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MAGTF Aviation Planning



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MAGTF AVIATION PLANNING

1. For administrative purposes, FMFM 5-70 is reidentified as MCWP 5-11.1.

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FOREWORD

1. PURPOSE

Fleet Marine Force Manual (FMFM) 5-70, *MAGTF Aviation Planning*, provides Marine air-ground task force (MAGTF) planners with a foundation for aviation planning. Part I addresses planning relationships and responsibilities for a MAGTF operating autonomously, within the structure of a naval expeditionary force, or in a joint environment. Part II provides specific planning considerations for the separate functions of Marine aviation. The appendices include briefing formats, employment planning checklists, and aircraft and equipment capability charts.

2. SCOPE

FMFM 5-70 provides the MAGTF-level planner and the aviation combat element (ACE)-level planner with an authoritative reference for aviation planning. FMFRP 5-71, *MAGTF Aviation Planning Documents*, (which is currently under development) will provide samples of aviation planning documents.

3. SUPERSESION

None.

4. CHANGES

Recommendations for improvements to this manual are invited from commands as well as directly from individuals. Forward suggestions using the User Suggestion Form format to—

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5. CERTIFICATION

Reviewed and approved this date.

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MAGTF Aviation Planning

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Part I

The Planning Environment

The Marine Corps' mission is to provide combat-ready Marine air-ground task forces (MAGTFs) that can operate autonomously, as part of a naval expeditionary force, or as part of a joint force. MAGTFs employ combined arms to present the enemy with a dilemma—a no win situation. In order to counteract the firepower or mobility of one arm, the enemy becomes more vulnerable to the firepower or mobility of another arm.

The MAGTF commander is the warfighter. As the MAGTF commander plans and executes seamless operations through the employment of his combined arms, he maintains an operational outlook. He sets the stage for the tactical actions of his subordinate commanders by clearly transmitting his intent, concept of operations, and mission-type orders.

The ground combat element (GCE) and aviation combat element (ACE) are the two combat arms of the MAGTF. They conduct tactical actions, which may have operational significance, to support the MAGTF commander's plan. Both the GCE and the ACE can be used as a maneuver force or a source of fires in the MAGTF commander's application of combined arms. In addition, the GCE or the ACE may be designated as the main effort. The MAGTF commander might choose the ACE as his main effort to shape the battlespace prior to contact between friendly and enemy ground forces.

The combat service support element (CSSE) commander plans and executes operations that provide essential logistics functions, activities, and tasks to support and permit force sustainment to all elements of the MAGTF. Although the CSSE is not a combat arm, it may also be designated the main effort.

Effective use of MAGTF aviation requires planning and coordination among all of the MAGTF elements. It is the responsibility of the ACE commander, with the MAGTF commander's guidance, to ensure coordination and interoperability of MAGTF aviation operations with naval operations, joint/combined operations, and their control agencies.

Part I provides a broad introductory discussion of aviation doctrine and planning fundamentals, and it gives the reader an overall view of aviation planning—a macro look at MAGTF, naval, and joint/combined planning environments. A detailed discussion of the MAGTF air tasking process concludes Part I.

Chapter 1

Aviation Planning Within the MAGTF

Proper planning must be accomplished if a MAGTF is to successfully integrate its operations within a naval expeditionary force (NEF) or a joint force. Chapter 1 addresses the critical issue of aviation planning at the MAGTF level. Aviation planning within the MAGTF is cyclical and consists of a series of analyses and judgments based on the current situation, previous actions, and future requirements. It is a deliberate and continuous process marked by concurrent, parallel, and detailed planning.

Deliberate Planning

A MAGTF conducting maneuver warfare is a machine with many moving and potentially conflicting parts that operate at great speed. It continually adjusts itself to seize the fleeting opportunities presented in the modern battlespace. Aviation planning must be careful and deliberate to orchestrate these moving parts. The need to accomplish deliberate planning within a time limit has led to the use of three different planning frameworks: concurrent, parallel, and detailed. These frameworks complement each other to produce a timely planning cycle.

Concurrent Planning

Concurrent planning is planning accomplished simultaneously by two or more echelons of the same command or by corresponding echelons of different commands. The skillful use of concurrent planning helps to compensate for the time spent on detailed planning by successive echelons. The detailed planning process can become stalled at any echelon due to lack of information. Subordinate commanders can begin concurrent planning prior to the issuance of written planning documents by using information announced at planning conferences and briefings. Planning memorandums, warning orders, and outline plans provide additional means to disseminate fragmentary planning information. Concurrent planning

is kept on track by a common understanding of the commander's intent.

Parallel Planning

Parallel planning results from close and continuous coordination between corresponding units. Coordination requirements, the interrelationship of assigned tasks, and complex support requirements make parallel planning essential. Basic decisions made by individual commanders are based on a common understanding of objectives and procedures obtained from the free exchange of information between units. Mission-type orders, clear commander's intent, and continuous liaison between units provide an atmosphere conducive to parallel planning.

Detailed Planning

Detailed planning is required at all levels, although its extent is situation-dependent. What is adequately detailed for one operation may not suffice for another. The necessity for economy of means and careful allocation of scarce assets may limit a commander's options. To the maximum extent possible, detailed planning should promote, rather than inhibit, flexibility. Detailed planning allows planners to foresee likely possibilities and develop plans that can respond to changing conditions.

Planning Considerations

The MAGTF commander and his staff plan MAGTF aviation operations within the standard framework of METT-T:

- Mission
- Enemy
- Terrain and weather
- Troops and support available
- Time available

Note

Planners must remember that throughout the planning process the two most critical issues to remain focused on are the mission and the threat.

The MAGTF commander must consider many factors when developing his planning guidance for aviation operations. He relies on the expertise and advice of his element commanders and their staffs to help him shape his concept of operations.

The Assigned Mission

A complete understanding of the mission is critical to its success. Commanders must issue mission orders with clear intent. Subordinate commanders must have a complete understanding of the mission and the commander's intent before they begin planning. They must also think at the two levels of command above them as they begin to plan and execute the mission. Properly balanced, these top-down (mission and commander's intent) and bottom-up (thinking two levels up) processes ensure unity of effort.

Control of Air Operations

The effectiveness of MAGTF aviation depends on the ability of ground assets to interface with airborne platforms. A fully functional Marine air command and control system (MACCS) maximizes the effectiveness of aviation. In addition to its ground-based agencies, the MACCS includes airborne assets functioning as a tactical air coordinator (airborne) (TAC[A]), forward air controller (airborne) (FAC[A]), direct air support center (airborne) (DASC[A]), or assault support coordinator (airborne) (ASC[A]). However, a lack of assets or a degraded interface between MACCS agencies and airborne assets will have a detrimental effect on aviation

operations. Since a fully functional MACCS is never a certainty, plans must be simple and flexible enough to compensate for a margin of degradation.

Capabilities

Aviation offers the following capabilities to the MAGTF.

Variety of Attack. Aircraft can perform a variety of attacks and tactics against both airborne and surface targets. The use of surface-to-air weapons (SAWs) complements this airborne capability by providing an even greater choice of attack methods.

Observation. Aircrews use sensors or visual observation to observe enemy activity in areas that are hidden from surface observation and to observe large areas of terrain. They relay this information through the MACCS. The surveillance capabilities of MACCS radar systems also enhance and complement an aircrew's observation capabilities. The MACCS integrates this information with other information to form the overall air picture.

Responsiveness. Marine aviation can launch from an array of dispersed flight decks and forward operating bases (FOBs). This allows the MAGTF to concentrate overwhelming and accurate firepower against the enemy. Decentralized control of aviation assets allows rapid reaction to changing battlespace conditions. The ACE's ability to rapidly respond to the MAGTF commander's needs allows the MAGTF commander to quickly seize and exploit fleeting opportunities within his battlespace. The MACCS allows the ACE to quickly respond to immediate requests.

Flexibility. The employment capabilities and control structure of Marine aviation make it a highly flexible asset. The ACE's variety of aircraft, attack methods, and profiles allows a commander to meet or adapt to changing situations. The ability to employ electronic warfare (EW), unmanned aerial vehicles (UAVs), and refueler aircraft in support roles also enhances the ACE's flexibility. Ground-based anti-air warfare (AAW) assets complement the capabilities of airborne platforms and provide commanders with a choice of weapons and control methods. Control of airborne missions can shift from one MACCS agency to another as required. The integration of aviation with other supporting arms provides additional flexibility.

Range. The forward basing of MAGTF aviation can extend its range. Forward-based aircraft and MACCS radars allow friendly forces to detect and engage enemy aircraft and ground-based weapons systems at greater distances.

Firepower and Mobility. Aircraft provide the MAGTF commander with his most powerful source of firepower. The wide variety of air-to-ground and air-to-air ordnance that can be brought to bear against the enemy gives the MAGTF commander many options for employment. Mobility allows dispersed aircraft to quickly converge in order to mass their firepower whenever and wherever needed.

Accuracy. Sophisticated radar systems aboard Marine aircraft and resident in the MACCS enable accurate location, detection, and identification of enemy targets. The accuracy of airborne and ground weapons system also increase the probability of kill. Radar-/sensor-computed bombing displays provide a pilot with flexible attack profiles that provide near pinpoint accuracy. The technological accuracy of radar systems and airborne and ground weapons systems reduces the number of aircraft, sorties, and ordnance required to destroy or neutralize a target.

Limitations

Effective planning requires early recognition and consideration of factors that limit the effectiveness of Marine aviation.

Visibility and Weather. Technological advances have revolutionized night and all-weather capabilities and tactics. The development and use of night vision devices (NVDs), radar, targeting and navigational forward looking infrared (FLIR), ground proximity warning systems, inertial navigation systems, global positioning systems (GPSs), advanced tactical aerial reconnaissance systems, and other technologies have drastically improved night and all-weather capabilities. Despite these advances, some aircraft are still more capable in certain environments than others. To accurately assess the limiting effects of visibility and weather, planners must know and understand the limitations of each aircraft and its on board systems.

Target Identification. The inability to identify an airborne or ground target can limit air operations. Visual means combined with existing/emerging technologies

(FLIR, radar, NVDs, laser, datalink, inertial navigation system, global positioning system, etc.) and accurate target descriptions increase target identification capability.

Time on Station. All aircraft have time on station limitations which affect the aviation capability of the MAGTF. These limitations may be minimized by planning for the use of airborne tankers and cyclic operations.

Radius of Action. The amount of fuel on board, flight profile, and weapons/sensors load limits an aircraft's radius of action. Refueling, while airborne or at FOBs, reduces the effect of this limitation, but it also requires additional planning, coordination, and support assets.

Range. The maximum effective range of aircraft weapons and sensors and ground-based radars used by the MACCS and SAW units is a limiting factor. The range of communications equipment is also a limiting factor.

Line of Sight/Terrain Masking. Line of sight (LOS) and terrain masking affect all radars and many communications means. Breaks in LOS combine with terrain features to mask target areas and create blind spots in radar and communications coverage. Proper site selection and placement of equipment can reduce LOS and terrain limitations. The use of airborne radar platforms, satellite communications, relay/retransmission, and other technological advances can reduce LOS and terrain masking limitations.

Enemy Air Defenses. Enemy defenses can limit the scope of air operations conducted by the MAGTF. The sophistication and capability of enemy air defenses influence the amount and method of aviation asset employment necessary to accomplish the mission.

Communications. Effective command, control, and coordination of aviation assets depend on reliable communications means. Degraded MAGTF communications, due to the condition of the equipment or enemy efforts to disrupt communication, limit the effectiveness of MAGTF aviation. Careful planning and the use of redundant communications architectures can help offset this limitation. See FMFM 3-30, *Communications*.

Logistic Constraints. A degraded aviation logistics capability limits MAGTF aviation capabilities. An aircraft is useless to the MAGTF commander if fuel, repair parts,

and ordnance are not available to keep it combat ready. Preplanning aviation logistics requirements is essential to minimize this limitation.

Phasing Ashore. Phasing ashore is the physical process of moving combat power ashore. This type of movement takes considerable time and manpower. The goal of phasing ashore is the seamless transition of power from sea to shore without loss of operational readiness. To achieve this goal, skillful planning is required to minimize the limiting effects of phasing ashore. Planners must determine the size and amount of equipment and any special movement considerations.

Achievement of Local Air Superiority

To achieve local air superiority, MAGTF operations must be free of prohibitive interference by enemy air assets. Although the complete destruction of enemy air strength may not be possible, all elements of the MAGTF must be provided with air defense during the operation. See Joint Pub 3-01.2, *Joint Doctrine for Theater Counterair Operations*; NWP-32 (C), *Antiair Warfare* (U); and FMFM 5-50, *Antiair Warfare*.

Access to Control Agencies

Planners must ensure that all MAGTF echelons have direct access to agencies that control close air support (CAS) aircraft in the event that immediate CAS is required. Intermediate ground command levels may countermand or modify requests of subordinates for CAS at the time the requests are made to the CAS control agency.

Role of the MAGTF Commander

The MAGTF commander must understand his aviation capabilities and think of his aviation assets as a maneuver force in his application of combined arms. He must know how to effectively apply his aviation assets in support of the MAGTF. He must use aviation to influence deep operations, support close operations, and protect rear areas. Aviation does not merely support the ground commander's ground operations. It is part of the MAGTF commander's air/ground team. Aviation can be the main effort or the decisive force in the MAGTF's battlespace. The MAGTF commander outlines proactive plans for the use of aviation and identifies his intent to the ACE. Working closely with the ACE, the MAGTF commander ensures that the ACE's planning of aviation

operations supports his intent for MAGTF operations and does not stray from his combined-arms concept.

Role of the MEF G-3 Air Officer and His Staff

The Marine expeditionary force (MEF) G-3 air officer and his staff interface between the MEF-level MAGTF commander and the ACE. They provide the MEF commander with aviation expertise at the command level. The presence and assistance of the MEF G-3 air officer allows the MAGTF commander to develop his plans with a thorough understanding of aviation capabilities and limitations. The MEF G-3 air officer and his staff interface between the MEF commander's staff and combat operations center (COC)/fire support coordination center (FSCC) and the ACE commander's battlestaff (Marine tactical air command center [TACC]) and ACE HQ staff. They also provide personnel to MEF current and future operations sections, the MEF FSCC, and the rear area operations center (RAOC). These personnel provide MEF air operation expertise to these sections/agencies. The staff functions of the MEF G-3 air officer and his staff do not circumvent the command relationship between the MEF commander and the ACE commander. They do not replace or duplicate the functions of the Marine TACC. Figure 1-1 shows the command and coordination relationships pertinent to MEF-level aviation planners.

Specifically, the MEF G-3 air officer and his staff perform the following functions:

- Maintain the status of air operations in support of all current and future MEF operations.
- Coordinate with MEF current operations section (COS), MEF future operations section (FOS), MEF FSCC, GCE, CSSE, and RAOC to ensure that they understand the ACE concept of operations.
- Consolidate and review the MEF's aviation requirements, including preplanned air requests submitted by MEF major subordinate commands and coordinating with the MEF COC/FSCC and ACE, as required.
- Provide targeting and air tasking input per requirements and requests.
- Disseminate battle damage assessment from air missions to MEF current and future operations sections.

- Coordinate air operations with joint, other services/nations, host country, and other external agencies.
- Ensure that any external taskings of MEF air assets are coordinated between the ACE, MEF, and applicable external agencies/commands.
- Coordinate requests by the MAGTF for air support from sources other than the ACE.
- Ensure MAGTF air operations are coordinated with joint air operations via the MEF liaison branch of the joint force air component commander (JFACC) staff.

Note

It may be necessary to augment the MEF air staff with additional personnel in order to successfully accomplish all of these functions.

Role of the GCE and CSSE Commanders

Aviation planning is not the exclusive domain of the MAGTF and ACE commanders. The GCE and the CSSE also provide vital input to the aviation planning process. Their degree of involvement is determined by the mission, the role of aviation in the MAGTF's concept of operations, and the enemy situation. As GCE and CSSE commanders conduct their own planning, they must address their aviation requirements. They must make recommendations to the MAGTF commander and regularly coordinate with the ACE concerning aviation

issues. Aviation issues include, but are not limited to, the following:

- Developing essential elements of information (EEIs) and other intelligence requirements (OIRs) for aviation operations and submitting them to the MAGTF G-2.
- Recommending objectives and air defense priorities.
- Nominating targets.
- Providing input for the implementation of AAW areas; including delineation of the vital, destruction, and surveillance areas.
- Determining GCE and CSSE requirements for aviation operations.
- Ensuring a common understanding of procedures, plans, and control measures.

Role of the ACE Commander

The ACE commander is the MAGTF commander's aviation expert. His inputs are critical to the development of the aviation estimate of supportability, the air plan, and the air operations annex to the MAGTF operation order. In a decentralized planning environment, the ACE commander is free to conduct much of the MAGTF's detailed aviation planning. However, the ACE commander's actions and decisions must support the MAGTF commander's intent and concept of operations. He provides the detailed planning that supports the MAGTF

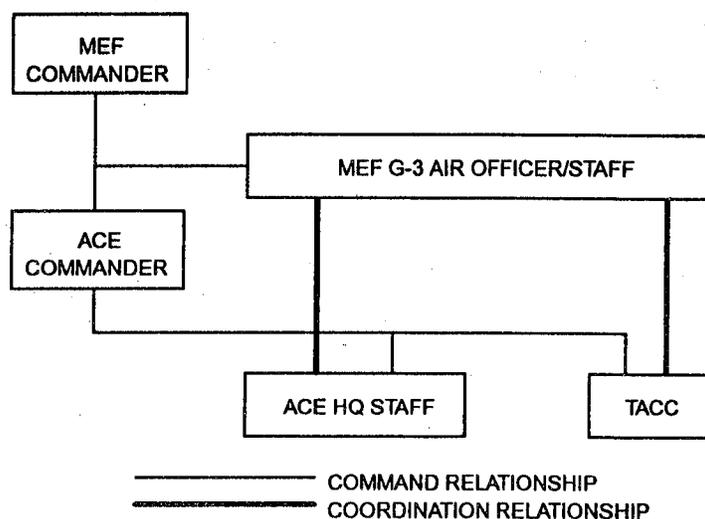


Figure 1-1. MEF Aviation Planning Relationships.

commander's broad concept for employment of aviation assets. The ACE commander's responsibilities include—

- Developing EEIs and OIRs and submitting them to the MAGTF G-2.
- Developing preliminary air operation plans for MAGTF approval.
- Coordinating air operations with the GCE and CSSE.
- Coordinating externally with the NEF and joint task force (JTF) as necessary.
- Developing the MAGTF air tasking order (ATO).
- Receiving the MAGTF's initial assessment of the enemy air defense.
- Providing input to the MAGTF list of targets.
- Recommending target priorities to the MAGTF commander.
- Submitting external support requirements requests to the MAGTF commander.
- Recommending air defense priorities (along with the GCE and CSSE commanders) to the MAGTF commander.

One of the most critical and challenging responsibilities of the ACE commander is the publication of the MAGTF ATO. The MAGTF ATO provides a concept of operations for a 24-hour period. It reflects the MAGTF commander's priorities and allocates assets for specific unit tasking. See chapter 4 of this manual and FMFM 5-60, *Control of Aircraft and Missiles*, for a detailed discussion of the ATO.

Role of the ACE HQ Staff

Long-term planning is conducted by the G-3 plans section of the ACE HQ staff. This staff focuses on aviation operations that occur well into the future (beyond 48 hours) and coordinates with higher, adjacent, and external agencies.

Role of the ACE Battlestaff

The ACE battlestaff conducts near-term planning and current execution of aviation operations. The ACE battlestaff consists of the senior watch officer (SWO), the intelligence watch officer (IWO), the FOS, and the COS. The need to continuously man the ACE battlestaff with qualified planners, combined with the dynamics of continuous operations, requires detailed turnover briefs and close coordination.

Note

The manning requirements of the FOS and COS should be very specific if all six functions of MAGTF aviation are to be planned and executed.

The Marine TACC provides the facility from which the ACE commander and his battlestaff plan, supervise, coordinate, and execute MAGTF air operations. Marine TACC personnel come from the ACE staff and from the Marine air control group (MACG). The Marine TACC's organizational structure is based on the size and scope of the operation and the Marine TACC's intended role. Its structure must be flexible enough to satisfy the requirements of the ACE commander in any tactical situation. Linkage with the MAGTF FSCC/COC allows the Marine TACC to integrate ACE operations with the MAGTF command element. The Marine TACC is also linked to the tactical air operations center (TAOC)/sector antiair warfare coordinator (SAAWC) and the direct air support center (DASC) to facilitate control, coordination, and planning.

Figure 1-2 shows the ACE commander's relationship with the G-3/S-3 planning section (long-term planning) and the Marine TACC/battlestaff (near-term planning and execution).

Senior Watch Officer

The SWO is the direct representative of the ACE commander in the Marine TACC. He is responsible for the overall functioning of the COS and the FOS. He is the key coordinator between the COS, the FOS, and the Marine TACC and the ACE commander and his staff. He also ensures that the IWO integrates and coordinates with both the COS and FOS.

Intelligence Watch Officer

The IWO is responsible to the SWO for maintaining an accurate display of the enemy situation, both air and ground. Although he primarily supports the COS, he also advises the FOS on possible future enemy courses of action. He is the coordinator of all Marine TACC intelligence functions. He coordinates with outside intelligence agencies to ensure that EEIs, imagery, status boards, and dissemination of information are available and current.

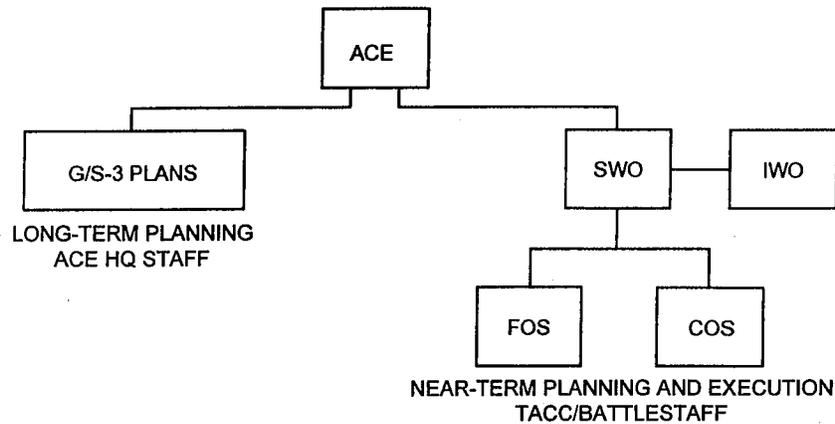


Figure 1-2. ACE Planning Relationships.

Current Operations Section

Execution of current operations is managed by the ACE commander from the Marine TACC. He is assisted by the COS of the ACE battlestaff. The COS manages the execution of the current day's ATO (developed by the FOS) and assists the commander in making timely, tactical decisions regarding operations conducted within 0 to 24 hours. The COS helps the ACE commander maintain situational awareness by monitoring communications nets, viewing and updating data link pictures and plotting boards, and maintaining contact with external agencies. The COS is staffed with the following personnel:

- Senior air coordinator (SAC) (overall in charge).
- Air defense coordinator (ADC).
- Air support coordinator (ASC).
- Tactical air watch officer (TAWO).
- Assault support watch officer (ASWO).
- Track data coordinator (TDC).

Future Operations Section

The FOS develops tomorrow's air operations plan and ATO. The plan is formulated based upon the planning guidance received from the ACE commander and is structured to follow the framework of the long-term plan developed by the G-3/S-3 plans section. The FOS collects inputs from supported MAGTF units (via MAGTF G-3 air staff) and integrates them into the next day's plan. The following representatives are normally required to

adequately man a FOS planning staff for operations involving all six functions of MAGTF aviation:

- G-3/S-3 watch officer (overall in charge).
- Fixed-wing tasker.
- Rotary wing tasker.
- Weapons employment officer.
- Planning officers for six functions of MAGTF aviation (as required).
- Liaison officers (as required).

Initiating the MAGTF Aviation Planning Sequence

Aviation planning parallels the MAGTF command and staff action sequence. Upon mission receipt, the ACE commander and the G-3/S-3 staff review the MAGTF commander's intent and conduct an initial mission and threat analysis. They analyze and develop an initial list of implied missions. The plans section of the G-3/S-3 staff analyzes the available information and determines the requirement for additional information (EIs). The G-3/S-3 plans section begins developing an operational sequence for the ACE, focusing on the objectives outlined by the MAGTF commander. The G-3/S-3 plans section assists the ACE commander in developing the apportionment to accomplish the assigned tasking. Once the ACE commander has reached some basic decisions, he provides the battlestaff with his guidance and recommendation for apportionment.

General Situation

- Review of the joint force mission and commander's intent (if applicable).
- Review of the MAGTF mission and commander's intent.
- Review of the MAGTF commander's main effort.
- Review of the MAGTF commander's approach to phasing the operations.
- Review of the ACE tasking by the MAGTF commander.

The ACE Commander's Intent (Principal Objectives)

- Purpose of the operation.
- Critical vulnerabilities and centers of gravity for both enemy and friendly forces.
- Vision of how the operation will be conducted in a broad scope.
- Description of the end state with respect to the relationship of the force, the enemy, and the battlespace.
- Description of how the end state will facilitate future operations.

ACE Commander's Concept of Operations (Plan of Execution)

- Description of the sequence of operations from the ACE perspective. This will help define the "how," "when," and "why" for subordinates.
- Definition of phases and how they relate to the MAGTF plan.
- Determination of criteria that will cause the ACE to shift from phase to phase.
- Determination of who will be the main effort during the various phases.
- Description of contingencies that would substantially alter the ACE plan.

Additional Considerations

- Rules of engagement.
- Task organization.
- Delegation of authority and command and control.
- MAGTF air defense priorities.
- Etc.

Figure 1-3. ACE Commander's Guidance Format.

ACE Commander's Guidance

The ACE commander's guidance to the battlestaff and his subordinate units is normally given in an intent and concept of operations format. Figure 1-3 provides a framework for the ACE commander's guidance.

FOS Planning

FOS planning starts upon receipt of the ACE commander's guidance. The initial planning process must be completed in a matter of a few hours. A rough plan must be developed that supports the commander's intent and main effort on paper as soon as possible so that subordinate units will have sufficient time for detailed planning. Many tasks must be completed in a limited time:

- G-3/S-3 watch officer consolidates information received via joint tactical air strike requests (JTARs), joint tactical air reconnaissance/surveillance requests (JTAR/SRs), and assault support requests (ASRs).
- Planners review the MAGTF, GCE, and CSSE schemes of maneuver and the ACE commander's guidance with the battlestaff to ensure that all members clearly understand priorities and intent.
- Air requests are prioritized and sequenced based on the ACE commander's guidance.
- The enemy situation and the threat are assessed.
- If necessary, FOS planners initiate requests for additional information.

- The FOS develops a list of threats that must be addressed if the ACE is to effectively conduct air operations in the MAGTF sector.
- A timeline for inputs and completed action items is developed.

Additionally, the FOS allocates MAGTF aviation assets within the guidelines set by the MAGTF commander's apportionment decision. The following tasks comprise the allocation process:

- List all specified tasks and prioritize.
- List all critical implied tasks and prioritize.
- Determine aircraft availability and sortie rates/turn-around times.
- Review the air defense plan and compare it with the air defense priorities to determine AAW requirements.
- Review target list and targeting folders/information.
- Determine specific requirements for all six functions of MAGTF aviation and the subfunctions they encompass, including the numbers of aircraft/sorties required.
- Determine multi-role/multi-mission capabilities of assets available.
- Determine periods of vulnerability, surge periods, and other critical time periods.
- Review the ACE commander's apportionment recommendations and priorities.
- Construct an initial timeline of events.
- Allocate assets based on priorities, specified and implied tasks, and aircraft capabilities.

Once the initial allocation is completed, the FOS reviews the existing operations order or airspace control order (ACO) to determine if the published routing, control points (CPs) and initial points (IPs), command and control (C²) architecture, and surveillance plan support the new plan being developed. Next, FOS planners must address issues that require the ACE commander's approval. Some of these issues include, but are not limited to,—

- Launch and divert authority.
- Delay/abort/change authority.
- Changes to rules of engagement (ROE).
- Reasonable assurance issues (requires MAGTF commander approval).

The final process in the allocation process is to review the planning accomplished thus far and perform the following, as applicable:

- Fill all preplanned JTARs, JTAR/SRs, and ASRs.
- Allocate for immediate CAS missions.
- Allocate for on-call tactical recovery of aircraft and personnel (TRAP) and medical evacuation (MEDEVAC).
- Determine requirements for airborne controllers and coordinators (TAC[A]/ASC[A] or FAC[A]).

Once these actions are completed, the FOS staff prepares to deliver the concept of employment briefing to the ACE commander.

The ACE Concept of Employment Brief

The concept of employment brief is the first brief given to the ACE commander by the FOS. It is a general description of how the FOS has allocated the assets and how they envision accomplishing the assigned tasks based on the ACE commander's guidance. The briefer should use maps and other aids, as necessary, to paint an adequate picture for the ACE commander. This brief is the G-3/S-3's vehicle to communicate the proposed plan to the ACE commander for his approval. It allows the ACE commander to review the plan, make changes, or provide additional guidance early in the planning process. The brief should be clear and concise and—

- Provide the ACE commander with a picture of how the plan is taking shape.
- Show the ACE commander how the planners intend to use the ACE assets to accomplish the ACE objectives in support of the MAGTF.
- Describe how tasking will be accomplished.
- Provide a broad sequence of events.
- Identify any unresolved issues.

Refining the Plan

During the concept of employment brief, the ACE commander provides input and guidance on the direction that he wants the plan to take. Following the briefing, the G-3/S-3 issues warning orders to subordinate units that have not yet received them. The FOS incorporates the ACE commander's inputs and conducts the necessary coordination to finalize the aviation plan. The FOS—

- Reviews the enemy situation and updates the plan, as required.
 - Incorporates additional support requirements as necessary (fuel, ordnance, special equipment, external support, etc.).
 - Addresses issues of concern that surfaced during the courses of action brief.
 - Develops a final sequence of events (master plan).
 - Determines the number of sorties to be given to the joint force commander (JFC) for joint force use (sorties requested by the JFC for long-range reconnaissance, long-range interdiction, and air defense plus any excess sorties after MAGTF requirements have been met).
 - Conducts internal mission coordination and deconfliction.
 - Reviews the airspace control plan (ACP)/ACO.
 - Reviews the communications plan.
 - Reviews the target area/objective area flow and deconfliction.
 - Drafts the MAGTF ATO.
 - Develops the coordinating instructions and special instructions (SPINS).
 - Conducts continuous coordination with MAGTF, GCE, CSSE, subordinate units, and mission commanders.
- How ACE assets are used to achieve the assigned objectives.
 - How ACE assets are integrated to maximize their effectiveness.
 - How the ACE and GCE have integrated their fire support plan.
 - How the C² system manages the air defense plan.
 - How the C² plan supports the flow of critical information.
 - How airspace control measures support the operation.

Planning and coordination continue between the FOS and subordinate units until the plan is executed. Once the plan is refined, the FOS concentrates on developing a confirmation briefing for the ACE commander and his staff.

The Confirmation Brief

The confirmation brief helps the ACE commander, his staff, and key participants understand how the different missions within the air operation are integrated and where a particular mission fits into the overall plan. This briefing, short of ATO dissemination, is the end product of the ACE battlestaff's planning effort. In most cases, the confirmation briefing is where the whole plan comes together. A confirmation briefing may not always be possible, but it is strongly recommended if time permits. It should present the following information:

Completing the Aviation Plan

Immediately following the confirmation brief, the FOS finalizes the MAGTF ATO. The MAGTF ATO's distribution to unit commanders for scheduling marks the end of a MAGTF aviation planning sequence.

Rapid Response Planning

MAGTFs may be faced with situations where quick action is required affording little time for planning. For example, a Marine expeditionary unit (MEU) may have to quickly conduct a noncombatant evacuation operation (NEO), in-extremis hostage rescue (IHR), TRAP, or raid. In these situations, rapid response planning must be used. Rapid response planning is not an abandonment of the deliberate planning process. It is deliberate planning that is constrained by time. The idea is to streamline the process by advance thought, action, coordination, and positioning and the skillful use of concurrent and parallel planning.

To allocate the reduced time available for planning, a 1/3-2/3 rule is considered optimum. One-third of the time for staff planning and two-thirds of the time for major subordinate command planning—although a 50/50 division of time may be more realistic. MAGTFs will have standing operating procedures that address rapid response planning. Appendix A contains a notional rapid response planning timeline that addresses a need to respond in 6 hours (possibly a MEU operation).

Chapter 2

MAGTF Aviation Planning for Amphibious Expeditionary Operations

Expeditionary operations are operations conducted by an armed force to accomplish a specific objective in a foreign country. Amphibious operations are expeditionary operations launched from the sea by naval and landing forces embarked on ships or craft and involve landing on a hostile or potentially hostile shore. MAGTFs are trained and equipped to conduct amphibious operations. This chapter discusses issues critical to MAGTF aviation planners operating in an amphibious environment.

Command Relationships Within the ATF

The interrelationship of naval and landing force (LF) tasks during the planning and execution of an amphibious operation requires the establishment of parallel chains of command and corresponding commanders at all levels of the amphibious task force (ATF) organization. The following command relationships apply:

- The commander, amphibious task force (CATF) is responsible for the operation. He exercises operational control (OPCON) over the entire force, except during the planning phase.
- The commander, landing force (CLF) has OPCON over the LF.
- The CATF and CLF are on a corresponding level of command with regard to their respective components.
- The CATF, through the Navy chain of command, handles matters of command that affect only Navy forces.
- The CLF, through the LF chain of command, handles matters of command that affect only the LF.
- Matters of command that affect both the Navy and the LF are dealt with through the corresponding Navy and LF chains of command. Commanders at all levels are required to maintain close and continuous coordination to ensure that no commander makes decisions affecting corresponding commanders without consultation, except in emergency situations. The commander making an emergency

decision notifies the corresponding commanders of his action at the earliest practicable time.

- Corresponding commanders are established at each subordinate level of both naval and LF elements.

The Initiating Directive

The initiating directive is an order to the CATF to conduct an amphibious operation. Its dissemination begins the planning process. The initiating directive may not be a single comprehensive document. For example, during crisis action planning for a contingency operation, the initiating directive's information may be found in several orders: warning order, alert order, planning order, and execute order. The initiating directive—

- Establishes the ATF.
- Assigns a mission.
- Provides forces to accomplish the mission.
- Assigns assault shipping for both the assault echelon and assault follow-on echelon.
- Designates CATF, CLF, and other commanders, as appropriate.
- Defines the amphibious objective area (AOA) in terms of sea, air, and land space.
- Provides code words for the operation name and for other key specifics about the operation.
- Sets target dates for the execution of the operation.
- Provides special instructions on command relationships.

- Provides instructions for planning, employment, allocation, and control of nuclear and chemical munitions.
- Includes instructions that govern the termination of the operation and, if feasible, command arrangements and disposition of forces to be effective at that time.
- Provides information regarding operations conducted after termination of the amphibious operation.
- Assigns responsibility and provides necessary coordination instructions for the conduct of supporting operations.
- Provides cryptographic and operations security (OPSEC) guidance.
- Provides a concept for military deception operations conducted in support of the amphibious operation.

Planning Relationships Within the ATF

Special relationships are observed during the planning phase of an amphibious operation. These planning relationships are designed to ensure that both naval and LF considerations are adequately factored into decisions that address conduct of an amphibious operation. The CATF coordinates planning of an amphibious operation. However, the CATF, CLF, and other commanders designated in the initiating directive are co-equals in planning matters and decisions. All decisions are made based on a common understanding of the mission, objectives, and procedures and on a free exchange of information. Any differences between commanders that cannot be resolved are referred to their common superior in the operational chain of command.

Once the LF is embarked on amphibious shipping, the CATF assumes full responsibility for the ATF and for the operation. If a change in the mission occurs after an operation begins or if an amphibious operation is initiated from an afloat posture, co-equal planning relationships apply to any subsequent planning. These planning relationships are described above or as specified in the initiating directive. If the operational situation dictates, the CATF's OPCON may specify planning relationships that better coordinate planning efforts, especially if time-sensitive planning is required.

The ATF Air Plan

The CATF's staff develops the ATF air plan. It is published as an annex to the ATF operation plan. The ATF tactical air officer, in close coordination with the CLF, prepares the air plan and directs the air effort within the area of operations (AO). The ATF tactical air officer is responsible to the CATF. The ATF air plan must address pre D-day operations, D-day operations, and post D-day operations:

Pre D-Day Operations

- Achievement of air superiority within the landing area. This includes neutralization or destruction of enemy air defense capabilities.
- Neutralization or destruction of enemy forces within the landing area.
- Interdiction of enemy forces capable of interfering with assault landings.
- Airborne mine countermeasures.
- Naval surface fire support (NSFS).
- Antisubmarine warfare.
- TRAP.
- Reconnaissance and air operations in support of reconnaissance forces.
- Psychological operations.

D-Day Operations

- Pre H-hour neutralization of beaches, drop zones, and landing zones.
- Transport and helicopterborne operations.
- Tactical airlift operations.
- CAS (preplanned and immediate).
- Suppression of enemy air defenses (SEAD).
- Air reconnaissance, observation and spotting.
- Operations of TAC(A), FAC(A), and ASC(A).
- Continuation of applicable pre D-day air operations. This includes maintaining local air superiority and interdiction of enemy forces.
- Battlefield illumination.
- Air delivery of supplies.
- Medical evacuation.
- TRAP.
- Air defense.
- Attack helicopter operations.
- Other assault support.

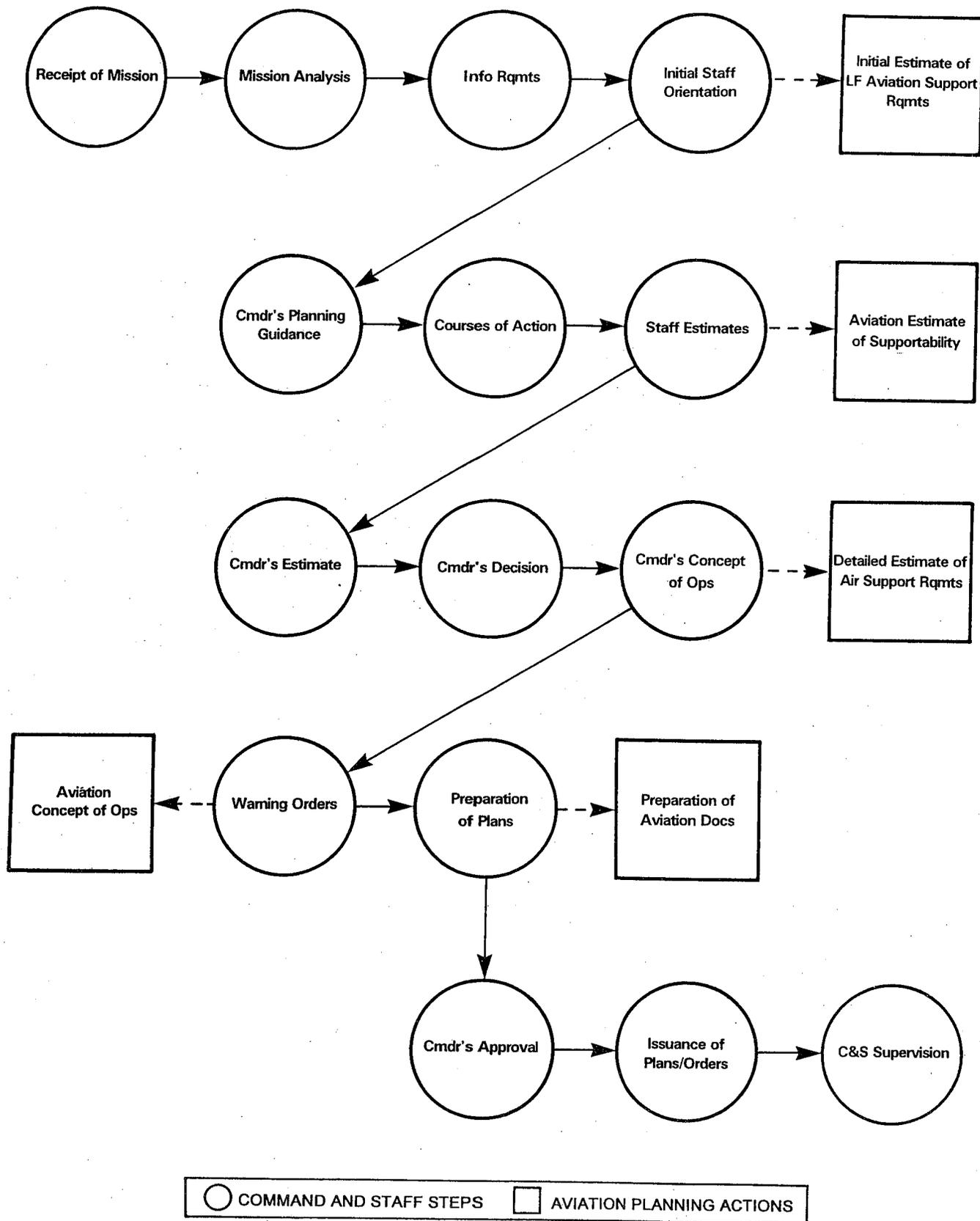


Figure 2-1. Command and Staff Steps and Aviation Planning Actions.

Post D-Day Operations

Post D-day aviation requirements are difficult to forecast because of the unpredictable nature of the unfolding battle. Missions performed during pre D-day and D-day operations are continued as applicable. The ACE commander, knowing the MAGTF mission and commander's intent, can anticipate and plan for a wide range of contingencies. For example, he may direct that a series of offensive air support (OAS) combat air patrol (CAP) stations near critical areas be manned continuously during the decisive phase of the operation. This provides a ready force for the MAGTF commander to use as one of his combined arms or to support a ground commander with CAS.

Additional Considerations

- Comprehensive plans for aircraft control, air warning, and air defense.
- Movement of forces and supplies into the AOA by air transport.
- Early arrival of liaison and observation aircraft in the landing area.
- Rehabilitation of airfields or construction of FOBs. This includes vertical/short takeoff and landing (V/STOL) capable locations in the landing area.

MAGTF Aviation Planning Actions

Typically, amphibious operations involve extensive air operations. Effective planning in this environment is a complex and demanding task due to the participation of a wide variety of aircraft performing the full spectrum of aviation missions. See Joint Pubs 3-02, *Joint Doctrine for Amphibious Operations*, and 3-02.1, *Joint Doctrine for Landing Force Operations*.

MAGTF amphibious operations are planned using 15 command and staff planning steps. Throughout the planning process, the MAGTF aviation section performs vital planning functions. The timing and interplay between the command and staff steps and the five aviation planning actions must be understood by all aviation planners. The circles in figure 2-1 show the command and staff planning steps accomplished by the MAGTF commander/CLF. The squares in figure 2-1 show the five aviation planning actions performed by the MAGTF G-3 air section which correspond to the command and staff steps. MAGTF aviation planners may draw on the expertise of the ACE to complete these planning actions. The ACE

commander and his planning staff must understand that they are involved in both the 5-step process and the 15-step process, but at different levels. At the MAGTF command level, the ACE assists the MAGTF G-3 air section by completing the five planning actions. At its own command level, the ACE initiates its own 15-step command and staff process. See FMFM 3-1, *Command and Staff Action*.

Initial Estimate of Landing Force Aviation Requirements

After the CLF meets with the CATF, he briefs his staff and his staff begins to develop the initial estimate of landing force aviation requirements. This estimate addresses all six functions of Marine aviation. It is an informal examination of each staff and functional area that will identify information for the CLF. The CLF uses this information at the initial staff planning conference. This estimate is shaped by input solicited from subordinate MAGTF units and completed preliminary planning. Once the estimate is complete, the staff briefs the CLF during the initial staff orientation step. The initial estimate is broad in nature and identifies the approximate number and type of participating units, the necessary control agencies, and the logistic support required.

Note

Some intelligence requirements are identified during the development of this estimate. The CLF coordinates with the CATF and other agencies to provide intelligence as the need arises throughout the entire planning process.

Aviation Estimate of Supportability

The aviation estimate of supportability is presented to the MAGTF commander/CLF during the staff estimate step. During this briefing, the aviation staff provides input as to the supportability of each course of action from an aviation perspective. This estimate also provides advice to the MAGTF commander on how to best employ aviation within those courses of actions. The aviation estimate may be framed within the five categories of—

- Mission.
- Situation and considerations.
- Analysis.
- Evaluation.
- Conclusions.

Note

The ground combat and combat service support estimates are also presented at this time.

Detailed Estimate of Air Support Requirements

The detailed estimate of air support requirements begins after the MAGTF commander issues his concept of operations. This estimate identifies the number and type of aircraft needed to support the operation. It addresses targeting and the control facilities required to support the MAGTF's concept of operations. It identifies logistics requirements (including fuel, ordnance, shipping, and special equipment). The ACE commander should be closely involved in the MAGTF staff process. If he determines that the necessary assets are not available, he informs the MAGTF commander. The MAGTF commander may have to request additional assets from higher authorities or modify the MAGTF concept of operations.

Aviation Concept of Operations

The aviation concept of operations summarizes the support that assigned aviation units will provide to support the MAGTF concept of operations. An ACE task organization must be completed, which requires inclusion of all aviation support units needed for the units specified in the detailed estimate of air support requirements. The

aviation concept of operations is incorporated into the air operations annex of the operation plan/order. The aviation concept of operations is general in nature and provides an overall picture of how Marine aviation operations are executed. It should answer the following questions:

- Which units will provide air support, including assets external to the ACE?
- What functions of aviation air support will be provided?
- When will the air support be provided?
- Where will the aviation assets provide support from and where will support be provided?

Preparation of Aviation Documents

The required type and number of aviation documents varies with the nature and complexity of each operation. FMFRP 5-71, *MAGTF Aviation Planning Documents* (currently under development), provides a comprehensive listing of document formats and examples, as well as a list of who is responsible for preparing each document. These documents are presented in the Joint Operation Planning and Execution System (JOPES) format. This permits rapid cross-referencing to similar documents of other Services.

Chapter 3

MAGTF Aviation Planning Within a Joint Force

As Marines, our focus is operational maneuver from the sea. We are amphibious warriors with a unique air/ground capability. However, we must be prepared to become a self-sustaining, contributing part of joint operations ashore under command of a JFC. As delineated in Joint Pub 0-2, *Unified Action Armed Forces (UNAAF)*, if the MAGTF operates as part of a joint force, some of its aviation sorties may be tasked to support JTF missions that do not directly support the MAGTF. Conversely, in the joint environment, the MAGTF may also request and receive JTF air support from non-MAGTF sources as needed.

The job of planning and tasking MAGTF aviation to support the MAGTF commander becomes more complex when operating in a joint environment. MAGTF planners must understand the MAGTF planning environment and the joint planning environment and how they interface. It is critical that MAGTF aviation planners understand the various staffs and agencies that make up a joint force in order to maximize the potential of the MAGTF in this environment.

See Navy and Marine Corps White Paper, "...*From the Sea*" of September 1992; Joint Pub 3-56.1, *Tactical Command and Control Planning Guidance and Procedures for Joint Operations (Procedures and Formats)*; Joint Pub 3-52, *Doctrine for Joint Airspace Control in the Combat Zone*; and Naval Doctrine Test Publication 3-56.1, *Joint Force Air Component Commander Organization and Processes*, for specific information.

Role of the MAGTF in a Joint Force

A commander in chief (CINC) may elect to organize a joint force strictly along Service or functional lines, but most often their organization is a combination of the two. Figure 3-1 depicts Service components (Marine Corps, Army, Air Force, and Navy) displayed alongside functional components (joint force air component and special operations component). If the joint organizational structure is to be effective, MAGTF planners must understand the operation of the other components and agencies and how they affect the MAGTF.

MAGTF planners must appreciate the aviation capabilities of the other components of the joint force. The MAGTF commander may need to supplement his inherent MAGTF aviation support with the specialized and sophisticated capabilities performed by theater or national

assets. These capabilities are only provided if proper procedures are used and if the request is made with sufficient lead time. The MAGTF planner that operates under the inflexible attitude of "we can do it alone" may deny the MAGTF access to significant additional capabilities. Since the MAGTF provides sorties to the JFC for joint missions, MAGTF aviation planners should not hesitate to ask for specific supplemental joint air support.

Joint Force Air Component Commander

The JFC may designate a JFACC to consolidate the efforts of theater air assets and support the JFC's objectives. Typically, a JFACC is not designated in a single-Service operation that requires limited support from other components or in a multi-Service operation where each Service operates in an autonomous AO with its own inherent aviation capability (very little cross

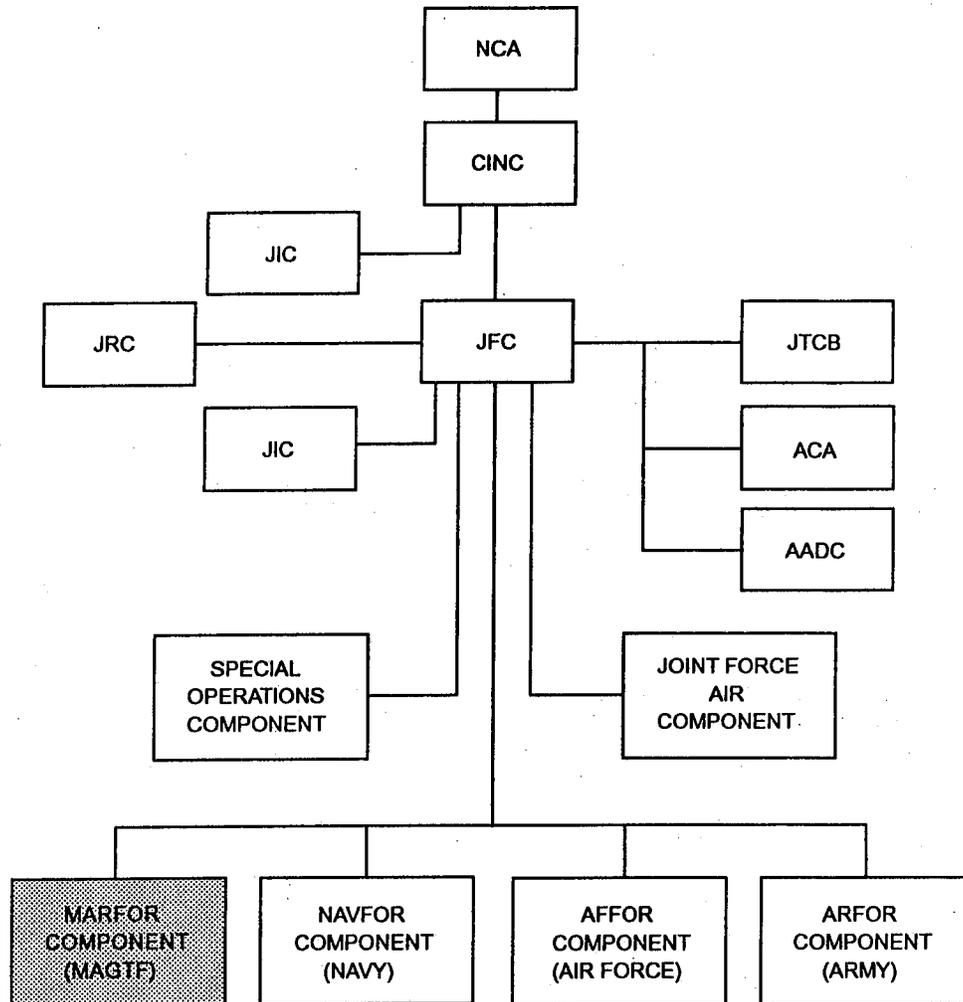


Figure 3-1. MAGTF Within a Joint Structure.

boundary coordination is required). The following factors influence a JFC's decision to appoint a JFACC:

- Service participation.
- Scope of the operation.
- Duration of the operation.
- Operational boundaries assigned to service components.

The JFACC is drawn from the component that has the preponderance of aviation assets in theater and the ability to control them. Based upon JFC guidance, the JFACC may be designated the supported commander for such operations as AAW/counterair and air interdiction. The JFC may choose to assign the responsibilities of JFACC (if assigned), area air defense commander (AADC), and

airspace control authority (ACA) to the same person. However, the JFC may also assign separate individuals to perform these functions.

Normally collocated with the JFC, the JFACC functions as a coordinator. The JFACC provides coordinated and unified joint air operations in order to deliver direct support to certain components while exploiting the flexibility of air operations to achieve campaign objectives. The JFC assigns responsibilities to the JFACC. The JFACC's responsibilities include, but are not limited to, the following:

- Planning integrated air operations that support JFC objectives.
- Coordinating designated air activities with other operations within the theater.

- Recommending apportionment of the joint air effort to the JFC for approval or revision.
- Translating the JFC's apportionment decision into sortie allocation. The JFACC determines allocation by mission, but individual components assign missions to specific squadrons.
- Tasking available component air sorties for support of the joint campaign, normally through an ATO and SPINS. Tasking is done at the JFACC level for joint targets and missions and at the MAGTF level for Marine Corps targets and missions. There is a single ATO for all joint air operations.

The JFACC also coordinates and integrates with other joint agencies, such as the joint rescue center and the joint targeting coordination board. See Joint Pub 3-56.1

MAGTF Commander and JFACC Relationship

As stipulated in the UNAAF (see app. B), the MAGTF commander retains operational control of his organic air assets. During joint operations, MAGTF aviation assets normally support the MAGTF mission. The MAGTF commander makes sorties available to the JFC for air defense, long-range interdiction, and long-range reconnaissance. These sorties are tasked through the JFACC. Sorties in excess of MAGTF direct support requirements are provided to the JFC for the support of other components or the joint force as a whole, and are also tasked through the JFACC. Authority to alter this relationship by reassigning, redirecting, or reallocating MAGTF direct support sorties rests at the JFC level and higher. It only occurs when MAGTF sorties are required for higher priority missions.

Composition of the JFACC Staff

The JFACC staff is a joint staff that maintains a joint focus. It is staffed with personnel from participating components. The personnel mix is proportional to the component mix of the joint force. Liaison officers from individual components collocate and coordinate with the JFACC staff in order to address their Services' concerns. The JFACC staff operates out of the joint air operations center. It performs the following functions:

- Conducts detailed planning (targeting, weaponeering, tasking) and coordination of joint air operations. Planning is conducted 24 to 72 hours in advance of ATO publication.

- Publishes the sortie allotment and ATO messages.
- Tracks and monitors all air operations within the joint operations area or the area of responsibility.
- Coordinates redirected sorties as directed by the JFC through the JFACC.
- Administers the current ATO.
- Provides intelligence, targeting support, situational analysis, and enemy threat assessment and reporting.
- Coordinates operations through the joint targeting coordination board (JTCCB), the JFACC, and the joint intelligence center (JIC).
- Ensures intelligence personnel are connected via secure communications nodes to all critical intelligence elements.
- Ensures communications and data connectivity between the JFACC, JFC, and all component and supporting commanders.
- Provides for all written and data fax support required by the JFACC.
- Maintains all records and correspondence.
- Hosts liaison officers from component commander's staffs, supporting commands, and coordinating agencies in order to provide functional expertise and connectivity with their commanders for all air operations in the joint operations area or area of responsibility.

Joint Intelligence Center

There are two JICs: one at the CINC level and one at the JFC level. The CINC-level JIC handles theater-wide intelligence requirements. The JFC-level JIC supports the intelligence needs of the JFC, JFACC, and Service components (e.g., the MAGTF). The JIC provides valuable up-to-date intelligence from sources that are not available to MAGTF intelligence agencies. MAGTF aviation planners should use the capabilities of the JFC-level JIC through their Service liaisons on the JFACC staff, or directly if the opportunity presents itself.

Joint Targeting Coordination Board

The JTCCB is manned by representatives from all Services. The JTCCB coordinates targeting information, recommends targeting priorities to the JFC, and prepares and refines the joint target list. Normally, JTCCB meetings are conducted daily to disseminate JFC targeting guidance and objectives, monitor effectiveness of targeting efforts (battle damage assessment), coordinate and deconflict all joint targeting operations, validate no-fire

areas, approve new targeting nominations for inclusion in the joint target list, and establish priority targets in the joint target list. The JTCB ensures deconfliction between operations of the various service components. It also ensures that various service components support each other and support the JFC's campaign strategy. JTCB results are considered to be JFC direction and are disseminated through the JFC to the appropriate components or agencies. If conflicts arise between the MAGTF and the JFACC, they are submitted to the JTCB for resolution.

Airspace Control Authority

The ACA coordinates and integrates the use of the airspace control area through the use of airspace control measures. Centralized coordination by the ACA does not imply operational control over any air assets. The ACA's key responsibility is to provide the airspace control system with the flexibility it needs to meet contingency situations that require rapid employment of forces. To facilitate control and coordination, the ACA uses the following control measures:

- Corridors.
- Low level transit routes (LLTRs).
- Restricted operations zones (ROZs).

- High density airspace control zones (HIDACZs).
- Identification, friend or foe (IFF) on/off lines.

These control measures can be found in the ACO. The ACA also develops an ACP that is implemented through the ACO. The ACA also coordinates with civilian aviation agencies as necessary. See Joint Pub 3-52.

Area Air Defense Commander

The AADC integrates the operation of all air defense systems and provides recommendations to the JFC for establishment of air defense priorities. He also coordinates air defense operations with other operations. Since the functions of the AADC are closely related to those of the ACA, it is critical that they maintain close and continuous coordination. Both staffs coordinate to release the tactical operational data (TACOPDAT) message. See Joint Pub 3-01.2

Joint Rescue Center

The joint rescue center (JRC) is established by the JFC to plan, coordinate, and task components to execute combat search and rescue and MEDEVAC missions. Its staff is comprised of representatives from all components that participate in rescue activities, including the Coast Guard when applicable.

Chapter 4

The MAGTF Air Tasking Cycle

The MAGTF mission drives the MAGTF air tasking cycle. The air tasking cycle is a tool used by MAGTF planners to achieve mission accomplishment. It is an integral part of the MAGTF planning process. By using and completing the tasking cycle, planners can ensure that limited aviation assets are used to achieve their maximum effect with correct prioritization based on the main effort.

The MAGTF air tasking cycle is divided into four phases designed to occur during a 24-hour period. Completion of phase IV (scheduling) marks the complete evolution of the MAGTF air tasking cycle. Because the cycle is continuous, the next evolution will have already begun. The MAGTF ATO is the final product of the MAGTF air tasking cycle.

Operations that involve significant joint or combined forces may require an adjustment to the time period of the MAGTF air tasking cycle so that it conforms to the larger force's cycle. This normally involves increasing the MAGTF air tasking cycle from a 24-hour period to a 36-hour period, but it may be longer or shorter based on the decision of the overall force commander. See Joint Pub 3-56.1 and Joint Pub 3-56.24, *Tactical Command and Control Planning Guidance and Procedures for Joint Operations—Joint Interface Operational Procedures—Message Text Formats*, for more information on the joint air tasking cycle.

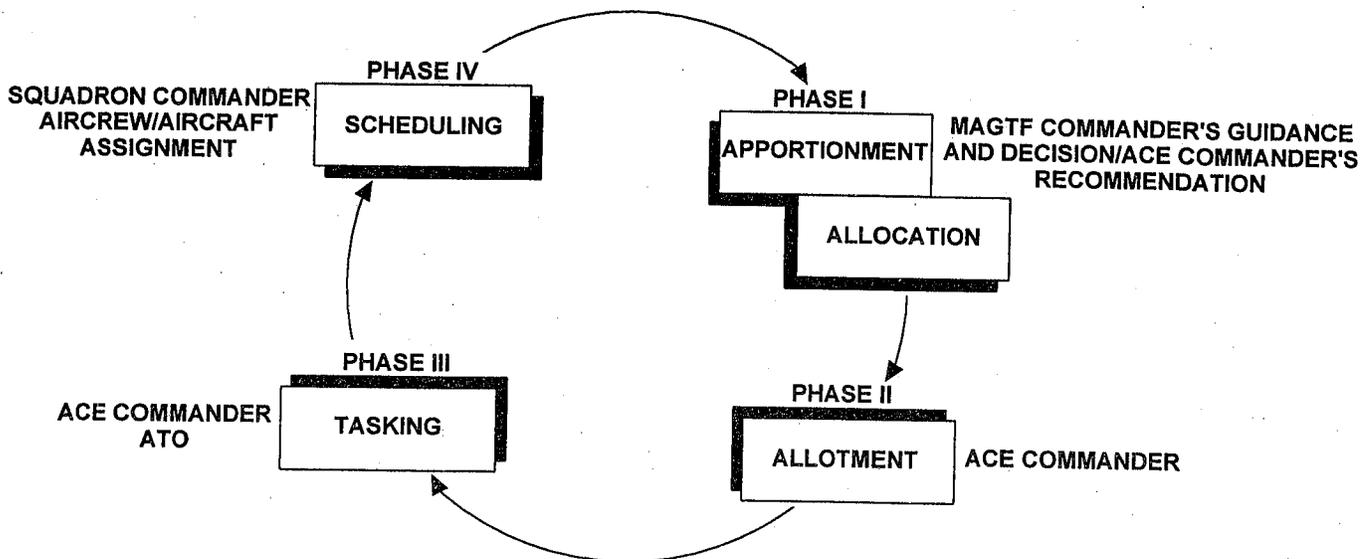


Figure 4-1. MAGTF Air Tasking Cycle.

Mission Assignment

The MAGTF commander assigns missions to his major subordinate commanders (GCE, ACE, and CSSE). He designates a main effort and establishes priorities for the total level of effort through his guidance, mission orders, and commander's intent. The mission order includes the higher commander's intent, the MAGTF commander's intent, and the MAGTF commander's concept of operations. The commander's intent conveys his vision of the desired end state and the purpose. The ACE commander initiates the MAGTF air tasking cycle after he receives his mission and apportionment decisions from the MAGTF.

Note

If the MAGTF is a Service component of a joint force, the MAGTF commander may issue special instructions pertaining to the JFC's apportionment guidance for MAGTF aviation sorties provided to the joint force.

Initiating the MAGTF Air Tasking Cycle

The ACE commander initiates the MAGTF air tasking cycle after he receives his mission from the MAGTF commander and after he receives the MAGTF commander's apportionment decision. The ACE commander assigns missions to his subordinate commanders and provides guidance and his commander's intent. Throughout the air tasking cycle, the ACE commander and his subordinate commanders must consider their assigned mission and the higher commander's intent.

Table 4-1, located at the end of this chapter, describes a MAGTF air tasking cycle including the functions that occur within each phase. This example assumes that the following actions occurred: all subordinate commanders (ACE, GCE, CSSE) were briefed on the MAGTF's mission and concept of operations; subordinate commanders received their mission orders, including the MAGTF commander's intent; and subordinate commanders developed their concept of operations based on their mission and the MAGTF's main effort.

Phase I: Apportionment and Allocation

Apportionment is the determination of the total level of effort that should be dedicated to various types of air

operations/tasks. The level of effort is determined for a given period of time by priority or percentage. Apportionment ensures the efficient use of limited assets to perform a wide range of missions. The ACE commander makes apportionment recommendations based on his assigned mission. He presents his recommendations to the MAGTF commander for approval.

Allocation is the translation of the apportionment into the total numbers of sorties (by aircraft type) available for each operation/task. Marine Corps allocation is geared more to aircraft capability than specific aircraft type. Allocation includes the submission of preplanned air support requests (AIRSUPREQs) by the ACE, GCE, and CSSE commanders. These preplanned requests include JTARs, JTAR/SRs, and ASRs. Preplanned requests, after approval by the appropriate major subordinate commanders, are prioritized and submitted to the MAGTF FSCC/air center. After approval by the MAGTF, preplanned requests are submitted to the FOS of the Marine TACC. Once all AIRSUPREQs have been received, the ACE presents his allocation request (ALLOREQ) to the MAGTF commander.

During phase I, the ACE commander—

- Issues guidance to his staff.
- Identifies, if applicable, the percentage of effort and sorties to be dedicated to joint force missions of air defense, long-range interdiction, and long-range reconnaissance as stipulated in the Joint Pub 0-2 under guidelines set by the JFC. These sorties are provided "up front" to the JFC after approval by the MAGTF commander.
- Calculates the total number of sorties available for MAGTF use. This calculation is based on sorties remaining after the "up front" joint force sorties are factored out.
- Estimates the number of sorties required to fulfill the MAGTF's air operations needs.
- Calculates the percentage of effort and number of sorties required to support the AAW plan based on input from his staff, the MACCS, and subordinate units. Once these sorties are identified, the remaining sorties are available for tasking to accomplish the other functions of Marine aviation in support of the MAGTF.

- Identifies any additional requirements for air operations and determines whether they can be sourced from within the MAGTF or require other joint air assets. If non-Marine joint air support is needed, it is requested and included in the ALLOREQ.

Note

Once the needs of the MAGTF have been met, excess MAGTF sorties are turned over to the JFC for joint tasking. Unlike the "up front" sorties, which covered only three specific missions, excess sorties are culled from all functions of Marine aviation. These sorties are identified and included in the ALLOREQ.

Phase II: Allotment

During phase II, sorties that were allocated in phase I are distributed, or allotted, to support the MAGTF and its elements. Allotment decisions allow MAGTF elements to plan and coordinate the integration of sorties into their fire and maneuver efforts. Specifically, after phase I is completed, GCE and CSSE commanders know the deep air support (DAS) targets to be attacked and the allocation of CAS, assault support, and other aviation sorties. Phase II is the allotment of these sorties to the GCE and CSSE. The GCE and CSSE commanders determine the appropriate distribution of these sorties, based on the main effort, to the control of subordinate units. GCE and CSSE commanders determine their scheduled and on-call preplanned mission requirements.

For example, aviation support may be needed for the start of an operation. Since the start time is known, preplanned scheduled support is requested. If the GCE or CSSE commander knows that a certain type of support is required at some point during a 2-hour period, preplanned on-call support is needed.

During the allotment phase, the ACE commander presents the ALLOREQ to the MAGTF commander. The MAGTF commander transmits it to the JFC. The JFC then prepares a sortie allotment (SORTIEALOT) and transmits it back to the service components. The SORTIEALOT includes—

- Revisions, if any, to the Service component's planned allocation to the joint force.

- Approval/disapproval of a Service component's request for air support beyond its capability.
- Allotment of other service component's excess sorties to fill the approved requests.
- Allotment of Service component excess sorties to fill mission requirements for the joint force.

Note

Excess sorties are considered returned to the reporting Service component if they are not allotted in an applicable SORTIEALOT message.

- Revisions to mission data for Service component requests, such as a changed mission priority or time on target. This is usually the result of informal coordination between Service components and the joint operations center.

Phase III: Tasking

Tasking is the process of translating the allocation and allotment decisions made in phases I and II into orders, and then passing these orders to the units involved. The MAGTF ATO provides instructions that allow executing units to accomplish their missions successfully. The tasking phase concludes once the ACE commander issues the MAGTF ATO.

The MAGTF ATO is prepared by the ACE commander and should include, but is not limited to, the following information:

- Mission number.
- Tasked unit.
- Supported unit.
- Request number (JTAR, JTAR/SR, ASR, etc.).
- Priority.
- Mission type.
- Mission times (time on/off target, time on station, pick up/drop off times, etc.).
- Alert status.
- Location of mission, target, pick up/drop off zones (to include coordinates).
- Cargo/passengers (size, weight, number).
- Call sign.
- Number and type of aircraft.
- Number/type of ordnance.
- IFF/selective identification feature (SIF) mode and code.

- Call sign/frequency of control agency, controller, terminal controller, landing zone control, etc.
- Amplifying notes and SPINS.

The MAGTF ATO is disseminated to all major subordinate elements of the MAGTF and to all elements that requested air support. Normally, it is distributed to the following:

- Marine TACC.
- TAOC.
- Early warning/control (EW/C).
- DASC.
- Marine air traffic detachment (MATCD).
- Force fires coordination center (FFCC)/FSCC.
- Operations sections.
- Air bases.
Aircraft groups/squadrons.
- Separately deployed units (squadrons/detachments).

It is not necessary to distribute the entire MAGTF ATO to everyone. The MAGTF ATO may be tailored for dissemination to specific agencies/units. For example, a battalion air officer would not need the entire ATO; he only needs those portions applicable to his battalion. Similarly, data that remains applicable over a period of several days may be supplemented by a partial (fragmentary) ATO. The partial ATO would contain only information that is new or has changed.

Phase IV: Scheduling

The MAGTF ATO assigns missions to specific squadrons. Upon receipt of the ATO, aircraft squadrons complete the scheduling process by assigning individual aircrews and aircraft to specific mission numbers and issuing squadron flight schedules. The scheduling process completes one evolution of the air tasking cycle.

Table 4-1. Notional Sequence of MAGTF Air Tasking.

Phase	Function	Who Does	Description	Example
I	Apportionment	MAGTF CMDR (ACE CMDR recommends)	Per JFC guidance, the MAGTF will provide up-front sorties to the JFC for air defense, long-range air interdiction, long-range air reconnaissance.	We will provide the JFC with five sorties for air defense, three sorties for long-range air interdiction, and three sorties for long-range air reconnaissance.
		MAGTF CMDR (ACE CMDR recommends, w/input from MAGTF MSCs)	Total level of effort (by priority or percentage) to be dedicated to various types of air operations/tasks for a given period of time.	My priority of effort is to gain and maintain the air superiority necessary for the MAGTF to conduct operations. This will be accomplished through AAW; the ACE will be the main effort. Of secondary concern will be OAS, focused primarily on DAS. AAW will give the MAGTF air superiority and DAS will help shape the battlespace for future MAGTF operations. Assault support, specifically combat assault transport, will be used to position forces and supplies for future combat operations.
I	Allocation	ACE commander	Translate apportionment into total number of sorties available for each air operation/task. (MAGTF allocation geared to aircraft capability vice specific aircraft type.)	I have: 60 sorties available for AAW (40 for OAAW, 20 for air defense). 40 sorties available for OAS (15 for air interdiction, 10 for armed reconnaissance, 15 for CAS). 10 sorties available for EW. 60 sorties available for assault support (45 for combat assault transport, 10 for aerial refueling, 5 for TRAP). 5 sorties available for visual reconnaissance. 5 sorties available for air C ² (two for TAC[A], two for FAC[A], one for DASC[A]).
		MAGTF MSCs	Submit preplanned air support requests and other aviation requirements.	JTARs, JTAR/SRs, ASRs.
		MAGTF CMDR (ACE CMDR recommends)	Submit ALLOREQ to MAGTF commander. MAGTF commander submits to the JFC.	The MAGTF will fly 180 direct support sorties per the following assigned missions/type aircraft . . .etc.. I can provide to the JFC: three excess F/A-18 (air-to-air) sorties and two excess AV-8B (air-to-ground) sorties. I need joint force support for aerial refueling and AEW/C.

Table 4-1. Notional Sequence of MAGTF Air Tasking (continued).

Phase	Function	Who Does	Description	Example
II	Allotment	ACE commander	Distribution of allocated sorties to elements of the MAGTF (supported commander knows what he is getting and supporting commander knows what he is providing).	I have allotted: 40 of 60 AAW sorties retained by the ACE for OAAW, provided by MAGs-31, 14. 20 remaining AAW sorties provided for air defense: 10 sorties for air defense of GCE (2d MarDiv), provided by MAG-31; 10 sorties for air defense of CSSE (2d FSSG), provided by MAG-31. 15 sorties for air interdiction retained by ACE for DAS, provided by MAG-14. 10 sorties for armed reconnaissance retained by ACE for DAS, provided by MAG-14. 15 sorties for CAS to support GCE (2d MarDiv): 10 provided by MAG-32, 5 provided by MAG-26. 10 sorties for EW to support OAAW and air interdiction missions, provided by VMAQ-2. 60 sorties for assault support: 30 sorties to support GCE (2d Mar Div) heliborne operations, provided by MAG-26; 15 sorties to support GCE (2d MarDiv) resupply, provided by MAG-29; 10 sorties for aerial refueling, provided by VMGR-252; 5 sorties for TRAP, provided by MAG-29. 5 sorties for visual reconnaissance, provided by MAG-31. 2 sorties for TAC(A) to support DASC, provided by MAG-31. 2 sorties for FAC(A) to support GCE (2d MarDiv), provided by MAG-29. 1 sortie for DASC(A) to support DASC, provided by VMGR-252.
		MAGTF MSCs	Distribute allotted sorties to subordinate units.	GCE (2d MarDiv) commander: I have 15 CAS sorties allotted to me, 2d Marines is my main effort. I will distribute 12 of 15 sorties to 2d Marines. I will distribute remaining three sorties to 8th Marines.
		JFC	Prepare and transmit SORTIEALOT.	MAGTF up-front sorties are sufficient for joint force. The Air Force Service component will provide the MAGTF three KC-135 sorties for aerial refueling. The Navy Service component will provide the MAGTF two E-2C sorties for AEW/C.

Table 4-1. Notional Sequence of MAGTF Air Tasking (continued).

Phase	Function	Who Does	Description	Example
III	Tasking	ACE commander	Translate allocation and allotment into publication and dissemination of MAGTF ATO. MAGTF ATO assigns missions to specific aircraft squadrons. Supported commander knows what missions he is getting.	MSNDAT/24001/CRUSADER 01/2FA-18/CAP/4-2-G/0730U/0730U/WES T CAP/350//
IV	Scheduling	Aircraft group/squadron commanders	Assign individual aircrew and aircraft to specific mission number of MAGTF ATO.	Publication of squadron flight schedule.

Part II

Planning Considerations

There are six separate functions of Marine aviation: control of aircraft and missiles, antiair warfare, air reconnaissance, electronic warfare, assault support, and offensive air support. Each of these functions is a critical component in the overall effectiveness of MAGTF aviation.

Part I was a horizontal look across the breadth of planning environments. It covered issues common to all six functions of Marine aviation. Part II is a vertical approach that covers planning considerations for each of these functions.

Proper planning for each function of MAGTF aviation ensures that all functions receive the amount of planning attention required to maximize its effectiveness. Planning also keys aviation planners to consider each function in relation to the other functions and to prioritize and integrate them in a manner that best accomplishes the overall mission.

If planners do not perform proper and thorough planning for each function of MAGTF aviation, they may overlook critical capabilities and jeopardize mission accomplishment. For example, a plan for an aviation operation that details how CAS is used but does not plan for sufficient AAW to protect CAS assets may be doomed to fail.

The chapters contained in Part II complement the employment planning checklists contained in appendix C to provide vital information to planners as they begin to focus on each specific function of MAGTF aviation.

Chapter 5

Control of Aircraft and Missiles

The control of aircraft and missiles is the core function of the six functions of Marine aviation. It ties all air operations together within the MAGTF. It allows the ACE commander to plan, direct, and control the efforts of the ACE to support the MAGTF. Control of aircraft and missiles is a combination of tasks that integrate all Marine aviation functions within the MAGTF and with joint/combined forces.

The ACE commander exercises his authority to command, coordinate, and control MAGTF air operations through the MACCS. The MACCS provides the command and control required for the other five functions of Marine aviation to operate and interact. Figure 5-1 shows the major elements of the MACCS. See FMFM 5-60 for a detailed discussion on the MACCS.

Planners must understand the critical planning considerations that relate to the control of aircraft and missiles. This chapter provides aviation planners with 15 critical planning considerations that provide a firm foundation from which to begin effective planning. Although they are presented in sequential fashion, some of the issues are addressed by concurrent vice sequential planning.

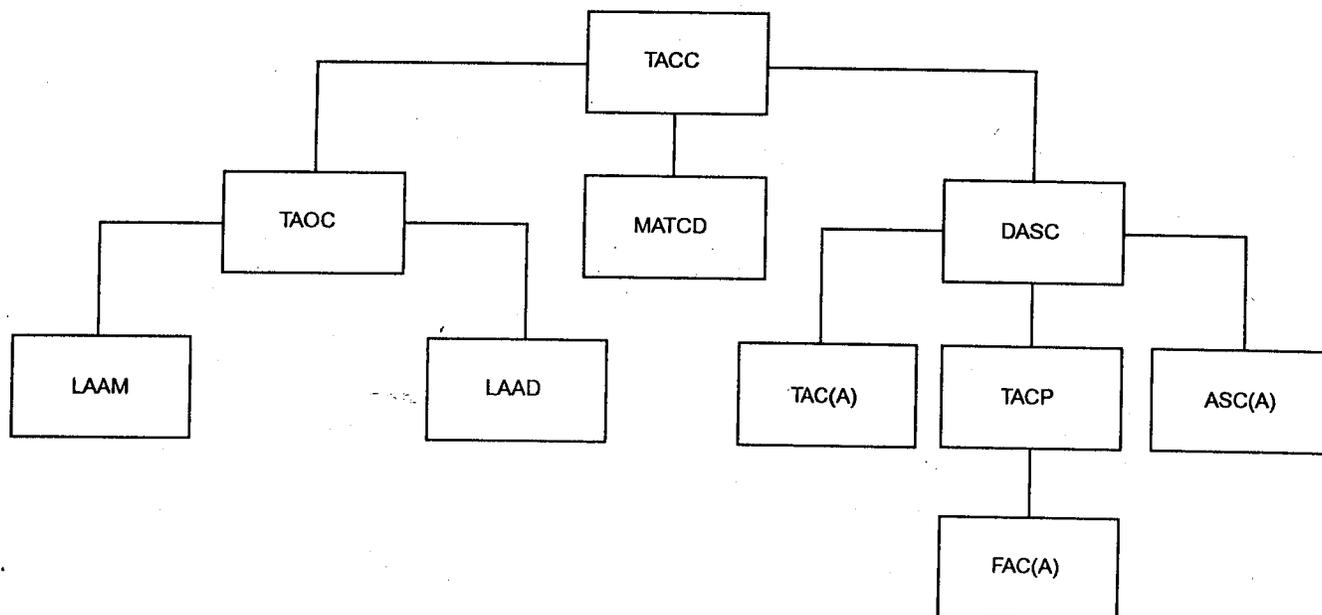


Figure 5-1. Major Elements of the MACCS.

The Mission

Planners must understand the MAGTF's and the ACE's missions. This understanding includes the commander's intent, the main effort, the desired end state, and the specified and implied tasks. Understanding the mission is the starting point for the effective planning of control of aircraft and missiles.

Assumptions

Assumptions can significantly impact continued planning. Therefore, they must be identified early in the planning process. Planners incorporate any guidance they previously received concerning assumptions.

Friendly Force Composition

Planners must examine the friendly force composition from the joint and combined level down to the MACCS level. They must identify any unique integration requirements and plan accordingly.

Planners must address MACCS interface with the JFACC, ACA, and AADC. They must ensure that the delineation of authority and responsibilities within these joint agencies is understood, particularly in contrast to the responsibilities of MACCS agencies. They must plan for MACCS integration with joint or combined air C² agencies; to include electronic connectivity as well as division of labor and responsibility requirements for surveillance, CAP control and management, tanker control, cross sector coordination, etc. Contingency operations may require planners to effect liaison with the International Civil Aviation Organization, host nation air traffic control facilities, and the Federal Aviation Administration.

At the MAGTF level, detailed planning is required to integrate UAV operations into the overall plan for control of aircraft and missiles. UAVs are integrated early in the planning phase. This gives planners sufficient time to minimize the difficulties of deconflicting UAV and piloted aircraft operations within an assigned airspace. Planners must also address the means to disseminate UAV combat information.

Once planners assess the mission and the force composition at the joint, combined, and MAGTF level, they can determine the appropriate level of MACCS support required to successfully complete the ACE mission.

Threat Assessment

Threat assessment permeates the entire planning process; from mission receipt to mission accomplishment. During the threat assessment process, planners evaluate enemy capabilities in regard to the friendly situation and MAGTF capabilities, limitations, and intentions. As the threat changes, planners change the employment plan accordingly. Planners must evaluate the following issues during threat assessment.

Air Order of Battle

The air order of battle is one of the first threat assessment issues addressed by planners. Their assessment extends beyond the raw data on airframe capabilities and limitations. They focus on enemy ordnance capabilities, training and morale, likely tactics, and enemy-anticipated priority targets.

Unmanned Aerial Vehicles

Enemy UAVs may be used as targeting, jamming, or reconnaissance platforms. They may also be used as drones to stimulate our air defenses and make us more susceptible to antiradiation missiles. Therefore, planners must identify the potential enemy UAV threat.

Ground Order of Battle

Planners must consider the enemy's mechanized capability and the impact of enemy mobility when choosing sites for MACCS agencies. The enemy's mechanized capability is of particular concern if the enemy has access to high speed avenues of approach into the MAGTF's operation area.

Surface-to-Air Weapons

Planners must assess the enemy's SAW threat. This includes his anti-aircraft artillery (AAA) as well as surface-to-air missiles (SAMs). The range and accuracy of the enemy's SAW systems must be identified as well as his ability to rapidly displace and fire again.

Electronic Warfare

Planners must examine the EW capability of the enemy. This includes enemy electronic warfare support (ES) and electronic attack (EA) capabilities.

Reconnaissance

Planners must identify the enemy's airborne and ground reconnaissance capabilities.

Terrorism

Planners must identify any potential for terrorist activity or unconventional operations. A terrorist with a well-aimed sniper round or a well-placed satchel charge can easily disrupt the MAGTF's ability to effectively control its aircraft and missiles.

Amphibious Objective Area/Area of Operations

Planners must consider the location and size of the AOA or AO. Within the AO, planners must identify the airspace control area and air defense area. These areas are then divided into airspace control sectors, air defense regions and, ultimately, air defense sectors. Planners must understand which sector or sectors the MAGTF has been assigned responsibility for. They must also be aware of sector boundaries to continue planning.

Terrain and Weather

Topography, masking effects, mobility and trafficability, and vegetation/foilage must be analyzed. Planners must also consider environmental effects on communications gear, radars, and personnel.

Airspace Control

Airspace control entails the coordination, regulation, and integration of the assigned airspace, as well as the identification of all tracks within the assigned airspace. Proper planning of airspace control is critical to the success of MAGTF aviation operations. Planners must address the following areas.

Surveillance Plan

The proper planning of surveillance ensures that all surveillance-capable assets are properly integrated to support MAGTF operations. The surveillance plan also helps determine which agencies are granted identification authority. Aviation planners must ensure that the surveillance plan provides reliable communications links for the passage of time-critical information. Rapid and reliable communications links are also important to nonradar-capable assets such as Stinger teams and visual combat air patrol aircraft. Once the surveillance plan is

established, planners can assess the extent of the recognized air picture. This assessment includes identification of any gaps in coverage. An assessment of the surveillance plan and the capabilities, limitations, and integration potential of each surveillance-capable asset facilitates the development of an effective radar control (RADCON) plan and the establishment of radar contracts to minimize gaps in surveillance. To reduce the enemy's EW capability, the RADCON plan addresses the need to maintain situational awareness during conditions when emissions are minimized emission control (EMCON). The RADCON plan also identifies the radar contracts established between the TAOC and radar-capable CAP aircraft.

Handover Procedures

Control procedures, both positive and procedural, must be established to effect handovers of aircraft from the original airfield traffic area, through the control agencies and terminal controllers for mission execution, and then back to the appropriate agency for aircraft recovery.

IFF/SIF Requirements

Planners must develop IFF/SIF mode and code procedures to facilitate the identification of air tracks.

Airspace and Air Defense Control Measures

The assigned airspace must be segmented by volume and/or time through the establishment of airspace and air defense control measures.

Destruction Area

The enemy airborne threat is destroyed or defeated in the destruction area. The destruction area includes base defense zones (BDZs), missile engagement zones (MEZs), fighter engagement zones (FEZs), and crossover zones/points. The destruction area is built around the air defense priorities established by the MAGTF commander. See Joint Pub 3-01.2 and FMFM 5-50 for additional information.

BDZs. BDZs are established as needed around main air facilities and FOBs. Their size is limited to the effective engagement envelopes of the deployed short-range air defense (SHORAD) system (i.e., Stinger). When planners establish BDZs, they must establish entry and exit

procedures (including safe lanes) and IFF mode and code requirements.

MEZs and FEZs. When planners establish MEZs and FEZs, they must address the threat, primary threat axes, effects of terrain, and realistic engagement envelopes of the weapon system that will be used to engage the threat.

Crossover Zones. With the increased sophistication of aircraft navigation capabilities, it may not always be necessary to establish a crossover zone between FEZs and MEZs. In some instances a crossover line is sufficient.

Airspace Coordination Areas

Airspace coordination areas are established, either formally or informally, to facilitate and protect friendly aircraft operations from concurrent fire support missions (NSFS, artillery, mortars). Planners must consider the ramifications of fire support coordination measures such as the fire support coordination line, free fire areas, restricted fire areas, and no fire areas. See Joint Pub 3-09, *Doctrine for Joint Fire Support* (under development); NWP 22-2, *Supporting Arms in Amphibious Operations*; and FMFM 6-18, *Techniques and Procedures for Fire Support Coordination*.

Routing Procedures

Effective routing procedures ensure safe and expeditious passage of friendly aircraft and allow ground air defenses and other sources of fire support freedom to engage enemy targets without undue restriction. Planners establish routing procedures to ensure safe passage of friendly aircraft into, out of, and within the air defense sector. Minimum risk routes are delineated by aircraft type and should include altitude and speed requirements/constraints. Minimum risk routes should not be positioned on the seam of adjacent weapon engagement zones (WEZs) or directly overhead an air defense priority or ground-based air defense agency. The plan for routing should also include fade and bugout plans for high-value assets.

Control Points

Control points are used for ease of navigation and routing. Easily identifiable terrain features or landmarks are normally chosen as control points.

Orbit Areas

Orbit areas may be required for EA and ES tracks (EA-6B), tanker tracks, TAC(A) tracks, FAC(A) tracks, DASC(A) tracks, and CAS stacks. They are defined by specific altitudes and lateral dimensions. When planners establish orbit areas, they should orient specific tracks to specific missions of the user aircraft (e.g., ES track parallel to the forward line of own troops, EA track perpendicular to the forward line of own troops).

Additional Airspace Control Measures

There are a variety of additional airspace control measures that may be required based on the tactical situation. The following subparagraphs discuss some, but not all, of the potential additional airspace control measures. See Joint Pub 3-52 and FMFM 5-60 for additional information.

HIDACZ. An HIDACZ may be required for concentrated employment of numerous and varied weapons and airspace users. The HIDACZ allows the commander to restrict nonmission essential use of a volume of airspace. Such a restriction may be necessary due to the large volume and density of supporting fires.

LLTR. A LLTR is a temporary corridor that may be activated to facilitate the low-level passage of friendly aircraft through friendly air defenses. Currently, LLTRs are established only in NATO.

Coordinating Altitude. A coordinating altitude may be published in the ACP. It provides altitude separation for fixed-wing and rotary wing aircraft.

ROA/ROZ. A restricted operations area (ROA)/restricted operations zone (ROZ) may be designated by the ACA in response to specific operational situations or requirements in order to restrict airspace use. Particular attention must be given to establishing exclusion areas or exclusion zones to restrict civil use of airspace as necessary. To establish a ROA/ROZ, planners must publish international notices to airmen via the International Civil Aviation Organization.

SAAFR. When participating in joint operations involving U.S. Army helicopters, planners may use standard-use Army aircraft flight routes (SAAFRs) established below the coordinating altitude. SAAFRs do not require ACA approval and could present a source of conflict.

Civil Airways. Planners must assess the impact of civil aviation on operations. They must identify the international and national civil airways that remain open to both civil and military air traffic.

Lame Duck Procedures

Planners must establish lame duck procedures for aircraft that can't squawk, talk, or navigate. Their first consideration is risk assessment. A decision must be made to either weigh risk assessment in favor of the returning lame duck aircraft or in favor of air defense priorities. If air superiority has been gained and the enemy air threat is being engaged well forward, risk assessment would likely be weighed in favor of the lame duck aircraft. This forces a delay in engagement by air defenses. If the enemy air threat is greater, risk assessment may be weighed toward air defenses. The lame duck aircrew must ensure that it presents a nonthreatening profile to air defense agencies. Once risk assessment is determined, it becomes easier to develop specific lame duck procedures.

Air Control

Once planners establish baseline procedures for air control and apply applicable control measures, they must consider specific air control issues that impact mission execution and enemy contact. Specific air control issues include the following items:

Engagement Authority

Engagement authority must be determined. Will the authority be given to the flight lead on CAP or will it reside at the agency exercising CAP control?

CAP and Tanker Control

Agency responsibility and procedures are determined for CAP control and tanker control.

Hawk Mode of Control

The mode of control must be delineated for Hawk engagements: Will the TAOC or EW/C exercise centralized control of engagements? Will engagement authority be decentralized to the tactical officer in the Hawk platoon? The mode of control is selected based on several considerations. These include the ability to respond to the threat, extent of recognized air picture, risk of fratricide, political considerations, and the situational awareness of the missile controllers as compared to that of the tactical officers. Control by exception, though rarely

used, is also an option that might apply when the threat is such that the tactical officer requires freedom to prosecute engagements without keeping the missile controller informed on a real-time basis.

Rules of Engagement

Planners receive ROEs (peacetime, transition to war, and wartime) guidance from the National Command Authorities, through the supported CINC, to the MAGTF commander, and down through the ACE commander. This guidance and the published ROE must be clear and specific. It must address each engagement-capable weapon system. ROE includes the following issues:

Identification and Engagement Authority. The agencies deemed appropriate by the MACCS planning staff to exercise identification and engagement authority must be consistent with the agencies identified in the ROE. Aviation planners must operate within the established ROE guidelines when conferring this authority.

Identification Criteria and Weapons Control Status. Identification criteria for hostile, unknown, and friendly aircraft must be clearly delineated. Additionally, there must be a clear and easily understood relationship between identification criteria and weapons control status.

Commit Criteria. Commit criteria must be clearly stated for CAP aircraft.

Self-Defense Criteria. Self-defense criteria must be disseminated in mission briefs, the operation order, and SPINS to the ATO. This information must be planned and well promulgated for each weapon system. It is critical that each unit have access to self-defense criteria for other units. For example, a Hawk platoon may be well aware of its own self-defense criteria but a potential for fratricide exists if a transiting aircraft is not aware of Hawk criteria.

Night Operations. If night operations are planned, planners must consider potential changes to the ROE. This is of particular concern due to the advent and increased availability of night optics and infrared devices.

Reasonable Assurance. The ROE should clearly state under what conditions reasonable assurance will go into effect for OAS operations and when it will cease as stipulated by the MAGTF commander.

Air Direction

Air direction regulates employment of air resources (aircraft and ground-based air defense units) to maintain a balance between their availability and their priority of usage. Air direction planning requirements include the following:

CAP and Tanker Management

Planners must delineate responsibilities and procedures for CAP management and tanker management.

Launch and Divert Authority

Planners must determine responsibility for aircraft launch and divert authority for AAW, OAS, and assault support missions.

States of Alert

Planned states of alert maximize employment and availability of CAP aircraft and ground-based air defense units. States of alert can include battle stations, airborne alert, 5-minute alert, 1-hour alert, etc.. States of alert are driven by the extent of situational awareness, ability to respond to the threat, indications and warnings capability, and maintenance and crew fatigue considerations. A detailed time-distance analysis is useful in determining the required states of alert.

Communications

Communications is one of most critical planning areas. Insufficient planning for communications can render an otherwise functional aircraft and missile control system inoperative. Appendix D includes a listing of MACCS communications capabilities. Planners should accomplish the following tasks to ensure an effective communications plan. See FMFM 3-30 for additional information.

Identify Requirements

In identifying communications requirements, planners should review the commander's intent and the friendly force composition. Additionally, planners must identify critical information flow requirements for each agency that supports the control of aircraft and missiles.

Assess Available Assets

Planners must have a realistic idea of what is required to fulfill communications requirements and what is available. Once the list of communications requirements is

consolidated, it must be balanced against the available communications assets. Communications requirements may exceed the assets available, especially in a joint or combined environment. Planners can request communications assets from other agencies if requirements exceed available assets.

Ensure Equipment and Cryptographic Compatibility

Compatibility of equipment and cryptographic compatibility is critical, particularly in a joint or combined environment.

Plan Backup Paths for Critical Information Flow

Planners must address the need for redundancy of communications paths to ensure the flow of critical information in case primary paths are rendered inoperative.

Develop EMCON Plans

EMCON plans need to be developed to protect friendly communications and radars from enemy ES and EA means.

Plan Integration of Intelligence

Planners must conduct detailed planning to identify communications paths for intelligence flow and combat information dissemination. Planners must be aware of the intelligence sources available as well as the integration means for each source (e.g., Marine All-Source Fusion Center, electronic intelligence platforms, UAVs).

Survivability

The MAGTF's air control system must be able to survive system degradation or the loss of one or more components. Survivability and the ability to function in degraded conditions are critical planning considerations. Planners must address the potential for degradation from three perspectives: an agency perspective, a functional perspective, and a communications perspective. For example, if the Marine TACC becomes a casualty, it cannot be assumed that the TAOC alone will perform as the alternate Marine TACC. A division of Marine TACC responsibilities is the likely solution. The TAOC may functionally assume responsibility for some of the current operations functions of the Marine TACC (including responsibility for AAW operations) while the senior air director in the DASC may assume responsibility for OAS and assault support functions.

Logistics

Planners must anticipate the need for resupply and sustainment (ordnance, fuel, repair parts) and provide for those needs. They also must consider the effect the logistics plan for the control of aircraft and missiles will have on other logistical support capabilities.

Unmanned Aerial Vehicles

Planning of UAV operations is critical to ensure effective control. UAVs are controlled in the same manner as manned aircraft. They enter the airspace control system via the appropriate airspace control agency, normally the DASC. UAV controllers maintain communications with the appropriate airspace control agency during missions to receive routing, altitude, and other pertinent airspace control information. UAV missions should be included on the ATO and coordinated with other air operations and supporting arms. Requests for UAVs are made via the JTAR or JTAR/SR form. See FMFM 3-22-1, *Unmanned Aerial Vehicle (UAV) Company Operations*, and Joint Pub 3-55.1, *Joint Tactics, Techniques, and Procedures for Unmanned Aerial Vehicles*.

Phasing MACCS Elements Ashore

An amphibious operation's goal is to achieve a seamless transition of power from sea to shore. Because many MACCS elements are ground-based and much of the MACCS's equipment must be phased ashore, proper planning is critical to ensure that effective control of aircraft and missiles is not interrupted during the ship-to-shore movement. The following subparagraphs address the different MACCS elements, discuss their movement ashore, and provide considerations for their employment during amphibious operations.

Low Altitude Air Defense Sections

Low altitude air defense (LAAD) sections are a vital part of the integrated air defense system. The primary LAAD weapon is the Stinger, which is designed to provide close and low coverage. It is best employed along key avenues of approach and in masked terrain that would not be protected by larger systems. Initially, LAAD assets may come ashore in direct support of the maneuver forces. Notionally, a LAAD battery of three platoons would be assigned to a MEF (forward). Teams supporting the assault should coordinate with the forward air controller (FAC) to help deconflict friendly aircraft from hostile aircraft. While still afloat, the LAAD commander can

provide early warning alerts from the Navy tactical air control center (TACC). As the beachhead expands, Stinger sections are employed in general support of the MAGTF, concentrating in areas likely to be targeted by enemy air (e.g., airfields, port facilities, and beach support areas). See FMFM 5-52, *Employment of the Low Altitude Air Defense Battalion*, for detailed information on the LAAD.

Direct Air Support Center

The DASC lands and collocates with the senior FSCC of the GCE. Since the DASC does not have a radar, it relies on procedural control (control points, altitudes, airspeeds, and other routing measures) to move aircraft from one location to another. After the DASC has come ashore, the LAAD commander may collocate and coordinate with the DASC for deconfliction of friendly aircraft.

Light Antiaircraft Missile Battalion

The primary light antiaircraft missile (LAAM) weapon is the Hawk missile. Elements of a Hawk firing platoon come ashore to augment the LAAD capability as the MAGTF vital area enlarges. Planners should consider echeloning the platoon ashore to provide quick establishment of low altitude protection. Once the full platoon is established ashore, they can provide protection against medium and low altitude threats. The first Hawk platoon is supplemented, as soon as possible, by an additional Hawk firing platoon. See OH 5-5A, *Employment of the Light Antiaircraft Missile Battalion—Hawk*.

Early Warning/Control Site

Surface-to-air and air-to-air weapons systems must be integrated with EW/C capabilities. This integration allows sufficient lead time to acquire, track, and destroy enemy air assets. An advance echelon of EW/C equipment and personnel should arrive ashore at about the same time as the Hawks to provide this capability. An EW radar, an operations van, and the necessary personnel comprise this preliminary capability and are usually the first element of the TAOC to come ashore. This is a limited system designed to support the SAWs until the full TAOC is ashore.

Marine Air Traffic Control Detachment

As MAGTF aircraft begin to operate from FOBs ashore, they require the MATCD to provide them with air traffic

control. Once ashore, two fully staffed MATCDs can support two main air bases and four air facilities/sites with continuous all-weather service.

Tactical Air Operations Center

As additional MACCS units are phased ashore, the TAOC is established ashore to provide surveillance, weapons control, and positive control of aviation assets. The ACE commander's air defense battle manager, the SAAWC, should be collocated with or integrated into the TAOC. A fully functional TAOC significantly enhances the MAGTF's capability to conduct deep air operations and is a prerequisite for MAGTF assumption of AAW responsibility in a sector. See FMFM 5-50 for additional information on the TAOC.

Tactical Air Direction Center

There will be a transfer of complete control from the Navy TACC to the Marine tactical air direction center (TADC) at some point during the movement of personnel and equipment ashore. However, in the interim, there may be a requirement for coordination of air operations from the beachhead. As the balance of control begins to shift landward, a Marine TADC may be established to control the functions that are phasing ashore. For example, the DASC may be controlling OAS missions or the TAOC may be handling AAW missions. In either instance, both agencies would benefit by being able to coordinate with a Marine TADC ashore until the Navy TACC transfers control. The growing Marine TADC becomes the Marine TACC when overall control is transferred; thereby ensuring a smooth transition. Once control transfers to the Marine TADC, the Navy TACC reverts to a TADC.

Chapter 6

Antiair Warfare

AAW refers to the actions undertaken to destroy, or reduce to an acceptable level, the enemy air and missile threat. It includes the use of interceptors, bombers, antiaircraft guns, surface-to-air and air-to-air missiles, and EW. AAW also refers to the methods taken to minimize the effects of hostile air action, such as cover, concealment, dispersion, deception, and mobility. AAW's primary purpose is to gain and maintain a degree of air superiority that allows the MAGTF to conduct aviation and ground operations without prohibitive interference from enemy aircraft and missiles. There are two general types of AAW: air defense and offensive AAW (OAAW). Air defense consists of defensive measures designed to destroy attacking enemy aircraft or missiles or to nullify or reduce the effectiveness of an attack. OAAW consists of operations against enemy air or air defense systems before they can assume an attacking role. See Joint Pub 3-01.2 and FMFM 5-50.

Successful employment of AAW requires a flexible AAW system that is capable of operating independently or as part of a larger system. An effective AAW system integrates all available AAW assets and coordinates the execution of the three components of a viable AAW system (surveillance, control, and weapons employment). Aviation planners must understand the MAGTF AAW system and MAGTF AAW employment doctrine in order to properly plan AAW use. This chapter begins with a discussion of basic AAW issues (including principles of AAW, tasks of OAAW, categories of air defense, and air defense priorities) and ends with a discussion of AAW planning responsibilities and considerations.

AAW Principles

Planning and execution of AAW is based upon three fundamental principles: destruction-in-depth, mutual support, and centralized coordination and decentralized control.

Destruction-in-Depth

Destruction-in-depth is considered the most important principle of AAW. Its goal is to engage and destroy the enemy air threat as far out as possible. The area required to ensure this destruction is designated the AAW area and consists of the vital area, the destruction area, and the surveillance area. See figure 6-1.

Vital Area. A vital area is a designated area or installation defended by air defense assets. It contains critical

facilities, units, and installations necessary to MAGTF mission accomplishment. There may be one or more vital areas depending on the size and scope of the operation. The outer boundary of the vital area serves as the reference point in the application of destruction-in-depth principles. Expected enemy attack profiles and anticipated weapons are considered, along with required minimum standoff range, when planners determine and designate the vital area.

Destruction Area. The destruction area is the planned area for the destruction or defeat of the enemy airborne threat. Beginning at the edge of the vital area, the destruction area varies in size depending on the situation. Three factors that normally determine the size of the destruction area are the capabilities of the air defense weapons system, engagement sequence, and surveillance

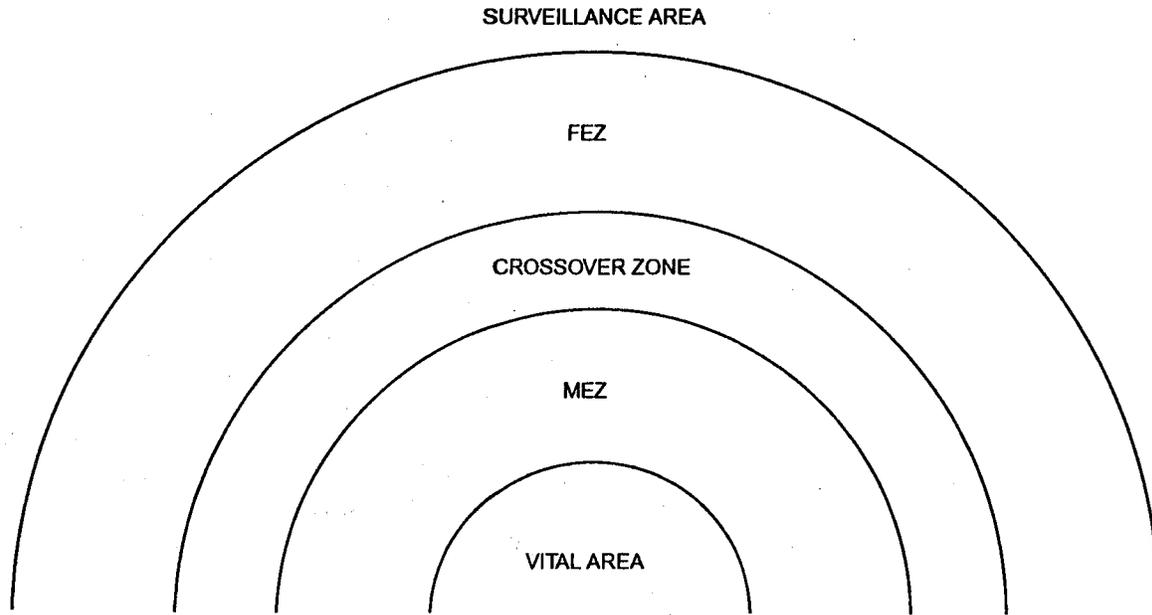


Figure 6-1. Notional AAW Area.

capabilities. The destruction area is normally divided into three geographical subdivisions: the MEZ, crossover zone, and FEZ.

MEZ. The MEZ is the geographic portion of the destruction area where SAMs have primary responsibility for destruction of airborne targets. It is normally tailored to encompass the maximum range of the SAM system. The MEZ is closest to the vital area.

Crossover Zone. The crossover zone is the geographic portion of the destruction area where the primary responsibility for destruction shifts from SAMs to interceptor aircraft.

FEZ. The FEZ is the geographic portion of the destruction area where interceptor aircraft have primary responsibility for destruction of airborne targets. The FEZ is furthest away from the vital area.

Surveillance Area. The surveillance area is the area in which search, detection, and tracking are accomplished. It extends beyond the destruction area to allow enough warning and reaction time to permit engagement as the target reaches the destruction area.

Mutual Support

AAW assets should be positioned and employed to ensure continuity of engagement. An integrated and overlapping pattern of support and continuity ensures that each target is brought within range of several AAW elements. This increases the chances of preventing the penetration of the vital area by hostile aircraft or missiles. For example, if enemy aircraft successfully transit the FEZ and enter the crossover zone, MAGTF fighter aircraft alert MEZ, ground-based air defense systems to the approaching threat.

Centralized Coordination and Decentralized Control

To provide a viable and self-sufficient system in an environment that requires rapid reaction, planners must ensure that control is decentralized enough to permit timely employment of AAW assets. In the example provided in the paragraph above of a surviving enemy aircraft approaching the MEZ, MAGTF fighters are free to engage the enemy immediately by using SAWs in the MEZ if the ROE is satisfied. But if clearance to fire could only be given by higher echelons, valuable time would be lost and the enemy aircraft might be able to penetrate the vital area before being engaged. Centralized coordination is achieved through reliable communications and a common understanding of the ROE.

past enemy attack methods, enemy location and strength, type of enemy aircraft and ordnance, and enemy doctrine aid planners in this matching process.

Planning Responsibilities

AAW planning and coordination is necessary throughout the MAGTF; not just between the MAGTF commander and the ACE commander. Without local air superiority, all elements of the MAGTF are at risk of unpredictable impairment due to enemy air attack. The MAGTF commander must have input from higher and lower level commanders to ensure that all AAW needs are met.

Higher Headquarters

Planning for AAW, including the coordination of all air defense weapon systems and EA, is initially the responsibility of higher headquarters (JFC, NEF commander, or CATF). At this level, planning responsibilities include—

- Establishing and disseminating the appropriate ROEs.
- Coordinating plans for early warning and air surveillance.
- Determining the general policy for AAW priorities.
- Establishing appropriate AAW sectors.
- Establishing AAW restricted areas as required.

MAGTF Commander

The AAW planning responsibilities of the MAGTF commander (or CLF) include—

- Coordinating MAGTF intelligence planning.
- Translating information requirements into collection tasks for agencies internal and external to the MAGTF.
- Providing initial and periodic assessments of enemy air defense capabilities.
- Determining landing force requirements for the conduct of AAW.
- Submitting requirements for support of the landing force's AAW effort and a statement of landing force AAW capabilities to the CATF.
- Establishing priorities between the ACE, GCE, and CSSE for AAW operations, including delineation of vital, destruction, and surveillance areas.
- Issuing OAAW and air defense objectives in the initial MAGTF planning guidance.
- Ensuring AAW means are available and properly allocated.

- Acting on requests for organic and nonorganic AAW support.
- Providing for early movement of AAW capabilities ashore.
- Providing for early establishment ashore of land-based EW and target acquisition capabilities.
- Establishing necessary AAW control agencies ashore.

ACE Commander

Because the ACE commander may not have direct access to all available intelligence collection activities, he must inform the MAGTF, GCE, and CSSE commanders of his intelligence requirements. OAAW operations short of the fire support coordination line (FSCL) and vital area air defense operations require in-depth coordination with other element commanders. The ACE commander's planning responsibilities include—

- Developing EEIs and OIRs for air defense and OAAW operations and submitting them to the MAGTF G-2.
- Developing preliminary OAAW and air defense plans for MAGTF approval and coordinating with the GCE and CSSE in their development.
- Receiving the MAGTF's initial assessment of enemy air defense capabilities.
- Recommending OAAW and air defense objectives to the MAGTF commander.
- Assisting in the development of air defense priorities with respect to the ACE and recommending air defense priorities to the MAGTF commander.
- Recommending vital, destruction, and surveillance areas to the MAGTF commander.
- Providing input to the MAGTF list of targets and recommending OAAW target priorities to the MAGTF commander.
- Submitting requests for external support to the MAGTF.
- Developing procedures for monitoring AAW operations between the ACE, GCE, and CSSE, including the status of enemy air and air defense assets.
- Processing and disseminating information on air defense targets of opportunity detected by GCE and CSSE units or aircrews.
- Developing procedures for rapidly attacking or engaging enemy air and air defense targets and targets of opportunity by MAGTF elements.

OAAW Tasks

OAAW can be broken down into three specific tasks. Each task has its own individual objective.

Preemptive Measures

Preemptive measures weaken the enemy air threat before it can be brought to bear against the MAGTF. Preemptive measures allow MAGTF air and ground operations to proceed. They can include—

- Air strikes on enemy airfields to destroy or damage aircraft, facilities, and logistic support.
- Attacks on C² facilities and surveillance systems.
- Air strikes on the enemy's air supply and support; e.g., railroads and convoys.
- Offensive air-to-air sweeps to search out and destroy enemy aircraft.

Suppression of Enemy Air Defenses

SEAD's objective is to temporarily suppress the enemy's anti-air capability in a defined zone of airspace in order to allow MAGTF air missions to proceed. SEAD is a tactical mission that supports other aviation missions. It includes direct engagement of enemy air defense assets by friendly ground, air, and naval forces as well as countermeasures against enemy C² capabilities. See Joint Pub 3-01.4, *Joint Tactics, Techniques, and Procedures for Joint Suppression of Enemy Air Defenses (J-SEAD)*, and FMFM 5-45, *Suppression of Enemy Air Defenses*.

Local Air Superiority Measures

Despite application of preemptive measures and SEAD, a residual air threat may still exist. The objective of local air superiority measures is to prevent the residual air threat from prohibitive interference in specific zones of action. Local air superiority measures include offensive CAPs, escort tactics, and aircraft countermeasures and maneuvers.

Air Defense Categories

There are two categories of air defense: active and passive. Active air defense is direct defensive action taken to destroy attacking enemy aircraft or missiles or to nullify or reduce the effectiveness of an attack. It includes the use of aircraft, interceptor missiles, air defense artillery, nonair defense weapons in an air defense role, and EA. Passive air defense constitutes all measures, other than active air defense, taken to minimize the effects of

hostile air action. These include the use of cover, concealment, camouflage, deception, dispersion, and protective construction.

Air Defense Priorities

Air defense priorities are determined by the MAGTF commander and based on recommendations from his staff and element commanders. To determine these priorities, the MAGTF commander evaluates each asset to determine its relative importance toward mission accomplishment. This list is balanced against available air defense assets. Planners begin at the top (most critical item appears first) of the list and assign air defense capabilities to the prioritized assets. When determining the air defense priorities, planners should consider the following factors.

Criticality

Criticality is the degree that the asset is essential to mission accomplishment. When planners determine criticality, it may be helpful if they divide assets into four groups:

- Assets, which if damaged, are capable of preventing mission accomplishment.
- Assets, which if damaged, are capable of immediate serious interference with mission accomplishment.
- Assets, which if damaged, are capable of eventual serious interference with mission accomplishment.
- Assets, which if damaged, are capable of limited serious interference with mission accomplishment.

Vulnerability

Vulnerability is the asset's resistance to destruction or degradation, its mission, its ability to move or disperse, and its ability to employ passive air defense protection measures.

Recuperability

Recuperability is the degree that the asset can recover from damage in terms of time, equipment, and manpower.

Threat Characteristics

Planners use threat characteristics to determine which weapons provide the most economical air defense of an asset. Knowledge derived from intelligence estimates,

past enemy attack methods, enemy location and strength, type of enemy aircraft and ordnance, and enemy doctrine aid planners in this matching process.

Planning Responsibilities

AAW planning and coordination is necessary throughout the MAGTF; not just between the MAGTF commander and the ACE commander. Without local air superiority, all elements of the MAGTF are at risk of unpredictable impairment due to enemy air attack. The MAGTF commander must have input from higher and lower level commanders to ensure that all AAW needs are met.

Higher Headquarters

Planning for AAW, including the coordination of all air defense weapon systems and EA, is initially the responsibility of higher headquarters (JFC, NEF commander, or CATF). At this level, planning responsibilities include—

- Establishing and disseminating the appropriate ROEs.
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- Establishing AAW restricted areas as required.

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- Submitting requirements for support of the landing force's AAW effort and a statement of landing force AAW capabilities to the CATF.
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- Issuing OAAW and air defense objectives in the initial MAGTF planning guidance.
- Ensuring AAW means are available and properly allocated.

- Acting on requests for organic and nonorganic AAW support.
- Providing for early movement of AAW capabilities ashore.
- Providing for early establishment ashore of land-based EW and target acquisition capabilities.
- Establishing necessary AAW control agencies ashore.

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Because the ACE commander may not have direct access to all available intelligence collection activities, he must inform the MAGTF, GCE, and CSSE commanders of his intelligence requirements. OAAW operations short of the fire support coordination line (FSCL) and vital area air defense operations require in-depth coordination with other element commanders. The ACE commander's planning responsibilities include—

- Developing EEIs and OIRs for air defense and OAAW operations and submitting them to the MAGTF G-2.
- Developing preliminary OAAW and air defense plans for MAGTF approval and coordinating with the GCE and CSSE in their development.
- Receiving the MAGTF's initial assessment of enemy air defense capabilities.
- Recommending OAAW and air defense objectives to the MAGTF commander.
- Assisting in the development of air defense priorities with respect to the ACE and recommending air defense priorities to the MAGTF commander.
- Recommending vital, destruction, and surveillance areas to the MAGTF commander.
- Providing input to the MAGTF list of targets and recommending OAAW target priorities to the MAGTF commander.
- Submitting requests for external support to the MAGTF.
- Developing procedures for monitoring AAW operations between the ACE, GCE, and CSSE, including the status of enemy air and air defense assets.
- Processing and disseminating information on air defense targets of opportunity detected by GCE and CSSE units or aircrews.
- Developing procedures for rapidly attacking or engaging enemy air and air defense targets and targets of opportunity by MAGTF elements.

- Maintaining the enemy air and air defense status by using all available intelligence sources, and providing the MAGTF commander with periodic evaluations of their impact on overall MAGTF objectives.

GCE and CSSE Commanders

GCE and CSSE commanders must also provide input to AAW planning. Their involvement is determined by the size of the MAGTF and the degree of enemy air and air defense threat. Their efforts can encompass both air defense and OAAW areas of concern. These responsibilities include—

- Developing EEIs and OIRs for AAW operations and submitting them to the MAGTF G-2.
- Making recommendations to the MAGTF commander and coordinating with other element commanders on—
 - Developing OAAW and air defense objectives.
 - Developing OAAW target priorities and procedures.
 - Developing air defense priorities with respect to the GCE and CSSE.
 - Delineating the vital, destruction, and surveillance areas.
 - Developing the preliminary AAW plan.
 - Determining GCE and CSSE requirements for the AAW planning and execution phases.
 - Developing procedures to monitor AAW operations.
 - Developing procedures to process and disseminate information on air defense targets of opportunity and air assets.
- Assisting the ACE commander in developing procedures for the rapid engagement of enemy air and air defense targets of opportunity discovered by the GCE and CSSE.
- Providing periodic evaluation on the impact of enemy air and air defense capabilities on the GCE and CSSE objectives.

Planning Considerations

Principal Considerations

The MAGTF commander's decision to conduct AAW operations is based primarily on his mission and objectives. Situational considerations include—

- Concept of operations and scheme of maneuver.
- Characteristics of AO/AOA.
- MAGTF size and composition.
- Enemy forces type, composition, organization, and capabilities.
- Enemy air defense capability.
- MAGTF commander's air defense priorities.
- Duration of anticipated amphibious or expeditionary operations.
- Integration of the MAGTF AAW system with naval and joint forces.
- Logistics support (especially aviation and surface-to-air ordnance).
- Communications.
- Reserve forces available.

Availability and Capability

The quantity, type, and readiness of aircraft, SAWs, and MACCS elements all combine to determine the operational availability and capability of the AAW system. Multipliers, such as the use of FOBs, must be considered when assessing this capability.

Air Defense

Air defense considerations directly affect the MAGTF commander's courses of action. The enemy air and missile threat and the type of AAW requested determine the degree of destruction or reduction necessary. If existing enemy air defense assets pose prohibitive interference to MAGTF operations, the MAGTF commander makes their neutralization or elimination a high priority. If assigning terrain objectives for air defense purposes, the MAGTF commander must give priority to the early establishment of air defense facilities ashore.

Threat Levels

Threat levels are tools used to estimate the extent of AAW required. There are three threat levels: low, medium, and high. When determining threat levels, planners must remember that a low threat to one MAGTF aircraft or AAW asset may be a high threat to another. Likewise, a high threat during daylight hours may be a low threat during darkness or overcast conditions. Threat levels aid aircrews, SAW operators, and MACCS personnel in tailoring their tactics, actions, and responses based on changes in the threat and the environment.

Low Threat. A low threat level allows MAGTF operations to proceed without any prohibitive interference. A low threat environment consists of—

- Small arms and medium anti-aircraft weapons.
- Limited optical acquisition AAA with no integrated fire control systems.

Medium Threat. A medium threat allows acceptable exposure time of friendly aircraft to enemy air defenses or acceptable interference by enemy aircraft to MAGTF operations. This threat level can restrict the flexibility of the MAGTF commander and would be characterized by—

- Limited radar or electro-optic acquisition capability not supported by fully integrated fire control systems.
- A fully integrated fire control system that has been degraded due to terrain, weather, or other factors.

High Threat. A high threat level exists when the enemy has an air defense system that includes integrated fire

control systems and EW capabilities. This threat level severely affects the MAGTF's ability to conduct operations and includes—

- C² systems.
- Mobile or strategic SAMs.
- Early warning radars.
- EW capability.
- Integrated AAA fire control systems.
- Interceptor aircraft.

Unmanned Aerial Vehicles

UAVs can be used to support AAW through their normal task of reconnaissance, surveillance, and target acquisition. UAVs can also support OAAW strikes by locating enemy SAW systems and forcing them to radiate or launch weapons thereby exposing themselves to electronic or physical attack. They can also be used to adjust SEAD fires in support of an OAAW mission and to provide real-time, post-strike damage assessment of the mission. See FMFM 3-22-1 for additional information.

Chapter 7

Air Reconnaissance

Air reconnaissance plays a vital role in the planning and execution of military operations. Air reconnaissance may be strategic or tactical. Strategic air reconnaissance provides information for the formulation of plans and policies at the national and international level. Tactical air reconnaissance obtains specific information about terrain, weather, and the enemy. MAGTFs normally conduct tactical air reconnaissance using a variety of aircraft (manned and unmanned) as well as national assets. The Marine Corps' intelligence system processes and disseminates intelligence information to commanders and their staffs as analyzed intelligence products. The G-2/S-2 officer plans and coordinates air reconnaissance. See FMFM 5-10, *Air Reconnaissance*. This chapter identifies categories of air reconnaissance, provides a listing of MAGTF air reconnaissance tasks and capabilities, and discusses specific air reconnaissance planning and tasking considerations.

Air Reconnaissance Categories

There are three types of air reconnaissance: visual, multisensor imagery, and electronic. A single mission can employ any combination of these types.

Visual

Visual reconnaissance aids offensive actions such as artillery, naval gunfire, or air support missions. It obtains information concerning enemy activities and resources or the physical characteristics of a given area. It also supplements operational information concerning friendly forces. Consider the following when requesting or planning visual reconnaissance:

- Visual reconnaissance provides immediate information on the disposition of friendly and enemy forces.
- Visual reconnaissance requires planning on a day-to-day basis due to the fluid nature of combat operations.
- Visual reconnaissance requires close coordination with supporting arms because both use the same airspace.

- Aircraft speed, visibility conditions, enemy camouflage and deception measures, and standoff distances can limit collection ability.

Throughout the history of warfare, unpredictable, chance observations have turned the tide of battle. But many opportunities have also been lost because an observer did not understand the importance of what he had just witnessed or the information was not reported in time to be useful. If commander's intent is known by all and time is taken to brief aircrews and analysts on what to look for, the MAGTF commander maximizes his chances of using random, valuable pieces of visual reconnaissance information to his advantage.

Multisensor Imagery

Multisensor imagery reconnaissance uses a variety of sensors to detect and pinpoint the location of enemy installations, facilities, and force concentrations. It is also a valuable tool for terrain analysis. Effective imagery depends on proper operation of the system. Therefore, planning to use two or more systems and using visual reconnaissance to complement and enhance the validity of information is prudent. Multisensor imagery sources include the following items:

Hand-held and Mounted Cameras. Photography produces the most recognizable image for use by untrained observers. When compared to other imagery systems, photographs offer the highest resolution. Processing and production times are relatively short and a wide variety of cameras, films, viewing angles, and scales are available. Poor visibility, cloud cover, and darkness limit photographic capabilities.

Airborne Radars. Radar may provide acceptable imagery during periods of darkness and in conditions of light rain, smoke, haze, or dust. Radar systems are detectable and susceptible to countermeasures.

Infrared Devices. Infrared may be effective in periods of darkness or reduced visibility. Viewing methods include a scope presentation for instantaneous viewing and imagery recording on film for later use.

Electronic

Electronic reconnaissance detects, identifies, evaluates, and locates enemy electromagnetic radiation. Electronic interception equipment recovers signals and determines signal direction, source, and characteristics. It is passive and can operate continuously.

MAGTF Tasks and Capabilities

MAGTF air reconnaissance assets are suited for the following functions:

- Battlefield surveillance.
- Route/area reconnaissance.
- Artillery/NSFS spotting.
- Battle damage assessment.
- Target acquisition/identification.

Proper planning ensures that air reconnaissance assets can—

- Collect multisensor imagery of areas of interest.
- Provide and maintain surveillance of enemy activities or areas of interest.
- Conduct airborne electronic reconnaissance.
- Support the direction and adjustment of artillery and NSFS.
- Provide intelligence collection capabilities to the MAGTF.
- Afford the MAGTF commander the ability to sustain coverage in areas of operations.

- Provide rapid and current information on enemy composition, disposition, activity, installations, and terrain.

Effective air reconnaissance helps the MAGTF commander by—

- Identifying targets for attack.
- Warning of hostile intent or actions.
- Allowing for analysis and development of counter tactics.
- Assessing damage to enemy and friendly targets.
- Determining enemy force structure.

The following units provide air reconnaissance to the MAGTF:

- VMFA(AW) - multisensor reconnaissance.
- VMAQ - electronic reconnaissance.
- UAV company - multisensor reconnaissance.
- All aviation units - visual reconnaissance.

Planning Considerations

Planners must address the following basic considerations while planning air reconnaissance missions:

- Avoid offensive combat action in order to accomplish the primary mission of delivering information to the supported commander.
- Use deception, surprise, and speed to avoid detection and afford protection.
- Integrate sensor systems to complement individual capabilities, permit comparison and confirmation of information, and provide backup if one system fails.
- Support reconnaissance missions with other sorties (strike, EW, fighter escort, air refueling), as required.

In addition, specific planning factors include the threat, terrain, target acquisition, and meteorology.

Threats

The status of enemy air defenses has a direct effect on air reconnaissance missions. A significant AAA threat may degrade visual reconnaissance due to a need for aircraft to stay above the threat altitude. The optimum altitude for unaided visual observation is 1200 to 1500 ft AGL. SEAD may be required to conduct air reconnaissance.

Planners must consider enemy SAMs, AAA, and air-to-air threats when evaluating risk and determining routes. Enemy SAMs are not considered a significant threat to a UAV because of its small radar cross section and low infrared radiation signature, but SAMs can be disastrous to other aircraft. Because of a UAV's slow speed, AAA is its greatest threat. It is also susceptible to jamming because it must maintain a radio up-link. Enemy air-to-air assets do not pose a great threat to the UAV because of its small size, but an air-to-air threat can impede the missions of other aircraft.

Terrain

All reconnaissance systems must have LOS with the target area to be effective. Planners must assess the effects of mountains, defilade, and vertically developed terrain.

Target Acquisition

The ideal target is in flat terrain, has a high contrast color from the background, and has a significant thermal difference from the surrounding area. A target that is well camouflaged and positioned can be difficult to detect no matter what reconnaissance platform is used.

Meteorology

Weather is a limiting factor that aggravates other limiting factors. Bad weather in the target area makes identification and location difficult and limits the type of observation. Low ceilings and poor visibility decrease visual reconnaissance effectiveness as well as the resolution of photographic systems.

Precipitation. Visible moisture degrades optical and visual reconnaissance systems. A UAV is not an all-weather aircraft. Exposure to rain, ice, and snow can severely damage or destroy a UAV.

Wind. UAVs, due to their lighter weight, are significantly more affected by wind than manned aircraft. The Pioneer UAV has a cross-wind limitation of 16 knots for takeoff and landing and a total wind component limitation of 30 knots in flight. The UAV currently under development will have a cross-wind limitation of 25 knots and a total wind component limitation of 30 knots in flight.

Clouds, Haze, and Smoke. In addition to affecting an aircrew's ability to conduct visual reconnaissance, these conditions also affect optical and infrared radiation systems in manned aircraft and UAVs.

Daylight, Sun Angles, and Shadows. The angle of the sun affects visual, TV, and FLIR observation in varying degrees. The quality of FLIR imaging decreases as the sun rises and reaches a point where a target can be seen visually. At this point the target cannot be detected by a FLIR. Prior to sunset and just after sunrise, long shadows are cast by large terrain features and can obscure objects in their path. The ideal time to take photographs or observe a target is mid-morning or mid-afternoon. During these periods, shadows are cast long enough to add definition and dimension to a target.

Tasking Air Reconnaissance Missions

Immediate requests for visual reconnaissance can be submitted directly to the DASC. Preplanned air reconnaissance requests are submitted using the JTAR/SR form. Preplanned requests are routed through the intelligence chain and consolidated by the senior intelligence section to improve coordination and reduce duplication. The senior intelligence section may be able to determine that the requested imagery is already available from another source. Once a decision is made to conduct an air reconnaissance mission, the tasking is placed on the ATO.

Chapter 8

Electronic Warfare

EW is any military action that involves the use of electromagnetic or directed energy to control the electromagnetic spectrum or to attack the enemy. Military forces depend on electronic equipment and the electromagnetic spectrum for communications and the detection, identification, and destruction of enemy forces. Therefore, the use of the electromagnetic spectrum is integral to operations and intelligence, and it is a critical element in the MAGTF's ability to counter the enemy's C² capability. If a force can selectively inhibit the enemy's use of the electromagnetic spectrum or exploit the electromagnetic spectrum to obtain information on the enemy while maintaining its own capability, it can maintain an important advantage over the enemy. EW is an integral part of command and control warfare, which also includes military deception, operations security, psychological operations, and C² protection. See FMFM 3, *Command and Control*; Joint Pub 3-51 (S), *Electronic Warfare in Joint Military Operations (U)*; FMFM 7-12, *Electronic Warfare*; and FMFRP 15-5, *Electronic Warfare in Combined Arms*.

EW's three major subdivisions are electronic attack, electronic protection, and electronic warfare support. This chapter begins by defining the major subdivisions and addressing measures that are applicable to each subdivision. The chapter concludes with a discussion of airborne EW: its characteristics, the requirements for its effective employment, and available airborne assets.

Electronic Attack

EA is the use of electromagnetic or directed energy to attack enemy personnel, facilities, or equipment with the intent of degrading, neutralizing, or destroying the enemy's combat capability. EA includes—

- Actions that prevent or reduce effective enemy use of the electromagnetic spectrum (e.g., jamming, electromagnetic deception).
- Employment of weapons that use either electromagnetic or directed energy as their primary destructive mechanism (e.g., lasers, radio frequency weapons, particle beams).

Jamming

Electronic jamming affects enemy receivers by masking the signals it was designed to receive with more powerful

signals. Because jamming can also impact friendly electronic emitters (e.g. radios, radars, data links), it normally requires centralized control authority. However, control authority can be delegated to lower commanders. In making the decision to use electronic jamming, commanders must carefully weigh the operational requirement against the possible restrictions or effects imposed on friendly systems and the resulting degradation of ES capabilities. MAGTF C² communications can be degraded if jamming is employed.

Jamming can warn the enemy that the MAGTF knows which frequencies he is using. The enemy can then change his frequencies. This makes further jamming difficult and ES less productive. Therefore, jamming for the purpose of merely harassing the enemy or supporting a minor operation may be counterproductive. Jamming, like all warfare techniques, is most effective when used against an enemy who is not prepared for it.

Deception

Electronic deception uses electromagnetic energy to mislead the enemy's interpretation of information received by his electronic systems. It is normally conducted as part of a larger deception operation. Advances in electronic sensor technology and the speed of transmitting and processing make it difficult to execute large electronic deception operations successfully. An enemy with advanced technological capabilities is likely to discover large deception efforts unless they are planned in detail and adequately supported by personnel and equipment. To increase deception's chances of success, planners should define specific objectives that are limited in time and scope. Deception operations, like jamming, normally require centralized coordination and control. Missions are normally preplanned, but they may be immediate if opportunities for deconflicted, limited applications present themselves.

Electronic Protection

EP involves the actions taken to protect personnel, facilities, and equipment from any effects of friendly or enemy employment of EW that could degrade, neutralize, or destroy friendly combat capability. Typically, the EP measures needed to protect friendly units from enemy EA and ES are a byproduct of proper communications planning. EP is further enhanced by the proper planning of noncommunications electronic equipment (e.g., radar, data links) usage. There are two types of EP: preventive and remedial.

Preventive Electronic Protection

Preventive EP involves measures taken by commanders during planning. They include the selection of a scheme of maneuver that minimizes friendly electronic emissions that the enemy can intercept or disrupt using his ES and EA capabilities. This can be accomplished by devising a simple scheme of maneuver with few or no emissions (EMCON), by imposing radio silence, or by selecting avenues of approach that facilitate terrain masking. Preventive EP also includes measures used to minimize the vulnerability of friendly receivers to enemy jamming.

Corrective Electronic Protection

Corrective EP involves measures taken by operators when the enemy jams their transmissions. The operator takes steps to optimize the performance of his equipment and to determine if the problem is his equipment or actual

enemy activity. Possible solutions can include reorienting antennas, increasing power out, changing equipment, etc..

Electronic Warfare Support

ES consists of actions tasked by, or under the direct control of, an operational commander to search for, locate, intercept, and identify sources of intentional and unintentional radiated electromagnetic energy for the purpose of immediate threat recognition. ES systems provide immediate threat recognition and a source of information for immediate decisions involving EA, EP, avoidance, targeting, and other tactical employment of forces. Examples of ES capabilities include radar warning equipment installed on tactical aircraft for self-defense, the receiver suite of the tactical jamming system of EW aircraft, and equipment used to determine the surface threat by submarines. To program ES equipment correctly, planners must have accurate information on the enemy electronic order of battle.

Data derived from ES can be rapidly disseminated as combat information, although the processing and evaluation time required to turn the raw data into useful information may vary. ES data can be used to produce signals intelligence, communications intelligence, and electronics intelligence. Tactical examples of ES information usage include use of directed energy weapons (EA) against targets of opportunity whose radar emissions were detected and employment of jammers (EP) in response to a displayed signal.

Responsibilities

EW operations must effectively support combat operations. Therefore, planners must develop the EW plan, integrate it into the overall operational plan, and continually update it to reflect changes in the tactical situation. If the conduct of EW is not adjusted as the situation changes, ES can become degraded and EA can have an adverse effect on friendly command and control. EW must be coordinated at all levels, both internal and external, of the MAGTF.

ES and EA are executed by EW units. These units respond to taskings issued by supported commanders or higher headquarters. However, for self-protection missions, units do not depend on higher headquarters for employment authorization. EP is the responsibility of all users of electronic equipment.

Airborne Electronic Warfare

In principle, planning and execution procedures for airborne EW are similar to those used for ground EW. The most significant difference between ground and airborne support requirements is time. The timeliness of airborne EW is critical in a fast-paced aviation operation. Characteristics of airborne EW include—

- Airborne EA activities conducted in direct support of other tactical aviation missions. They may support assigned mission aircraft, be part of a planned deception operation, or support other MAGTF operations.
- Airborne ES missions conducted by VMAQ EA-6B assets in general support of the MAGTF, as directed by the MAGTF commander.
- Special platforms that perform ES and/or EA in support of MAGTF operations requested through the JTF/theater commander.

Requirements

To complete the assigned mission and survive, airborne EW platforms require the following:

Protection From Enemy Air Defenses. Aircraft that conduct ES and EA usually fly predictable paths with extended periods of stable, straight, and level flight. The aircraft's high priority for destruction by the enemy and its relative vulnerability to attack require that planners provide for its defense. Typically, this protection is provided by AAW aircraft.

Proper Positioning. Proper radial and elevation alignment between an EA platform and the supported OAS aircraft is required. This requires detailed liaison between the aircrews of the EW aircraft and the supported aircraft.

Information Processing Capability. The MAGTF commander must have highly-trained collection and analysis personnel at his disposal, and they must possess a clear understanding of the MAGTF's EW needs. They are responsible for processing the raw data received from various sources into useful combat intelligence.

Assets

VMAQ. VMAQs, using the EA-6B aircraft, are the only specialized Marine airborne EW units. Their primary mission is to conduct EW in support of FMF operations. They support the MAGTF in the following areas:

- EA support for strike force aircraft to prevent, delay, or interrupt detection and tracking by enemy early warning, acquisition, and fire control radars. EA operations may also be conducted against elements of a SAW system (e.g., missile seekers, missile beacons, target tracking/acquisition radars) to prevent effective engagements or increase miss distances.
- ES operations to develop and maintain electronic order of battle, including selected emitter parameters and locations of nonfriendly emitters. Additionally, aircraft ES capabilities may be employed to provide threat warnings for friendly aircraft, ground units, or ships.

Note

The data collected by the EA-6Bs is processed by the Tactical Electronic Reconnaissance Processing and Evaluation System (TERPES). TERPES is an integrated, land-mobile, air-transportable, data processing system organic to VMAQs. Each TERPES has two shelters with equipment and software capable of receiving, processing, evaluating, and reporting electronic reconnaissance information and tactical jamming data.

Other Services. MAGTFs normally participate in joint or combined operations. Other Services or nations usually have airborne EW assets that also can support the MAGTF if proper coordination is performed. EW assets of other services include the U.S. Air Force EF-111, RC-135, and EC-130H (compass call) aircraft; U.S. Army EW aircraft and CEWI battalions; and U.S. Navy VAQ and VQ squadrons.

Chapter 9

Assault Support

Assault support is the use of aircraft to provide tactical mobility and logistic support to the MAGTF, movement of high priority cargo and personnel within the immediate area of operations, inflight refueling, and evacuation of personnel and cargo. Assault support gives the MAGTF commander the mobility to focus and sustain his combat power at decisive places and times. It allows the MAGTF commander to take full advantage of fleeting battlespace opportunities.

There are three levels of assault support: tactical, strategic, and operational. Operational assault support operations provide the link between the strategic and tactical levels. The MAGTF commander uses operational assault support to attain strategic objectives. The MAGTF's organic aviation capability allows the commander to project power well in advance of close operations in order to shape the battlespace. See FMFM 5-30, *Assault Support*.

This chapter identifies the seven categories of assault support and explains assault support mission classifications. It concludes with a discussion of assault support planning considerations.

Assault Support Categories

Combat Assault Transport

Combat assault transport provides mobility and logistic support to the MAGTF. It is used to rapidly deploy forces, bypass obstacles, or redeploy forces to meet the enemy threat. Combat assault transport allows the MAGTF commander to rapidly build up his forces at a specific time and location.

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 C-130. Air drops are normally employed when surface or helicopter transport cannot be used due to range, closed lines of communication, lack of adequate airfields, prohibitive ground tactical situation, high tonnage, or reduced response time. The supported commander selects the drop zone using the following criteria:

- Drop zone is free of obstacles.
- Aircraft approach routes are not over enemy controlled territory.
- Flat terrain.
- Rectangular area with prevailing wind along the zone's long axis.
- Prominent terrain features.

The best drop zone is located close to cover and concealment. This allows materiel recovery, segregation, inventory, and preparation for distribution without exposing personnel to enemy observation or fire.

Aerial Refueling

Marine KC-130 aircraft serve as airborne tankers for air support aircraft. Aerial refueling allows Marine aircraft to conduct flight-ferrying operations, extend time on station, and extend mission range. In addition, aerial refueling aids in the recovery of damaged or low-fuel aircraft.

Air Evacuation

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

Tactical Recovery of Aircraft and Personnel

TRAP operations recover personnel and equipment while avoiding additional losses. TRAP is performed when the tactical situation prevents a normal search and rescue mission and when survivors and their locations are confirmed. TRAP operations require detailed planning and briefing of assigned aircrews. MAGTF aviation assets may perform limited self-supporting combat search and rescue support using the TRAP concept.

Note

Combat search and rescue is a secondary task that does not interfere with the MAGTF's primary warfighting functions.

Air Logistical Support

Fixed-wing aircraft perform air logistical support. These transport operations provide assault support to the MAGTF in much the same manner as helicopters. Air logistical support delivers troops, equipment, and supplies that exceed helicopter lift capabilities, to areas beyond helicopter range, or if surface transportation is slow or unavailable. For large-scale operations, limited MAGTF transport aircraft assets may be supplemented by requesting support from other services through the JFC.

Battlespace Illumination

Fixed- or rotary wing aircraft can be used to illuminate the battle area by dispensing various types of flares. Battlespace illumination may be visible or invisible to the naked eye and can last for a few minutes or several hours.

Mission Classification

Assault support missions are classified as preplanned or immediate. Both types of support are delivered in response to specific requests via the ASR.

Preplanned Missions

Preplanned missions are performed according to an agenda. Planning must begin far enough in advance to permit detailed mission coordination. Preplanned missions allow for more effective management of limited air assets. They are either scheduled or on-call. Scheduled missions are executed at specific times. Coordination requirements demand approval from each intermediate level of command. On-call missions are configured for a particular task and placed in an appropriate ground/air alert readiness condition. The supported unit specifies the period of required support.

Of the two types of preplanned missions, on-call support is usually most effective in a dynamic environment. Scheduled air support requires that the requesting commander identify his requirements and set a specific time for the mission well in advance. This is often impossible on a fluid, ever changing battlespace. On-call missions allow the requesting commander to specify his requirements without setting a specific time.

Preplanned requests (both scheduled and on-call) originate throughout the echelons of the GCE and CSSE and proceed up the chain of command to the MAGTF air officer. At each command level, the air officer consolidates the requests and validates the need for aviation to support the request. Requests approved by the MAGTF air officer are forwarded to the Marine TACC for incorporation into the ATO. If a request is not approved or cannot be filled (insufficient assets), it is forwarded back to the originator with another type of support identified.

Immediate Missions

Immediate missions meet requests that arise during battle and respond to situations that cannot be identified far enough in advance for detailed planning and coordination to occur. Response time, or the action cycle, begins with the request and ends with execution. Response time is a prime consideration. Urgency may require diverting aircraft from a preplanned mission to fill an immediate assault support request. While a diverted aircraft may not fit the exact mold for the desired type or configuration, the MAGTF's swift response to the request can exploit an enemy's weakness or maintain the momentum of the attack. Immediate mission requests are handled by the MACCS. Mission details are coordinated and issued

while aircraft are assigned and moving toward the area. Immediate air support requires extensive use of electronic communications for rapid tasking and coordination. This communication may be difficult in a high-intensity jamming environment.

Immediate requests are submitted via the tactical air request net to the DASC (or Marine TACC if control is afloat). However, if unable to contact the DASC on the Marine tactical air reconnaissance (TAR) net, any other means of communicating the request to the DASC is acceptable.

Planning Considerations

Assault support assets are traditionally employed in general support of the MAGTF. However, assault support assets can be placed in direct support of MAGTF elements for a particular phase of an operation or a specified period of time. Planners must understand that there are trade offs when direct support is used. A major planning factor, and possible limitation, involves the logistical support requirements for the aviation assets placed in direct support. Commanders should consider the following when planning assault support operations.

AAW

The success of an assault support operation depends on lack of prohibitive interference by enemy aircraft and SAWs. The level, scope, and timeframe of air superiority required for success and survivability varies with the threat and the nature of the planned assault support operation. Planners use threat levels to gauge the potential for mission success and the need to adjust AAW or the assault support mission concept of operations.

Planners should initially assess the ability of the assault support aircraft to defend itself. If assault support aircraft lack a sufficient, inherent AAW capability, planners can assign dedicated AAW assets to provide the necessary protection. There may also be a need to provide assault support aircraft with attached escort and/or detached escort. Attached escort aircraft maintain close contact with the assault force. The need to maintain this contact reduces the attached escort aircraft's speed and freedom of action. Attached escort aircrews may find themselves in a defensive posture at the start of an engagement. Detached escort aircraft provide protection by clearing a path for the assault force and preventing the enemy from closing with the assault force. Detached escort allows

aircrews to retain the initiative and more freedom of action. However, the assault force may suffer serious losses if attacked by enemy forces that evade the detached escort.

Deception

Deception techniques can be used against opposing radars, communications intelligence sites, and other enemy assets. Effective deception draws the enemy's interest and forces away from the assault force and their intended objective. It reduces the enemy's ability to mass his forces against an assault force. To provide deception for the assault force, planners can—

- Vary flight profiles to simulate different types of missions.
- Use decoy aircraft or drones to pose a threat from a different direction than the actual threat.
- Use aircraft to make misleading transmissions to deceive enemy communications intelligence sites.
- Use EW techniques to present targeted enemy radars with false information.
- Use chaff to attract a radar operator's attention or deny radar discrimination in critical areas.

For deception to be effective, planners must understand and address the following:

- The enemy must see the deception and respond as predicted.
- The deception must appear to pose a credible threat.
- Possible enemy reaction should not result in increased danger to friendly units.
- The assault force should remain undetected.
- The risk to deception aircraft must be in proportion to the expected benefit.
- Deception, confusion, suppression, and target attack times must be disseminated, understood, and adhered to.
- Deception planning is an integral part of the assault force mission and should be coordinated with the total MAGTF deception effort.

Confusion

Confusion can deny or delay the enemy's ability to analyze the assault force threat and to take appropriate action. Planners can produce confusion using EW, chaff,

aircraft maneuvers, deception, and concurrent ground operations to mask the assault force objectives.

Operations Security

OPSEC is the MAGTF commander's best defense against enemy intelligence gathering. The less information the enemy has concerning assault support operations, the easier it is to conduct successful deception and confusion. Planners must carefully analyze enemy capabilities in order to determine if OPSEC measures are adequate for the planned mission. See Joint Pub 3-54, *Joint Doctrine for Operations Security*. Planners must be aware

that OPSEC for assault support missions may be inadvertently compromised by the use of—

- The same ingress and egress routes.
- The same frequencies, code words, and authentication procedures.
- Flight profiles that place assault support aircraft in enemy search or early warning radar coverage areas.
- Emissions from radios, radars, radar altimeters, or other electronic sources.

Chapter 10

Offensive Air Support

OAS is conducted against enemy installations, facilities, and personnel to directly assist in the attainment of MAGTF objectives by the destruction of enemy resources or the isolation of his military force. The MAGTF commander shapes the battlespace by focusing combined arms against critical vulnerabilities. The destruction or neutralization of these targets creates the conditions for decisive action. The firepower, mobility, and flexibility provided by OAS are critical in establishing favorable conditions for deep, close, and rear operations. The MAGTF commander uses combined arms to create a dilemma for the enemy; if enemy forces move against MAGTF ground combat forces, they expose themselves to attack by OAS aircraft. See Joint Pub 3-09.3, *Joint Tactics, Techniques, and Procedures for Joint Close Air Support* (under development); FMFM 5-40, *Offensive Air Support*; FMFM 5-41, *Close Air Support and Close-In Fire Support*; and FMFM 5-42, *Deep Air Support*.

The principal effects created by OAS are neutralization and destruction. Neutralization renders areas, weapons, or enemy forces ineffective for a specified time. These missions provide temporary relief from hostile fires and can protect friendly forces during movement. Other neutralization missions can include attacks against installations or areas the enemy uses to support his combat activity. Destruction missions render enemy forces, equipment, supplies, and installations permanently unusable. Total destruction is difficult to achieve due to the number of sorties and amount and type of ordnance required. Destruction missions are normally restricted to high priority targets.

This chapter discusses categories of OAS and OAS mission classifications. It also addresses OAS planning considerations.

OAS Categories

The supported unit's required degree of coordination determines the category of support provided. The two categories of OAS are CAS and DAS. The categories are not dictated by the type of aircraft. Attack helicopters as well as fixed-wing aircraft can conduct CAS and DAS.

Close Air Support

CAS is air action against hostile targets that are in close proximity to friendly forces and require detailed integration of each air mission with the fire and movement of friendly forces. The supported commander requests and

approves all CAS missions within his area of responsibility. CAS missions may be flown on either side of the FSCL.

Deep Air Support

DAS is air action taken 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. However, DAS missions require varying degrees of coordination. DAS missions may be flown on either side of the FSCL. DAS tasks include air interdiction and armed reconnaissance.

Air Interdiction. Air interdiction operations destroy, neutralize, or delay the enemy's military potential before it can be brought to bear effectively against friendly forces. These missions respond to known targets briefed in advance.

Armed Reconnaissance. Armed reconnaissance missions find and attack targets of opportunity (i.e., enemy materiel, personnel, and facilities) in assigned areas. Armed reconnaissance differs from air interdiction because armed reconnaissance targets are not known or briefed in advance.

Mission Classification

There are two classifications for OAS missions: preplanned and immediate. Both are executed in response to specific requests via the JTAR.

Preplanned Missions

Preplanned missions are performed according to an agenda. Planning must begin far enough in advance to permit detailed mission coordination. Preplanned missions allow for more efficient management of limited air assets. Preplanned missions are either scheduled or on-call.

Scheduled missions are executed at a specific time, and aircrews are assigned a time-on-target. Scheduled missions provide effective coordination and economical use of aircraft and ordnance. They require approval from each intermediate level of command. Scheduled air support requires that the requesting commander identify a specific target or type of target and a specific time for the attack well in advance. This is often impossible in a fluid, ever changing battlespace.

On-call missions are configured for a particular target or type of target and placed in an appropriate ground/air alert readiness condition. The supported unit specifies the period of required support. On-call missions allow the requesting commander to specify a target or area where specific targets are to be attacked in order to minimize required communications after launch.

Note

Preplanned on-call OAS offers planners some of the advantages found in both preplanned scheduled and immediate missions: the ability to plan in advance, yet be responsive and flexible at the same time.

Preplanned requests (both scheduled and on-call) originate throughout the echelons of the GCE and CSSE and proceed up the chain of command to the MAGTF air officer. At each command level, the air officer consolidates the requests and validates the need for aviation to support the request. Requests approved by the MAGTF air officer are forwarded to the Marine TACC for incorporation into the ATO. If a request is not approved or cannot be filled (insufficient assets), it is forwarded back to the originator with another type of support identified.

Immediate Missions

Immediate missions meet requests that arise during battle and respond to situations that cannot be identified far enough in advance for detailed planning and coordination to occur. Response time, or the action cycle, begins with the request and ends with the attack. Response time is a prime consideration. Urgency may require diverting aircraft from a preplanned mission to fill an immediate OAS request. While a diverted aircraft may not carry the optimum mix of ordnance, the MAGTF's swift response to the request can exploit an unexpected enemy weakness or maintain the momentum of the attack. Immediate mission requests are handled by the MACCS. Mission details are coordinated and issued while aircraft are assigned and moving toward the target. Immediate support requires extensive use of electronic communications for coordination. This communication may be difficult in a high-intensity jamming environment.

Immediate requests are submitted via the tactical air reconnaissance net to the DASC (or Navy TACC if control is afloat). However, if unable to contact the DASC on the TAR net, any other means of communicating the request to the DASC is acceptable.

Planning Considerations

The MAGTF is task-organized to exploit the combat power inherent in closely integrated air and ground forces. A large percentage of its combat power is provided by its organic aviation assets. It is, therefore, imperative that every effort be made to use the MAGTF's limited aviation assets effectively. MAGTF effectiveness can be maximized if planners clearly understand the requirements for effective OAS and tailor their plans to meet the requirements.

Air Superiority

The success of an OAS mission depends on the ability of the aircraft to prosecute the attack without prohibitive interference by enemy aircraft or air defense systems. Planners must gauge and apportion the proper amount of AAW support to protect an OAS mission.

SEAD

SEAD allows the attacking aircrew to concentrate on accurate delivery of ordnance rather than reacting to enemy SAWs. It also gives the aircrew more latitude in selecting attack profiles. If SAMs can be suppressed by high-speed antiradiation missiles (HARMs), EA performed by EA-6Bs, or other means, the OAS aircraft can deliver its ordnance accurately from a higher altitude, which reduces the AAA threat. Planners must coordinate the ground-sourced and air-sourced SEAD for effective suppression to occur at the proper times.

Weather/Environment vs. Systems/Proficiency

Planners must consider the effects of weather and environment (day/night) and balance them against the capabilities of the delivery platforms. For example, DAS strikes against a radar-significant target by F/A-18s may be more immune to weather interference than CAS delivered by AH-1Ws. With the advent of GPS-based marking and weapons delivery technologies, situations may develop where CAS can be delivered through a solid undercast by aircrews that never see the target in support of Marines that never see the CAS aircraft.

OAS planning must include a margin of system degradation and operator error. A common mistake of planners is to look at a static list of aircraft capabilities and base their plans on 100% capability. Planners must remember that sensors fail, aircrews make mistakes, and aircraft systems become degraded. No system can be counted on to perform as advertised all the time. If planners underestimate the effects of environmental factors, they can cause the loss of assets and lives. A point of balance between environment and technology must be assessed by planners. Planners who fail to make full use of new technologies and systems may pass up opportunities for success that might seem to be unattainable at first glance.

Targeting and Marking

Planners must use all assets at their disposal to achieve effective targeting and marking: both deep and close operations. A MAGTF commander who designates the ACE as the main effort to shape the battlespace needs to emphasize and conduct deep operations. In deep operations, the required emphasis can include MAGTF aircraft searching the area of influence. Consistent, effective OAS, particularly CAS, also requires detailed planning for primary and backup target marking means.

Weaponry

Planners evaluate the available weapons and delivery platforms and match them to the targets they are trying to kill. This matching process can be a challenging one if a variety of targets exist that must be serviced by limited assets. The use of *Joint Munitions Effectiveness Manuals* is essential in determining the ordnance loads required to achieve the desired effect and retain a degree of mission flexibility.

Flexible Control

A responsive C² system is required to ensure that the proper OAS requester receives timely OAS support. Planners must integrate their OAS plans within the C² system. The use of TAC(A)s and FAC(A)s should be planned, if possible and tactically feasible, in order to provide maximum situational awareness for OAS aircrews.

Appendix A

Notional Rapid Planning Timeline

Time	Process	Command Element	ACE
	Receipt of mission	Acknowledge receipt, assemble battlestaff	Acknowledge receipt, assemble battlestaff
0 + 05	Mission analysis	Mission precedence, implied tasking	Rapid planning cell activation, maintenance alerted
0 + 10	Determine information	Enemy situation, environment	Crews assembled, map issue, planning begins
0 + 15	Initial staff orientation	All staff personnel assembled	Battle gear issue; escape and evasion; survival, evasion, resistance, and escape plan development; submit EEs
0 + 20	MAGTF commander's planning guidance	Restate mission, intent, major actions	Identify ordnance and other requirements, develop mission plan
0 + 30	Develop courses of action	Developed by MAGTF commander and individual mission commanders	Liaison with GCE, aircraft mix identified, check air support element equipment, configure aircraft
1 + 00	Courses of action brief	Briefed by each appropriate staff member	Preflight aircraft, create SmartPac
1 + 30	MAGTF concept	Commander's intent and guidance, principal objectives	Landing zones, routes, rendezvous points determined and submitted as SPINS
2 + 00	Preparation of detailed plans	Review existing plans, modify plans	Load plan created, preparation for confirmation brief and flight brief
2 + 30			Rehearsal of confirmation and flight briefs
3 + 00	Confirmation brief	Finalize timeline, execution checklist	SmartPac completed, operations duty officer and weather briefer ready
4 + 00	Commander, time, mission, preparation rehearsals		Common/specific brief
5 + 30	Final inspection staging force		Man aircraft
6 + 00	Command and staff supervision		First launch

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Appendix B

Policy for Command and Control of USMC TACAIR in Sustained Operations Ashore

The Marine Air-Ground Task Force (MAGTF) commander will retain operational control of his organic air assets. The primary mission of the MAGTF air combat element is the support of the MAGTF ground element. During joint operations, the MAGTF air assets will normally be in support of the MAGTF mission. The MAGTF commander will make sorties available to the Joint Force Commander, for tasking through his air component commander, for air defense, long-range interdiction, and long-range reconnaissance. Sorties in excess of MAGTF direct support requirements will be provided to the Joint Force Commander for tasking through the air component commander for the support of other components of the joint force or the joint force as a whole.

Nothing herein shall infringe on the authority of the theater or joint force commander in the exercise of operational control, to assign missions, redirect efforts (e.g., the reapportionment and/or reallocation of any MAGTF TACAIR sorties when it has been determined by the Joint Force Commander that they are required for higher priority missions), and direct coordination among his subordinate commanders to insure unity of effort in accomplishment of his overall mission, or to maintain integrity of the force.

Joint Pub 0-2, *Unified Action Armed Forces (UNAAF)*

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Appendix C

Employment Planning Checklists

The following checklists provide employment planning considerations for each of the six functions of MAGTF aviation. They are designed to complement the planning information presented in Part II of this manual.

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CONTROL OF AIRCRAFT AND MISSILES

Mission

- Specified tasks
- Implied tasks
- Based on MAGTF and ACE missions and commanders' intents

Assumptions

Friendly Force Composition

- JFACC/ACA/AADC
- Joint/combined
- MAGTF
- MACCS
- Unique integration requirements

Threat

- Assess capabilities, limitations, doctrine, training and likely courses of action with respect to the friendly situation
- Air order of battle
 - Fighter
 - Attack
 - Helicopters
 - UAVs
- Ground order of battle
- Electronic warfare
- Reconnaissance
- Terrorist/unconventional

AOA/AO Description

- Size
- Airspace control area
- Air defense area
- Sectors of responsibility

Terrain and Weather

- Topography
- Masking effects
- Mobility/trafficability
- Vegetation/foilage
- Environmental effects on—
 - Communications
 - Radar
 - Personnel

Airspace Control

- Surveillance plan
 - Agency responsibilities
 - Radar contracts
 - RADCON plan
 - Identification authority
- Control of aircraft within airfield traffic area
- Control of aircraft after departing airfield traffic area
- Control of aircraft by terminal controllers
- Control of aircraft during recovery operations
- IFF/SIF requirements

Airspace and Air Defense Control Measures

- Destruction area (BDZs, MEZs, FEZs, JEZs, crossover zones)
- Airspace coordination areas
- Routing
- Control points
- Orbit points

Airspace and Air Defense Control**Measures-Continued**

- Additional airspace control measures
 - HIDACZ
 - LLTR
 - Coordinating altitude
 - ROA/ROZ
 - SAAFR
 - Civil airways
- Lame duck procedures

Air Control

- Engagement authority
- CAP and tanker control procedures
- Mode of control
- Rules of engagement (peacetime, transition, war-time)
 - Identification criteria
 - Weapons control status
 - Self-defense criteria
 - ROE changes for night operations
- States of alert

 Air Direction

- CAP and tanker management
- Launch and divert authority
- States of alert

Communications

- Requirements
- Assets available
- Equipment and cryptographic compatibility
- Redundant architectures
- Critical information flow
- EMCON

Casualty Procedures (Vulnerability)

- Agency
- Function
- Communications

Logistics

- Resupply and sustainment
 - Ordnance
 - Fuel
 - Class IX
- Impact on plan for control of aircraft and missiles on logistical considerations and constraints

ANTIAIR WARFARE

Missions

- Air defense
 - Active
 - Passive
- Offensive anti-air warfare
 - Preemptive anti-air warfare
 - SEAD
 - Local air superiority
- Threat assessment
 - Aircraft
 - Missiles
 - SAMs
 - AAA
 - EW
 - UAVs
- AAW assets available
 - RADCAP
 - HAWK
 - STINGER
 - VISCAP
 - OAS assets
 - Supporting assets (UAVs, EW, tanker, etc.)
 - Weapons
 - Command and control

Air Defense Considerations

- Air defense priorities
- Air surveillance picture/reaction time

Air Defense Considerations-Continued

- Principles of AAW
 - Destruction in depth
 - Mutual support
 - Centralized command/decentralized control
- Air defense employment principles
 - Mass
 - Mix
 - Mobility
 - Integration

OAAW Considerations

- Fundamentals of OAAW
 - Locate
 - Destroy
 - Deceive
 - Intimidate
- Identification criteria/rules of engagement
- Integration
 - Airspace control means
 - System status

Meteorology

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AIR RECONNAISSANCE

MAGTF Capabilities

- Tradeoffs
- Systems available
- Secondary mission

UAV Characteristics

- Size
- Airspeed
- Altitude
- Endurance
- Radius of action
- Sensors (day/night)
- Guidance

Threats

- SAMS
- AAA
- EW
- Air-to-Air

Terrain

- Target acquisition
- Sensor effects
- Line of sight

UAV Navigation

- Routing/deconfliction
- Standoff observation
- Target location accuracy

Meteorology

- Precipitation
- Wind
- Clouds/haze/smoke
- Sun angles/shadows

Mission Assignment

- DS vs. GS
- Liaison

Tasking

- JTAR/SR
- Consolidated at G-2/S-2
- Tasked by G-3/S-3

Tactical Applications

- Battlefield surveillance
- Route/area reconnaissance
- Artillery/Naval gunfire spotting
- BDA
- Target acquisition/identification

UAV Intelligence Products

- Report
- Videotape
- Real time data link
- Remote video terminal

Intelligence Product Dissemination

- Voice
 - GO/NO-GO criteria
- Remote video terminal with user
- Report/tape/data link

Asset Location

- Ground data terminal/ground control station
- Remote video terminal
- Operating field
- Launch and recovery site
- Turnaround time
- Weak link

Other Systems/Capabilities

- F/A-18
 - Targeting FLIR
 - LASER detector tracker/camera pod
- AV-8B
 - ARBS dual mode tracker
 - Night attack NAVFLIR

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ELECTRONIC WARFARE

Enemy Defenses

- Enemy order of battle
- Air defense integration
- Threat assessment

Meteorology

- Night vs. day
- Weather
- Ducting

Terrain

- Strike masking
- Jammer line of sight
- Multipath

EW Target Vulnerability

- EA coverage and effectiveness
- EP capability

HARM Considerations

- Numbers/platforms
- Prebriefed
- Targets of opportunity
 - Range known
 - Range unknown
 - Acquisition before launch
- Impact times

Force Requirements

- EW mission requirements
- Organic assets

Force Requirements-Continued

- Nonorganic assets
- EW asset protection

Navigation

- Attack route and alignment
- Deception axis
- Detection and unmasking times
- Turn times
- Egress route and alignment

Formation

- EW asset location
- EW asset protection
- Airspace deconfliction

Rules of Engagement

- Prohibited and restricted frequencies
- Noncombatant nations
- Electromagnetic interference

Command and Control

- Threat warning and reporting
- EW asset threat warning
- Divert and employment authority
- Nonorganic coordination
- Bugout procedures
- Return to support procedures

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ASSAULT SUPPORT

Mission

- Stated
- Implied
- Scheme of maneuver
- Mission orders
- Overtasking/underutilization
- Night/day
- GO/NO-GO criteria

Threat

- SAMS
- AAA
- EW
- Fixed-wing aircraft
- Helicopter
- Armor
- Artillery
- TAMPS
- Suppression/neutralization/avoidance
- Support arms/escort
- Survivability equipment

Terrain

- Routing
- Objective area/landing zones
- Command and control

Meteorology

- Sun
- Temperature
- Humidity
- Elevation
- Winds
- Visibility
- Light level
- Slower/lower

Command and Control

- Chain of command/authority
- Critical information flow
- Alternate means
- MEZ

CAS

- Asset location
- Integration
- Targeting

Support Requirements/Logistics

- Forward arming and refueling point
- Forward operating bases
- Helicopter support team
- Support asset (UAVs, escort, EW, etc.)

KC-130

- Rapid ground refueling
- Battlefield illumination
- Emergency resupply
- C² integration

Aerial Refueling

- Track
- Escort/CAP
- Fuel required
- Assets
- C² integration
- Bugout

DASC(A)

- Track
- Escort/CAP
- Time on station
- Aerial refueling
- C² integration

TRAP

- Assets/location
- TRAP zones
- Selected area for evacuation
- Communication
- Actions if downed
- Recovery site folders
- Isolated personnel report/barter kit/blood chit
- Local area populace

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OFFENSIVE AIR SUPPORT

Big Picture

- Scheme of maneuver
- Fire support plan
- ACE guidance

OAS Missions

- DAS
 - Air interdiction
 - Armed reconnaissance
- CAS (Fixed- and rotary wing)

Threat

- SAMS
- AAA
- Fighters
- EW

Assets

- Force requirements
- External support
- Types, numbers, capabilities
- Location
- Turnaround times
- Surge rates
- Day/night

Ordnance

- Type/numbers
- Probability of kill
- Standoff capability
- Carriage
- Loadout

Support Assets

- Tankers
- Jammers

Support Assets-Continued

- Fighters
- SEAD
- UAVs

Terrain

- Masking
- Navigation
- CPs, IPs, APs
- Target acquisition

Weather

- Sun/moon angle
- Illumination
- Cloud layers
- Precipitation
- Visibility
- Temperature

Navigation

- Systems
- Avenues of approach
- Defense along route
- DAS/CAS
- Minimum risk route

Targeting

- Deliberate
- Reactive
- Acquisition
- Vulnerability
- Defenses
- Point/area
- Structure/type

Appendix D

MACCS Capabilities Chart

Agency/ Unit	Equipment/Characteristics	Employment
Marine TACC	UHF/VHF/HF/MUX/SATCOM ¹ TADIL-A, -B; NATO Link-1; JTIDS ²	MEF/MEF (forward)
TAOC	UHF/VHF/HF/MUX/SATCOM ¹ TADIL-A, -B, -C; NATO Link-1; ATDL-1; JTIDS ² Radars: AN/TPS-59 (300 nmi) AN/TPS-63 (150 nmi)	MEF/MEF (forward)
DASC	UHF/VHF/HF/MUX/SATCOM ¹	MEF/MEF (forward)/MEU (air support element)
MATCD	UHF/VHF/HF/MUX/SATCOM ¹ TADIL-B, -C Radars: AN/TPN-22 (10 nmi) AN/TPS-73/107 (60 nmi) TACANS: AN/TPN-30 (10 nmi) AN/TRN-44 (130 nmi)	MEF/MEF (forward)/MEU (MATCD mobile team)
LAAD Battery	Stinger missile (5-7 nmi; 8-10,000 ft) (limited to gunner visibility) VHF/HF Radars: AN/UPS-3 (10 nmi; under 10,000 ft)	MEF (2 batteries)/MEF (forward) (1 battery)/ MEU (platoon/section) Organized into 3 platoons of 3 sections of 5 teams each (45 teams per battery)
LAAM Battery	Hawk missile (20 nmi; 40,000 ft) VHF/HF ATDL-1, JTIDS ² Radars: CWAR (3) (30 nmi) PAR (3) (40 nmi) HIPIR (6) (20 nmi)	MEF/MEF (forward) Organized into 3 platoons of 2 sections of 3 launchers each (54 missiles on rail per battery; each platoon can engage 2 targets simultaneously)

Notes:

¹ Dependent on asset/channel availability.

² Planned capability.

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Appendix E

Concept of Employment Brief Format

Mission Overview

Enemy situation

Weather forecast

Friendly situation

MAGTF mission

MAGTF scheme of maneuver

Significant concerns

ACE specified tasks

Threat assessment and countertactics

Enemy offensive capabilities

Enemy defensive capabilities

ACE implied tasks

ACE broad sequence of events

Command and Control

Air defense priorities

Available assets and locations

Surveillance plan

Routing plan

Destruction area

Responsiveness to threat

CAP management and control

Identification/engagement authority

Rules of engagement

Communication architecture

Critical information

Fixed-Wing Employment

Available assets and locations

Sequence of events

Mission assignments/allocation overview

Rotary Wing Employment

Available assets and locations

Sequence of events

Mission assignments/allocation overview

Issues Requiring ACE Approval

Launch, delay, divert, and abort authority as applicable for all six functions
of MAGTF aviation
Reasonable assurance

Unresolved Issues Requiring ACE Guidance

Delegation of authority

Launch, delay, divert, and abort authority as applicable for all six functions
of MAGTF aviation

Employment of Aviation Assets (fixed- and rotary wing)

Specified and implied tasks
Threat assessment and countertactics
Available assets and locations
Sequence of events
Mission assignments/allocation

Functional Area Employment**AAW**

Offensive anti-air warfare
Air defense

Air reconnaissance

Visual
Multi-sensor
Electronic

Electronic warfare

Electronic attack
Electronic protection
Electronic warfare support

Assault support

Combat assault transport
Aerial delivery
Aerial refueling
Air evacuation
Logistical support
Battlefield illumination

TRAP**Offensive air support**

Deep air support (air interdiction and armed reconnaissance)
Close air support (fixed- and rotary wing)

Appendix F

Confirmation Brief Format

Mission Overview

- Enemy situation
- Weather brief
- Friendly situation
- MAGTF mission
 - MAGTF scheme of maneuver
 - Significant concerns
 - ACE specified tasks
- Threat assessment and countertactics
 - Enemy offensive capabilities
 - Enemy defensive capabilities
- ACE implied tasks
- ACE broad sequence of events

Command and Control

- Threat assessment and countertactics
- Air defense priorities
- Available assets and locations
- Surveillance coverage and radar contracts
- Destruction area (BDZs, MEZs, FEZs, JEZs, crossover zones)
- Responsiveness to threat
- Orbit areas
- Routing (minimum risk route/tanker/fade/lame duck/IFF)
- CAP and tanker management and control
- Initial air defense warning condition
- Initial weapons control status
- Initial stages of alert (aircraft/SAW)
- Rules of engagement
 - Identification authority
 - Engagement authority
 - Identification criteria
 - Commit criteria
 - Self-defense criteria
 - Night operations
 - Reasonable assurance
- Communications
 - Planned and exceptions
 - Critical information flow
 - Communications assignments
 - Cryptographic change times
 - EMCON plan

Appendix G

Aircraft Capabilities Chart

Type	Crew	Performance	Payload	Sensors/ Self Protection	Comm/ Navigation
F/A-18 A/C F/A-18 D ²	1 2	<p>Maximum level speed @ sea level 550 kias</p> <p>Typical delivery speed: 500 kias</p> <p>Maximum endurance speed: 250 kias</p> <p>Time on station after 30 min transit: 30-55 min</p> <p>Radius of action: LLL 160 nmi HLH 360 nmi HHH 450 nmi</p>	<p>13,700 lbs</p> <p>Air-to-air: Sparrow, Sidewinder, AM-RAAM, 20 mm gun</p> <p>Air-to-ground: MK-80 Series/LGBs, 2.75/5" rockets, MK-20, CBU-59/78, MK-77, Maverick, HARM, MK-50/60 series, Wall-eye I/III</p> <p>Tactical air-launched decoy</p>	<p>Radar</p> <p>NAVFLIR</p> <p>Targeting FLIR¹</p> <p>NVG¹</p> <p>HARM seeker head</p> <p>Strike camera</p> <p>LST</p> <p>Laser (self) designator</p> <p>ALR-67</p> <p>ALQ-126</p> <p>Flares/chaff</p>	<p>2 UHF (AM/FM)</p> <p>2 VHF (AM/FM)</p> <p>TADIL-C</p> <p>Secure voice</p> <p>Radio relay</p> <p>tacan</p> <p>Automatic direction finder</p> <p>Inertial navigation system</p> <p>Radar</p> <p>NAVFLIR</p>
AV-8B	1	<p>Maximum level speed @ sea level 500 kias</p> <p>Typical delivery speed: 500 kias</p> <p>Maximum endurance speed: 230 kias</p> <p>Time on station after 30 min transit: 20-40 min</p> <p>Radius of action: LLL 140 nmi HLH 280 nmi HHH 380 nmi</p>	<p>8,000 lbs</p> <p>Air-to-air: Sidewinder 25mm gun</p> <p>Air-to-ground: MK-80 Series/LGBs, 2.75/5" rockets, MK-20, CBU-59/78, MK-77, Maverick, Sidearm</p>	<p>Radar³</p> <p>NAVFLIR⁴</p> <p>NVG⁴</p> <p>ARBS optical laser tracker</p> <p>Flares/chaff</p>	<p>2 UHF (AM/FM)</p> <p>2 VHF (AM/FM)</p> <p>Secure voice</p> <p>tacan</p> <p>Inertial navigation system</p> <p>Radar³</p>
EA-6B	4	<p>Maximum level speed @ sea level 550 kias w/extended stores 515 kias</p> <p>Cruise speed 420 kias</p> <p>Maximum endurance speed: @ 10K 265 kias @ 20K 260 kias</p>	<p>HARM</p> <p>Jamming pods</p> <p>Chaff</p> <p>Drop tanks</p>	<p>ALQ-99</p> <p>ALQ-126A</p> <p>Flares</p> <p>Chaff</p>	<p>2 UHF</p> <p>1 VHF</p> <p>1 HF</p> <p>AM/FM scanner</p> <p>tacan</p>

Type	Crew	Performance	Payload	Sensors/ Self Protection	Comm/ Navigation
EA-6B (con't)		Time on station (2/200 nmi radius): 60 min Radius of action: 500 nmi			Automatic direction finder Inertial navigation system
KC-130	6	Maximum speed: 350 kias Cruise speed: 250 kias Maximum endurance speed: 240 kias Minimum speed: 105 kias Time on station 13 + 00 Radius of action: 1000 nmi Jet-assisted takeoff	90,000 lbs 94 PAX, 74 litters DASC(A) Refueling mode: 58,000 lbs Giveaway Parachute flares	Radar homing and warning ALE-39 Infrared radiation countermeasure Missile warning receiver Search radar IFF interrogator	
AH-1	2	Maximum speed: 190 kias Cruise speed: 130 kias Maximum endurance speed: 72 kias Time on station in CAS configuration: 1.8-2.4 hrs Radius of action: 100 nmi	Sidewinder Hellfire Sidarm 2.75/5" rockets Fuel air explosive 20 mm turret gun 20 mm gun pod	FLIR ALE-39 Infrared radiation countermeasure Laser designator Radar detector CW warning receiver	2 UHF (AM/FM) 2 VHF (AM/FM) tacan Automatic direction finder FM homer Radar beacon
UH-1	3/4 ⁵	Maximum speed: 130 kias Cruise speed: 100 kias Maximum endurance speed: 55-65 kias Time on station 1 + 30 (30 + 10 best case w/auxiliary tanks) Radius of action 89 nmi	1,400-1,800 lbs 6-13 PAX, 6 litters 7.62mm .50 caliber guns 2.75" rockets	Radar homing and warning ALE-39 Infrared radiation countermeasure Radar detector CW warning receiver Communications jammer Loudspeaker for psychological operations	UHF/VHF/HF tacan Automatic direction finder loran ASC-26 communications package (3 additional radios: 1 UHF/2 VHF) for airborne command and control

Type	Crew	Performance	Payload	Sensors/ Self Protection	Comm/ Navigation
CH-46	3/4 ⁵	Maximum speed: 145 kias Cruise speed: 120 kias Maximum endurance speed: 70-90 kias Time on station 1 + 30-3 + 30 Radius of action: 80-200 nmi	2,000-4,000 lbs 10-18 PAX, 15 litters 2, .50 caliber guns	Radar homing and warning ALE-39 Infrared radiation countermeasure Radar detector	1 UHF/VHF 1 UHF 1 HF tacan
CH-53D	4	Maximum speed: 130 kias Cruise speed: 120 kias Maximum endurance speed: 70 kias Time on station 3 + 00 (5 + 30 w/auxiliary tanks) Radius of action: 170 nmi	8,000 lbs 30 PAX, 24 litters 2, .50 caliber guns	Radar homing and warning ALE-39 Radar detector	1 UHF 1 VHF 1 HF tacan
CH-53E	4	Maximum speed: 150 kias Cruise speed: 130 kias	20,000 lbs 37-55 PAX, 24 litters 2, .50 caliber guns	Radar homing and warning ALE-39 Radar detector	1 UHF 1 VHF 1 HF tacan
Pioneer UAV	N/A	Dash speed: 100 kts Cruise speed: 65 kts Maximum endurance @ cruise @ 5,000 ft: 5 hrs Radius of action: 100 nmi Rolling takeoff: 210 m Pneumatic launch: 21 m Rocket-assisted takeoff launch Rolling recovery: 366 m Arrested recovery: 130 m	75 lbs Day sensor (TV camera) FLIR	Day sensor (TV camera) FLIR	G band Up/down link (PRI) UHF uplink (sec) UAV company has UHF/VHF/HF

Type	Crew	Performance	Payload	Sensors/ Self Protection	Comm/ Navigation
Hugin UVA ⁶	N/A	Dash speed: 110 kts Cruise speed: 90 kts Maximum endurance: classified Radius of action: classified Rolling takeoff: 300 m Rocket-assisted takeoff launch Rolling recovery: 400 m Arrested recovery: 70m	200 lbs Day/night sensor (FLIR) Airborne data relay	Day/night sensor (FLIR) Airborne data relay	G band Up/down link (PRI) UHF uplink (sec) UAV company has UHF/VHF/HF

Notes:

- ¹ FA/18 C/D only.
- ² F/A-18D is two-seat variant. It also provides night attack (NVD), air reconnaissance, and air control and coordination.
- ³ Radar-equipped variant only.
- ⁴ Night attack variant only.
- ⁵ One additional crewman for NVD operations.
- ⁶ Follow-on replacement system for Pioneer UAV.

Appendix H

Glossary

Section I. Acronyms

AAA	antiaircraft artillery
AADC	area air defense commander
AAW	antiair warfare
ACA	airspace control authority
ACE	aviation combat element
ACO	airspace control order
ACP	airspace control plan
ADC	air defense coordinator
AGL	above ground level
AH-1W	attack helicopter (Super Cobra)
AIRSUPREQ	air support request
ALLOREQ	allocation request
AO	area of operations
AOA	amphibious objective area
ARBS	angle rate bombing system
ASC	air support coordinator
ASC(A)	assault support coordinator (airborne)
ASR	assault support request
ASWO	assault support watch officer
ATDL-1	Army tactical data link-1
ATF	amphibious task force
ATO	air tasking order
BDZ	base defense zone
C-130	cargo transport aircraft (Hercules)
C ²	command and control
CAP	combat air patrol
CAS	close air support
CATF	commander, amphibious task force
CEWI	combat electronic warfare and intelligence
CINC	commander in chief
CLF	commander, landing force
COS	current operations section
CP	control point
CSSE	combat service support element

DAS	deep air support
DASC	direct air support center
DASC(A)	direct air support center (airborne)
EA	electronic attack
EA-6B	all-weather electronic attack aircraft (Prowler)
EC-130	electronic warfare-capable configuration of C-130 aircraft
EI	essential elements of information
EF-111	electronic warfare-capable configuration of C-135 aircraft
EMCON	emission control
EP	electronic protection
ES	electronic warfare support
EW	electronic warfare
EW/C	early warning/control
F/A-18	all weather, fighter/attack aircraft (Hornet)
FAC	forward air controller
FAC(A)	forward air controller (airborne)
FEZ	fighter engagement zone
FFCC	force fires coordination center
FLIR	forward looking infrared
FMF	Fleet Marine Force
FMFM	Fleet Marine Force manual
FOB	forward operating base
FOS	future operations section
FSCC	fire support coordination center
FSCL	fire support coordination line
ft	feet
GCE	ground combat element
GPS	global positioning system
HARM	high-speed antiradiation missile
HF	high frequency
HHH	high-high-high
HIDACZ	high density airspace control zone
HLH	high-low-high
HQ	headquarters
hrs	hours
IFF	identification, friend or foe
IHR	in-extremis hostage rescue
IWO	intelligence watch officer

JEZ	joint engagement zone
JFACC	joint force air component commander
JFC	joint force commander
JOPEs	Joint Operation Planning and Execution System
JTAR	joint tactical air strike request
JTAR/SR	joint tactical air reconnaissance/surveillance request
JTCB	joint targeting coordination board
JTIDS	joint tactical information distribution system
JTF	joint task force
kias	knots indicated airspeed
KC-130	aerial refueling/transport aircraft (Hercules)
kts	knots
LAAD	low altitude air defense
LAAM	light anti-aircraft missile
lbs	pounds
LF	landing force
LGB	laser guided bomb
LLL	low-low-low
LLTR	low level transit route
loran	long-range aid to navigation
LOS	line of sight
LST	laser spot tracker
MACCS	Marine air command and control system
MACG	Marine air control group
MAGTF	Marine air-ground task force
MATCD	Marine air traffic control detachment
MEDEVAC	medical evacuation
MEF	Marine expeditionary force
METT-T	mission, enemy, terrain and weather, troops and support available-time available
MEU	Marine expeditionary unit
MEZ	missile engagement zone
min	minute
mm	millimeter
mux	multichannel radio
NATO	North Atlantic Treaty Organization
NAVFLIR	navigation forward looking infrared
NEF	naval expeditionary force
NEO	noncombatant evacuation operation
nmi	nautical mile
NSFS	naval surface fire support

NVD	night vision device
NVG	night vision goggle
OAAW	offensive anti-air warfare
OAS	offensive air support
OIR	other intelligence requirements
OPCON	operational control
OPSEC	operations security
PRI	pulse repetition interval
RADCON	radar control
RAOC	rear area operations center
RC-135	reconnaissance-capable configuration of C-135 aircraft
ROE	rules of engagement
ROA	restricted operations area
ROZ	restricted operations zone
SAAFR	standard-use Army aircraft flight route
SAAWC	sector anti-air warfare coordinator
SAC	senior air coordinator
SAM	surface-to-air missile
SATCOM	satellite communications
SAW	surface-to-air weapon
SEAD	suppression of enemy air defenses
SIF	selective identification feature
SORTIEALOT	sortie allotment
SPINS	special instructions
SWO	senior watch officer
TAC(A)	tactical air coordinator (airborne)
TACC	tactical air control center (USN)
tacac	tactical air command center (USMC)
tacn	tactical air navigation system
TACOPDAT	tactical operational data
TADIL	tactical digital information link
TAMPS	tactical aviation mission planning system
TAOC	tactical air operations center
TAR	tactical air reconnaissance
TAWO	tactical air watch officer
TDC	track data coordinator
TERPES	Tactical Electronic Reconnaissance Processing and Evaluation System
TRAP	tactical recovery of aircraft and personnel

UAV	unmanned aerial vehicle
UHF	ultrahigh frequency
UNAAF	Unified Action Armed Forces
VHF	very high frequency
VMAQ	Marine tactical electronic warfare squadron
VMFA (AW)	Marine fighter attack (all weather) squadron
V/STOL	vertical/short takeoff and landing
WEZ	weapon engagement zone

Section II. Definitions

A

- active air defense**—Direct defensive action taken to nullify or reduce the effectiveness of hostile air action. It includes such measures as the use of aircraft, air defense weapons, weapons not used primarily in an air defense role, and electronic warfare. (Joint Pub 1-02)
- air control**—The authority to effect the maneuver of aircraft. The elements of air control are: air control agency, air controller, airspace control, operational control, positive control, procedural control, radar control, and terminal control. (FMFRP 0-14 under "Marine air command and control system") Air control is the authority to direct the physical maneuver of aircraft in flight or to direct an aircraft or SAW unit to engage a specific target. (FMFM 5-60)
- air control agency**—An organization possessing the capability to exercise air control. (FMFRP 0-14 under "Marine air command and control system")
- air defense**—All defensive measures designed to destroy attacking enemy aircraft or missiles in the Earth's envelope of atmosphere, or to nullify or reduce the effectiveness of such attack. (Joint Pub 1-02)
- air defense area**—A specifically defined airspace for which air defense must be planned and provided. (Joint Pub 1-02, part 1 of a 2-part definition.)
- air defense sector**—A geographical subdivision of an air defense region. (Joint Pub 1-02)
- air defense warning conditions**—A degree of air raid probability according to the following code. The term air defense division/sector referred to herein may include forces and units afloat and/or deployed to forward areas, as applicable. (extract from Joint Pub 1-02)
- air direction**—The guidance and supervision which a commander employs to focus his resources on mission accomplishment. Air direction occurs as a sequence of the following activities: apportionment, allocation, tasking, and fragmentary order. (FMFRP 0-14 under "Marine air command and control system") The authority to regulate the employment of air resources (aircraft and SAW units) to maintain a balance between their availability and the priorities assigned for their usage. (FMFM 5-60)
- air intercept zone**—A subdivided part of the destruction area in which it is planned to destroy or defeat the enemy airborne threat with interceptor aircraft. (Joint Pub 1-02) The air intercept zone (AIZ) may be divided into fighter engagement zones (FEZ). Also called **AIZ**.
- air interdiction**—Air operations conducted to destroy, neutralize, or delay the enemy's military potential before it can be brought to bear effectively against friendly forces at such distance from friendly forces that detailed integration of each air mission with the fire and movement of friendly forces is not required. (Joint Pub 1-02)
- air reconnaissance**—The acquisition of intelligence information by employing visual observation and/or sensors in air vehicles. (Joint Pub 1-02)
- airspace control in the combat zone**—A process used to increase combat effectiveness by promoting the safe, efficient, and flexible use of airspace. Airspace control is provided in order to prevent fratricide, enhance air defense operations, and permit greater flexibility of operations. Airspace control does not infringe on the authority vested in commanders to approve, disapprove, or deny combat operations. Also called **combat airspace control**; **airspace control**. (Joint Pub 1-02)
- airspace control order**—An order implementing the airspace control plan that provides the details of the approved requests for airspace control measures. It is published either as part of the air tasking order or as a separate document. Also called **ACO**. (Joint Pub 1-02)
- airspace control plan**—The document approved by the joint force commander that provides specific planning guidance and procedures for the airspace control system for the joint force area of responsibility. Also called **ACP**. (Joint Pub 1-02)
- airspace control sector**—A subelement of the airspace control area, established to facilitate the control of the overall area. Airspace control sector boundaries normally coincide with air defense organization subdivision boundaries. Airspace control sectors are designated in accordance with procedures and guidance contained in

the airspace control plan in consideration of Service component, host nation, and allied airspace control capabilities and requirements. (Joint Pub 1-02)

airspace control system—An arrangement of those organizations, personnel, policies, procedures, and facilities required to perform airspace control functions. (Joint Pub 1-02)

airspace coordination area—A block of airspace in the target area in which friendly aircraft are reasonably safe from friendly surface fires. (FMFRP 0-14) Also called **ACA**.

airspace management—The coordination, integration, and regulation of the use of airspace of defined dimensions. (Joint Pub 1-02)

air superiority—That degree of dominance in the air battle of one force over another which 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. (Joint Pub 1-02)

air supremacy—That degree of air superiority wherein the opposing air force is incapable of effective interference. (Joint Pub 1-02)

air surveillance—The systematic observation of air space by electronic, visual or other means, primarily for the purpose of identifying and determining the movements of aircraft and missiles, friendly and enemy, in the air space under observation. (Joint Pub 1-02)

air threat levels—The conditions which relate to the enemy's air defense capability against airborne friendly aircraft. There are three levels of air threat: **a. low.** An air threat environment which permits combat operations and support to proceed without prohibitive interference. Associated tactics and techniques do not normally require extraordinary measures for preplanned or immediate support. **b. medium.** An air threat environment in which the specific aircraft performance and weapons system capability allow acceptable exposure time to enemy air defenses. This air threat environment restricts the flexibility of tactics in the immediate target/objective area. It is an environment in which the enemy may have limited radar and/or electro-optical acquisition capability at medium ranges, but the air defense system is not supported by fully integrated fire control systems. **c. high.** An air

threat environment created by an opposing force possessing air defense combat power including integrated fire control systems and electronic warfare capabilities which would seriously diminish the ability of friendly forces to provide necessary air support. This air threat environment might preclude missions such as immediate CAS, as the requirement for effective radio communications and coordination may not be possible. (FMFRP 0-14)

allocation (air)—The translation of the apportionment into total numbers of sorties by aircraft type available for each operation/task. (Joint Pub 1-02)

allotment—The temporary change of assignment of tactical air forces between subordinate commands. The authority to allot is vested in the commander having combatant command (command authority). (Joint Pub 1-02)

amphibious objective area—A geographical area, delineated in the initiating directive, for purposes of command and control within which is located the objective(s) to be secured by the amphibious task force. This area must be of sufficient size to ensure accomplishment of the amphibious task force's mission and must provide sufficient area for conducting necessary sea, air, and land operations. (Joint Pub 1-02) Also called **AOA**.

antiair warfare—A US Navy/US Marine Corps term used to indicate that action required to destroy or reduce to an acceptable level the enemy air and missile threat. It includes such measures as the use of interceptors, bombers, antiaircraft guns, surface-to-air and air-to-air missiles, electronic attack, and destruction of the air or missile threat both before and after it is launched. Other measures which are taken to minimize the effects of hostile air action are cover, concealment, dispersion, deception (including electronic), and mobility. (Joint Pub 1-02) Also called **AAW**.

antiair warfare commander—The antiair warfare commander is the antiair warfare agent of the commander, amphibious task force. He is responsible for AAW of the amphibious task force in a particular region, (the amphibious objective area), and during its movement to, and arrival in, the amphibious objective area. Also called **AAWC**.

apportionment (air)—The determination and assignment of the total expected effort by percentage and/or by priority that should be devoted to the various air operations

and/or geographic areas for a given period of time. (Joint Pub 1-02)

area air defense commander—Within a unified command, subordinate unified command, or joint task force, the commander will assign overall responsibility for air defense to a single commander. Normally, this will be the component commander with the preponderance of air defense capability and the command, control, and communications capability to plan and execute integrated air defense operations. Representation from the other [Service] components involved will be provided, as appropriate, to the area air defense commander's headquarters. (Joint Pub 1-02) Also called **AADC**.

area of influence—A geographical area wherein a commander is directly capable of influencing operations, by maneuver or fire support systems normally under the commander's command or control. (Joint Pub 1-02)

area of operations—That portion of an area of war necessary for military operations and for the administration of such operations. Also called **AO**. (Joint Pub 1-02)

B

base defense zone—An air defense zone established around an air base and limited to the engagement envelope of short-range air defense weapons systems defending that base. Base defense zones have specific entry, exit, and identification, friend or foe procedures established. (Joint Pub 1-02) Also called **BDZ**.

battlespace—All aspects of air, surface, subsurface, land, space, and electromagnetic spectrum which encompass the area of influence and area of interest. (FMFRP 0-14)

battlespace dominance—The degree of control over the dimensions of the battlespace which enhances friendly freedom of action and denies enemy freedom of action. It permits force sustainment and application of power projection to accomplish the full range of potential missions. It includes all actions conducted against enemy capabilities to influence future operations. (FMFRP 0-14)

C

close air support—Air action by fixed- and rotary-wing aircraft against hostile targets which are in close proximity to friendly forces and which require detailed

integration of each air mission with the fire and movement of those forces. (Joint Pub 1-02) Also called **CAS**.

close operations—Military actions conducted to project power decisively against enemy forces which pose an immediate or near term threat to the success of current battles and engagements. These military actions are conducted by committed forces and their readily available tactical reserves, using maneuver and combined arms. (FMFRP 0-14)

combat air patrol—An aircraft patrol provided over an objective area, over the force protected, over the critical area of a combat zone, or over an air defense area, for the purpose of intercepting and destroying hostile aircraft before they reach their target. (Joint Pub 1-02) Also called **CAP**.

combatant command—A unified or specified command with a broad continuing mission under a single commander established and so designated by the President, through the Secretary of Defense and with the advice and assistance of the Chairman of the Joint Chiefs of Staff. Combatant commands typically have geographic or functional responsibilities. (Joint Pub 5-0)

combatant command (command authority)—Nontransferable command authority established by title 10 ("Armed Forces"), United States Code, Section 164, exercised only by commanders of unified or specified combatant commands unless otherwise directed by the President or the Secretary of Defense. Combatant command (command authority) cannot be delegated and is the authority of a combatant commander to perform those functions of command over assigned forces involving organizing and employing commands and forces, assigning tasks, designating objectives, and giving authoritative direction over all aspects of military operations, joint training, and logistics necessary to accomplish the missions assigned to the command. Combatant command (command authority) should be exercised through the commanders of subordinate organizations. Normally, this authority is exercised through subordinate joint force commanders and Service and/or functional component commanders. Combatant command (command authority) provides full authority to organize and employ commands and forces as the combatant commander considers necessary to accomplish assigned missions. Operational control is inherent in combatant command (command authority). Also called **COCOM**. (Joint Pub 0-2)

combatant commander—A commander in chief of one of the unified or specified combatant commands established by the President. (Joint Pub 1-02)

combat information center—The agency in a ship or aircraft manned and equipped to collect, display, evaluate, and disseminate tactical information for the use of the embarked flag officer, commanding officer, and certain control agencies. Certain control, assistance, and coordination functions may be delegated by command to the combat information center. (Joint Pub 1-02) Also called action information center; AIC.

combat operations center—The primary operational agency required to control the tactical operations of a command that employs ground and aviation combat, combat support, and combat service support elements or portions thereof. The combat operations center continually monitors, records, and supervises operations in the name of the commander and includes the necessary personnel and communications to do the same. (FMFRP 0-14) Also called COC.

combined arms—The full integration of arms in such a way that in order to counteract one, the enemy must make himself vulnerable to another. (FMFM 1) The tactics, techniques, and procedures employed by a force to integrate firepower and mobility to produce a desired effect upon the enemy. (FMFRP 0-14)

combined operation—An operation conducted by forces of two or more allied nations acting together for the accomplishment of a single mission. (Joint Pub 1-02)

command—The authority that a commander in the Armed Forces lawfully exercises over subordinates by virtue of rank or assignment. Command includes the authority and responsibility for effectively using available resources and for planning the employment of, organizing, directing, coordinating, and controlling military forces for the accomplishment of assigned missions. It also includes responsibility for health, welfare, morale, and discipline of assigned personnel. (Joint Pub 0-2)

command and control—The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. Command and control functions are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by a

commander in planning, directing, coordinating, and controlling forces and operations in the accomplishment of the mission. (Joint Pub 0-2) Also called C².

command and control system—The facilities, equipment, communications, procedures, and personnel essential to a commander for planning, directing, and controlling operations of assigned forces pursuant to the missions assigned. (Joint Pub 1-02)

command and control warfare—The integrated use of operations security (OPSEC), military deception, psychological operations (PSYOP), electronic warfare (EW), and physical destruction, mutually supported by intelligence, to deny information to, influence, degrade, or destroy adversary command and control capabilities, while protecting friendly command and control capabilities against such actions. C²W applies across the operational continuum and all levels of conflict. Also called C²W. C²W is both offensive and defensive: a. counter C²—To prevent effective C² of adversary forces by denying information to, influencing, degrading, or destroying the adversary C² system. b. C² protection—To maintain effective command and control of own forces by turning to friendly advantage or negating adversary efforts to deny information to, influence, degrade, or destroy the friendly C² system. (Joint Pub 1-02)

control—Authority which may be less than full command exercised by a commander over part of the activities of subordinate or other organizations. (Joint Pub 1-02, part 1 of a 4-part definition)

control of aircraft and missiles—The coordinated employment of facilities, equipment, communications, procedures, and personnel which allows the ACE commander to plan, direct, and control the efforts of the ACE to support the accomplishment of the MAGTF's mission. (FMFRP 0-14)

coordinating altitude—A procedural airspace control method to separate fixed- and rotary-wing aircraft by determining an altitude below which fixed-wing aircraft will normally not fly and above which rotary-wing aircraft normally will not fly. The coordinating altitude is normally specified in the airspace control plan and may include a buffer zone for small altitude deviations. (Joint Pub 1-02)

coordinating authority—A commander or individual assigned responsibility for coordinating specific functions or activities involving forces of two or more Military Departments or two or more forces of the same Service. The commander or individual has the authority to require consultation between the agencies involved, but does not have the authority to compel agreement. In the event that essential agreement cannot be obtained, the matter shall be referred to the appointing authority. Coordinating authority is a consultation relationship, not an authority through which command may be exercised. Coordinating authority is more applicable to planning and similar activities than to operations. (Joint Pub 0-2)

coordination—The action necessary to ensure adequately integrated relationships between separate organizations located in the same area. Coordination may include such matters as fire support, emergency defense measures, area intelligence, and other situations in which coordination is considered necessary. (FMFRP 0-14)

counter air—A US Air Force term for air operations conducted to attain and maintain a desired degree of air superiority by the destruction or neutralization of enemy forces. Both air offensive and air defensive actions are involved. The former range throughout enemy territory and are generally conducted at the initiative of the friendly forces. The latter are conducted near or over friendly territory and are generally reactive to the initiative of the enemy air forces. (Joint Pub 1-02)

crossover zone (crossover point)—That range in the air warfare area at which a target ceases to be an air intercept target and becomes a surface-to-air missile target. (Joint Pub 1-02) Weapons systems making engagements in this zone will normally be under positive control of the TAOC, EW/C, or airborne early warning aircraft.

D

data link—The means of connecting one location to another for the purpose of transmitting and receiving data. (Joint Pub 1-02)

deep air support—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. Deep air support missions are flown on either side of the fire support coordination line;

the lack of a requirement for close coordination with the fire and movement of friendly forces is the qualifying factor. (FMFRP 0-14) Also called **DAS**.

deep operations—Military actions conducted against enemy capabilities which pose a potential threat to friendly forces. These military actions are designed to isolate, shape, and dominate the battlespace and influence future operations. (FMFRP 0-14)

destruction area—An area in which it is planned to destroy or defeat the enemy airborne threat. The area may be further subdivided into air intercept, missile (long-, medium-, and short-range), or antiaircraft gun zones. (Joint Pub 1-02)

detection—In surveillance, the determination and transmission by a surveillance system that an event has occurred. (Joint Pub 1-02, part 2 of a 3-part definition)

direct air support—Air support flown in direct response to a specific request from the supported unit. (FMFRP 0-14)

direct air support center—The principal air control agency of the U. S. Marine air command and control system responsible for the direction and control of air operations directly supporting the ground combat element. It processes and coordinates requests for immediate air support and coordinates air missions requiring integration with ground forces and other supporting arms. It normally collocates with the senior fire support coordination center within the ground combat element and is subordinate to the tactical air command center. Also called **DASC**. (proposed modification to Joint Pub 1-02)

direct air support center (airborne)—An airborne aircraft equipped with the necessary operations and communications facilities, and manned by the essential personnel, to function, in a limited role, as a direct air support center. Also called **DASC(A)**. (proposed modification to Joint Pub 1-02)

E

electronic warfare—Any military action involving the use of electromagnetic and directed energy to control the electromagnetic spectrum or to attack the enemy. Also

called **EW**. The three major subdivisions within electronic warfare are: electronic attack, electronic protection, and electronic warfare support. **a. electronic attack**—That division of electronic warfare involving the use of electromagnetic or directed energy to attack personnel, facilities, or equipment with the intent of degrading, neutralizing, or destroying enemy combat capability. Also called **EA**. EA includes: 1) actions taken to prevent or reduce an enemy's effective use of the electromagnetic spectrum, such as jamming and electromagnetic deception, and 2) employment of weapons that use either electromagnetic or directed energy as their primary destructive mechanism (lasers, radio frequency weapons, particle beams). **b. electronic protection**—That division of electronic warfare involving actions taken to protect personnel, facilities, and equipment from any effects of friendly or enemy employment of electronic warfare that degrade, neutralize, or destroy friendly combat capability. Also called **EP**. **c. electronic warfare support**—That division of electronic warfare involving actions tasked by, or under direct control of, an operational commander to search for, intercept, identify, and locate sources of intentional and unintentional radiated electromagnetic energy for the purpose of immediate threat recognition. Thus, electronic warfare support provides information required for immediate decisions involving electronic warfare operations and other tactical actions such as threat avoidance, targeting, and homing. Also called **ES**. Electronic warfare support data can be used to produce signals intelligence (SIGINT), both communications intelligence (COMINT), and electronics intelligence (ELINT). (Joint Pub 1-02)

electronic reconnaissance—The detection, identification, evaluation, and location of foreign electromagnetic radiations emanating from other than nuclear detonations or radioactive sources. (Joint Pub 1-02)

emission control—The selective and controlled use of electromagnetic, acoustic, or other emitters to optimize command and control capabilities while minimizing, for operations security (OPSEC): a. detection by enemy sensors. b. minimize mutual interference among friendly systems; and/or c. execute a military deception plan. (Joint Pub 1-02) Also called **EMCON**.

essential elements of information—The critical items of information regarding the enemy and the environment needed by the commander by a particular time to relate with other available information and intelligence in order

to assist in reaching a logical decision. (Joint Pub 1-02) Also called **EEI**.

F

fighter engagement zone—In air defense, that airspace of defined dimensions within which the responsibility for engagement of air threats normally rests with fighter aircraft. Also called **FEZ**. (Joint Pub 1-02, under "weapon engagement zone") FEZs may be designated within the **AIZ**.

fire support coordination center—A single location in which are centralized communications facilities and personnel incident to the coordination of all forms of fire support. (Joint Pub 1-02) Also called **FSCC**.

fire support coordination line—A line established by the appropriate ground commander to ensure coordination of fire not under the commander's control but which may affect current tactical operations. The fire support coordination line is used to coordinate fires of air, ground, or sea weapons systems using any type of ammunition against surface targets. The fire support coordination line should follow well-defined terrain features. The establishment of the fire support coordination line must be coordinated with the appropriate tactical air commander and other supporting elements. Supporting elements may attack targets forward of the fire support coordination line without prior coordination with the ground force commander provided the attack will not produce adverse surface effects on or to the rear of the line. Attacks against surface targets behind this line must be coordinated with the appropriate ground force commander. (Joint Pub 1-02). Also called **FSCL**.

force sustainment—Capabilities, equipment and operations which ensure continuity, freedom of action, logistics support, and command and control. (FMFRP 0-14)

forward arming and refueling point—A temporary facility, organized, equipped, and deployed by an aviation commander, and normally located in the main battle area closer to the area of operation than the aviation unit's combat service area, to provide fuel and ammunition necessary for the employment of aviation maneuver units in combat. The forward arming and refueling point permits combat aircraft to rapidly refuel and rearm simultaneously. (Joint Pub 1-02) Also called **FARP**.

forward operating base—An airfield used to support tactical operations without establishing full support facilities. The base may be used for an extended time period. Support by a main operating base will be required to provide backup support for a forward operating base. (FMFRP 0-14) Also called **FOB**.

G

ground alert—That status in which aircraft on the ground/deck are fully serviced and armed, with combat crews in readiness to take off within a specified short period of time (usually 15 minutes) after receipt of a mission order. (Joint Pub 1-02) Also called **strip alert**.

ground controlled interception—A technique which permits control of friendly aircraft or guided missiles for the purpose of effecting interception. (Joint Pub 1-02) Also called **GCI**.

H

Hawk—A mobile air defense artillery, surface-to-air missile system that provides non-nuclear, low to medium altitude air defense coverage for ground forces. Designated as MIM-23. (Joint Pub 1-02)

high-altitude missile engagement zone—In air defense, that airspace of defined dimensions within which the responsibility for engagement of air threats normally rests with high altitude surface-to-air missiles. Also called **HIMEZ**. (Joint Pub 1-02 under weapon engagement zone)

high density airspace control zone—Airspace designated in an airspace control plan or airspace control order, in which there is a concentrated employment of numerous and varied weapons and airspace users. A high-density airspace control zone has defined dimensions which usually coincide with geographical features or navigational aids. Access to a high-density airspace control zone is normally controlled by the maneuver commander. The maneuver commander can also direct a more restrictive weapons status within the high-density airspace control zone. (Joint Pub 1-02) Also called **HIDACZ**.

I

identification—The process of determining the friendly or hostile character of an unknown detected contact. (Joint Pub 1-02)

identification, friend or foe—A system using electromagnetic transmissions to which equipment carried by friendly forces automatically responds, for example, by emitting pulses, thereby distinguishing themselves from enemy forces. (Joint Pub 1-02) Also called **IFF**.

interdiction—An action to divert, disrupt, delay or destroy the enemy's surface military potential before it can be used effectively against friendly forces. (Joint Pub 1-02)

J

joint amphibious operation—An amphibious operation conducted by significant elements of two or more Services. (Joint Pub 1-02)

joint amphibious task force—A temporary grouping of units of two or more Services under a single commander, organized for the purpose of engaging in an amphibious landing for assault on hostile shores. (Joint Pub 1-02) Also called **JATF**.

joint engagement zone—In air defense, that airspace of defined dimensions within which multiple air defense systems (surface-to-air missiles and aircraft) are simultaneously employed to engage air threats. (Joint Pub 1-02, under weapon engagement zone) Also called **JEZ**.

joint force air component commander—The joint force air component commander derives authority from the joint force commander who has the authority to exercise operational control, assign missions, direct coordination among subordinate commanders, redirect and organize forces to ensure unity of effort in the accomplishment of the overall mission. The joint force commander will normally designate a joint force air component commander.

The joint force air component commander's responsibilities will be assigned by the joint force commander (normally these would include, but not be limited to, planning, coordination, allocation, and tasking based on the joint force commander's apportionment decision). Using the joint force commander's guidance and authority, and in coordination with other Service component commanders and other assigned or supporting commanders, the joint force air component commander will recommend to the joint force commander apportionment of air sorties to various missions or geographic areas. (Joint Pub 1-02) Also called **JFACC**.

joint operation—An operation carried on by a force which is composed of significant elements of the Army, Navy or the Marine Corps, and the Air Force, or two or more of these Services operating under a single commander authorized to exercise unified command or operational control over joint forces. Note: A Navy/Marine Corps operation is not a joint operation. (FMFRP 0-14)

joint operations center—A jointly manned facility of a joint force commander's headquarters established for planning, monitoring, and guiding the execution of the commander's decisions. (Joint Pub 1-02) Also called **JOC**.

L

low-altitude missile engagement zone—In air defense, that airspace of defined dimensions within which the responsibility for engagement of air threats normally rests with low-to medium- altitude surface-to-air missiles. Also called **LOMEZ**. (Joint Pub 1-02, under weapon engagement zone)

low level transit route—A temporary corridor of defined dimensions established in the forward area to minimize the risk to friendly aircraft from friendly air defenses or surface forces. (Joint Pub 1-02) Also called **LLTR**.

M

maneuver warfare—A philosophy for action that seeks to collapse the enemy's cohesion and effectiveness through a series of rapid, violent, and unexpected actions which create a turbulent and rapidly deteriorating situation with which he cannot adequately cope. (FMFRP 0-14)

Marine air command and control system—A US Marine Corps air command and control system which provides the aviation combat element commander with the means to command, coordinate, and control all air operations within an assigned sector and to coordinate air operations with other Services. It is composed of command and control agencies with communications-electronics equipment that incorporates a capability from manual through semiautomatic control. Also called **MACCS**. (proposed modification to Joint Pub 1-02)

military deception—Actions executed to deliberately mislead adversary military decisionmakers as to friendly military capabilities, intentions, and operations, thereby causing the adversary to take specific action (or inactions) that will contribute to the accomplishment of the friendly mission. The five categories of military deception are:

a. strategic military deception—Military deception planned and executed by and in support of senior military commanders to result in adversary military policies and actions that support the originator's strategic military objectives, policies, and operations.

b. operational military deception—Military deception planned and executed by and in support of operational-level commanders to result in adversary actions that are favorable to the originator's objectives and operations. Operational military deception is planned and conducted in a theater of war to support campaigns and major operations.

c. tactical military deception—Military deception planned and executed by and in support of tactical commanders to result in adversary actions that are favorable to the originator's objectives and operations. Tactical military deception is planned and conducted to support battles and engagements.

d. Service military deception—Military deception planned and executed by the Services that pertain to Service support to joint operations. Service military deception is designed to protect and enhance the combat capabilities of Service forces and systems.

e. military deception in support of operations security (OPSEC)—Military deception planned and executed by and in support of all levels of command to support the prevention of the inadvertent compromise of sensitive or classified activities, capabilities, or intentions. Deceptive OPSEC measures are designed to distract foreign intelligence away from, or provide cover for, military operations and activities. (Joint Pub 3-58)

minimum-risk route—A temporary corridor of defined dimensions recommended for use by high-speed, fixed-wing aircraft that presents the minimum known hazards to low-flying aircraft transiting the combat zone. (Joint Pub 1-02) Also called **MRR**.

missile engagement zone—The airspace of defined dimensions within which the responsibility for engagement normally rests with missiles. Also called **MEZ**. **MEZs** may be designated within the missile intercept zone (**MIZ**).

missile intercept zone—That geographical division of the destruction area where surface-to-air missiles have primary responsibility for destruction of airborne objects. (Joint Pub 1-02) Also called **MIZ**.

mutual support—That support which units render each other against an enemy, because of their assigned tasks, their position relative to each other and to the enemy, and their inherent capabilities. (Joint Pub 1-02)

N

naval surface fire support—Fire provided by Navy surface gun, missile, and electronic warfare systems in support of a unit or units tasked with achieving the commander's objectives. Also called **NSFS**. (Joint Pub 1-02)

O

offensive air support—Those air operations conducted against enemy installations, facilities, and personnel to directly assist the attainment of **MAGTF** objectives by the destruction of enemy resources or the isolation of his military force. (FMFRP 0-14) Also called **OAS**.

offensive anti-air warfare—Those operations conducted against enemy air assets and air defense systems before they can be launched or assume an attacking role. Offensive anti-air warfare operations in or near the objective area consist mainly of air attacks to destroy or neutralize hostile aircraft, airfields, radars, air defense systems, and supporting areas. (FMFRP 0-14) Also called **OAAW**.

offensive counter air operation—An operation mounted to destroy, disrupt, or limit enemy air power as close to its source as possible. (Joint Pub 1-02)

operational control—Transferable command authority that may be exercised by commanders at any echelon at or below the level of combatant command. Operational control is inherent in combatant command (command authority). Operational control may be delegated and is the authority to perform those functions of command over subordinate forces involving organizing and employing commands and forces, assigning tasks, designating objectives, and giving authoritative direction necessary to accomplish the mission. Operational control includes authoritative direction over all aspects of military operations and joint training necessary to accomplish missions assigned to the command. Operational control should be exercised through the commanders of subordinate organizations. Normally this authority is exercised through subordinate joint force commanders and Service and/or functional component commanders. Operational control normally provides full authority to organize commands and forces and to employ those forces as the commander in operational control considers necessary to accomplish assigned missions. Operational control does not, in and of itself, include authoritative direction for logistics or matters of administration, discipline, internal organization, or unit training. Also called **OPCON**. (Joint Pub 0-2)

operational level of war—The level of war at which campaigns and major operations are planned, conducted, and sustained to accomplish strategic objectives within theaters or areas of operations. Activities at this level link tactics and strategy by establishing operational objectives needed to accomplish the strategic objectives, sequencing events to achieve the operational objectives, initiating actions, and applying resources to bring about and sustain these events. These activities imply a broader dimension of time or space than do tactics; they ensure the logistic and administrative support of tactical forces, and provide the means by which tactical successes are exploited to achieve strategic objectives. (Joint Pub 1-02)

P

passive air defense—All measures, other than active air defense, taken to minimize the effectiveness of hostile air action. These measures include deception, dispersion, and the use of protective construction. (Joint Pub 1-02)

positive control—A method of airspace control which relies on positive identification, tracking, and direction of aircraft within an airspace, conducted with electronic

means by an agency having the authority and responsibility therein. (Joint Pub 1-02) Also the tactical control of aircraft by a designated control unit, whereby the aircraft receives orders affecting its movements which immediately transfer responsibility for the safe navigation of the aircraft to the unit issuing such orders. (FMFRP 0-14 under "Marine air command and control system")

power projection—The application of measured, precise offensive military force at a chosen time and place, using maneuver and combined arms against enemy forces. (FMFRP 0-14)

procedural control—A method of airspace control which relies on a combination of previously agreed and promulgated orders and procedures. (Joint Pub 1-02)

R

rear operations—Military actions conducted to support and permit force sustainment and to provide security for such actions. (FMFRP 0-14)

restricted operations area—Airspace of defined dimensions, designated by the airspace control authority, in response to specific operational situations/requirements within which the operation of one or more airspace users is restricted. (Joint Pub 1-02) Also called **ROA**. Also known as restricted operations zone (ROZ).

rules of engagement—Directives issued by competent military authority which delineate the circumstances and limitations under which United States forces will initiate and/or continue combat engagement with other forces encountered. (Joint Pub 1-02) Also called **ROE**.

S

sector—An area designated by boundaries within which a unit operates, and for which it is responsible. (Joint Pub 1-02, part 1 of a 2-part definition)

short-range air defense engagement zone—In air defense, that airspace of defined dimensions within which the responsibility for engagement of air threats normally rests with short-range air defense weapons. It may be established within a low- or high-altitude missile engagement zone. Also called **SHORADEZ**. (Joint Pub 1-02, under weapon engagement zone)

Sidewinder—A solid-propellant, air-to-air missile with non-nuclear warhead and infrared, heat-seeking homer. Designated as AIM-9. (Joint Pub 1-02)

sortie—In air operations, an operational flight by one aircraft. (Joint Pub 1-02)

Sparrow—An air-to-air solid-propellant missile with non-nuclear warhead and electronic-controlled homing. Designated as AIM-7. (Joint Pub 1-02)

Stinger—A lightweight, man-portable, shoulder-fired, air defense artillery missile weapon for low altitude air defense of forward area combat troops. Designated as FIM-92A. (Joint Pub 1-02)

strategic air warfare—Air combat and supporting operations designed to effect, through the systematic application of force to a selected series of vital targets, the progressive destruction and disintegration of the enemy's war-making capacity to a point where the enemy no longer retains the ability or the will to wage war. Vital targets may include key manufacturing systems, sources of raw material, critical material, stockpiles, power systems, transportation systems, communication facilities, concentration of uncommitted elements of enemy armed forces, key agricultural areas, and other such target systems. (Joint Pub 1-02)

strategic level of war—The level of war at which a nation, often as a member of a group of nations, determines national or multinational (alliance or coalition) security objectives and guidance, and develops and uses national resources to accomplish these objectives. Activities at this level establish national and multinational military objectives; sequence initiatives; define limits and assess risks for the use of military and other instruments of national power; develop global plans or theater war plans to achieve those objectives; and provide military forces and other capabilities in accordance with strategic plans. (Joint Pub 1-02)

suppression of enemy air defenses—That activity which neutralizes, destroys, or temporarily degrades surface-based enemy air defenses by destructive and/or disruptive means. (Joint Pub 1-02) Also called **SEAD**.

surface-to-air guided missile—A surface-launched guided missile for use against air targets. (Joint Pub 1-02) Also called **SAM**.

surface-to-air weapon—A surface-launched weapon for use against airborne targets. Future developments in air defense systems may lead to the employment of weapons other than missiles. Examples include rockets, directed-energy weapons, and air defense guns. (FMFRP 0-14) Also called SAW.

surveillance—The systematic observation of aerospace, surface, or subsurface areas, places, persons, or things, by visual, aural, electronic, photographic, or other means. (Joint Pub 1-02)

T

tactical air command center (Marine TACC)—The principal U. S. Marine Corps air command and control agency from which air operations and air defense warning functions are directed. It is the senior agency of the U. S. Marine air command and control system which serves as the operational command post of the aviation combat element commander. It provides the facility from which the aviation combat element commander and his battlestaff plan, supervise, coordinate, and execute all current and future air operations in support of the Marine air-ground task force. The tactical air command center can provide integration, coordination and direction of joint and combined air operations. Also called **Marine TACC**. (FMFM 5-60) (proposed modification to Joint Pub 1-02)

tactical air control center—The principal air operations installation (land- or ship-based) from which all aircraft and air warning functions of tactical air operations are controlled. (Joint Pub 1-02) Also called **Navy TACC**. US Navy only; US Air Force changed their TACC to AOC (air operations center).

tactical air control system—The organization and equipment necessary to plan, direct, and control tactical air operations and to coordinate air operations with other Services. It is composed of control agencies and communications-electronics facilities which provide the means for centralized control and decentralized execution of missions. (Joint Pub 1-02) Also called **TACS**. US Air Force TACS is "theater air control system."

tactical air direction center—An air operations installation under the overall control of the tactical air control center (afloat)/tactical air command center, from which aircraft and air warning service functions of tactical air

operations in an area of responsibility are directed. (Joint Pub 1-02) Also called **TADC**.

tactical air officer (afloat)—The officer (aviator) under the amphibious task force commander who coordinates planning of all phases of air participation of the amphibious operation and air operations of supporting forces en route to and in the objective area. Until control is passed ashore, this officer exercises control over all operations of the tactical air control center (afloat) and is charged with: a. control of all aircraft in the objective area assigned for tactical air operations, including offensive and defensive air; b. control of all other aircraft entering or passing through the objective area; and c. control of all air warning facilities in the objective area. (Joint Pub 1-02) Also called **TAO**.

tactical air operations center—The principal air control agency of the U. S. Marine air command and control system responsible for airspace control and management. It provides real time surveillance, direction, positive control, and navigational assistance for friendly aircraft. It performs real time direction and control of all anti-air warfare operations, to include manned interceptors and surface-to-air weapons. It is subordinate to the tactical air command center. Also called **TAOC**. (proposed modification to Joint Pub 1-02)

tactical digital information link—A Joint Staff approved, standardized communication link suitable for transmission of digital information. Current practice is to characterize a tactical digital information link (TADIL) by its standardized message formats and transmission characteristics. TADILs interface two or more command and control or weapon systems via a single or multiple network architecture and multiple communication media for exchange of tactical information. a. **TADIL-A**—A secure, half-duplex, netted digital data link utilizing parallel transmission frame characteristics and standard message formats at either 1364 or 2250 bits per second. It is normally operated in a roll-call mode under control of a net control station to exchange digital information among airborne, land-based, and shipboard systems. NATO's equivalent is Link 11. b. **TADIL-B**—A secure, full-duplex, point-to-point digital data link utilizing serial transmission frame characteristics and standard message formats at either 2400, 1200, or 600 bits per second. It interconnects tactical air defense and air control units. NATO's equivalent is Link 11B. c. **TADIL-C**—An unsecure, time-division digital data link utilizing serial

transmission characteristics and standard message formats at 5000 bits per second from a controlling unit to controlled aircraft. Information exchange can be one-way (controlling unit to controlled aircraft) or two-way. NATO's equivalent is Link 4. d. TADIL-J—A secure, high capacity, jam-resistant, nodeless data link which uses the Joint Tactical Information Distribution System (JTIDS) transmission characteristics and the protocols, conventions, and fixed-length message formats defined by the JTIDS Technical Interface Design Plan (TIDP). NATO's equivalent is Link 16. e. Army Tactical Data Link 1 (ATDL-1)—A secure, full-duplex, point-to-point digital data link utilizing serial transmission frame characteristics and standard message formats at a basic speed of 1200 bits per second. It interconnects tactical air control systems and Army or Marine tactical air defense oriented systems. f. Interim JTIDS Message Specification (IJMS)—A secure, high capacity, jam-resistant, nodeless interim message specification that uses the Joint Tactical Information Distribution System (JTIDS) transmission characteristics and the protocols, conventions, and fixed-length message formats defined by the IJMS. (Joint Pub 1-02)

tactical level of war—The level of war at which battles and engagements are planned and executed to accomplish military objectives assigned to tactical units or task forces. Activities at this level focus on the ordered arrangement and maneuver of combat elements in relation to each other and to the enemy to achieve combat objectives. (Joint Pub 1-02)

target acquisition—The detection, identification, and location of a target in sufficient detail to permit the effective employment of weapons. (Joint Pub 1-02)

tasking—The process of translating the allocation into orders, and passing these orders to the units involved. Each order normally contains sufficient detailed instructions to enable the executing agency to accomplish the mission successfully. (NATO, Joint Pub 1-02)

terminal control—The authority to direct the maneuver of aircraft which are delivering ordnance, passengers, or cargo to a specific location or target. Terminal control is a type of air control. (FMFRP 0-14 under "Marine air command and control system")

U

unmanned aerial vehicle—A powered, aerial vehicle that does not carry a human operator, uses aerodynamic forces to provide vehicle lift, can fly autonomously or be piloted remotely, can be expendable or recoverable, and can carry a lethal or nonlethal payload. Ballistic or semiballistic vehicles, cruise missiles, and artillery projectiles are not considered UAVs. (Joint Pub 1-02)

V

vital area—A designated area or installation to be defended by air defense units. (Joint Pub 1-02)

W

weapon engagement zone—In air defense, airspace of defined dimensions within which the responsibility for engagement of air threats normally rests with a particular weapon system. Also called WEZ. (Joint Pub 1-02)

Appendix I

References and Related Publications

1. Allied Tactical Publications (ATPs)

- 8 Doctrine for Amphibious Operations
- 33 NATO Tactical Air Doctrine
- 40 Doctrine and Procedures for Airspace Control in the Combat Zone

2. Joint Publications (Joint Pubs)

- 0-2 Unified Action Armed Forces (UNAAF)
- 1-02 Department of Defense Dictionary of Military and Associated Terms
- 3-0 Doctrine for Joint Operations
- 3-01.2 Joint Doctrine for Theater Counterair Operations
- 3-01.3 Joint Doctrine for Air Defense from Overseas Land Areas (to be consolidated with Joint Pub 3-01.2)
- 3-01.4 Joint Tactics, Techniques, and Procedures for Joint Suppression of Enemy Air Defenses (J-SEAD)
- 3-01.5 Doctrine for Joint Theater Missile Defense
- 3-01.6 Joint Tactics, Techniques, and Procedures for Joint Air Defense Operations/Joint Engagement Zone (JADO/JEZ) (under development)
- 3-02 Joint Doctrine for Amphibious Operations
- 3-02.1 Joint Doctrine for Landing Force Operations
- 3-09 Doctrine for Joint Fire Support (under development)
- 3-09.3 Joint Tactics, Techniques, and Procedures for Joint Close Air Support (under development)
- 3-51(S) Electronic Warfare in Joint Military Operations (U)
- 3-52 Doctrine for Joint Airspace Control in the Combat Zone
- 3-54 Joint Doctrine for Operations Security
- 3-55.1 Joint Tactics, Techniques, and Procedures for Unmanned Aerial Vehicles
- 3-56.1 Command and Control for Joint Air Operations
- 3-56.23 Tactical Command and Control Procedures for Joint Operations—Joint Interface Operational Procedures—Air Control/Air Defense Procedures for Joint Operations (the current 3-56.23 will be incorporated into the new Joint 3-56.1, *Command and Control for Joint Air Operations*)
- 3-56.24 Tactical Command and Control Planning Guidance and Procedures for Joint Operations—Joint Interface Operational Procedures—Message Text Formats
- 6-01 Series Tactical Digital Information Link (TADIL) Series Message Standards

3. Navy Publications

Naval Warfare Publications (NWP)

10-1-21 Anti-air Warfare Commander's Manual
 22-2 Supporting Arms in Amphibious Operations
 32 (C) Anti-air Warfare (U)
 55/9-ASH/ Assault Support Helicopter Tactical Manual, Vol. 1, (Rev. F)
 FMFM 5-35

Navy/Marine Departmental Publications (NAVMC)

2800 Joint Users Handbook for Message Text Formats

Naval Doctrine Test Publications (NDTP)

3-56.1 Joint Force Air Component Commander Organization and Processes

Miscellaneous

Navy and Marine Corps White Paper, dated September 1992, . . . *From the Sea: Preparing the Naval Service for the 21st Century*

4. Marine Corps Publications

Fleet Marine Force Manuals (FMFMs)

1 Warfighting
 2-6 Marine Air-Ground Task Force Rear Area Security
 2-7 Fire Support in MAGTF Operations
 2-7-1 Fire Support Coordination by MAGTF Command Elements
 3 Command and Control
 3-1 Command and Staff Action
 3-21 MAGTF Intelligence Operations
 3-22-1 Unmanned Aerial Vehicle (UAV) Company Operations
 3-22 Surveillance, Reconnaissance, and Intelligence Group (under development)
 3-23(C) Signals Intelligence Electronic Warfare Operations (U)
 3-30 Communications
 3-51 Electronic Warfare in Joint Military Operations (under development)
 5 Marine Air-Ground Task Force Aviation (under development)
 5-1 Organization and Function of Marine Aviation
 5-10 Air Reconnaissance
 5-30 Assault Support
 5-40 Offensive Air Support
 5-41 Close Air Support and Close-in Fire Support
 5-42 Deep Air Support
 5-45 Suppression of Enemy Air Defenses
 5-50 Anti-air Warfare
 5-51 Employment of the Light Anitaircraft Missile Battalion (under development)
 5-52 Employment of the Low Altitude Air Defense Battalion

5-60	Control of Aircraft and Missiles
6-18	Techniques and Procedures for Fire Support Coordination
6-21	Tactical Fundamentals of Helicopterborne Operations
7-12	Electronic Warfare
7-13	Military Deception
7-22	Tactical Fundamentals for Aviation in Cold Weather Operations
7-27	Desert Operations
7-30	Counterinsurgency (under development)
7-31	Special Operations (under development)

Fleet Marine Force Reference Publications (FMFRPs)

0-14	Marine Corps Supplement to the DOD Dictionary of Military and Associated Terms
1-11	Fleet Marine Force Organization—1992
5-54	Small Arms Defense Against Air Attack
5-71	MAGTF Aviation Planning Documents (under development)
5-85	Marine Aviation Equipment and Systems
14-4	Evolving Doctrine for Landing Forces in Year 2010
15-5	Electronic Warfare in Combined Arms
15-6	Strategic and Operational Military Deception: US Marine Corps and the Next Twenty Years

Operational Handbook (OH)

5-5A	Employment of the Light Antiaircraft Missile Battalion—Hawk
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Miscellaneous

EWTG Pac ACE Staff Planning Text
 MAWTS-1 Battlestaff Planning and Briefing Text
 MAWTS-1 Combat Mission Planning Text
 MAWTS-1 Control of Aircraft and Missiles Text
 MAWTS-1 Joint Operations and the JFACC Text
 MAWTS-1 OAS Planning and Execution Text
 MAWTS-1 OAS Planning Considerations Text
 MAWTS-1 Rapid Response Planning Text
 MAWTS-1 Six Functions of Marine Aviation Text
 MSTP Course Materials

5. Air Force Manual (AFM)

2-7	Tactical Air Force Operations—Tactical Air Control Systems (TACS)
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6. Army Field Manuals (FMs)

1-60	Airspace Management and Army Air Traffic in a Combat Zone
100-42	US Air Force/US Army Airspace Management in the Area of Operations

7. Multicommand Manual (MCM)

3-1, Vol 2 (S) Threat Reference Guide and Countertactics (U)

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