Chapter VII

AVIATION

1. Background

The Army views aviation as a maneuver arm in its right. The Marines also view aviation as a possible maneuver element; however, they primarily employ it as a supporting arm that assists in accomplishing MAGTF objectives. This chapter familiarizes commanders and staffs on the missions, capabilities, limitations, command and control, and planning factors for employment of respective service aviation organizations. Although the text discusses notional aviation organizations, there are no *"fixed"* aviation units assigned to or supporting either the DRB or MEF (FWD). Operational requirements and METT-T considerations drive the specific composition of aviation forces that may deploy with AMCI forces.

2. Army Aviation Overview

a. Army Concept of Aviation. Aviation, as a maneuver force, is the third dimension element of Army operations. Aviation organizations feature manned systems, operating as units, employed as air combined arms' teams that use terrain in the same fashion as ground units. Although they offer some unique advantages to the commander, the ability to fight over and within swamps, the tops of the forests, and the sides of the mountains, they are subjected to the same dynamics of the battlefield and the same physics of land warfare as ground combat units.

b. DRB Augmentation. Aviation forces deployed with the DRB are tailored to the mission, location, and DRB ground force composition. The most likely augmentation would include target acquisition and reconnaissance aircraft, attack helicopters, assault helicopter elements, cavalry units, and aeromedical evacuation sections (see Table VII-l). Aviation forces could include special electronic mission aircraft (SEMA) for electronic warfare operations.

(1) Aircraft. Each aviation unit brings unique capabilities. AH-64 attack aircraft are excellent night reconnaissance and security and attack aircraft. The AH-64 laser designator/laser spot tracker is compatible with other laser capable aircraft and laser guided munitions. The OH-58D also has excellent night capabilities and possesses the ability to integrate fixed-wing support into Army fire support operations through its communications and laser designation capabilities. The OH-58D can designate for artillery (Copperhead) and attack aircraft (laser guided munitions). The UH-60 provides lift support for air assault and air movement of troops, command and control, combat support, and combat service support. If deployed, the EH-60A, a divisional SEMA system, is capable of intercepting, direction finding, and jamming enemy VHF communications systems.

Table VII-1. Army Aviation Augmentation Assets

TYPE UNIT	#/TYPE AIRCRAFT	PERSONNEL
• Attack Battalion*	24 AH-64A	300
• Air Cavalry Troop	8 OH-58D or 8 AH-1F	75
• Assault Company	8 UH-60A/L	150
• TARP	6 OH-58C	50
• Aeromedical Evacuation (2 sections)	6 UH-1 or UH-60	33
• Flight Platoon	2 EH-60A	15
• Support Aviation Company	8 UH-60A/L	80

* Attack battalion requires utility support from the support aviation company and the division's command aviation company for air logistics and airborne C2 capabilities.

(2) Requirements. Due to the nature of aircraft maintenance and logistics, the maintainer-to-aircraft-supported ratio improves (decreases) as the number of aircraft deployed increases. For example, to properly support an attack company of 8 AH-64, about one-half of the battalion is required (aviation and ground maintenance, POL, and communications). However, personnel required to support a battalion is not three times that required to support a company. Thus, it is more economical to deploy the entire attack battalion rather than individual companies to support operational requirements.

(3) Aeromedical Evacuation. Two air ambulance sections may deploy with the brigade. The aeromedical evacuation sections consist of 6 UH-1 or UH-60 helicopters and 33 personnel (including maintenance support). Appropriate aviation unit maintenance (AVUM) and aviation intermediate maintenance (AVIM) support deploy with the section. The aircraft in these sections provides aeromedical evacuation from the maneuver units to the FSB medical company/forward surgical team location, forward service support group hospital, or amphibious ready group ships. The aeromedical evacuation sections normally collocate with the aviation element for maintenance and logistical support and security. These aeromedical sections do not have organic forward arming and refueling point (FARP) capability. They must depend on other aviation units for support.

c. Missions. The flexibility of Army aviation allows for its employment throughout the width and depth of the battlefield. During close, deep, and rear operations, force commanders can use aviation to mass superior combat power against the enemy's detected vulnerabilities and projected weaknesses. Aviation forces and assets for close, deep, and rear operations are allocated according to the force commander's intent, operational or tactical objectives, and priority mission support requirements. Table VII-2 shows the various mission capabilities of Army aviation.

(1) Deep Operations. Aviation enhances the joint force warfighting capabilities by allowing the commander to exploit the entire battlefield by projecting combat power rapidly throughout the battlefield. Due to their speed, maneuverability, and long-range direct fire capabilities, Army aviation forces are well suited for operations over extended ranges. Deep operations are normally conducted for two purposes: *set the conditions for the close battle and attack the enemy in depth.* Successful aviation deep operations require deliberate planning, detailed coordination, and timely, accurate intelligence. SEAD/ J-SEAD, EW, and deception are critical to the success of deep operations. Information flow between forward (deep aircraft) and rear command posts requires enhanced communications capabilities.

Table VII-2. Army Aviation Missions

DEEP	CLOSE	REAR
• Attack • Reconnaissance • Security advanced guard* covering force** • Air combat • Air assault • C2	• Attack • Reconnaissance • Security (screen) • Air combat • Air assault • C2 • Reserve	• Attack • Reconnaissance • Air combat • Air assault • Tactical combat force (TCF)* • C2 • Reserve
*Requires Augmentation **May form part of the covering force		

(2) Close Operations. Army aviation performs close operations as part of the main battle or while executing the mission of the reserve. During close operations, aviation forces enable the commander to mass the effects of overwhelming combat power, attack an assailable frank, and add depth to the close battle. In the close battle, aviation forces provide immediate antiarmor firepower; attack moving, attacking, withdrawing, or bypassed forces; maneuver to blunt enemy counterattacks and to envelop enemy forces; attack enemy counterattacking forces; and conduct air combat operations.

(3) Rear Operations. Aviation forces employed in rear operations can function as a TCF headquarters for planning and executing rear operations if augmented with additional maneuver, CS, and CSS assets; provide initial response force for Level III incursions; conduct air movement of personnel, supplies, and equipment to assist in CSS operations; and provide surveillance and assist in securing lines of communication.

3. Capabilities and Limitations

Table VII-3 lists primary employment capabilities and limitations of Army Aviation. Other operational considerations include—

a. Operations. Army aviation units are maintenance intensive, limited assets. Units can normally sustain 4-6 flight hours per day per airframe. They cannot be employed continuously without periodic maintenance of airframes and personnel. While combat operations are enhanced by keeping personnel on a set cycle—either night or day—flexibility of scheduling is permitted. The aviation commander assesses the operational risk using factors of METT-T to identify the risk to mission accomplishment. A 24-hour break in cycles is normally required for aircrews to transition from night-to-day or for day-to-night operations. The operating environment also has an impact on the sustainability of flight operations. For example, increased maintenance requirements in a dusty or sandy environment could adversely impact available flight hours.

b. Security. The combat power of aviation forces resides in the aircraft. While on the ground, aviation forces are vulnerable to attack. Aviation forces use dispersion as a prime means of security. Except for local security, aviation forces must rely on external support for protection. Aviation unit assembly areas normally collocate with other units in the brigade or division rear area.

c. Weather Support. Aviation forces do not have weather forecasting capability. They must rely on external support. Besides the standard weather considerations, attack helicopters request infrared (IR) crossover information for integration into mission and attack planning.

d. Sustainment. The division aviation support battalion (ASB) and AVIM company provide CSS to the aviation brigade. During deployment, aviation support elements may augment the DRB forward support battalion to support the aviation element or the division support command (DISCOM) may organize the required CSS assets to form a service support element in DS of the aviation element (III, V, medical, maintenance).

Table VII-3. Army Aviation Capabilities and Limitations

CAPABILITIES	LIMITATIONS
• Night operations • Long range direct fires • Maneuverability • Shock effect • Mobility • Ability to close rapidly • Uses common fuel (JP-8)	• Consumes large amounts of class III, V, and IX • Environment • Maintenance intensive • Maintenance support requirements • Security • No organic weather forecaster

(1) Class III. Army rotary-wing aviation and ground vehicles use a common fuel, JP-8. Aviation fuel testing requirements require Army aviation access to a testing facility. Aviation units normally receive class III (aviation) through unit distribution. Army rotary-wing aircraft use either the D1 or closed circuit refuel (CCR) nozzle. The FARP normally carries both nozzles.

(2) Class V. The aviation unit receives class V (air and ground) through the ammunition supply point (ASP) established for the DRB.

(3) Maintenance. Aviation units receive maintenance support from the ASB. ASB required support includes ground support equipment maintenance, common authorized stockage list (ASL) items, and support for ground vehicles. The ASB slice provides ASL and maintenance support, including missile maintenance and backup AVUM support. If the aircraft deploy by sealift, the aircraft require reassembly upon arrival. Phase maintenance is not possible until a mature theater evolves.

4. Command and Control

Aviation units OPCON to or receive units OPCON from ground maneuver brigades. Aviation units receive their mission as any other maneuver unit and require the same planning time and considerations as ground units.

a. Army Airspace C2. While Army aircraft can operate under positive control, procedural control is the preferred method. Normally, only those aircraft with mission profiles above the coordinating altitude operate under positive control. Most Army rotary-wing aviation operates under procedural control.

(1) Procedural control for Army rotary-wing aircraft is based primarily on graphic control measures such as standard Army aviation flight routes (SAAFR), air corridors, air control points (ACPs), attack axes, high density aircraft control zones (HIDACZs), restricted operations zones (ROZs), and airspace coordination areas (ACAs). These and/or other ACMs require coordination through the Marine TACC.

(2) Air Routes. Army rotary-wing aviation missions normally operate below the coordinating altitude. Within the parent unit rear area (division rear to brigade rear boundary) rotary-wing aircraft follow SAAFR. From the brigade rear boundary, forward mission support aircraft operate under the supported brigade operations center control.

(3) Air Corridors and Attack Axes. For deep attacks/air assault missions, units follow a corridor through the brigade area to the FLOT. From the FLOT forward units normally follow attack axes. Corridors may be assigned forward of the FLOT if a detailed knowledge of the threat is available. In the close battle, attack/air assault units follow corridors from the brigade rear boundary to a release point short of their battle position, then occupy their battle positions using battle formations.

(4) Identification Friend or Foe (IFF). Army rotary-wing aircraft use equipment compatible (codes I-IV) with Marine aircraft. Army rotary-wing aircraft comply with IFF procedures outlined in the airspace control order (ACO).

(5) Joint ATO. Aviation units may be listed on the joint ATO for coordination and deconfliction; however, they do not receive their missions through the joint ATO. The focal point for Army aircraft entry into the joint ATO is through the DRB S3 air. Neither the DRB S3 air nor the aviation unit can input into or receive the joint ATO electronically. Joint ATO input is through MSE (primary) or radio (secondary). The DRB and aviation element must rely on higher headquarters to provide a hardcopy of the joint ATO.

b. Army Integration into Marine Air Command and Control System.

(1) DRB Level. A2C2 is the responsibility of the DRB commander for operations within DRB boundaries. While there is no formal A2C2 special staff element at brigade level, primary staff responsibility resides with the S3 air. Other members of the brigade A2C2 element includes the S2, FSO, air defense artillery (ADA) and aviation liaison officers, and the ALO. The air traffic services (ATS) LNO is also included in the A2C2 element if ATS are augmented from corps.

(a) Responsibilities. The primary tasks of the A2C2 staff element include—

• Developing and coordinating airspace control SOPs, plans, and annexes.

• Coordinating and integrating airspace user requirements within the area of operations, to include other services and adjacent units.

• Identifying and resolving airspace user conflicts.

• Approving, staffing, and forwarding requests for special use airspace to the next higher headquarters.

• Maintaining A2C2 information displays and maps.

(b) Procedures. The DRB coordinates airspace and air control measures through the Marine TACC. To ensure proper coordination, the DRB should provide a LNO with the TACC. Since it is not a formalized staff element, the brigade A2C2 staff is not equipped with assets (communications automated data processing [ADP] equipment) dedicated to the A2C2 mission. Coordination is accomplished via MSE, FAX, or radio.

(c) A2C2 Planning Considerations. The following planning considerations guide development of A2C2 control plans—

• Maximize use of procedural means of control using a variety of ACMs. When established, these ACMs reserve airspace for specific airspace users, restrict their actions, control actions of specific users, and/or require users to accomplish specific actions.

• Employ positive control only where such control is required and possible. To do so, a means must exist to identify and locate airspace users and to maintain communications with them.

• Ensure that the commander's intent and scheme of maneuver govern design of the plan.

• Use airspace with maximum freedom consistent with the degree of risk that is acceptable to the commander.

• Structure ACMs to facilitate recognition by airspace users and ground-based weapons crews.

• Ensure temporary ACMs are within the boundaries of the command level requesting the measure.

(2) ATS. Aviation augmenting a DRB normally does not have Army air traffic service support. For operations within DRB boundaries, Army rotary-wing aircraft normally operate below the coordinating altitude and coordinate with the DRB operations section. For flight outside DRB boundaries or above the coordinating altitude Army rotary-wing aircraft must contact the tactical air operations center (TAOC) for flight following and coordination.

5. Planning Considerations

During close, deep, and rear operations, force commanders can use aviation to rapidly and repeatedly mass superior combat power to exploit enemy vulnerabilities. Aviation forces and assets for close, deep, and rear operations must be allocated according to the force commander's intent, operational or

tactical objectives, and priority mission support requirements. Army aviation planning considerations include the following:

a. Planning Time. Aviation units require the same planning time as their ground counterparts. Because aviation units operate throughout the width and depth of their parent unit's AO, each mission requires detailed analysis, planning and coordination, and rehearsals.

b. Coordination. Successful aviation operations require detailed coordination. In addition to the mission information, the following requires coordination: locations of assembly areas (holding areas) FARPs; battle positions; routes into and out of battle positions; SEAD/J-SEAD; EW; and fire support.

(1) Assembly Areas. Typically, aviation operations are dispersed over three separate assembly areas:

(a) Main Assembly Area. Aviation units establish their main assembly area in the division rear. The main assembly area includes the AVIM and associated logistical base. Because this log base is not 100 percent mobile, it requires wheeled vehicle augmentation to move in one lift. The logistical base cannot provide full maintenance support while moving but requires some type of stable, secure field site to perform maintenance operations.

(b) Tactical Assembly Areas. Units operate deployed away from the main assembly area. Normally, aviation units establish a tactical assembly area for limited periods of time toward the rear of the main battle area. This tactical assembly area moves based on the nature of the threat. In a high threat environment, it may move every 12-24 hours. Limited maintenance is accomplished in this assembly area.

(c) Forward Assembly Areas (FAAs). For mission execution, aviation units operate from FAAs. FAAs reduce response time while providing security for aircraft and aircrews. Aircraft may shut down while in the FAA.

(2) Holding Areas (HAs). For security, HAs are planned throughout the battle area to provide dispersion. Army attack aircraft normally do not shut down in HAs. They normally remain in a HA for 10-15 minutes, while the scout conducts final coordination and reconnaissance of the battle position.

(3) FARP

(a) FARP Location. Aviation units normally locate in the rear area given their relatively high payoff value to the enemy. FARPs are normally located outside medium artillery range (17-25 km) from the FEBA but will be pushed forward as required to support operations. FARP assets normally travel to their initial location with the combat trains of the ground maneuver forces for security. Primary protection of these assets is accomplished by continuous displacement during combat operations into preplanned locations.

(b) FARP Interoperability. Prior coordination is required to resolve equipment and procedural differences when Army and USMC aircraft use the same FARP. FARP personnel must receive training on standardized procedures, such as hand and arm signals, weapons safe signals, lighting, and aircraft peculiar requirements.

(4) Battle Positions (BPs). Attack helicopter BPs are normally planned to the flanks of ground maneuver units using the factors of METT-T. A company normally requires 3-5 km for a battle position. In open terrain, however, a company BP may require as much as 7-10 km for dispersion, while a battalion BP may require 15-20 km for dispersion.

c. Synchronization. The maneuver of Army aviation forces must be integrated into the commander's intent and overall concept of the operation to capitalize on the

synergistic effects of synchronization. The flexibility of Army aviation allows the commander to strike the enemy in depth and at unexpected times and places. Army aviation attacks vary in length depending on the employment method. An attack battalion may select one of three methods: continuous attack, phased attack, or maximum destruction that is short but extremely violent. Generally, aviation assets lack the endurance of armored and mechanized forces. As a result, the initiative gained by the use of Army aviation is lost if the enemy is allowed time to recover from an attack. Thus, aerial maneuver must be closely synchronized with ground operations to achieve optimum results.

d. Deep Operations. Aviation deep missions are high risk, high payoff operations. Deep operations are based on the ability of the controlling headquarters to see the battlefield. Thus, corps deep operations may extend forward of the FSCL, while brigade deep operations may extend only a few kilometers beyond the FEBA. Table VII-4 depicts a sample deep operations GO/NO-GO planning matrix. Deep operations planning factors include—

(1) Acceptable Risk—Mission/Destruction Criteria. Army aviation generally uses three terms to describe destruction criteria: *destroy*— kill more than 70 percent of the target; *attrit*— kill more than 30 percent but less than 70 percent of the target; *disrupt*— kill less than 30 percent of the target. The higher the destruction criteria, the higher the risk. The force commander sets the amount of risk based on potential friendly losses, the location of the attack, or the number of attacks that will be made.

(2) Abort Criteria. The force commander sets the abort criteria for early mission termination based on potential friendly losses or the minimum number of aircraft required for the mission. If the commander states that the abort criteria is 2 UH-60s destroyed due to air defense, the mission automatically aborts upon the destruction of the second UH-60. Abort criteria considers the nature and location of the threat, acceptable risk, and location of the aircraft when they are destroyed.

(3) Intelligence. Detailed intelligence (target, landing zone [LZ] location, ADA systems and locations) is paramount to the success of the operation. Every detail of the synchronization and coordination of the mission is based on available intelligence. The better the intelligence the lower the risk and the greater the probability of mission completion.

Table VII-4. Aviation Deep Operations GO/NO-GO Planning Matrix

FACTOR	GO	NO GO	COMMENTS
Assets available for reconstitution			
J-SEAD available			
Artillery positioned for SEAD/HPT targeting			
Enemy location and array confirmed			
Light conditions			
Weather conditions			
Enemy AD located			
Time on station			
Availability for next mission			
Terrain favorable for attack			
A2C2 deconflicted			
Electrooptic conditions favorable			
Fixed-wing support available			
Risk VS payoff			

(4) SEAD/J-SEAD. SEAD/J-SEAD is vital for deep operations. Primary SEAD/J-SEAD planning is the responsibility of the fire support officer. One technique is to coordinate mission times and locations with aviation strike packages from another service. This allows the attack mission to take advantage of the strike package SEAD. Planning a mission in this manner does not provide full J-SEAD coverage but some degree of protection. Normally, all known and suspected enemy ADA locations along the ingress/egress and battle positions are targeted. Army aircraft can provide their own SEAD; however, this technique is not normally the preferred method.

(5) Fire Support. In addition to SEAD, fire support in the target area is essential when the target is within field artillery range. A quick-fire channel facilitates that support. If attack helicopters are employed against a dispersed target, artillery may be required to attack that portion of the target attack helicopters cannot engage.

(6) Friendly ADA Systems and Air Corridors. Establish air corridors that do not interfere with air defense and artillery. This prevents fratricide and keeps aviation operations from degrading the responsiveness of fire support. Weapons control status (WCS) along air corridors is normally *weapons hold* during ingress and egress.

(7) Air Combat. Army aviation units (AH-64A, AH-IF, and OH-58D Kiowa Warrior) conduct air combat to provide protection for members of the combined arms team, augment air defense, and for self-defense. At least one aircraft in each flight should monitor the Marine TAOC for early warning and integration into the air defense network.

(8) Terrain Management. The attack or assault unit requires terrain for HA, FARP locations, and FAA. A minimum of 2 FARPs and holding areas are planned for each operation. Primary planning concerns for FARPs are security, wheeled vehicle access, and location vis-a-vis main enemy avenues of approach.

(9) Debriefings. Information brought back after a cross-FLOT mission is of a transitory nature and requires intelligence processing as soon as possible. To facilitate information flow, an intelligence representative from higher headquarters extracts priority intelligence from aircrews. AH-64 and OH-58D camera tapes have a unique format and cannot be used by higher headquarters unless accompanied by special equipment.

e. Close Operations. Priority targets in close operations are armored reserves and counterattacking forces. Many of the planning factors that apply to deep operations also apply to close operations. Listed below are those factors that are unique to integrating aviation into close operations:

(1) Fire support. Normally, aviation units do not have their own fire support. However, attack battalions do have fire support officers assigned. Fire support for aviation requires integration with close operations. Normally this is done by establishing a quick-fire channel with priority of fire to the committed aviation unit.

(2) Coordination and Synchronization. Employment in close operations requires the same exact timing as in deep operations. Aircraft that arrive too early will have insufficient fuel available when the operation begins. If aircraft arrive late, the target engagement window may be closed. Uncoordinated FA support may interfere with the attack by obscuring the target.

(3) Fratricide Prevention. Fratricide prevention is a primary concern in close operations. The best preventive measure is good situational awareness. Air and ground units must know where respective forces are operating. Employment of ACM—BPs, engagement areas (EAs), and FSCMs assist in the control of friendly forces' fires.

(4) Downed Aviator/Aircraft Evacuation/Security. Every effort must be made to recover downed aircraft so it can be returned to the fight. Army aviation units normally plan for self-recovery of downed aviators/aircraft. The tactical situation may require ground forces to extract crew members or provide security to aircraft downed due to enemy fire or maintenance. The overall combat search and rescue (CSAR) plan requires integration of all available assets.

f. Rear Operations. Aviation forces may be effectively employed in rear-area operations as described below:

(1) TCF. Aviation battalions and higher can function as a TCF headquarters for planning and executing rear operations if augmented with additional maneuver, CS, and CSS assets. Lift units can either augment or be augmented with ground forces for this mission. Attack and air cavalry can serve as the initial response force but are restricted by their lack of ability to close with dismounted infantry units. When given sufficient warning, attack and cavalry units are capable of providing air defense along enemy air avenues of approach.

(2) Integration into the Reconnaissance and Security Plan. Because aviation operations transit the entire battlefield, they can provide surveillance and assist in securing lines of communications. The division or brigade rear CP integrates aviation units into the rear reconnaissance and security plan. By varying their routes, arriving and departing aircraft can conduct counterreconnaissance operations in rear areas.

(3) Air Movement/Air Assault. Aviation units can support rear operations by conducting air movement of personnel, supplies, and equipment to assist in CSS operations. Air assault units support rear operations by providing lift for the TCF.

g. Security Operations. In security operations aviation forces enhance ground movement because of their speed and maneuverability and the firepower provided by armed helicopters. Aviation units perform screen missions but require augmentation for guard and cover missions. Aviation units may form part of the guard or cover force. Aviation's flexibility allows employment in a variety of ways.

(1) Army Aviation assets may be positioned to react rapidly to enemy contact initiated by the covering force or the advance guard.

(2) Aviation's speed and mobility allow them to cover large frontages.

(3) The reaction time and firepower of armed helicopters allow them to be committed quickly in a meeting engagement.

h. Reserve. The flexibility of Army rotary-wing aviation makes it ideally suited for the reserve mission. When assigning the reserve mission to an Army aviation unit, commanders must consider the duration of the mission. Aviation units cannot maintain a 100 percent readiness capability, as required for the reserve, for extended periods. Army aviation units must reduce their capability to maintain 24-hour operations.

6. Marine Aviation

Marine Corps aviation, as the Fleet Marine Force's air component, provides aviation assets to the MEF (FWD). When not deployed, Marine aircraft squadrons are consolidated by type/model/series within Marine aircraft wings in the Continental United States (CONUS). The aviation component of the MEF (FWD), the ACE, is task organized based on the mission to support MEF (FWD) operations. The command and control of Marine aviation is governed by the *Policy for Command and Control of USMC TACAIR in Sustained Operations Ashore* in Joint Pub 0-2.

7. Aviation Combat Element

Forming an ACE brings fixed- and rotary-wing aircraft assets into a task-organized unit to meet specific contingency requirements. The resulting ACE consists of a mix of fixed- and rotary-wing squadrons, groups, or wings along with supporting organizations. Logistics support of an ACE is addressed in Chapter IX, and major command and control organizations were addressed in Chapter II. Figure VII-1 depicts a notional ACE organization.

8. Marine Aviation Functions

Marine aviation performs six functions: antiair warfare (AAW), offensive air support (OAS), assault support, air reconnaissance, EW, and control of aircraft and missiles.

a. AAW. AAW is action required to reduce enemy air and missile threats to acceptable levels. The primary purpose of AAW is to gain air superiority. The basic principles of AAW are destruction-in-depth, centralized command and coordination, decentralized control, and mutual support.

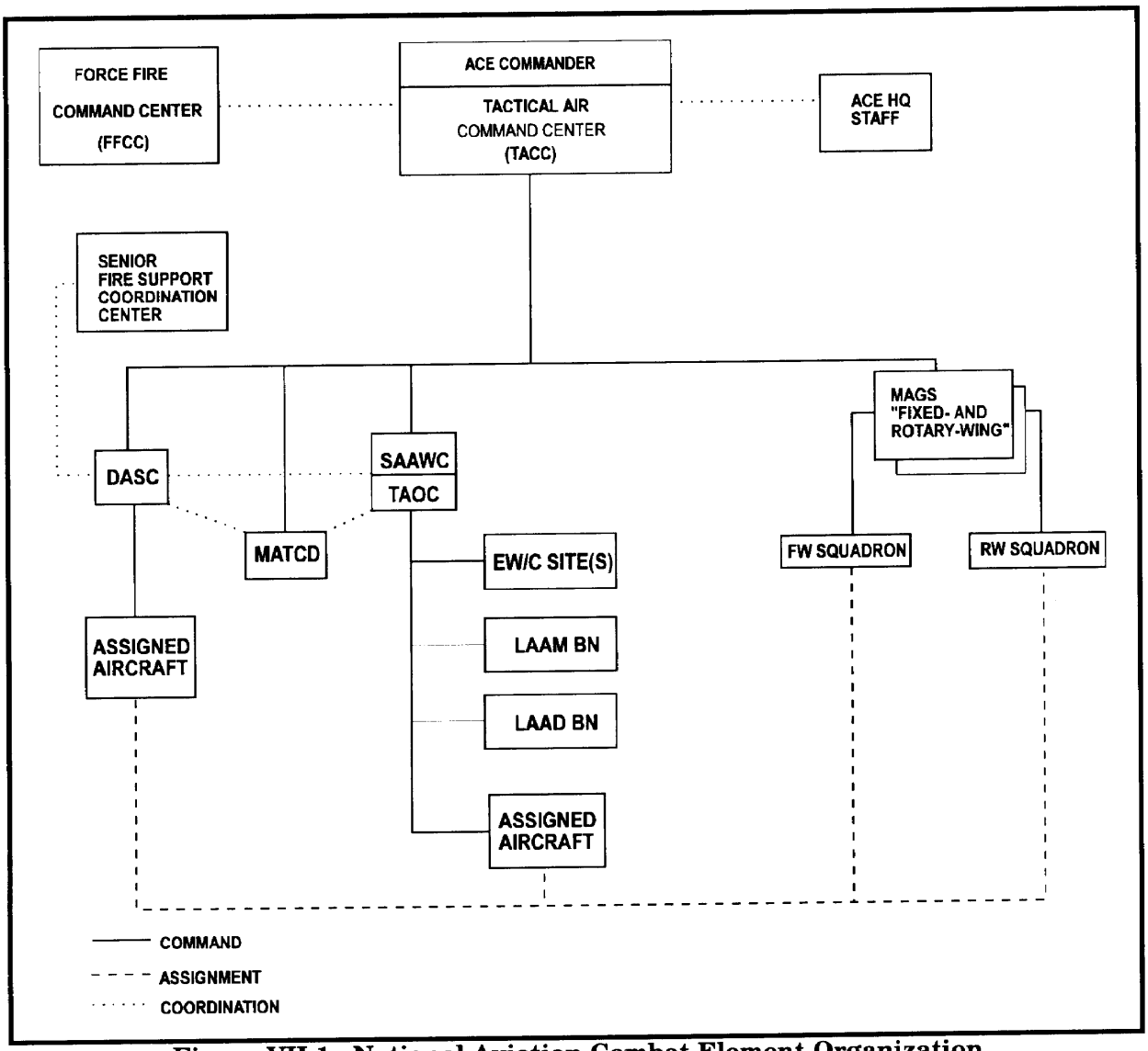

Figure VII-1. Notional Aviation Combat Element Organization

(1) AAW Tasks. Active AAW tasks are surveillance (including detection, identification, and evaluation), weapons control, and weapons employment. Surveillance enables the MEF (FWD) command centers to know what the air threat is and to plan how to counter that threat. Detection is the actual locating of threat aircraft or missiles through visual or electronic means. Identification is *separating the good from the bad*. Evaluation includes defining the most dangerous threats. Weapons control is putting a friendly AAW-capable asset against an enemy target, often by getting that asset to the right place at the right time. Weapons employment is the physical destruction of a threat target. Table VII-5 shows the capabilities of various facilities and systems to conduct active AAW tasks.

(2) AAW Organization. Organization for AAW is centered around the TAOC and its early warning/control site(s). The TAOC, under sector antiair warfare coordinator (SAAWC), provides control, surveillance, and management over assigned airspace. The TAOC controls the intercept of enemy targets identified within its assigned sector. Chapter II provided expanded discussion of ACE command and control.

(3) AAW Categories. AAW is either offensive (OAAW) or defensive (air defense). The MEF (FWD) uses OMW and air defense to reduce or eliminate the effectiveness of the enemy's air effort.

(a) Offensive AAW. Offensive AAW operations attack enemy air weapons systems before launch or before they assume an attacking role. Offensive AAW operations primarily consist of air attacks that destroy or neutralize hostile aircraft, airfields, missile launch sites, and supporting systems. The organization for offensive AAW centers on the TACC, with the DASC serving as a conduit for coordinating SEAD, targeting, and attack with the GCE, and the SAAWC/TAOC providing the facilitating coordination for theater ballistic missile defense (TBMD) attack operations.

(b) Air Defense. Air defense consists of active and passive means. Passive air defense includes measures, other than active measures, taken to minimize the effects of hostile air attacks. These include cover, concealment, deception, dispersion, and protective construction. Passive air defense is a MEF (FWD)-wide responsibility, not strictly an aviation function. Active air defense is the direct action taken to destroy attacking enemy aircraft or missiles through the use of aircraft, missiles, non-air defense weapons, and certain EW measures.

b. OAS. OAS has two categories: CAS and DAS. Fixed- or rotary-wing aircraft perform these missions. CAS and DAS can be performed both short of and beyond the FSCL; however, CAS requires detailed

Table VII-5. Asset Capabilities for Antiair Warfare Tasks

ASSET	SURVEILLANCE	ID	EVALUATION	WEAPONS CONTROL	WEAPONS EMPLOYMENT
TAOC	x	x	x	x	
EW/C	x	x	x	x	
LAAM	x	x	x	x	x
LAAD	x	x		x	x
F/A-18	x	x	x	x	x
AV-8	x	x			x
AH-1	Visual	x			x
Other A/C	Visual	x			

integration with the fire and movement of the supported force. DAS requires varying degrees of coordination but rarely approaches the detailed integration required by CAS.

(1) Factors. A high enemy threat consisting of an air defense system of integrated fire control systems and EW capabilities may restrict OAS and require SEAD. Limited visibility, weather in the target area, target identification, and aircraft time on station (target distance from base and fuel loads) also can affect OAS effectiveness.

(2) CAS. In addition to operating from fixed air bases, aircraft provide CAS from forward operating bases, carriers, and amphibious ships.

(a) CAS Roles. CAS allows the concentration of firepower at the time and place requested by a ground commander to support fire and maneuver. By supporting the attack or providing forward or flank security, CAS can support offensive ground operations. Defensively, GAS can support ground forces by providing highly mobile reserve forces and providing fire to areas not covered by surface fires.

(b) CAS Structure. The DASC coordinates CAS. The DASC takes requests over radio nets for on-call or immediate tactical air support. Units request CAS on the TAR Net. After prioritizing the requests and finding the assets, the DASC directs aircrews to check-in for terminal control on the Tactical Air Direction (TAD) Net. One of the terminal control agencies is the FAC. The FAC provides liaison and communications between ground commanders and air control agencies and exercises control of aircraft during the terminal phase of CAS missions to ensure accuracy of weapons delivery. Figure VII-2 depicts CAS request procedures.

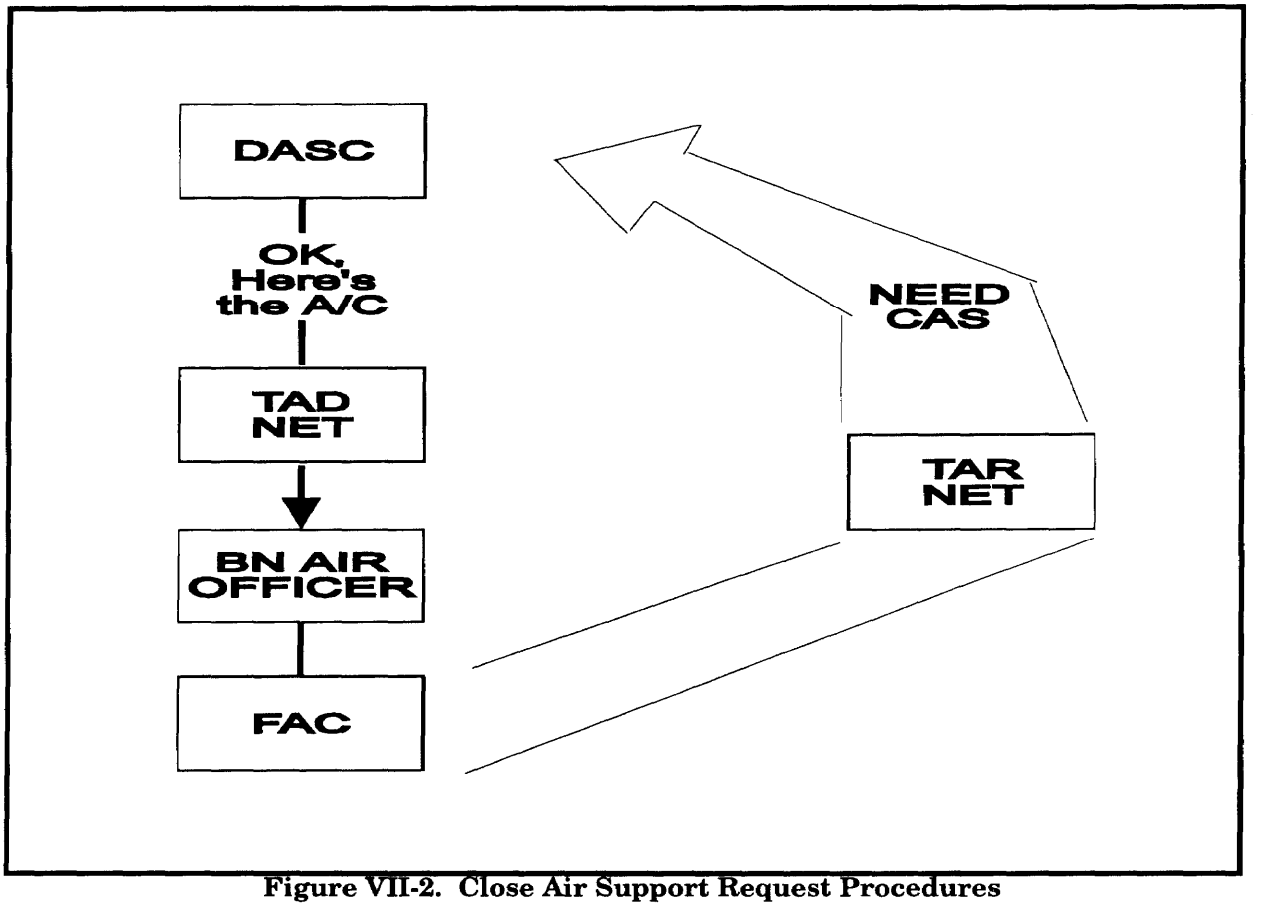

Figure VII-2. Close Air Support Request Procedures

(3) DAS. DAS tasks include armed reconnaissance and air interdiction. Armed reconnaissance missions are launched to locate and attack targets of opportunity, not to attack specific targets. Air interdiction missions are primary DAS missions because they deny use of specific areas, routes, facilities, or forces before they can be used against friendly forces.

c. Assault Support. Assault support provides operational and tactical mobility and logistics to the MEF (FWD). Assault support allows focusing of combat power at the decisive time and place to achieve local combat superiority. Assault support aircraft mobility and speed permit the commander to take full advantage of fleeting battlefield opportunities.

(1) Categories. Assault support categories are combat assault transport, air delivery, aerial refueling, air evacuation, tactical recovery of aircraft and personnel (TRAP), air logistical support, and battlefield illumination.

(a) Combat Assault Transport. Combat assault transport includes helicopter mobility to rapidly deploy forces, bypass obstacles, or redeploy forces to meet an enemy threat. Combat assault transport also uses transport helicopter assets to provide logistic support to ground forces.

(b) Air Delivery. Air delivery operations employ fixed-wing assets to move equipment and supplies to forward operating bases or remote areas. Air drops are used for delivery when distances, closed lines of communications, lack of adequate airfields, required delivery times, or prohibitive ground tactical situations exist.

(c) Aerial Refueling. KC-130 aircraft conduct aerial refueling to support flight-ferrying of aircraft, extend aircraft time on station, or to extend mission ranges.

(d) Air Evacuation. Air evacuation, by both fixed- and rotary-wing transport aircraft, is used to move personnel and equipment from forward operating bases or remote areas. This includes medical evacuation and retraction of forces.

(e) TRAP. The MEF (FWD) performs self-supporting CSAR operations and external CSAR support using the TRAP concept. TRAP should not detract from primary warfighting functions. TRAP does not include the search portion of CSAR and only performed when survivors and their locations are confirmed.

(f) Air Logistical Support. When ground forces are located beyond helicopter range, air logistical support is performed by fixed-wing aircraft. These operations include troops, equipment, and supplies.

(g) Battlefield Illumination. Fixed- and rotary-wing assets can perform battlefield illumination, either visible or invisible to the naked eye.

(2) Requesting Support. Requests for assault support are coordinated by the DASC in the same way as CAS requests. (See *paragraph 8b[2][a].)*

d. Air Reconnaissance. Air reconnaissance provides a major means for collecting current raw data on terrain, weather, hydrography, and the enemy situation for intelligence processing and distribution. Manned and unmanned systems perform air reconnaissance. Any aviation unit can perform visual reconnaissance. EW aircraft detect, identify, evaluate, and locate enemy electromagnetic information. The DASC coordinates air reconnaissance operations as requested by intelligence organizations or ground forces.

e. EW. EW systems collect tactical information. EW missions are flown in response to specific requests. EW provides timely information on the enemy, increases the MEF (FWD)'s combat power by disrupting the enemy's use of the electromagnetic spectrum, and ensures the

MEF (FWD)'s continued use of the electromagnetic spectrum despite enemy EW.

f. Control of Aircraft and Missiles. The ACE commander controls aircraft and missiles on behalf of the MEF (FWD) commander using the MACCS to coordinate employment of facilities, equipment, communications, procedures, and personnel.

(1) Principal MACCS Operating Agencies.

(a) TACC. As the senior MACCS agency, the TACC is the operational command post for planning, supervising, and directing the employment of Marine aviation's six functions. The TACC is divided into a future operations section responsible for planning *"tomorrow's"* air activities and a current operations section responsible for supervising the execution of aviation support for the MEF (FWD).

(b) DASC. Collocated with the senior MEF (FWD) FSCC (physically or electronically), the DASC is the principal air control agency for directing air operations directly supporting ground forces. In addition to processing and coordinating requests for air support, the DASC also coordinates air missions requiring integration with the ground forces (e.g., CAS, assault support, and designated air reconnaissance missions).

(c) TAOC. The TAOC is responsible for airspace control and management. Employing long-range and gap-filler air surveillance radar, the TAOC provides real-time surveillance of assigned airspace and direction and positive control of AAW operations involving aircraft and surface-to-air weapons. The SAAWC is normally collocated with the TAOC.

(d) MATCD. MATCD is the primary terminal air control organization for forward operating bases. MATCD provides friendly aircraft with continuous all-weather radar approach, departure, and en route air traffic control services. Also the MATCD is capable of fielding one mobile team to provide non-radar ATC services to remote operating locations.

(2) Other MACCS Control Agencies. Additional air control and coordination agencies, although not organic to the ACE, are fully integrated into MACCS through communications, doctrine, and procedures. These agencies are grouped into terminal air controllers and coordinators, airborne controllers and coordinators, and helicopter support teams (HSTs).

(a) Terminal Air Controllers and Coordinators. Terminal air controllers and coordinators control the delivery of ordnance, cargo, or personnel to specific targets or locations. Terminal air controllers include TACPs, MEF (FWD) CE air sections, and ANGLICOs.

• TACP. TACPs are organic to GCE infantry regiments and battalions, LAR battalions, and tank battalions. TACPs contain air officers, forward air controllers (FACs), and enlisted communicators as shown in Table VII-6. The TACP provides liaison and communications between the supported ground unit and the appropriate air control agency. Infantry and LAR battalions each have two FACPs attached to their TACPs. The primary mission of FACPs is to control fixed- and rotary-wing aircraft during the terminal phase of CAS.

Table VII-6. TACP/FACP Personnel

UNIT TYPE	TACP PERSONNEL	FACP PERSONNEL
Infantry Regiment	1 air officers	None
Infantry/LAR Battalion	1 air officers	2 AO/8 comm
Tank Battalion	1 air officers	None*

KEY:
Comm = Enlisted Communicator
*** Tank/reconnaissance air officers perform FACP and comm duties**

• MEF (FWD) CE Air Sections. The air section, assigned to the GCE operations center, consists of 2 to 4 air officers and appropriate administrative support. It provides the MEF (FWD) commander with current air employment and availability information and advises the commander and staff on matters of air support. The air section also participates in air employment planning and targeting.

• ANGLICOs. The ANGLICO is attached to US Army or allied forces to provide air support control or US fleet NSFS for their operations. See Chapter V for detailed information on ANGLICO organization and functions.

(b) Types of Airborne Controllers/ Coordinators. The ACE provides three types of airborne controllers/coordinators to function as part of the MACCS. These are forward air controllers (airborne) (Facial), TAC(A), and assault support coordinators (airborne) (ASC[A]). These agencies can support specific ground organizations or limit their activity to coordination of aircraft.

• FAC[A]. The FAC(A), operating from an aircraft, exercises terminal control of OAS aircraft and artillery and NSFS coordination. The FAC(A) is the airborne extension of the FAC and cannot perform both FAC(A) and TAC(A) duties simultaneously.

• TAC[A]. The TAC(A), operating from an aircraft, coordinates rotary- or fixed-wing CAS aircraft. The TAC(A) is the on-site extension of the DASC and FSCC. Principal responsibilities are to deconflict aircraft and coordinate air assets with other supporting arms. The TAC(A) coordinates with TACPs, FSCCs, ASC(A)s, and artillery (including NSFS) fire direction centers. The TAC(A) may or may not be employed, depending on mission requirements and availability.

• ASC [A]. The ASC(A) provides coordination and procedural control of aircraft during assault support operations. The ASC(A) is an airborne extension of the DASC. The ASC(A) supports assaults through command and control, airspace coordination, and integration of operations. An ASC(A) is employed when the scope and complexity of the assault support operation demands.

(c) HST. The HST is an organization equipped to facilitate the pickup, movement, and landing of heliborne forces, equipment, and supplies within landing and pickup zones. HSTs also assist in evacuation of casualties. HST operations are the responsibility of the heliborne unit commander. Figure VII-3 depicts the HST organization.

g. MEF (FWD) Aircraft Capabilities. MEF (FWD) aircraft capabilities are shown in Tables VII-7 and VII-8.

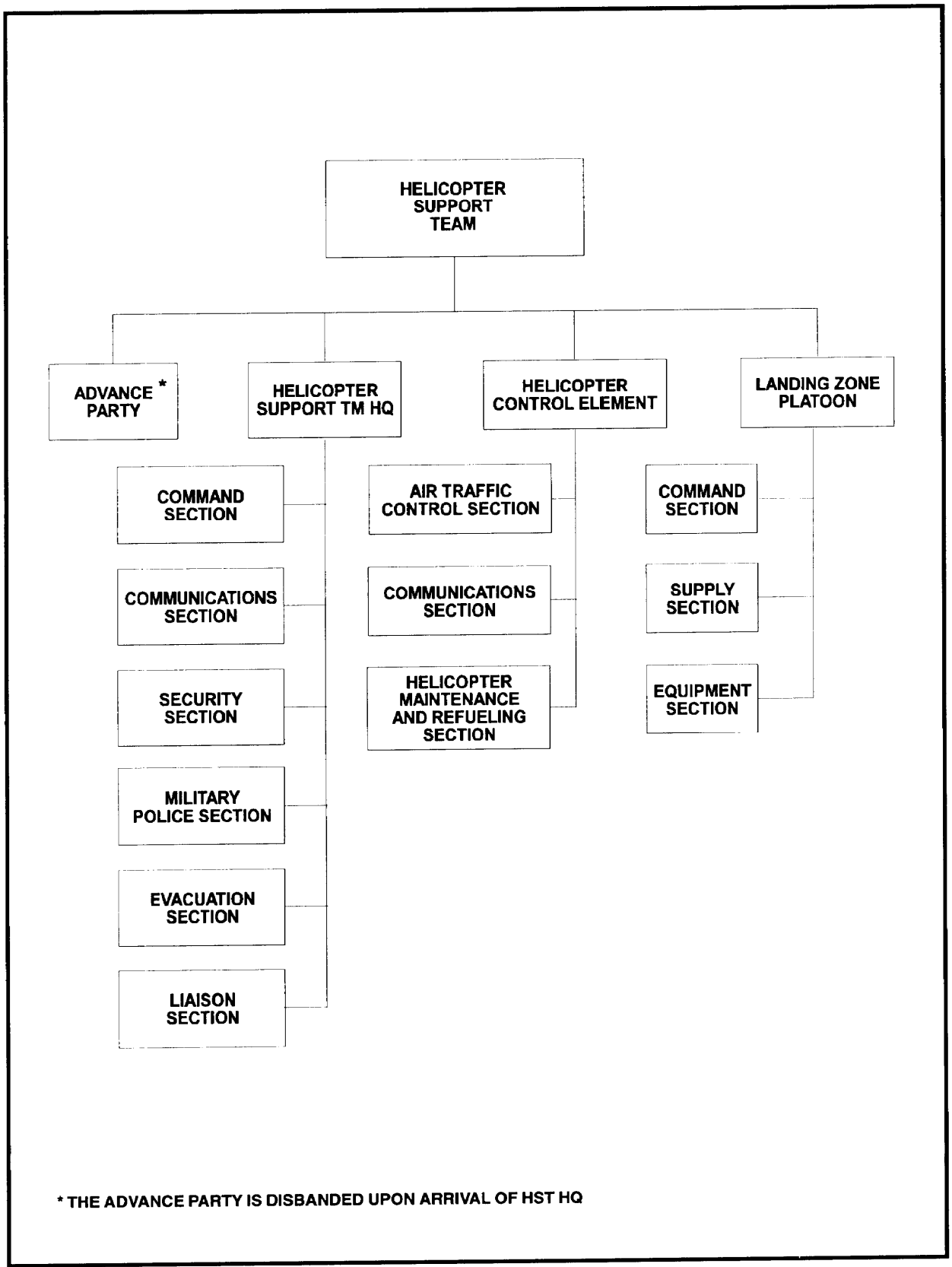

Figure VII-3. Helicopter Support Team

Table VII-7. MEF (FWD) Fixed-Wing Aircraft Capabilities

CAPABILITIES	AV-8B	F/A-18A/C	F/A-18D	EA-6B
Missions	AAW/CAS/DAS/AIR RECCE	AAW/CAS/DAS/ Air RECCE	AAW/CAS/DAS/ Air RECCE	ECM/Air RECCE
Ordnance/ Load/Guns	Conventional 8000 lbs 25mm	Conventional 13700 lbs 20mm	Conventional 13500 lbs 20mm	HARM
Navigation	TACAN/INS/ FLIR/Radar/GPS	TACAN/INS/ FLIR/Radar/ ADF/GPS	TACAN/INS/ FLIR/Radar/ ADF/GPS	TACAN/INS/ FLIR/Radar ADF/GPS
Communications	2 UHF-AM 2 UHF-FM 2 VHF-AM 2 VHF-FM	2 UHF-AM 2 UHF-FM 2 VHF-AM 2 VHF-AM	2 UHF-AM 2 UHF-FM 2 VHF-AM 2-VHF-FM	2 UHF-AM
Crew	1	1	2	4
SPEED	.9 Mach	1.8 Mach	1.8 Mach	.72 Mach
Range	500 nm	700 nm	600 nm	1000 nm
Laser Capability	Track	Track and Designate ("C")	Track and Designate	None

Note: Two multiband radios that each operate in any of the following four bands: UHF-AM, UHF-FM, VHF-AM or VHF-FM. These aircraft do not have eight radios.

KEY:

ADF Automatic direction finder

FLIR Forward looking infrared radar

ILS Instrument landing system

INS Inertial navigation system

TACAN Tactical air navigation

Table VII-8. MEF (FWD) Rotary-Wing Aircraft Capabilities

CAPABILITIES	AH-1W	UH-1N	CH-46E	CH53D (CH53E)
Missions	CAS/DAS/AAW	Assault	Assault/Log	Assault/Log
Ordnance	TOW/AIM-9/ Hellfire/FAE 2.75" & 5" Rockets	2.75" ROCKETS	None	None
Armament	20mm	7.62 MG/GAU-2 Mini-gun	2 .50 CAL MG	2 .50 CAL MG
Navigation	TACAN/ADF/GPS/ Doppler	TACAN/ADF/GPS	TACAN/ADF/GPS	TACAN/ADF/GPS
Communications	UHF/VHF-FM	UHF/VHF-FM/HF	UHF/VHF-FM, HF	UHF/HF VHF-FM/AM
Crew	2	3	4	4 (3)
SPEED	140 kt	126 kt	140 kt	170 kt (173 kt)
Range	280 mi	170 mi	200 mi	250 mi (480 mi)
Laser Capability	Track and Designate (NTS)	Track and Designate (White Eagle)	None	None
PAX	None	10-13	15	37 (56)

KEY:

ADF Automatic direction finder

FAE Fuel air explosive

NTS Night targeting system

TACAN Tactical air navigation system

TOW Tube launched, Optically tracked, Wire command link guided missile system

9. DRB Under MEF Control

All Army aircraft that deploy as part of the DRB can expect to perform missions in support of the MEF. The following narrative addresses mission planning factors to consider when integrating Army aviation with MEF operations.

a. Air Control Support. ANGLICO would provide air control support for Army maneuver units. Even when Navy air support is involved, coordination would be between the MEF (FWD) CE and the Navy command involved. ANGLICO support would continue.

b. Air Cavalry. The air cavalry OH-58D Kiowa Warrior provides the JFC with an excellent night capable reconnaissance and fire support aircraft. The aircraft are normally employed in pairs and can see farther than other organic DRB assets. Command and control is retained at the command level capable of providing the aircraft connectivity with intelligence and fire support channels. The capabilities of the aircraft allow for direct sensor-to-shooter linkage via a digital quick-fire channel with an appropriate attack system such as MLRS. Coordinating laser codes allow the aircraft to designate for precision guided munitions.

c. Attack Battalion. The attack battalion is normally employed by the headquarters that has the ability to track the high payoff target the battalion is directed to attack. If employed by the MEF, the attack mission is listed on the Marine ATO with mission command and control through the TACC. The DASC and TAOC have the ability to provide threat updates and maintain communication between all elements. The TACC responsibilities include the coordination of the SEAD and fixed-wing support. An Army liaison team should be present at the TACC to facilitate operations. A DASC(A) may be assigned to facilitate coordination and communications.

d. Air Assault. When performing air assault missions, air assault aircraft are normally OPCON to the ground force commander. The air mission commander, normally the ground force unit commander, is responsible for the planning of the air assault mission. The aviation unit provides liaison to assist in mission planning.

e. Class V. USMC and Army attack helicopters employ 2.75 inch folding fin aerial rockets (FFAR), 20mm, TOW, and Hellfire missiles. Either service can use the other service's common ammunition, depending on the airframe.

10. MEF Under Army Corps Control

In a theater where the Army has the preponderance of ground forces the Air Force normally has the preponderance of aircraft. In this case, the JFC assigns the Air Force responsibility for publishing the joint ATO. Coordination of joint air operations is normally assigned to a single subordinate commander who is usually designated the joint force air component commander (JFACC). For more information on JFACC responsibilities, see Joint Pub 3-56.1, *Command and Control for Joint Air Operations.*

a. MEF (FWD) Interoperability in the Theater Air Control System (TACS). The MEF (FWD) must interface with the TACS when supporting Army operations in order to access air support that exceeds its organic capabilities. This includes CAS, AI, and theater airlift. In AMCI, the MEF (FWD) retains its organic air assets and makes excess sorties available for use by the JFC. Once air support requirements exceed organic capabilities, requests for additional preplanned or immediate Air Force air support flow through the TACS system. Marine liaison officers at the corps TOC facilitate fire support planning and requests' flow. Corps FSE targeteers prioritize MEF (FWD) requests with those of the corps and other subordinate elements for submission to the BCE at the joint air operations center (JAOC). Figure VII-4 illustrates USAF/ USMC air operations connectivity.

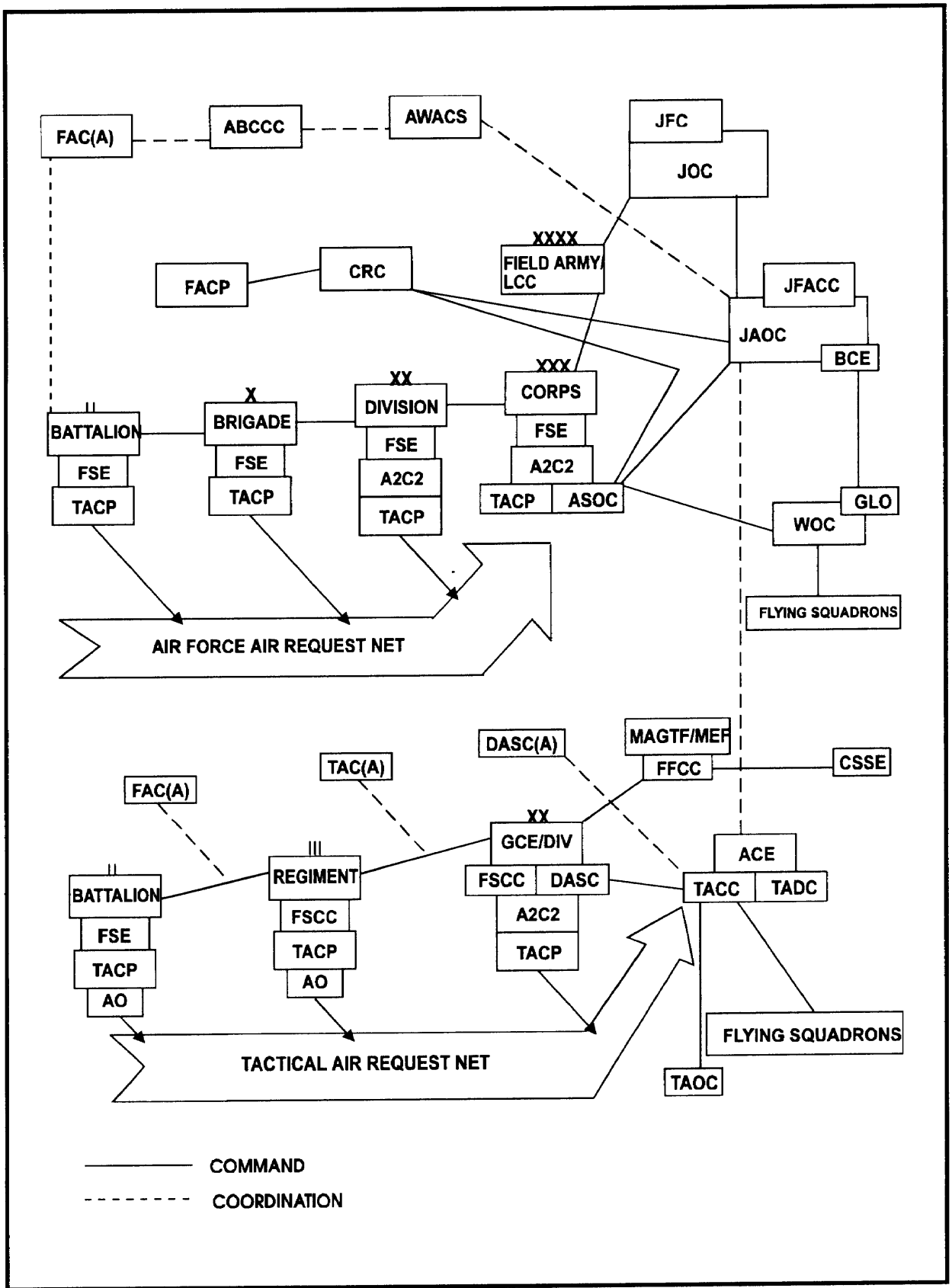

Figure VII-4. USAF/USMC Air Operations Connectivity

b. Requests for AI and CAS.

(1) Preplanned Requests. Preplanned requests include submissions for AI and scheduled and on-call CAS. As seen in Figure VII-5, preplanned requests flow from the MEF (FWD) FFCC to the corps FSE where the G-3 staff, Marine liaison officer, and corps ALO assist planners to validate and prioritize air support request submissions.

(2) Scheduled Requests. Scheduled requests require the requesting MEF (FWD)/ MEF to identify the target and the desired time on target (TOT) well in advance. Scheduled requests offer greater opportunity for coordination and provide a greater chance that aircraft have the proper weapons load for the assigned targets. Also, AI requires added coordination because each mission consists of packages of various fighter and support assets. For AI and CAS, the specific target and time for the attack is identified and continuously updated in advance so that after launch, minimum communications are necessary for final coordination.

(3) On-call Requests. On-call requests identify an anticipated CAS requirement be available during a period of time, with the exact time and date coordinated as required by the tactical situation. On-call CAS allows the requesting commander to indicate a time frame, probable target type, and place where the need for CAS is most likely. On-call aircraft are configured with the proper ordnance for anticipated targets (e.g., antiarmor) and maintain an alert status for a specified period of time. On-call requests can specify either ground or airborne alert.

(4) Immediate Requests. Immediate requests arise from situations that develop once the battle is joined. Requesting commanders use immediate CAS to exploit opportunities or to protect the force. A MEF (FWD) request for immediate CAS flows through the TAR Net to the DASC. If the DASC determines there are not enough organic air assets to support the request, the DASC passes the request to the TACC. The TACC passes the request to the air support operations center (ASOC) at the Army corps level. The ASOC coordinates the request with corps G-3 air for approval and commits CAS assets if available (see Figure VII-6). Because immediate requests respond to developments on a dynamic battlefield, they cannot be identified early enough to allow detailed coordination and planning that may preclude tailored ordnance loads. If on-call CAS is unavailable, the corps ALO advises the corps G-3/G-3 air to divert corps preplanned CAS missions or forward the request to the JAOC.

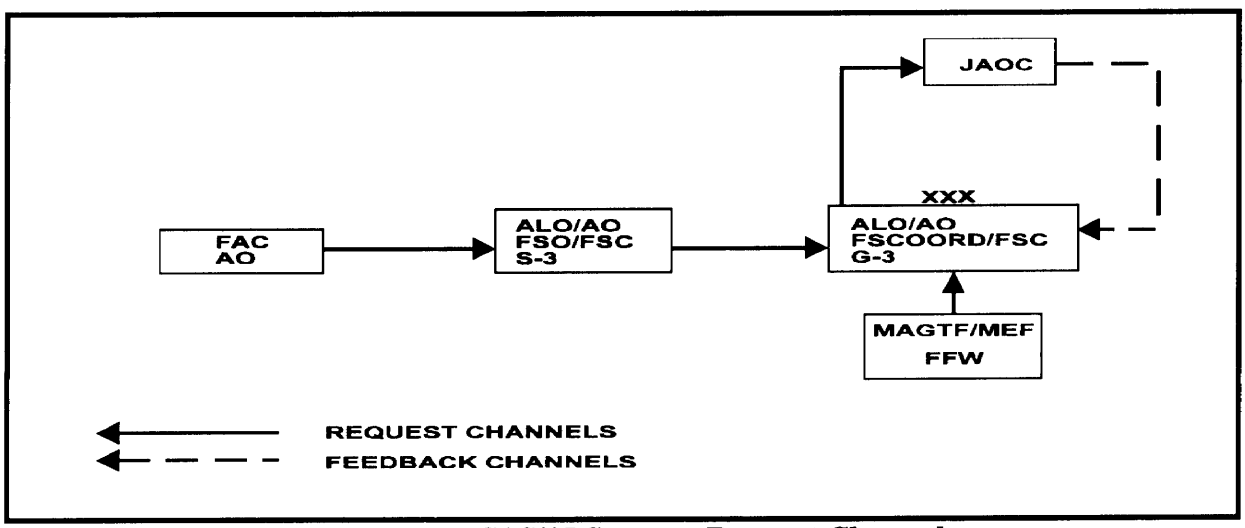

Figure VII-5. CAS/AI Support Request Channels

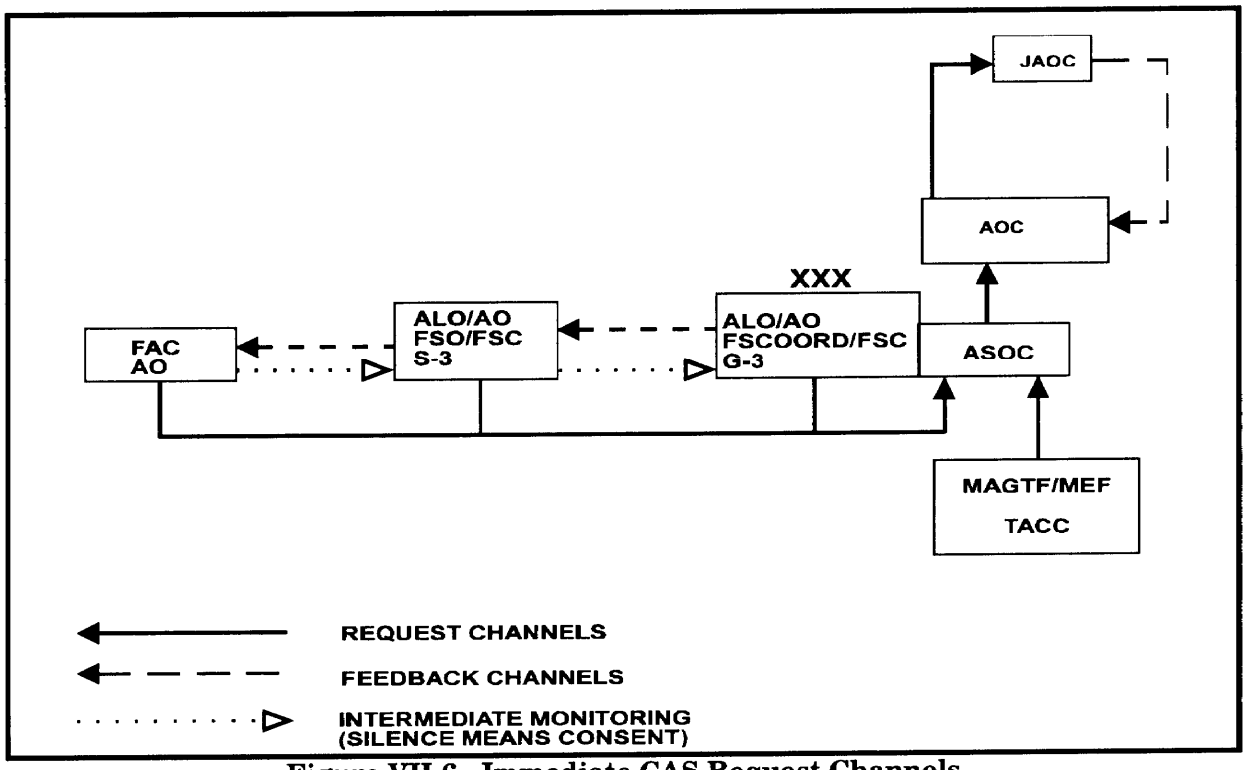

Figure VII-6. Immediate CAS Request Channels

(5) Request Formats. The US Message Text Format (USMTF) program establishes the standards and prescribes the rules and conventions governing message text formats. Air support requests will be submitted using the format prescribed in Joint Pub 3-09.3, *Joint Tactics, Techniques, and Procedures for Close Air Support (CAS).*

(a) Voice Backup. Units that do not have the capability to transmit record copy messages, or when time constraints require, will use the joint tactical air strike request (JTAR), DD Form 1972, voice format. (See Joint Pub 3-09.3).

(b) Mission Data. For preplanned CAS requests, information is passed down through maneuver force channels. Data may be included in the joint ATO, mission order, or fire support plan. For approved immediate CAS requests, mission data is passed down the same air request net used by the requesting unit to pass the request. Mission data is passed using the JTAR Section 3 format to the requesting unit. As a minimum, mission data includes—

- Mission number.
- Call sign.
- Number and type of aircraft.
- Ordnance.
- Estimated TOT/on station.
- Contact point.
- Initial contact.
- Call sign and frequency of final control agency.
- Laser codes.

c. Request for Airlift Support. The MEF (FWD) submits requests for airlift support through the Army Air-Ground System (AAGS). The AAGS provides the command and staff interface between the Army and the Air Force. The AAGS exercises responsibility for requesting and controlling of theater airlift movements as illustrated in Figure VII-7.

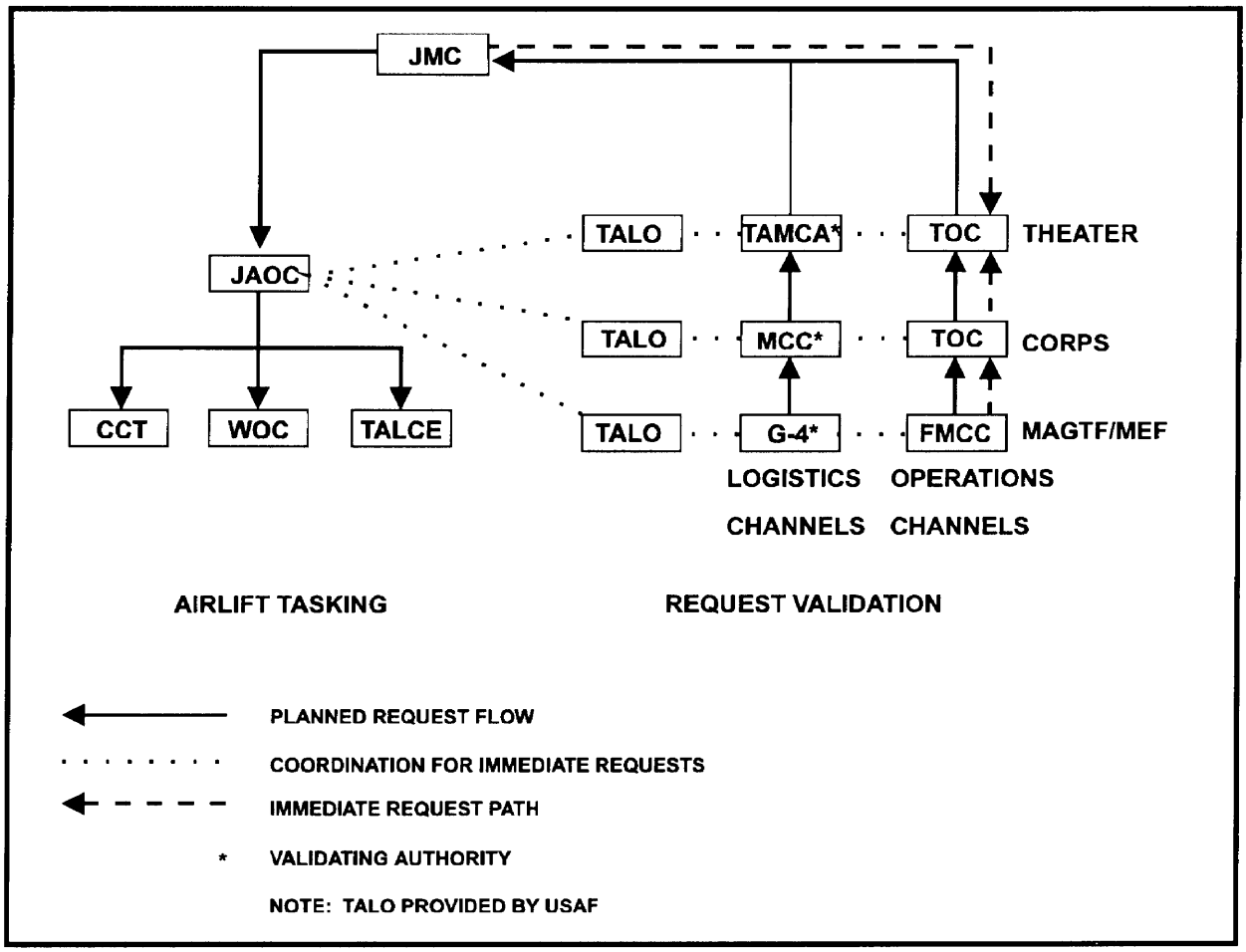

Figure VII-7. Request Channels for Airlift Support

(1) Types of Requests. Any organization in a joint force may request theater airlift support. Requests are supported based on operational necessity, the availability and suitability of alternate surface transportation modes, the JCS priority system, and the JFC's apportionment. Commanders and logistic planners should not hesitate to request theater airlift, if air movement enhances an assigned mission. Once made, airlift requests are handled through Army logistics channels.

(a) Planned Requests. When air movement requirements are known or projected in advance, they are handled as planned requests through normal logistics channels. Requests for planned airlift flow from the MEF (FWD) force movement control center (FMCC) to the corps transportation officer, who coordinates with the Air Force theater airlift liaison officer (TALO); Marine liaison officers and Army operations staff officers coordinate Army/Marine airlift priorities. The corps transportation officer then forwards the request to the joint movement center (JMC) for approval and mission assignment as shown in Figure VII-7. The approved mission is passed to the JAOC for inclusion in the joint ATO. Channel missions and most special assignment airlift missions (SAAMs) result from planned requests. In all cases, the request should allow for the operational lead time established by the corps. This is the time required to generate actual sorties in support of a specific requirement. Lead time varies, depending on the scale of the request, available forces, and the theater air planning process.

(b) Immediate Requests. Immediate requests satisfy urgent employment, sustainment, or extraction requirements. MEF (FWD) requests for immediate airlift flow to the corps transportation officer. The corps TALO assists logistics planners in forwarding the request to the BCE at the JAOC (See Figure VII-7).

(c) Emergency Requests. When air movement requirements must be satisfied before the JMC issues formal tasking, they will be handled as emergency requests. Emergency requests satisfy pressing tactical requirements, such as the evacuation of wounded or the immediate resupply of units engaged in combat. They are usually coordinated as immediate requests with two procedural variations. Required approvals, validations, and taskings may be accomplished by voice and followed with the routine documentation. The AOC director, representing the AFCC, also may divert theater airlift forces supporting planned requests before receiving a voice tasking from the JMC. In such a case, the AOC director should advise the JMC of the action and the pending request.

11. Communications Integration

a. Army Aviation Communications Equipment. Army aviation units are equipped with 3 radio systems (FM, UHF, and VHF); Army ground elements are only equipped with FM (SINCGARS), Aircraft use SINCGARS (FM), UHF, and VHF. Scout and lift (C2) aircraft normally use 2 SINCGARS FM radios; attack aircraft employ only 1 FM (SINCGARS) radio. The secure SINCGARS serves as the primary means for communicating with ground units. For air-to-air communications, Army aviation units use UHF and VHF. Some Army scout and attack aircraft are equipped with UHF with Have Quick capabilities. Have Quick II is being fielded on OH-58D and AH-64D aircraft. For a detailed description of communication equipment and capabilities see Tables VII-9 and VII-10.

b. Army Aviation Communications Radio Nets. Aviation units, (battalion and above) normally operate on 3 FM nets (internal and higher headquarters): a command net, an operations and intelligence (O&I) net, and an administrative and logistics (ADMIN/LOG) net. Other than flight operations, aviation company/troops normally are only l-net capable. They normally monitor the command net of their higher headquarters.

(1) Command Net. A secure command net, controlled by the S3, is used for command and control of the units. All assigned and attached units normally operate on this net. Priority only traffic is passed via this net.

(2) O&I Net. The O&I net is controlled by the S2. It functions as a surveillance net when required. All routine operations and intelligence reports are sent on this net.

(3) ADMIN/LOG Net. This net is controlled by the S1/S4. It is used for administrative and logistics traffic.

c. AMCI Communications Capabilities. The following tables describe the communications capabilities of joint aviation assets. Table VII-9 summarizes Army aviation equipment. Table VII-10 summarizes Air Force and Marine Corps fixed-wing communications capabilities. Table VII-11 provides a ready reference for the communications equipment found at various fire support and air support control agencies.

Table VII-9. Army Aviation Communications Equipment Summary

AIRCRAFT TYPE	RADIOS	FREQUENCY BAND (Note 1)	FREQUENCY HOPPING	SECURE CAPABLE
AH-1W	2-AN/ARC-182	(Note 2)	No	KY-58
UH-60	1-AN/ARC-201	VHF-FM	SINCGARS	KY-58
	1-AN/ARC-201	VHF-FM	No	KY-58
	1-AN/ARC-115	VHF-AM	No	
	1-AN/ARC-164	UHF	Have Quick II	KY-58
OH-58C (Note 4)	2-AN/ARC-201	VHF-FM	SINCGARS	KY-58
	1-AN/ARC-115	VHF-AM	No	No
	1- AN/ARC-164 or AN/ARC-116	UHF	(Note 5)	No
OH-58D (Note 6)	2-AN/ARC-201	VHF-FM	SINCGARS	KY-58
	1-AN/ARC-186	VHF	No	Yes
	1-AN/ARC-164	UHF	Have Quick II	Yes
	1-AN/ARC-199	HF	No	KY-75
AH-64	1-AN/ARC-201	VHF-FM	SINCGARS	KY-58
	1-AN/ARC-164	UHF	Have Quick I	KY-58
	1-AN/ARC-186	VHF (Note 3)	No	

Note 1: Frequency bands are as follows:
HF = 2.000 to 29.999 MHz in 1 kHz increments.
VHF-FM = 29.950 to 87.975 MHz in 25 kHz increments.
VHF-AM = 108.000 to 151.975 MHz in 25 kHz increments.
UHF = 225.000 to 399.975 MHz in 25 kHz increments.
Note 2: The AN/ARC-182 is a multiband radio that operates in any one of four bands: standard VHF-FM, VHF-AM, UHF, or 156.0-173.975 MHz VHF-FM. It can monitor only one band at a time.
Note 3: The AN/ARC-186 operates either in the VHF-AM or VHF-FM band. Each radio can monitor only one band at a time.
Note 4: Only one AN/ARC-201 is connected to the KY-58. The other one is unsecure.
Note 5: AN/ARC-164 aircraft are Have Quick I capable.
Note 6: The OH-58D has two KY-58s. One is dedicated to a AN/ARC-201. The other KY-58 is shared between the other three radios.

Table VII-10. USAF/USMC Fixed-Wing Aircraft Communication Summary

AIRCRAFT TYPE	RADIOS	FREQUENCY BAND (Note 1)	FREQUENCY HOPPING	SECURE CAPABLE
AC-130	2-AN/ARC-164	UHF	Have Quick II	KY-58
	1-AN/ARC-164	SATCOM		KY-58
	3-AN/ARC-186	VHF (Note 3)		
	2-AN/ARC-190	HF		KY-58 KY-75
EA-6B	2-AN/ARC-159	UHF		
	1-AN/ARC-175	VHF		
	1-AN/ARC-105	HF	No	KY-58
AV-8B	2-AN/ARC-182	(Note 2)	No	KY-58
A/OA-10	1-AN/ARC-164	UHF	Have Quick II	KY-58
	1-AN/ARC-186	VHF-FM	SINCGARS	KY-58
	1-AN/ARC-186	VHF-AM	No	No
B-1B	2-AN/ARC-171	UHF or SATCOM	No	Yes
	1-AN/ARC-190	HF	No	No
B-52H	1-AN/ARC-164	UHF	Have Quick II	KY-58
	1-AN/ARC-171	UHF or SATCOM	No	No
	1-AN/ARC-190	HF	No	No
F-14	1-AN/ARC-182	(Note 2)	Have Quick II	KY-58
	1-AN/ARC-59	UHF	No	KY-58
F-15E	2-AN/ARC-164	UHF	Have Quick II	KY-58
F-16	1-AN/ARC-164	UHF	Have Quick II	KY-58
	1-AN/ARC-186	VHF (Note 3)	No	
F/A-18 (Note 4)	2-AN/ARC-182	(Note 2)	No	KY-58
	2-AN/ARC-210	VHF/UHF	Have Quick II	KY-58
F-111	1-AN/ARC-164	UHF	Have Quick II	No
	1-AN/ARC-190	HF	No	No

Note 1: Frequency bands are as follows:
HF = 2.000 to 29.999 MHz in 1 kHz increments.
VHF-FM = 29.950 to 87.975 MHz in 25 kHz increments.
VHF-AM = 108.000 to 151.975 MHz in 25 kHz increments.
UHF = 225.000 to 399.975 MHz in 25 kHz increments.
Note 2: The AN/ARC-182 is a multiband radio that operates in any one of four bands: standard VHF-FM, VHF-AM, UHF, or 156.0-173.975 MHz VHF-FM. It can monitor only one band at a time.
Note 3: The AN/ARC-186 operates either in the VHF-AM or VHF-FM band. Each radio can monitor only one band at a time.
Note 4: F/A-18s are fitted with either two AN/ARC-182 radios or two AN/ARC-210 radios.

Table VII-11. TACP/FAC Communications Equipment

COMPONENT	RADIOS	FREQUENCY BAND (Note 1)	FREQUENCY HOPPING	SECURE CAPABLE
US Army *FIST*	AN/PRC-77	VHF-FM		Yes
	AN/PRC-177			
	AN/VRC-12			
	AN/VRC-24			
USAF *TACP*	AN/GRC-206	HF		Yes
		VHF-FM		Yes
		VHF-AM		Yes
		UHF	Have Quick II	Yes
	AN/PRC-77	VHF-FM		Yes
	AN/PRC-117	VHF-FM	Yes	
	AN/PRC-104	HF		Yes
	AN/PRC-113	VHF-AM		Yes
		UHF	Have Quick II	Yes
USMC *TACP*	AN/PRC-77	VHF-FM		Yes
	AN/PRC-119	VHF-FM		
	AN/PRC-104	HF		Yes
	AN/PRC-113	VHF-AM		
		UHF		
	AN/VRC-12	VHF-FM		
SOF *SOTAC*	AN/PRC-117D	VHF-FM		Yes
		VHF (Note 2)		Yes
		UHF (Note 3)		Yes
	AN/PRC-126	VHF-FM		Yes
	LST-5	UHF SATCOM		Yes

Note 1: Frequency bands for ground radios are as follows:
HF: 2.000 to 29.999 MHz in 1 kHz increment.
VHF-FM: 29.950 to 75.950 MHz in 50 kHz increments.
VHF-AM: 116.000 to 149.975 MHz in 25 kHz increments.
UHF: 225.000 to 399.975 MHz in 25 kHz increments.
NOTE 2: AN/PRC-117D VHF-AM/FM frequency range is 116.000-173.995 MHz.
NOTE 3: AN/PRC-117D UHF-AM/FM frequency range is 225.000-419.995 MHz.