support	X
MWCS						Communications
MWSG	Support	Support	Support	Support	Support	Support
MAG (VF/VA)	X	X	X	X	X	Support
MALS (fixed wing)	Support	Support	Support	Support	Support	Support
VMGR	Support	X	Support	Support	Support	DASC(A)
VMAQ	Support	Support	Support	X	X	Support
VMU	Support	Support	Support	Support	X	Support
VMFA	X	Escort	X	Support	X	Support
VMFA (AW)	X	Escort	X	Support	X	FAC(A)/TAC(A)
VMA	X	Escort	X	Support	X	Support
MAG (VH)	X	X	X	Support	X	Support
VMM	Self-defense	X	Support	Support	Support	Airborne control and coordination
MALS (rotary-wing)	Support	Support	Support	Support	Support	Support
HMH (CH-53D)	Self-defense	X	Support	Support	Support	Airborne control and coordination
HMH (CH-53E)	Self-defense	X	Support	Support	Support	Airborne control and coordination
HMM	Self-defense	X	Support	Support	Support	Airborne control and coordination
HMLA Utility	Self-defense	X	Support	Support	Support	Airborne control and coordination
HMLA Attack	X	X	X	Support	X	Airborne control and coordination

X—The unit performs that function of Marine aviation as part of its primary mission. However, all Marine aircraft are specifically designed to be multi-mission capable and provide significant support for multiple functions.

Support—The unit provides general support for that function in varying degrees based on equipment capabilities and the situation.

Specifically indicated support (armed reconnaissance, DASC, escort, etc.)—Many units perform a specific type of support for one or more of the six functions of Marine aviation. The ability to provide this type of support is often dependent on equipment and/or aircraft mission configuration or specialized personnel training, and it must be specifically requested. For MACG units, the MACCS agency provided by the unit is indicated.

- Organic nuclear, biological, and chemical capabilities.
- Routine and emergency sick call services.
- Security and law enforcement services.
- Air base command functions.

See MCWP 3-21.1, *Aviation Ground Support*, and MCWP 3-35.7, *MAGTF Meteorology and Oceanography [METOC] Support*, for additional information.

2003. Aviation Combat Element Task Organization

An ACE is the core element of a MAGTF that is task-organized to conduct aviation operations. It provides all or a portion of the six functions of Marine aviation. The ACE is usually composed of an aviation unit headquarters and various other aviation units or their detachments. It can vary in size from a small aviation detachment of specifically required aircraft to one or more MAWs. The ACE may contain other Service or foreign military forces assigned or attached to the MAGTF. The ACE itself is not a formal command.

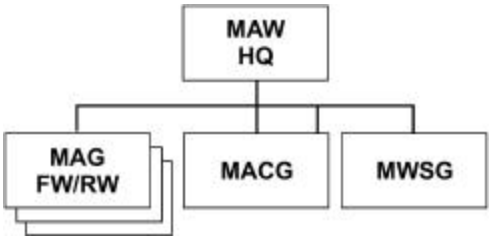

Figure 2-4. Notional MEF (ACE).

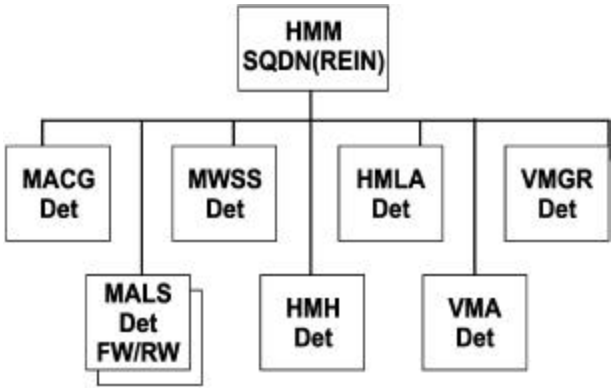

Figure 2-5. Notional MEU ACE.

The ACE is task-organized to contribute to battlespace dominance in support of the MAGTF's mission, project combat power, and conduct air operations. The ACE is task-organized to support the MAGTF based on the MAGTF commander's mission and his estimate of the aviation capabilities required to accomplish that mission. The MAGTF commander presents these requirements to the Marine Service component commander, and the selection of actual aviation units or detachments is determined by the tasked wing commander(s). Selected assets are task-organized to meet the MAGTF commander's requirements.

The ACE is normally built around an existing aircraft unit (squadron, group, or wing) reinforced as necessary with the appropriate command and control, combat, combat support, and combat service support (CSS) (including aviation logistic) units and detachments. In creating an ACE, the operational requirements of the mission, capabilities and limitations of specific units and equipment, and the availability of units determine the choice of units, type of equipment, and source location. Marine aviation forms the ACE of the three standing MEFs. However, this is merely the starting point for constructing the ACE for a MEF in time of war. For actual deployment, the ACE would be reinforced with units and/or detachments from the other two active duty MAWs and the Reserves. If providing the ACE to a Marine expeditionary unit (special operations capable) (MEU [SOC]), the ACE will usually be sourced from a single MAW.

Satisfying the MAGTF commander's aviation requirements is paramount. However, the identification of specific units for assignment to the ACE is driven by many factors in addition to the aviation functions required to support the MAGTF mission. Some of these factors are as follows:

- Mode of deployment (amphibious shipping, strategic airlift or sealift, aircraft carriers, self-deployment, or a combination).
- Mode of operations (from aircraft carriers and/or amphibious ships, FOBs, EAFs, or a combination).

- Availability of supporting infrastructure (runways, shelters, electricity, and fuel).
- Special qualifying criteria, training requirements and/or, operational experience.
- Length and responsiveness of logistic support determines sustainability.
- Replenishment rate of consumables, specifically aviation fuel and ordnance.
- Anticipated missions and expected intensity of flight operations.

The MEF ACE can be built around one or more MAWs, or any portion of the MAW, that fulfills the required functions of Marine aviation. It may consist of one or more MAGs (fixed-wing or rotary-wing), a MACG, and a MWSG. The MAW also provides task-organized forces for smaller MAGTFs, such as a Marine expeditionary unit (MEU) and special purpose MAGTFs (SPMAGTFs). See figures 2-4 for a notional MEF and 2-5 for a notional MEU ACE.

The MEU ACE normally consists of a reinforced helicopter squadron that includes attack aircraft and two fixed-wing assault support aircraft (the latter are based in the continental United States). The notional MEF ACE is task-organized to provide assault support, low-level air defense, CAS, and airborne command and control. It includes a MACG detachment, MWSS detachment, fixed-wing MALS detachment, and rotary-wing MALS detachment.

SPMAGTFs, are organized, trained, and equipped with narrowly focused capabilities. Each SPMAGTF is designed to accomplish a specific mission, often of limited scope and duration. This special purpose force may be any size but is normally small (the size of a MEU). It may contain other Service or foreign military forces assigned or attached to the MAGTF. The ACE composition for a SPMAGTF varies, but normally it is the size of a MEU ACE or smaller. For example, a SPMAGTF ACE may be created to operate and fly missions in support of host nation forces out of an EAF. In such a case, the SPMAGTF might consist predominantly of Marine aviation units supported by only a small security and logistic force. In other cases, the SPMAGTF ACE may represent a relatively small portion of the force.

Since the ACE is formed around an aviation headquarters, it will only contain one senior aviation unit. In the case of a MEF, the wing that comprises the ACE will be task-organized with units from a single wing and/or reinforced with as many groups and squadrons from other wings as are required to support the MAGTF's mission. For MEFs with multiple divisions in the GCE, the ACE may require the combined assets and personnel of several wings in order to meet this requirement. However, these assets and personnel remain under one ACE commander. This single ACE commander concept is essential to Marine aviation's doctrinal philosophy of centralized command and decentralized control (discussed in detail in chap. 4).

The ACE may be employed from ships or forward expeditionary land bases and can readily transition between sea and land bases without loss of capability. It has the capability to conduct command and control across the battlespace. The ACE is one of the two arms of the MAGTF specifically designed to conduct combat operations.

Chapter 3

The Role of Aviation in Combined-Arms Force Operations

"On our drive to Manila, I depended solely on [Marine Aircraft Groups 24 and 32] to protect my left flank against possible . . . counterattack. . . . . I can say without reservation that the Marine dive bombers are one of the most flexible outfits that I have seen in this war. They will try anything once, and . . . I have found . . . that anything they try usually pans out in their favor. [They] have kept the enemy on the turn. They have kept him underground and have enabled troops to move up with fewer casualties and with greater speed. I cannot say enough in praise of these men of the dive bombers . . . for the job they have done in giving my men close ground support in this operation."[3]

—MajGen Verne D. Mudge

The essential difference between Marine aviation and other aviation forces is that Marine aviation is designed to operate as an integral part of a combined-arms organization. Due to Marine Corps ground forces expeditionary nature and their limited indirect fire assets, ground forces rely heavily on the ACE to provide fire support in both close and deep operations. Therefore, the MAGTF must retain control of its aviation assets. But Marine aviation provides much more than just tactical fires in support of ground maneuver. It also provides the MAGTF commander with long-range fires (including electronic fires), intelligence collection, enhanced mobility, and force protection. It may also serve as the MAGTF's main effort.

This chapter begins with a discussion of the six warfighting functions; discusses the operational environment; moves to a discussion of a number of key maneuver warfare ideas; then examines the role that aviation may play in conventional offensive and/or defensive operations, security operations, and MOOTW, as discussed in MCDP-1, *Warfighting*.

3001. The Six Warfighting Functions

Marine aviation provides a significant contribution to each of the warfighting functions during all phases of an operation. The warfighting functions are discussed in more detail in MCDP 1-2, *Campaigning*, and MCWP 5-1, *Marine Corps Planning Process*.

a. Command and Control

Command and control is the exercise of authority and direction by the commander over assigned forces in the accomplishment of the assigned mission. Command and control functions are performed through organization of personnel, procedures, equipment, communications, and facilities by the commander and staff to plan, direct, coordinate, and control forces and operations in the accomplishment of the mission. Aviation's EW capabilities and control of aircraft and missiles contribute to this warfighting function.

b. Maneuver

Maneuver refers to the employment of ground or aviation forces in order to gain a relative advantage over a threat by achieving a tactical, operational, or strategic objective. The advantage can be positional, temporal, or psychological. In conjunction with fires, maneuver generates tempo and combat power in the battlespace to overwhelm the threat. Mobility operations are inherent in maneuver. Mobility operations enhance the command's ability to move forces and supplies within the area of operations. Deception operations are integral to maneuver and usually involve elements of the other warfighting functions. Marine aviation elements may, in some cases, function as maneuver elements themselves. In any case, any scheme of maneuver will have aviation aspects, particularly in assault support and OAS.

c. Fires

Fires include the organization, planning, coordination, and employment of all lethal and nonlethal attack systems that are available for use against threat resources and capabilities. This includes all sea-, air-, and land-based fire systems; the application of special operations capable forces; and psychological operations to achieve specified results. AAW, OAS, EW, and the control of aircraft and missiles are aviation functions that contribute to this warfighting function.

d. Intelligence

Intelligence is the actions taken to collect information, process and analyze it to determine its relevance, and disseminate it to commanders in a timely manner to support decisionmaking. Intelligence constantly evaluates three of the environmental elements (infrastructure, threat, and noncombatants) of the battlespace. Intelligence focuses on revealing threat capabilities, dispositions, and intentions. It enables the commander to anticipate the threat's actions and reactions and promote tempo. Timely intelligence is imperative in developing an effective plan. Air reconnaissance and aviation EW capabilities are major contributors to this warfighting function.

e. Logistics

Logistics encompasses all activities required to move and sustain military forces. The components of logistics include supplies, maintenance, transportation, general engineering, and health services. Aviation assault support is an important aspect of combat logistics.

f. Force Protection

Force protection is the protection of the fighting potential of the command so that the commander can conduct decisive actions at a chosen time and place. It is the most difficult of the warfighting functions to execute because it requires the efforts of every member of the command. It involves both active and passive measures taken by the command that include individual protective measures, camouflage, hardening of facilities and vehicles, operational security procedures, dispersion, counterreconnaissance operations, counterintelligence operations, and preventive health efforts by medical and dental personnel. The synchronization of countermobility efforts, fires, and maneuver results in the generation of combat power and a tempo that overwhelms the threat's capability to interfere with friendly mission accomplishment. All aviation functions, especially AAW and air reconnaissance, can contribute to force protection.

3002. The Operational Environment

Marine aviation is capable of operating in any environment and across the range of military operations. The challenge is to be equally prepared to operate in high- or mid-intensity combat scenarios against a technologically advanced and highly capable threat. Marine aviation must also operate against less advanced but numerically superior foes; in urban warfare; against diffused, ambiguous threats in undeveloped areas; and in adverse environmental conditions resulting from natural and/or manmade catastrophes, including nuclear, biological, chemical, or ecological events. Marine aviation may serve as either the main or supporting effort in offensive or defensive conventional

warfare, security operations, or MOOTW. MOOTW can include everything from counterinsurgency to disaster relief and other humanitarian operations.

3003. Organizational Adaptability

Given the uncertainties that are inherent in the operational environment, the greatest single requirement for Marine aviation is adaptability. The ACE can be task-organized to meet the MAGTF's needs. All ACE operations are conducted as part of an overall MAGTF air-ground concept of operations that is focused on the enemy. Aviation brings a degree of versatility, range, and agility not possessed by other elements of the MAGTF. It is not, however, a substitute for any other element of the MAGTF; its unique capabilities complement the other MAGTF elements' capabilities. For example, aviation under ideal circumstances may provide the MAGTF commander with long-range, 24-hour, all weather firepower to shape the battlespace and to exploit enemy critical vulnerabilities that are beyond the reach of other elements of the MAGTF. It enhances the operational and tactical mobility of the GCE by providing the capability to conduct vertical assaults as part of a ship-to-objective maneuver (STOM) or during sustained operations ashore. Aviation units can maneuver both rapidly and simultaneously throughout the battlespace, thereby enabling the commander to rapidly concentrate combat power at decisive points, anywhere and at any time, to set the stage for decisive action. The ACE also provides air defense for the MAGTF as part of the MAGTF force protection effort. The ACE's flexibility ensures that aviation combat and logistic capabilities are always available to the MAGTF.

Marine aviation is a highly visible asset. It provides the commander with options that are equally adaptable to combat and to MOOTW. Marine multirole aircraft provide a formidable capability that is useful across the range of military operations. MAGTF helicopters that carry combat-ready Marines into a hostile landing zone are the same platforms that evacuate noncombatants from life-threatening danger. Fixed-wing assault support aircraft can deliver thousands of pounds of supplies to support ground operations or thousands of pounds of food for humanitarian assistance. Multirole fighter/attack aircraft can gain air superiority in combat or patrol a no-fly zone to support peace enforcement operations.

Similarly, Marine aviation command and control agencies can function in many diverse roles and environments. The ACE MACCS can facilitate command and control in joint and combined aviation operations such as direction of interceptor aircraft, countering missile threats to the joint or combined force, or tracking aircraft in support of counterdrug operations.

Marine aviation forces can operate outside the MAGTF in support of joint or combined operations. Fixed-wing and rotary-wing aircraft conducting flight operations near a country's coastline demonstrate military presence through the effective use of show of force operations. For example, in Bosnia Operations Deny Flight and Joint Endeavor created conditions under which all warring factions agreed to the cessation of hostilities and a monitored separation. Both operations stand as examples of the powerful presence that aviation can provide in efforts to establish and maintain peace.

Marine aviation is not constrained by the challenges of poor infrastructure and restrictive terrain. The ability to operate from austere sites, along with the reach, mobility, and sustainment provided by fixed-wing or rotary-wing transport aircraft, can overcome obstacles commonly encountered in humanitarian assistance operations. These capabilities are particularly beneficial when providing humanitarian relief services. Marine ATC units can establish ATC capabilities if they have been disrupted or destroyed or if none previously existed. The damage resulting from natural disasters may span tens of thousands of square miles. Damage to roads and other transportation infrastructure may hamper disaster relief efforts. Aviation's ability to operate in such areas, to sustain delivery efforts until the local infrastructure

is restored, and to respond rapidly to crisis situations can be crucial to success in disaster relief.

One of the key features of a Marine's expeditionary nature is the ability to expand, contract, and change the balance and focus of Marine forces. Because many crises are sudden and require a rapid response, the initial force arriving at the scene of a developing crisis is rarely sufficient to conduct decisive operations. The ability to respond effectively to such crises demands the ability to restructure an expeditionary force after its introduction into the theater without sacrificing continuity in operational capability. The ACE's modular structure allows rapid expansion into a larger force by adding the needed forces to each of the existing subordinate units. Similarly, should the situation require a lesser force or a different balance of capabilities, the ACE is easily redesigned to suit the situation. This flexibility in size and force includes the ability to expand into a joint or combined force.

3004. Marine Aviation and Maneuver Warfare

The Marine Corps' warfighting philosophy emphasizes an integrated combined-arms approach that employs rapid, flexible maneuver. Maneuver warfare seeks to shatter the enemy's cohesion through a variety of rapid, focused, and unexpected actions. These actions create a turbulent and rapidly deteriorating situation for the enemy. The Marine Corps implements the maneuver warfare concept through air-ground teams—MAGTFs. These teams execute mission-type orders and maneuver in time and space, in combination with the application of fires, to create positional or temporal advantages over the enemy. Inherent in maneuver warfare is the need for speed in order to seize the initiative, dictate the terms of action, and keep the enemy off balance. Marine aviation plays a crucial role in the MAGTF's ability to conduct maneuver warfare by contributing task-organized ACEs that are specifically designed to provide the MAGTF with the necessary mobility, flexibility, force protection, and fires. The following subparagraphs discuss ways in which the maneuver warfare concept relates to the employment of Marine aviation.

a. Orienting on the Enemy

Orienting on the enemy is fundamental to maneuver warfare. Maneuver warfare attacks the enemy "system." The enemy system is whatever constitutes the entity confronting us within our particular sphere. For a pilot, it might be the combination of air defense radars, surface-to-air missiles, and enemy aircraft that must be penetrated to reach the target. For an electronic warfare specialist, it might be the enemy's command and control network. For a MEF commander, it might be all the major combat formations within an area of operation as well as their supporting command and control, logistic, and intelligence organizations.

Economy demands that the MAGTF focus its efforts toward some object or factor of decisive importance to achieve the greatest effect at the least cost. Therefore, planners must understand both the sources of the enemy's strength and where the enemy is vulnerable.

We call a key source of strength a "center of gravity." It represents something without which the enemy cannot function. In broad terms, centers of gravity are the characteristics, capabilities, or localities from which a military force derives its freedom of action, physical strength, or will to fight. In practice, planners must distinguish between a strategic center of gravity and an operational center of gravity. A strategic center of gravity is an objective whose seizure, destruction, or neutralization will have a profound impact on the enemy leadership's will or ability to continue the struggle. It may be something tangible, like a political leader, a particular military force, or a capital city, or it may be intangible, like a popular belief in a cause or faith in eventual victory. An operational center of gravity, on the other hand, is normally an element of the enemy's armed forces. It is that concentration of the enemy's military power that is most dangerous to us or the one that stands between us and the accomplishment of our mission. The degree of danger that a force poses may depend on its size or particular capabilities, its location relative to ourselves, or the particular

skill or enterprise of its leader. MCDP 1-2 contains detailed information on centers of gravity and critical vulnerabilities.

Often we cannot attack enemy strengths directly because they are too well protected. Rather, we seek to attack a weakness that allows us to strike at the enemy's center of gravity indirectly, pitting our power against its weakness. A vulnerability cannot be critical unless it undermines a key strength. It also must be something that we are capable of attacking effectively.

However, even critical vulnerabilities may not be easy to attack. We may have to design a progressive sequence of actions that expose, create, or isolate a vulnerability that creates, over time, an opportunity to strike the decisive blow. An example would be to peel away the enemy's air defenses in order to permit a successful air attack on key command and control facilities. These facilities become the critical vulnerability that allow us to disable or destroy the enemy's air force, which is one of its centers of gravity.

In supporting the maneuver warfare tenet of orienting on the enemy, Marine aviation operations draw on both the center of gravity and critical vulnerability concepts. Aviation expands the operational reach of the MAGTF, potentially exposing a wide range of the enemy's potential critical vulnerabilities to attack. At the same time, it contributes greatly to the protection of friendly centers of gravity and critical vulnerabilities. Just as we pursue our enemy's critical vulnerabilities, we should expect the enemy to pursue ours. The ACE can play a proactive role in identifying those aspects of the enemy defense that are vulnerable to attack by air. The ACE is also responsible for planning air defense for the MAGTF and ensuring that the MAGTF's assets are not exposed to enemy aviation.

b. Philosophy of Command

Our philosophy of command must support the way we fight. First and foremost, to generate the tempo of operations we desire and to best cope with the uncertainty, fluidity, and disorder of combat, command and control must be decentralized. Marine aviation adheres to the MAGTF's maneuver warfare philosophy of centralized command and decentralized control. Typically, the ACE is commanded by a single commander located in the TACC, who then delegates the control of aviation assets to the subordinate agencies of the MACCS involved in the execution of operations.

c. Decisive Actions

Decisive actions on the battlefield are those actions that most directly and expeditiously lead to the imposition of our will on the enemy by destruction of its forces and capability to wage warfare or the destruction of the enemy's will to resist. By concentrating our efforts and assets on actions that have a maximum impact on the enemy, we can minimize the number of decisive engagements required to attain victory.

It is possible for aviation forces to provide the decisive action in a battle. Normally, however, aviation forces are but one of several forces in the MAGTF that together conduct decisive actions. The MAGTF fights as a combined-arms team where the actions of the whole are greater than the sum of the actions of the individual parts. The MAGTF is more likely to be decisive (e.g., accomplish its mission) when it is employed as a whole, rather than employing its major subordinate elements sequentially, separately, or piecemeal. It does not rely on any one element alone to achieve a decisive action. Marine aviation makes its greatest contribution to MAGTF decisive action when the individual actions of aviation forces are integrated with those of the MAGTF's other elements.

d. Shaping Action

To influence an action to our advantage, we must project our thoughts forward in time and space. Since war is inherently disorderly and we cannot expect to dictate its terms with any sort of precision, we attempt to shape the general conditions of war. We shape the battlespace to create situations of advantage. Shaping actions are intended to render the enemy vulnerable to attack, facilitate the maneuver of friendly forces, and dictate the

time and place for decisive battle. Shaping operations occur at all levels of war.

Aviation contributes to the MAGTF's shaping efforts in several ways. Aviation can make the enemy react against its will. It can impede or prevent the enemy from moving when it must. Aviation can hinder or prevent the massing of enemy forces and equipment by delaying the arrival of those forces, compelling enemy commanders to commit their forces piecemeal, and denying the enemy the supplies it needs to remain operational. Aviation can diminish the enemy's physical capabilities, upset its plan, and stifle its initiative. Aviation also helps shape the battlespace through the operational range and mobility that it provides Marine ground forces. The option for vertical insertion of ground forces adds yet another dimension to the ground commander's maneuver options.

Shaping actions, by all elements of the MAGTF, are also used to maximize aviation capabilities. Special operations forces can identify, disrupt, or destroy portions of the enemy's air defense system. Enemy aircraft can be destroyed on the ground through OAAW. Ground forces can seize an airfield needed as a FOB to extend the reach of aviation. CSS units can ensure the uninterrupted supply of fuel and ammunition at FARPs to enhance aviation responsiveness. The combined shaping efforts of all elements provide aviation with the freedom of action necessary to conduct successful air operations.

The MAGTF commander uses organic ACE aviation to set the course of operations in support of the JFC's campaign plan well in advance of the GCE's close combat operations. Successful MAGTF shaping maximizes aviation's ability to provide continuous, uninterrupted air support; delay enemy reinforcements through interdiction; degrade critical enemy functions or capabilities such as command and control, OAS, or logistics; and manipulate the enemy's perceptions.

The most important shaping operation performed by aviation is to gain air superiority. Air superiority is the degree of dominance in the air battle of one force over another that permits the conduct of operations by the former and its related land, sea, and air forces at a given time and place without prohibitive interference by the opposing force. Successful MAGTF operations are contingent on the ability to operate freely within the battlespace and to deny the enemy freedom of action. The ACE's ability to shape both the close and deep battlespace, provide potent and responsive firepower and enhance mobility are key contributions to the MAGTF's achievement of battlespace dominance.

Air superiority is *essential* to the conduct of all functions of Marine aviation and therefore weighs heavily in creating conditions for successful aviation operations. Theater-wide air superiority cannot always be achieved immediately. At times, it may be necessary only to achieve local air superiority in order to facilitate a particular phase of a campaign.

Control of the air must be a priority for the entire MAGTF—not just the ACE. Air superiority extends beyond the realm of air-to-air combat. It requires the combined efforts of the MAGTF to neutralize or destroy enemy air defenses, airfields, and air command and control facilities. Once air superiority is achieved, aviation is free to provide effective support to the MAGTF.

This is also true for a joint force, where MAGTF actions, at least initially, will be integrated into the joint force's goal of achieving a degree of air superiority. One of the most important aspects of the initial air operations phase of Operation Desert Storm (January 17 to February 23, 1991) was to gain and maintain air superiority. The effectiveness of this action was illustrated by the fact that at no time during the subsequent ground operations phase (February 24 to 27, 1991) did Iraqi aviation possess either the capability or the will to interfere with our actions. Aviation operations seldom achieve a decisive result alone, but the advantage that air superiority provides in the conduct of MAGTF or joint operations is significant.

Although Marine aviation is designed largely for tactical operations, air superiority provides pro-

found operational and strategic benefits. During the island-hopping campaign of World War II, naval aviation's ability to attack virtually anywhere compelled the Japanese to spread their combat forces to defend everywhere (e.g., the concept of divide and conquer). It forced the Japanese to man literally hundreds of outposts. Thinly spread, the Japanese military proved unable to mass forces to withstand the combined might of U.S. air, land, and sea forces. This placed the Japanese on the defensive, created an opportunity to turn the course of the war in the Pacific, and achieved a decision.

e. Decisionmaking

Decisionmaking is essential to the conduct of war since all actions are the result of decisions or of nondecisions. Warfare, by its very nature, is fraught with uncertainty. Uncertainty is exacerbated by the lack of time—a critical factor and a fundamental constraint in effective decisionmaking. The commander must always balance the value of gaining more information to mitigate uncertainty against the need to shorten the decisionmaking process.

Decisionmaking may be an intuitive process based on experience, particularly when time is extremely constrained. This will likely be the case at lower command echelons and in fluid, uncertain situations like those in an ATC center or in the cockpit. Alternatively, decisionmaking may be a more analytical process that is based on comparing several options. This will more likely be the case at higher echelons or in deliberate planning situations found in the future planning cell of the TACC, where the planning horizon is longer.

In execution, decisionmaking becomes a time-competitive process, and timeliness of decisions becomes essential to generating tempo. Tempo is the use of time as a weapon, and it is a critical consideration for the ACE commander. Being able to consistently generate a tempo of operations that the enemy cannot handle is crucial to the conduct of maneuver warfare. However, the highest tempo of operations, of which a force is capable, is not normally sustainable over extended periods.

Two levels of operational activity exist for aviation: sustained and surge. Sustained operations match the regeneration capabilities of the system (maintenance, manpower, and supply) to the utilization rate, thus achieving tempo that maintains a steady state. Surge operations can temporarily increase tempo in order to take advantage of battlefield opportunities. However, surge rates are obtained at the expense of all or a portion of the regenerative capability. Aviation units operating at a sustained rate can maintain a specific tempo of operations for an extended period of time. These same units operating at the surge rate can maintain a heightened tempo, but only for a limited period. The ACE commander must employ an appropriate mix of sustained and surge operations to control the operational tempo and maintain momentum without exhausting assets before the culminating point is reached.

f. Mission Tactics

MCDP 1 and MCDP 6, *Command and Control*, both emphasize a command and control philosophy based on mission orders and mission tactics. This approach to command and control lies at the heart of maneuver warfare. Under this approach, seniors assign missions and explain their underlying intent but allow subordinates as much latitude as possible in the manner of accomplishment. It is the assignment of a subordinate a mission without specifying how the mission must be accomplished.

Mission tactics works in conjunction with aviation's philosophy of centralized command and decentralized control. It allows the senior commander to focus on higher-level concerns rather than the details of subordinate execution and serves as a contract between senior and subordinate commanders. The senior prescribes the method of execution only to the degree needed for coordination. The pace, complexity, and uncertainty of modern warfare necessitate this decentralization of control. The actual degree to which control is decentralized depends on the unique requirements of the specific situation. In some instances detailed and highly centralized control (e.g., ATC) is required. Centralized planning may be employed to enhance unity of effort and to

concentrate resources on an identified main effort. However, whenever possible, decentralized control is used to increase the speed and agility of the MAGTF—including its aviation arm.

Once the mission and plan have been prepared and briefed by the commander and the staff, subordinates are expected to exercise their initiative based on their understanding of the commander's intent. Aviation groups supply the aircraft and crews to meet the air tasking order (ATO) or air plan. They execute the assigned mission with the latitude necessary to accomplish it. MACCS agencies execute the plan for command and control without interference from the commander. Mission tactics are fundamental to Marine aviation operations and provide the flexibility necessary to adapt to rapidly changing situations and exploit fleeting opportunities.

g. Commander's Intent

There are two parts to any mission: the task to be accomplished and the reason or intent behind it. The task describes the action to be taken, and the intent describes the purpose of the action. The intent is part of every mission and is established by the commander assigning it. The commander's intent, clearly stated, enables unity of effort while decentralizing command and control. Once the mission is assigned, the commander develops a vision of how the operation should unfold in order to achieve the desired goal. This vision is shared with subordinates and includes the commander's intent. In the absence of detailed instructions, which are often unavailable in the midst of uncertainty and rapid changes in the battlespace, the intent provides the purpose and direction. The commander's intent is a device used at all command echelons within the MAGTF to enable subordinates to take the initiative. The MAGTF commander provides his intent to the ACE commander, the ACE commander provides his intent to his group commanders, and group commanders provide their intent to their squadron commanders. Prior to launching any aviation sortie, the mission commander, flight leaders, and individual pilots review the commander's intent and analyze how it applies to a particular mission so they will be prepared to take the initiative as the situation dictates.

h. Main Effort

The main effort is the designated subordinate unit whose mission is most critical to overall mission success. Commanders design an operation carefully so that success by the main effort facilitates the success of the entire force. The main effort receives priority for support of any kind, and all other units support the main effort. Unlike commander's intent, which is a harmonizing device for subordinate initiative, the main effort is a unifying device that concentrates the MAGTF's efforts on the most important goal. Support of the main effort becomes an overriding factor in all decisions. When the MAGTF commander designates an element (ACE, GCE, or CSSE) of the MAGTF as the main effort, the other elements assume a supporting role. Thus, the main effort is the supported unit (one element of the MAGTF), while the supporting effort is provided by the supporting units (other elements of the MAGTF). The ability to shift the emphasis or to change the main effort from one element to another provides the MAGTF commander with flexibility. Any element of the MAGTF can be designated as the main effort. But, typically, only the ACE or GCE (or any portion thereof) with their inherent capability to maneuver and fire is designated as the main effort during combat operations. Since MOOTW encompasses a wide spectrum of operations, any of the three MAGTF elements (ACE, GCE, or CSSE) can be designated as the main effort. The ACE provides the MAGTF commander with firepower, flexibility, mobility, force protection, sustainability, and command and control, whether it is designated as the main effort or as the supporting effort.

Within the ACE, the concept of main effort is critical to the decisions made in the planning and execution of all aviation operations. With the ACE as the main effort, both the GCE and CSSE provide full support to ensure the success of the ACE. For example, the MAGTF commander might designate the ACE as the main effort when his operation plan or the JFC's campaign plan requires air superiority. In this case, the GCE and

CSSE could provide suppression of enemy air defenses or security for a FOB, or they could give priority in fuel and ammunition transportation to aviation units.

When the ACE is not the MAGTF's main effort, it assumes a supporting role. The ACE commander focuses all internal ACE resources (maintenance, manpower, supply, etc.) on the aviation functions and capabilities needed to support the MAGTF's main effort. The ACE commander may still designate a main effort within the ACE to achieve maximum ACE support to the MAGTF's main effort.

i. Surfaces and Gaps

Surfaces are enemy strengths, also referred to as hard spots. Gaps are enemy weaknesses, also referred to as soft spots. We avoid enemy strengths and focus our efforts against the enemy's weaknesses. Whenever possible, we exploit existing gaps or we create gaps as needed. Surfaces and gaps are a tactical application of the operational concept of finding and attacking a center of gravity through a critical vulnerability. Surfaces and gaps can be, but are not always, centers of gravity or critical vulnerabilities. The commander strives to match the MAGTF's strength against the enemy's weakness.

Because of the fluid nature of war, gaps will rarely be permanent and will usually be fleeting. To exploit them requires flexibility and speed. The characteristics of Marine aviation make it ideally suited to temporarily fill gaps or to create gaps where none exist. Marine aviation's ability to rapidly and accurately concentrate firepower in a small area can be effective in creating gaps, and its continuous and aggressive aviation reconnaissance can seek out existing gaps. Once gaps are located, exploitation by fast-moving, mobile forces is critical. Aviation units can prevent enemy forces from closing the gap or they can be used to exploit the gap with assault support forces.

Exploitation usually occurs at a gap and extends the destruction of the enemy by maintaining continuous offensive pressure. Exploitation destroys the enemy's cohesion. In a classic demonstration of maneuver warfare, the commander aims to render the enemy incapable of effectively resisting by shattering his moral, mental, and physical cohesion and his ability to fight as an effective, coordinated whole. Marine aviation offers the commander the speed and flexibility needed to support exploitation in a number of ways. It can provide direct air support to the main effort to prevent enemy forces from disengaging, withdrawing, reconstituting, or reinforcing. It can also support a committed reserve, either with firepower or mobility, at the moment when the opportunity for exploitation is realized. As enemy cohesion breaks down, the exploitation may develop into a pursuit.

The pursuit seeks to annihilate the enemy force once resistance has completely broken down. The condition of the enemy may determine whether an exploitation becomes a pursuit. The opportunity to conduct a pursuit is often fleeting and must be seized quickly by the commander. An effective pursuit requires the integrated efforts of the MAGTF's combat arms. During a pursuit, a direct-pressure force must have sufficient combat power to maintain pressure on the enemy. An encircling force must have continuous fire support and greater mobility than the enemy. The ability of aviation to move quickly to destroy enemy forces and deny them routes of escape makes aviation particularly valuable as an encircling force in the pursuit. The main effort may shift to the ACE during the pursuit to maintain pressure on the enemy or to destroy the enemy's will to resist.

j. Combined Arms

Ten years after the first combat use of aircraft, the Italian air power theorist, Giulio Douhet, recognized the need to focus all combat forces toward one common goal. Douhet believed that the use of military ground, naval, and aerial forces in war should be focused on a single outcome—to win. Douhet cautioned that the best results can be obtained only by a proper apportioning of ground, naval, and aerial forces. To attain maximum effectiveness, these forces must be coordinated and in harmony with one another. These three forces

should function as ingredients (or factors) that produce a single product.

Douhet was speaking of combined arms. The MAGTF is the epitome of a combined-arms organization that focuses all combat forces on one common goal. Within the Marine Corps, combined-arms warfare is the full integration of various arms in such a way that to counteract one, the enemy must make itself more vulnerable to another. We present the enemy with more than one problem—a dilemma in which any action he takes makes him vulnerable to attack.

We accomplish combined arms through the tactics and techniques we use at the lower levels and through task organization at higher levels. In so doing, we take advantage of the complementary characteristics of different types of units and enhance our mobility and firepower. Firepower and mobility are complementary. Firepower aids mobility by causing the destruction and chaos necessary to render the enemy helpless to oppose our movement. Mobility enhances firepower by placing the attacker in a position where the target can be more accurately and effectively engaged. In combat, firepower and mobility are inseparable parts of a larger whole.

Firepower damages or threatens to damage enemy personnel, facilities, and equipment. Firepower sometimes fulfills the purpose of the mission—to destroy an enemy force or keep it from using a certain resource. Firepower aids our movement; e.g., using an air attack to destroy an enemy emplacement whose fires have immobilized our ground force. The benefits of firepower are not limited to physical destruction, but include the fear and mental chaos that firepower produces in the enemy. The appropriate application of firepower can have wide-ranging effects, from destruction to intimidation, to outright submission, to surrender. Operation Desert Storm is an example of the integrated application of aviation firepower in combined arms and its ability to condition and mold the enemy mentally. The innovative application of firepower and mobility in Operation Desert Storm created conditions for success that allowed coalition forces to exploit the enemy's loss of will and means to fight.

Combining the effects of all combat resources is essential in achieving a decision. For example, consider the outcomes of Operation Strangle versus Operation Diadem. The difference in the outcomes illustrates the difference in effectiveness between aviation acting alone and aviation acting as part of a combined-arms team to achieve a decisive action.

> Conducted in the spring of 1944, Operation Strangle was designed by the Allies to use aviation alone to destroy and disrupt German resupply efforts in Italy. Allied aviation assets were used to interdict railway systems that delivered supplies to the Germans. Unfortunately, without an Allied ground operation that supported the air effort, the German troops had a low supply expenditure rate and were actually able to stockpile resources during Operation Strangle.
>
> Operation Diadem was conducted immediately following Operation Strangle. With the ground forces designated as the main effort, aviation supported the ground effort by interdicting targets in the German rear areas. The combined ground and aviation efforts soundly broke the German resolve and allowed the Allies to liberate Rome.

Within the ACE, the combined-arms concept is applied to the tailoring of mission packages to ensure that each has the appropriate mix of mutually supporting aviation capabilities, is focused on a common goal, and are guided by the commander's intent. The actual make-up of mission packages varies significantly and is usually situation dependent. For example, an assault support mission package may include transport helicopters; attack helicopters; fixed-wing AAW, EW, and attack aircraft; and command and control aircraft that represent all six functions of Marine aviation.

Success in battle requires the integration of many disparate efforts. Effective action in any one effort is rarely decisive in and of itself. However,

Table 3-1. Functions of Aviation in Support of Warfighting Functions.

	Warfighting Functions and the Type of Support Provided					
Functions of Marine Aviation	**Command and Control**	**Maneuver**	**Fires**	**Intelligence**	**Logistics**	**Force Protection**
Assault Support	Support	Primary	Support	Support	Primary	Support
AAW	Support	Support	Support	Support	Support	Primary
Air Reconnaissance	Support	Support	Support	Primary	Support	Support
EW	Support	Support	Primary	Primary	Support	Primary
OAS	Support	Support	Primary	Support	Support	Primary
Control of Aircraft and Missiles	Primary	Support	Support	Support	Support	Support

the overall effect is greater when all efforts are combined and coordinated toward a single goal. The Marine Corps achieves this combined-arms synergy by organizing and coordinating all of these efforts into six warfighting functions: command and control, maneuver, fires, intelligence, logistics, and force protection. The six functions (i.e., capabilities) of Marine aviation are integrated and provide a significant contribution to each of these warfighting functions. Table 3-1 aligns the six functions of Marine aviation with the six warfighting functions. This alignment is a necessary first step in redefining the six functions of Marine aviation in terms applicable to emerging doctrinal concepts.

3005. The ACE in Maneuver Warfare

A maneuver element is a distinct force that uses both fire and movement in engaging the enemy to generate and exploit an advantage over it as a means of achieving a specific objective. Using the Marine aviation forces of the ACE as a maneuver element provides a wide range of possibilities for mission accomplishment. It also increases the number of courses of action (COAs) available to the MAGTF commander. Marine aviation forces can provide essential fires in support of ground maneuver elements, assault support aviation can vastly enhance ground forces' mobility and maneuverability, or Marine aviation forces can also be used purely or predominantly as a maneuver element. Aviation leaders and planners should be familiar with the variety of roles that combat forces can play in maneuver and think imaginatively about ways in which aviation can contribute.

Opportunities to employ and commit the ACE will depend on the nature of the enemy, the terrain, and the situation. By employing the ACE or its forces as a maneuver element, the MAGTF commander can fully capitalize on a force's range, speed, and agility. In that role, aviation can provide the main effort, provide a supporting effort, or serve as part of the MAGTF reserve.

Some tactical tasks and/or missions in which aviation units or forces may be able to perform as a maneuver element are listed below:

- Envelopment (single, double, vertical).
- Block.
- Rupture.
- Spoiling attack.
- Counterattack.
- Feint.
- Demonstration.
- Diversion.
- Reconnaissance.
- Raid.
- Exploitation.
- Pursuit.
- Fix.
- Screen.

- Guard.
- Cover.

Note: While aviation forces are capable of performing the tasks and/or missions listed above, they will seldom execute them alone. Marine Corps doctrine dictates that Marine forces operate as a combined-arms team, and most tasks and/or missions will be conducted with a variety of integrated, mutually supporting forces.

3006. Aviation in Offensive and Defensive Operations

The six functions of Marine aviation each play a significant role in both offensive and defensive operations. Because aviation inherently assumes an offensive role, it supports either offensive or defensive operations in exactly the same way. Aviation can continue offensive operations while the GCE is conducting defensive operations. The ACE commander apportions aviation assets as needed to best support the concept of operations and its assigned tasks and missions while remaining consistent with the MAGTF commander's intent.

a. Offensive Operations

The MAGTF conducts four types of offensive operations: movement to contact, attack, exploitation, and pursuit. It uses five forms of maneuver to effect offensive operations:

- A *frontal attack* can create a gap through which the attacking force can conduct a penetration. Aviation forces use fires to create gaps in the enemy's front or to prevent or delay enemy reinforcements reaching the front lines.
- A *penetration* is accomplished by concentrating overwhelmingly superior combat power on a narrow front and in depth in order to rupture the enemy's position and widen the gap. Mechanized and aviation forces are used to rupture the enemy's position and exploit the rupture.
- A *flanking attack* is directed at the flank of an enemy. A supporting effort engages the enemy's front with fire and maneuver, while the main effort maneuvers to attack the enemy's flank. Aviation forces support the main and supporting efforts as needed.
- An *envelopment* uses attacking forces to bypass the enemy's principal defensive positions to secure objectives to the enemy's rear. The operational reach and speed of aviation forces make them an ideal force to conduct envelopments.
- A *turning movement* uses attacking forces to pass around or over the enemy's principal defensive positions to secure objects deep in the enemy's rear. Aviation forces may serve as fixing forces or conduct the exploitation and pursuit in a turning movement.

In today's nonlinear battlespace, it is likely that several combinations of different types of operations and forms of maneuver will occur simultaneously. The ACE, with an area of operations that matches that of the entire MAGTF, must carefully allocate its assets to ensure a focus of effort that is responsive to the constantly changing situation. Depending on the circumstances, the ACE can support all forms of maneuver. Whether aviation provides the main or a supporting effort, its contribution with the six functions of Marine aviation in all types of offensive operations is significant. The ACE commander ensures that the focus of aviation remains commensurate with the MAGTF commander's priorities.

b. Defensive Operations

Defensive operations represent a coordinated effort to defeat the enemy and prevent it from achieving its objective. The purpose of defensive operations is to cause an enemy attack to fail and to achieve specific objectives, such as gaining time. These operations act as a prelude to offensive operations or serve to protect friendly forces and centers of gravity. An effective defense is never passive. Commanders at every level seek every opportunity to seize the initiative and shift to the offensive. The ACE is no less dynamic in defensive operations than in offensive operations, and it continuously seeks to create and exploit opportunities in order to defeat the enemy. The two fundamental types of defense are mobile defense and position defense. Commanders will rarely use one type or the other exclusively.

(1) Mobile Defense. A mobile defense is the defense of an area or position in which maneuver is used together with fire and terrain to seize the initiative from the enemy. A mobile defense focuses on the destruction of the enemy by permitting him to advance into positions that expose him to counterattack by a strong, mobile reserve. Minimal force is placed forward to canalize, delay, disrupt, and deceive the enemy as to the actual location of our defenses. By retaining the mobile forces until the critical time and place are identified, the commander can then focus combat power in violent and rapid counterattacks throughout the depth of the battlespace. Marine aviation provides vital support to all defending forces and may serve as the main or only counterattack force.

(2) Position Defense. A position defense (sometimes referred to as an area defense) places the bulk of the defending force in selected tactical positions (where the decisive battle will be fought). It denies the enemy critical terrain or facilities. A position defense focuses on the retention of terrain by absorbing the enemy into a series of interlocked positions from which he can be destroyed, largely by a combination of fire and maneuver. Principal reliance is placed on the ability of the forces in the defended positions to maintain their positions and to control the terrain between them. Marine aviation can provide the fires necessary for this form of defense.

3007. Aviation in Security Operations

Security is an aspect of all operations, whether offensive, defensive, or retrograde. Security operations are assigned missions. They involve the measures taken by a unit to protect itself against all acts that might impair its effectiveness. There are three types of security missions: screen, guard, and cover. Each of these missions entails placing a force between the enemy and our main force. As part of a task-organized security force, Marine aviation can provide various functional capabilities that extend a security mission's reach, responsiveness, and effectiveness. Depending on the nature of the enemy, weather, and terrain, fixed-wing and/or rotary-wing aircraft may be able to perform the security mission by themselves. However, most security operations include a mutually supporting mix of forces.

a. Screen

A screen observes, identifies, and reports information. It fights only in self-protection and—

- Provides early warning of enemy approach.
- Gains and maintains enemy contact and reports enemy activity.
- Conducts counterreconnaissance within its capabilities.
- Impedes and harasses the enemy within its capabilities.

A screen provides only surveillance and early warning of enemy action, not physical protection. It can be employed as an economy-of-force measure in a low-risk area because it provides security on a broad frontage with limited assets. Marine aviation combat forces are ideally suited to performing a screen because of the large areas to be screened during rapid and deep offensive operations. However, the cost in resources over time is a factor. For example, a screen consisting of one section of fighter and/or attack aircraft may require commitment of an entire squadron plus supporting aircraft (e.g., to provide EW and target acquisition) to ensure 24-hour coverage. Also, surveillance from the air has certain limitations and the enemy may have the ability to conceal its forces and facilities from aerial observation.

b. Guard

A guard protects the main force from attack, direct fire, and ground observation by engaging the enemy in order to gain time while also observing and reporting information. It also—

- Provides early warning of enemy approach.
- Provides maneuver space to the front, flanks, or rear of the force.
- Screens, attacks, defends, or delays (within its capabilities) to protect the force.

An advance guard provides early warning, develops the situation, and provides time and maneuver

space for an attacking force. A flank guard operates to the flank of a moving or stationary force to protect it from enemy ground observation, direct fire, and surprise attack. A flank guard must protect the entire depth of the main force's flank. A rear guard protects the rear of the column from hostile forces. It attacks, defends, and delays as necessary. The commander may order the guard to hold for a specified period of time. Marine aviation's reconnaissance capabilities, speed, range, firepower, and mobility make it ideal for a guard mission.

c. Cover

A covering force operates apart from the main force to intercept, engage, delay, disorganize, and deceive the enemy before it can attack the main body. It prevents surprise during the advance. It also—

- Gains and maintains contact with the enemy.
- Denies the enemy information about the size, strength, composition, and intention of the main force.
- Conducts counterreconnaissance and destroys enemy security forces.
- Develops the situation to determine enemy dispositions, strengths, and weaknesses.

Aviation forces assets may provide covering forces because of their speed, range, reconnaissance, and communications capabilities. A cover screens, guards, attacks, defends, and delays as necessary to accomplish its mission. It is a self-contained maneuver force that operates beyond the range of friendly artillery positioned with the main force. A covering force may be task-organized (including infantry and aviation forces, artillery, and combat service support) to operate independently. The cover mission may be expressed in terms of time or enemy disposition (e.g., delay the enemy for 3 hours before battle handover or delay the enemy until the advance guard is defeated).

3008. Aviation in Military Operations Other Than War

MOOTW involves the use of military forces in situations other than large-scale, sustained military operations. MOOTW focuses on deterring war, resolving conflict, promoting peace, and supporting civil authorities in response to domestic crises. As in war, MOOTW's goals are to achieve national objectives as quickly as possible and to conclude operations on terms that are favorable to the United States and its allies. MOOTW may involve elements of both combat and noncombat operations and may occur during either peacetime or war. JP 3-07, *Joint Doctrine for Military Operations Other Than War*, lists the following 16 types of MOOTW:

- Arms control.
- Combatting terrorism.
- Department of Defense support to counterdrug operations.
- Enforcement of sanctions and/or maritime intercept operations.
- Enforcing exclusion zones.
- Ensuring freedom of navigation and overflight.
- Humanitarian assistance.
- Military support to civil authorities.
- Nation assistance or support to counterinsurgency, which includes—
  - Security assistance.
  - Foreign internal defense.
  - Humanitarian and civic assistance.
- Noncombatant evacuation operations (NEOs).
- Peace operations, which include—
  - Peace enforcement.
  - Peacekeeping.
  - Operations in support of diplomatic efforts (which include preventive diplomacy, peacemaking, and peace building).
- Protection of shipping.
- Recovery operations.
- Show of force operations.
- Strikes and raids.
- Support to insurgency.

NEOs involve the protection and subsequent removal of noncombatants from potentially hostile or dangerous situations. Like raids, NEOs involve the swift insertion of a force, the temporary occupation of objectives, and a planned withdrawal. It is the most frequently conducted MOOTW by Marine forces. Marine aviation is a critical resource in the conduct of NEOs.

Marine aviation is versatile enough to deliver security forces to a remote area, evacuate threatened noncombatants, conduct rapid force withdrawal, and provide covering and supporting fires throughout. Its speed and mobility generate tempo, often allowing friendly forces to act before opponents can react. The inherent flexibility and capabilities of aviation, coupled with the forward presence of the MAGTF, make Marine aviation an ideal asset for MOOTW. For example, during January 1991, while conducting training for Operation Desert Storm off the coast of Oman, the 4th Marine Expeditionary Brigade received orders to conduct a NEO in Mogadishu, Somalia. While elements of the 4th Marine Expeditionary Brigade were steaming from Oman to Somalia, MAGTF aircraft were launched to begin the NEO. Thereby demonstrating Marine aviation's flexibility to rapidly transition from combat to MOOTW.

Another important consideration is the ACE's logistic capabilities. The ACE's logistic capabilities will sometimes prove far more important than firepower in a MOOTW. On April 29, 1991, a cyclone killed more than 130,000 people in Bangladesh. The country's entire infrastructure along the Bay of Bengal was destroyed, leaving an estimated 3 million people homeless. Operation Sea Angel provided MAG-50 helicopters that were loaded with supplies, food, water, water-making facilities, medicine and medical units, communications and liaison teams, area air reconnaissance, and basic air transportation. By the time the amphibious task force departed Bangladesh on May 29th, Marine aircraft had flown 1,167 helicopter sorties in 1,114 flight hours, moved 5,485 passengers, and delivered close to 700 tons of relief supplies.