

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.

Functions of Marine Aviation	Warfighting Functions and the Type of Support Provided					
	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.

- 1 Guard.
- 1 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:

- 1 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.
- 1 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.
- 1 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.

- 1 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.
- 1 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—

- 1 Provides early warning of enemy approach.
- 1 Gains and maintains enemy contact and reports enemy activity.
- 1 Conducts counterreconnaissance within its capabilities.
- 1 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—

- 1 Provides early warning of enemy approach.
- 1 Provides maneuver space to the front, flanks, or rear of the force.
- 1 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—

- 1 Gains and maintains contact with the enemy.
- 1 Denies the enemy information about the size, strength, composition, and intention of the main force.
- 1 Conducts counterreconnaissance and destroys enemy security forces.
- 1 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:

- 1 Arms control.
- 1 Combatting terrorism.
- 1 Department of Defense support to counterdrug operations.
- 1 Enforcement of sanctions and/or maritime intercept operations.
- 1 Enforcing exclusion zones.
- 1 Ensuring freedom of navigation and overflight.
- 1 Humanitarian assistance.
- 1 Military support to civil authorities.
- 1 Nation assistance or support to counterinsurgency, which includes—
 - 1 Security assistance.
 - 1 Foreign internal defense.
 - 1 Humanitarian and civic assistance.
- 1 Noncombatant evacuation operations (NEOs).
- 1 Peace operations, which include—
 - 1 Peace enforcement.
 - 1 Peacekeeping.
 - 1 Operations in support of diplomatic efforts (which include preventive diplomacy, peacemaking, and peace building).
- 1 Protection of shipping.
- 1 Recovery operations.
- 1 Show of force operations.
- 1 Strikes and raids.
- 1 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.