Chapter 1

The Role of Marine Aviation

“Today [aviation] is the dominant factor in war. It may not win a war by itself alone, but without it no major war can be won.”

—Adm Arthur Radford

Marine forces are general purpose forces and traditionally come “from the sea” with limited organic fire support and mobility assets. As such, Marine forces rely heavily on the fires, fire support, and mobility provided by Marine aviation. Marine aviation is an integral part of the Marine air-ground task force (MAGTF). It provides the MAGTF with a complete spectrum of operational capabilities and is a flexible instrument of the MAGTF’s combat power. The aviation combat element (ACE) is a powerful and versatile part of the MAGTF’s combined-arms team, complementing the MAGTF’s ground combat element (GCE) and combat service support element (CSSE), while functioning in consonance with the Marine Corps’ doctrinal philosophy of maneuver warfare.

Marine aviation provides the MAGTF with the operational flexibility it needs to accomplish its mission across the range of military operations. It extends the operational reach of the MAGTF and enables it to accomplish operational objectives designed to achieve strategic goals. The MAGTF uses the strategic and operational mobility afforded by the sea to employ its integrated air arm and to exert a powerful influence in most geographic areas of potential national concern. Since most ground- and ship-based fires have a limited range and ground-based mobility systems are limited by speed, range, and the terrain, the MAGTF’s ACE allows the MAGTF commander to conduct the deep fight. The ACE affords the MAGTF the ability to deliver fires, facilitate integrated command and control, enhance mobility and maneuver, provide force protection, sustain combat power, and collect intelligence.

Marine aviation’s expeditionary character sets it apart from all other aviation organizations. The ACE’s role is to project combat power, conduct air operations, and contribute to battlespace dominance in support of the MAGTF’s mission, and it organizes, trains, and equips for that role. Marine aviation can operate from amphibious platforms, forward operating bases (FOBs), forward expeditionary land bases, carriers (as an integral part of carrier air groups), or any combination thereof.

The MAGTF’s single-battle concept exploits the combined-arms nature of MAGTF operations. It allows the MAGTF commander to fight a single battle with an integrated, task-organized force of ground, aviation, and logistic forces. Based on this concept, operations performed by Marine aviation are rarely undertaken in isolation since its greatest value is in its integrated contribution to the MAGTF’s overall mission. It is designed to function most effectively as an integral part of the MAGTF and cannot be separated without a significant loss of capability. Marine aviation provides enhanced mobility and close fires for units in contact and augments ground and naval indirect fires. Marine aviation also gives a Marine expeditionary force (MEF), which would otherwise be a light infantry force, the operational reach of a corps-level force.

Marine aviation performs a variety of roles and tasks in support of national objectives. This can include fulfilling missions outside Marine aviation’s traditional MAGTF, naval expeditionary force, and joint force roles. Examples of Marine aviation being used in nontraditional roles include providing direct support to the President; providing aviation detachments for independent duty such as the Marines attached to the joint force air
component commander (JFACC) in Aviano, Italy, in support of operations in Bosnia; providing forces for counterdrug operations such as the ground-based air search radars teams deployed to support Operation Nimbus; and participating in disaster relief operations such as Homestead, Florida after it was struck by Hurricane Andrew.

Marine aviation provides the MAGTF with six specific functions: antiair warfare (AAW), offensive air support (OAS), assault support, air reconnaissance, electronic warfare (EW), and control of aircraft and missiles. These six functions are discussed in chapter 2.

1001. The Evolution of Marine Aviation: Adapting to Meet the Threat

The Marine Corps’ contribution to national security is due largely to the ability of Marines to identify and adapt to the nation’s strategic and tactical needs, often before those needs are widely recognized. As the Navy transitioned from sail to steam during the era of Alfred Thayer Mahan, the Marine Corps developed a concept for seizure and defense of advanced bases that would extend the fleet’s reach worldwide. In 1912, the Marine Corps recognized the potential contribution of aviation to its emerging Advanced Base Force Concept. Less than a year later, Marine aviation participated in its first maneuvers off Guantanamo, Cuba. Marine pilots performed scouting and reconnaissance missions and dropped aerial bombs to support the fleet. This was the beginning of the evolution of Marine aviation that would eventually evolve into today’s six functions of Marine aviation.

In January 1914, an all-Marine aviation force functioned in conjunction with Marine ground forces of the Advanced Base Brigade during annual fleet exercises. This was the first demonstration of what would become the Marine Corps’ integrated combined-arms approach to warfare. During World War I, Marine pilots received their first combat experience when they scored their first air-to-air victories, flew bombing missions, and conducted the first aerial resupply drop. These successfully integrated Marine air-ground operations proved that aviation could provide coordinated, direct support of Marine ground forces.

Marine operations in Nicaragua (1927–1933) produced the first practical air-ground integration and coordination techniques. Marine aviation was able to inflict heavy casualties on massed Sandinista forces by using bombs and machine guns. As a result of these attacks, Sandinista forces never massed again and were less of a threat to Marine forces. Marine aviation also conducted air reconnaissance, close air support (CAS), deep air support (DAS), aerial logistic support, and combat aerial evacuation against the Sandinistas. In 1932, Marine aviation experimented with the use of autogyros to support combat operations. However, at that stage of rotary-wing aircraft development, the rotary-wing aircraft was deemed ineffective because of its limited payload. But this experimentation set the stage for the helicopter’s future development as a means of mobility for both troops and logistics.

Meanwhile, world events indicated the likelihood of a major naval war in the Pacific. Accordingly, the Marine Corps developed amphibious warfare techniques that laid the foundation for U.S. and Allied amphibious triumphs in World War II. These techniques were published in the Tentative Landing Operations Manual (TLOM) in July 1935. Concurrent with the development of the TLOM was the formal recognition and integration of Marine aviation as a part of the Marine Corps’ operating forces. On December 8, 1933, the Fleet Marine Force (FMF) was created and aviation was formally incorporated into the FMF’s organization. Marine aviation went on to play a key role in operations throughout World War II, particularly in providing CAS to amphibious forces.

During World War II, in the early months of 1942, the U.S. committed six carriers to the Pacific. By November, all but one of them had been sunk or put out of action. Marines on Guadalcanal...
then focused on securing and improving a captured Japanese airstrip, later dubbed Henderson Field. From this “unsinkable” aircraft carrier, Marine, Navy, and Army Air Corps pilots launched numerous counterattacks against the enemy and provided a shield against Japanese forces attempting to dislodge our foothold on the island. Tactics used during these operations became the model for aviation support of ground and naval forces throughout the Pacific island-hopping campaign and, ultimately, led to the success of operations in the Pacific.

Following World War II, Marines focused on the helicopter’s potential utility. The first Marine Experimental Helicopter Squadron-1 was established at Quantico, Virginia. Its purpose was to conduct experiments, develop doctrine, and develop tactics for vertical envelopment using helicopters. The experiments produced tactics and doctrine, but the helicopter’s lift capacity in 1948 and 1949 was still limited to about 1,500 pounds. This experimentation resulted in the creation of the Shepherd Board and the establishment of minimum lift requirements for Marine troop transport helicopters.

As helicopter lift capabilities advanced so did the use of these aircraft. During the Korean War, helicopters were used extensively in combat operations. In July 1950, Marine Aircraft Group-33 (MAG-33) deployed with the Marine Corps’ First Provisional Brigade to Korea. One of MAG-33’s squadrons, Marine Observation Squadron-6 (Fixed-Wing) (VMO-6), was composed of fixed-wing observation aircraft and four helicopters. VMO-6 used its helicopters primarily for the rescue of downed pilots, and it developed tactics (e.g., the use of armed escorts) that are still used today during pilot rescue operations. In September 1951, the Marine Helicopter Transport Squadron 161 conducted the first Marine Corps vertical envelopment in combat, which was based on the vertical envelopment doctrine and tactics developed at Quantico, Virginia during the 1940s.

Marine aviation’s tradition of providing effective CAS with its fixed-wing aircraft was also significantly enhanced during the Korean War as it flew jets into combat for the first time on December 10, 1950. During March and April of 1951, one squadron maintained 10-minute standby alerts, with four pilots in the cockpits of their aircraft. This allowed the unit to respond to urgent calls for CAS from the tactical air command center (TACC) via the direct air support center (DASC). As a result, a more responsive CAS system was established that allowed the use of airborne, alert aircrews that were briefed as they approached the target.

Radar systems that were effective at night were also installed on some aircraft, such as the F-7F Tigercat, during the Korean War. Radar capabilities allowed commanders to designate some squadrons to fly only at night, thereby enhancing the squadron’s effectiveness while minimizing its vulnerability. These night-flying pilots were normally under the control of a forward air controller (FAC), an employment method that was later used extensively in the Vietnam War.

Another advancement during the Korean War was the establishment of Marine Photographic Squadron 1 on February 25, 1952. This squadron flew F2H-2P Banshees, which were specially modified with a long nose to accommodate several reconnaissance cameras. These were the first Marine aircraft specifically dedicated to reconnaissance. The aerial photographs provided by this unit were invaluable aids to intelligence and targeting.

During the post-Korean and pre-Vietnam period, the Marine Corps continued to develop doctrine and tactics for the employment of both fixed-wing and rotary-wing aircraft. In 1962, Marine Medium Helicopter Squadron 362 was deployed to South Vietnam to provide mobility support to the South Vietnamese army, which was conducting operations south of Saigon. These operations provided invaluable experience to the Marine Corps in the conduct of helicopterborne operations. On the basis of these experiences, helicopters were fitted with door-mounted, M-60 machine guns, which enabled helicopters to return fire while landing in hot landing zones. The need for an aerial escort to protect the helicopters and prepare a landing zone was also recognized. Initially, this
role was filled by slow-flying, fixed-wing fighter aircraft. Later, the UH-1B Huey helicopter gunship was developed to meet this need and was fielded in Vietnam in 1963. The need for greater firepower and for armor to protect critical areas of the helicopter were also identified. The UH-1B provided escort and fire support for helicopter-borne operations until the AH-1G Cobra was fielded in 1967.

Command and control of aircraft improved during the Vietnam War. Radar information was manually plotted during the first several years of the war, then a computer-based aircraft command and control system (Marine Corp tactical data system [MTDS]) was deployed to Vietnam. It provided the first automated aircraft command and control system for Marine aviation that was compatible with the Navy’s command and control system.

During the Vietnam War, Marine aviation developed the foundations for the doctrine, tactics, and equipment used today. At the conclusion of the Vietnam War, Marine aviation had developed and demonstrated the capability to conduct OAS, assault support, air reconnaissance, EW (including the ability to counter modern air defenses), control of aircraft and missiles, and AAW. Rotary-wing aviation concentrated on improvements in lift capability, mobility, and helicopter fire support techniques. Fixed-wing aviation focused on improvements in turbojet engine technology and aircraft design. These improvements led to a new generation of aircraft that were faster and more maneuverable, and which could carry a wide variety of new and improved munitions. One of the most significant aspects of this new technology, which was to have a profound impact on both aircraft design and AAW doctrine, was the introduction of the guided missile. Unlike the Korean War, when air-to-air combat and air defense was fought with essentially the same weapons and tactics as was used in World War II, the Vietnam air war was fought with the guided missile. By the end of the war, missile technology and employment dominated both friendly and enemy AAW doctrine and accounted for a majority of our air-to-air combat victories.

Full-scale Marine participation in Vietnam began in 1965. The doctrine and tactics for helicopter-borne operations, which were refined while supporting the South Vietnamese army, provided a sound basis on which Marines continued to build. The UH-1B gunships that deployed to Vietnam in 1963 were replaced by AH-1G attack helicopters in 1967 and two-engined AH-1J Sea Cobra in 1969. The CH-53A Sea Stallion and the CH-46 Sea Knight were introduced in 1966 and provided a significant improvement to lift capacity and the ability to conduct helicopterborne assaults and resupply operations.

In July 1965, Marine Composite Reconnaissance Squadron 1 (Fixed-Wing) arrived in Vietnam. This unit was equipped with the EF-10B Sky Knight, an electronic countermeasures platform. The EF-10B was flown extensively during the next 2 years and provided effective protection against Soviet-built and -supplied surface-to-air missiles (SAMs). Late in 1966, a newer, more capable aircraft (the EA-6A Intruder) replaced the EF-10B. Also in 1966, the Marine Corps introduced the RF-4B Phantom, which was a reconnaissance version of the F4 Phantom. The RF-4B provided a significant jump in combat capability. It replaced the RF-8A Crusader, initially deployed to Vietnam, and was the first Marine aircraft capable of acquiring imagery at night.

Through the late seventies, the eighties, and into the nineties, as the U.S. modernized its forces, the Marine Corps continued its legacy of innovation. From vertical/short takeoff and landing (V/STOL) aircraft to unmanned aerial vehicles (UAVs) to precision-guided munitions, the Marine Corps continued to be a leader in adapting new technology to warfighting. The Marine Corps developed a warfighting concept that emphasized smaller expeditionary forces that used speed, tempo, and seamless air-ground integration as force multipliers, known as maneuver warfare. This concept proved highly successful against Iraqi forces during the Persian Gulf War.

This concept resulted in a Marine air-ground team, referred to as a MAGTF, that has had a profound impact on the nation’s ability to respond to
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.

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 environments on short notice. It must possess a strategic mobility that allows it projection whenever 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.
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.