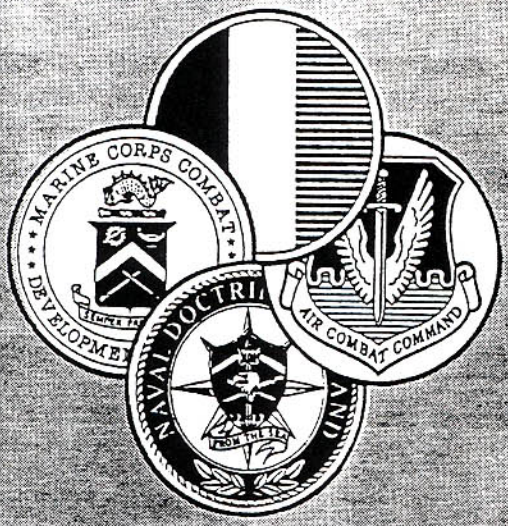
ARMY, MARINE CORPS, NAVY, COMBAT AIR FORCES



AMCI

ARMY AND MARINE CORPS INTEGRATION IN JOINT OPERATIONS

FM 90-31
MCRP 3-3.8

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MULTISERVICE TACTICS, TECHNIQUES, AND PROCEDURES

FM 90-31

US Army Training and Doctrine Command
Fort Monroe, Virginia

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Marine Corps Combat Development Command
Quantico, Virginia

29 May 1996

AMCI

Army and Marine Corps Integration in Joint Operations

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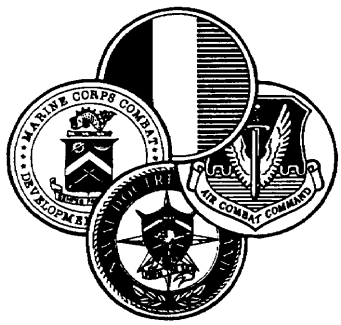


FOREWORD

This publication has been prepared under our direction for use by our respective commands and other commands as appropriate.

William W. Hartzog

WILLIAM W. HARTZOG
General, USA
Commander
Training and Doctrine Command
11 March 1996

Paul K. Van Riper

PAUL K. VAN RIPER
Lieutenant General, USMC
Commanding General
Marine Corps Combat
Development Command
6 November 1995

EXECUTIVE SUMMARY

AMCI

Army and Marine Corps Integration in Joint Operations

Our national military strategy recognizes today's uncertain world requires flexible and interoperable forces that can respond quickly to the multitude of potential crises that may threaten the United States vital national interests. To respond to these crises, the nation's evolving force structure must be capable and responsive to implement and enforce the strategy that will protect our national interests. The exact composition of a given force depends on the nature of the crisis and the prevailing strategic politico-military environment. Such *"adaptive force packaging"* seeks to maximize the capabilities of operational execution. This publication focuses on one type of force packaging available to the joint warfighting community: the integrated employment of United States Army (USA) and United States Marine Corps (USMC) forces.

Given the expanse of options available to joint planners in task-organizing Army and Marine Corps forces, this publication assumes two *"base cases"* to provide a common framework for discussion. These cases focus on the command and control (C2) of a notional Army brigade by a Marine expeditionary force (MEF) and the C2 of a notional Marine expeditionary force (forward) (MEF [FWD]) by an Army corps.

Organization and Fundamentals

Chapter I provides an overview of selected USA and USMC forces and describes the organization, capabilities, and limitations of an Army division ready brigade and a MEF (FWD) respectively. It also discusses the fundamentals of integrated operations to maximize the capabilities of one force to counterbalance the vulnerabilities of the other.

Command and Control

Chapter II provides an overview of the C2 system, principles of C2, and responsibilities for C2 commander. It describes the C2 organizations and facilities and C2 communications architecture of both the division ready brigade (DRB) and MEF (FWD). It recommends tactics, techniques, and procedures that are available for the joint force and subordinate commanders and staffs to C2 forces during integrated operations. Specific topical discussions include: command relationships, organization of forces, liaison, communications, and fratricide prevention.

Intelligence

Chapter III addresses intelligence support of integrated Army-Marine Corps operations. It highlights selected intelligence terms and defines the responsibilities of the various intelligence organizations that support the joint force and describes intelligence organizations and systems of the DRB and MEF (FWD). Service intelligence and electronic warfare (IEW) doctrine, organizations, and systems provide significant degrees of compatibility and interoperability. An integrated approach to IEW support to integrated operations builds upon the strengths and similarities of service IEW operations and organizations. The intelligence cycle described in Joint Pub 2-O, *Joint Doctrine for Intelligence Support to Operations,* and service intelligence doctrine provides a common framework for addressing these issues as

they apply to Army and Marine Corps IEW operations. The chapter uses the cycle functions of *plan and direct, collect, process, produce, and disseminate* as the basis for planning and executing integrated Army/Marine Corps IEW operations.

Maneuver

Chapter IV defines maneuver at the operational and tactical levels of war and describes a joint Army-Marine Corps perspective on maneuver. It focuses on maneuver from the DRB and MEF (FWD) perspectives and includes a discussion of maneuver from an integrated vantage point. Specific topics include: AMCI complementary operational capabilities, tactical planning considerations, recommended employment options, and a recapitulation of major weapons systems and aircraft assigned to the DRB and MEF (FWD).

Fire Support

Chapter V defines fire support and describes DRB and MEF (FWD) fire support operations. It discusses diverging service perspectives on fire support and selected fire support coordinating measures and presents fire support tactics, techniques, and procedures to support integrated combat operations. Specific topical discussions include: task organizing artillery assets, characteristics of MEF (FWD) and DRB artillery, counterfire operations, Multiple Launch Rocket System support of USMC operations, close air support operations, naval air support, and artillery communications.

Engineer Operations

Chapter VI describes engineer support to combat operations. It establishes common terminology and addresses DRB and MEF (FWD) engineer C2 and organizations and equipment respectively. It also offers an integrated approach to planning and executing those operations by cross-walking the engineering capabilities of DRB and MEF (FWD) engineers regarding four common primary engineering functions of mobility, countermobility, survivability, and general engineering. Planning considerations for integrated operations are addressed and required engineer reporting procedures are established.

Aviation

Chapter VII familiarizes commanders and staffs on the mission, capabilities, limitations, C2, and planning factors for employment of respective service aviation organizations. It describes the Army's and the Marine Corps' concepts, organizations, and C2 of their aviation assets, and defines the operational and augmentation requirements when employed with either the DRB or in support of USMC forces.

Air and Missile Defense

Chapter VIII addresses joint force air and missile defense operations. It provides the basis for a common lexicon and details operations from Army and Marine Corps perspectives respectively. The chapter also offers an integrated approach to planning and executing joint air defense operations.

Logistics

Chapter IX defines authority and responsibilities for, and control of, logistics within and supporting the joint force. It describes DRB and MEF (FWD) logistics organizations and operations and includes a discussion of integrated logistics operations using the six logistics functions as the framework (supply, maintenance, health services, transportation, services, and general engineering).

PROGRAM PARTICIPANTS

The following commands and agencies participated in the development of this publication:

Commander, Naval Doctrine Command, Norfolk Naval Base, Norfolk, VA

US Air Force Doctrine Center, Langley AFB, VA

US Army Air Defense Artillery School, Fort Bliss, TX

US Army Armor School, Fort Knox, KY

US Army Aviation Center, Fort Rucker, AL

US Army Combined Arms Command, Fort Leavenworth, KS

US Army Combined Arms Support Command, Fort Lee, VA

US Army Engineer School, Fort Leonard Wood, MO

US Army Field Artillery School, Fort Sill, OK

US Army Health Services Command, Fort Sam Houston, TX

US Army Infantry School, Fort Benning, GA

US Army Intelligence Center, Fort Huachuca, AZ

US Army Signal Center, Fort Gordon, GA

US Army Training and Doctrine Command, Fort Monroe, VA

US Atlantic Command, Norfolk Naval Base, Norfolk, VA

US Marine Corps Combat Development Command, Marine Base Quantico, VA

PREFACE

1. Scope

This unclassified publication addresses the *hows* of Army-Marine Corps Integration (AMCI) in joint operations. It describes the capabilities and limitations of selected Army and Marine Corps units and provides methodologies in the form of tactics, techniques, and procedures (TTP) for the integrated employment of those units in a joint warfighting environment. This publication has been prepared under the direction of the commander, United States Army Training and Doctrine Command and the commanding general, Marine Corps Combat Development Command for use by United States Army (USA) and United States Marine Corps (USMC) forces.

2. Purpose

This publication provides a single-source reference detailing multiservice TTP for planning and executing joint operations between USA and USMC forces.

3. Application

This publication applies to the operating forces of the Army and Marine Corps. It provides multiservice information for integration of Army and Marine Corps forces. Although the focus of the publication is at the joint force and component levels, it has application for planning and warfighting personnel at all echelons.

4. Implementation Plan

Participating service command offices of primary responsibility (OPRs) will review this publication, validate the information, and reference and incorporate it in service manuals, regulations, and curricula as follows:

Army. The Army will incorporate the procedures in this publication in US Army doctrinal and training publications as directed by the commander, US Army Training and Doctrine Command. Distribution is in accordance with DA Form 12-1lE.

Marine Corps. The Marine Corps will incorporate the procedures in this publication in US Marine Corps doctrinal and training publications as directed by the commanding general, US Marine Corps Combat Development Command. Distribution is in accordance with MCPDS.

5. User Information

a. The TRADOC-MCCDC-NDC-ACC Air Land Sea Application (ALSA) Center developed this publication with the joint participation of the approving service commands. ALSA will review and update this publication as necessary.

b. We encourage recommended changes for improving this publication. Key comments to specific pages and paragraphs and provide a rationale for each recommendation. Send comments and recommendations to—

Commander
US Army Training and Doctrine Command
ATTN: ATDO-J (Director)
Fort Monroe, VA 23651-5000
DSN 680-3153 COMM (804) 727-3153

Commanding General
US Marine Corps Combat Development Command
ATTN: C42 (Director)
3300 Russell Road
Quantico, VA 22134-5001
DSN 278-3608 COMM (703) 784-3363

ALSA Center
ATTN: Director
114 Andrews Street
Langley Air Force Base, VA 23665-2785
DSN 574-5934 COMM (804) 764-5934
E-mail Address: direct@alsa.langley.af.mil

c. This publication reflects current joint and service doctrine, command and control organizations, facilities, personnel, responsibilities, and procedures. Changes in service protocol, appropriately reflected in joint and service publications, will likewise be incorporated in revisions to this document.

Chapter 1

ORGANIZATION AND FUNDAMENTALS

> "The nature of modern warfare demands that we fight as a team.... Effectively integrated joint forces expose no weak points or seams to enemy action, while they rapidly and efficiently find and attack enemy weak points... "
>
> Joint Pub 1, Joint Warfare of the Armed Forces of the United States

1. Background

Given the expanse of options available to joint planners in task-organizing Army and Marine Corps forces, this publication provides two "base cases" for a common framework discussion. These two cases focus on the command and control (C2) of a notional Army brigade by a Marine expeditionary force (MEF) and the C2 of a notional Marine expeditionary force (forward) (MEF FWD) by an Army corps.

a. Army Division Ready Brigade. The Army division ready brigade (DRB) serves as the centerpiece for the discussions that follow. The rationale for using the DRB is threefold: a DRB will likely be the initial mechanized force deployed in a contingency situation requiring a mechanized capability; DRBs are ideally suited to deploy and linkup with Army equipment prepositioned both afloat and in the Central Command area of responsibility (AOR); and DRBs feature unique capabilities that complement United States Marine Corps (USMC) capabilities, as evidenced by the attachment of an armored brigade to a MEF during Operations Desert Shield and Desert Storm. The DRB can assume many different forms; throughout this text it refers to a tailored, early-deploying armor-heavy force that features a range of operational capabilities. See Appendix A, United States Army Corps, for an overview of other Army forces that may employ with USMC forces.

b. MEF (FWD). As the USMC focus of discussion, the MEF (FWD) affords a joint force commander (JFC) exceptional operational flexibility in planning and executing joint operations. See Appendix B, Marine Air-Ground Task Forces (MAGTFs), for an overview of USMC forces that may employ with Army forces.

2. United States Army (USA) Corps

The corps is the largest tactical unit in the USA. Designed to conduct operations at the tactical or operational levels of war, the corps normally fights as part of a larger joint or multinational force within the context of campaigns or major operations. See Appendix A and Field Manual (FM) 100-15, *Corps Operations,* for further information.

a. Composition. Corps differ in size and composition. Depending on the preponderance of armored, mechanized, or light infantry combat units, a corps can be characterized as heavy light, or mixed. Corps are tailored for the specific requirements of the mission. Generally, a corps consists of two to five divisions: a corps aviation brigade, corps artillery, a corps support command, and a number of combat, combat support (CS), and combat service support (CSS) units that range in size from companies to brigades.

b. Functions.

(1) The corps plans and conducts operations in concert with other elements of the joint force to achieve campaign or major operations' objective.

(2) The corps provides the C2 structure for the JFC when designated and properly augmented to perform that function.

(3) The corps performs the role of the Army service component commander. The corps may function as the Army forces (ARFOR) headquarters establishing linkages to joint, combined, and interagency organizations, conducting combat and support operations.

(4) The corps integrates available Air Force, Navy, and Marine combat, CS, and CSS into tactical operations, including joint efforts in intelligence, target acquisition, target attack, electronic warfare (EW), suppression of enemy air defenses (SEAD), and logistics.

(5) The corps plans and conducts close, deep, and rear operations.

c. Corps Role in Army-Marine Corps Integration (AMCI). When designated as the joint task force (JTF) or joint force land component commander (JFLCC), the corps commander and staff may exercise C2 of and provide appropriate augmentation to assigned MAGTFs. When directed, the corps provides major combat, CS, or CSS units or other augmentation to USMC control.

3. Army Divisions

The division is the Army's largest "fixed" organization that trains and fights as a tactical team. Army divisions are organized with varying numbers and types of combat, CS, and CSS units. They are classified as armored, mechanized, infantry, light infantry, airborne, or air assault. Normally divisions conduct operations as part of a corps or larger force but are capable of acting independently with appropriate augmentation. Divisional roles in AMCI parallel those of the corps during exceptional circumstances, when the division acts as the higher headquarters for a MAGTF. When subordinate to a MEF, divisional roles mirror those of the Army brigades discussed below. See FM 71-100, *Division Operations,* for further information.

4. Army Heavy DRB

Organized to fight successive battles on any part of the battlefield in conventional, nuclear, or chemical environments, the Army DRB features the mobility, firepower, and survivability needed to destroy enemy forces by fire and maneuver and to disrupt enemy operations by fire.

a. Organization. There is no standard organization for a division ready brigade. Specific composition depends on the strategic setting; nature of the contingency mission; forces available; and mission, enemy, terrain and weather, troops and support available, time available (METT-T) analysis of the particular situation that required the deployment and employment of the brigade. Figure I-1 reflects a notional DRB. The model is not absolute for

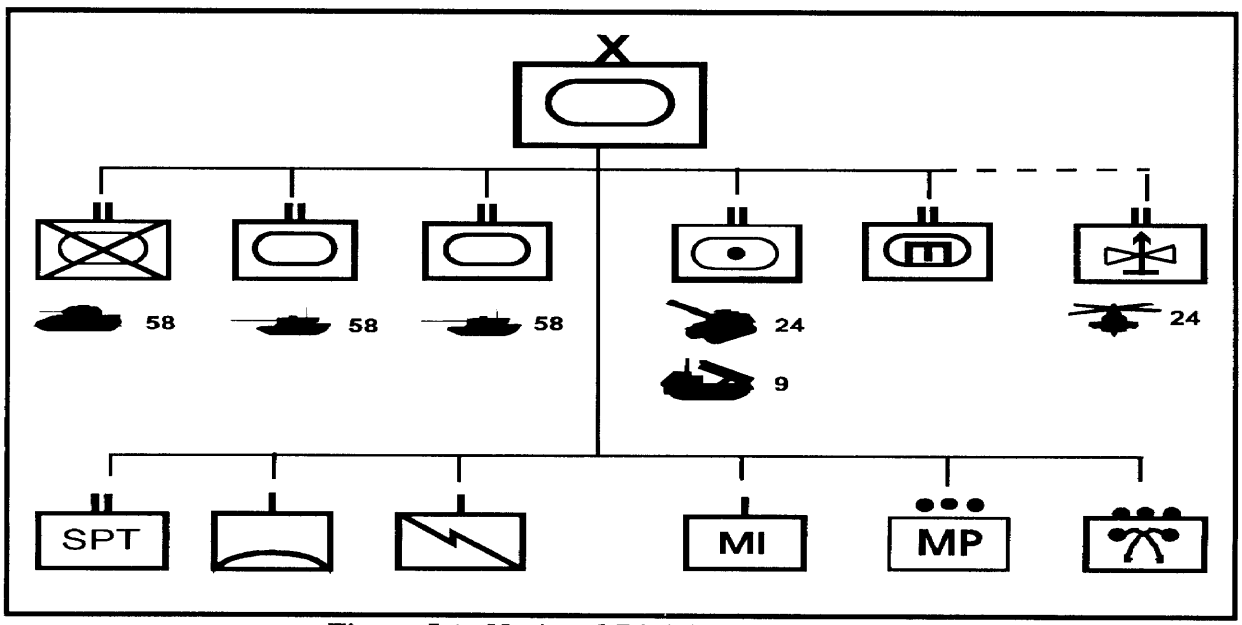


Figure I-1. Notional Division Ready Brigade

the units or types and quantities of weapons portrayed; its function is to serve as a common point of departure for subsequent discussions throughout the publication.

b. Capabilities/Limitations. The DRB accomplishes missions assigned by higher headquarters and conforms to that commander's intent and concept of operation. Although capable of acting independently, the brigade normally conducts operations as part of a larger force. Table I-1 reflects capabilities and limitations of the Army DRB.

5. MAGTF

Marine Corps forces are assigned to the Marine component of the US Atlantic and Pacific Commands. The Marine Corps provides deployable, tailored, and flexible combined arms MAGTFs to supported unified commands as directed by the National Command Authorities (NCA). Traditionally, the size ranges from the most capable MAGTF to a Marine expeditionary unit (MEU) or even to a special purpose (SP) MAGTF. The MAGTF is a MEF composed of one or more divisions, Marine air wings (MAWs), and force service support groups (FSSGs) capable of conducting extended combat operations. The MEU can be a reinforced infantry battalion and a reinforced aircraft squadron capable of executing operations of limited scope and duration. The SP Marine air ground task force (SPMAGTF) is usually a small, task-organized force configured to accomplish missions for which the MEF, MEF (FWD), or MEU are inappropriate. The specific composition of MAGTFs depends upon the requirements of a particular mission, but the basic organization is standard. Each MAGTF consists of a command element (CE), one or more ground combat elements (GCEs), an aviation combat element (ACE), and a combat service support element (CSSE).

a. CE. The CE consists of the MAGTF commander, a general and special staff, headquarters sections, communications, and other service support sections. The GE serves as the focal point for MAGTF operational execution in coordinating and directing the efforts of assigned aviation, ground, and CSSE.

b. GCE. The GCE is task organized around combat and CS units and can range in capability and size from a single reinforced rifle company to one or more reinforced Marine divisions (MARDIVs).

c. ACE. The ACE plans and executes air operations for the MAGTF. Marine aviation functions include air reconnaissance, antiair

Table I-1. Army DRB Capabilities/Limitations Summary

CAPABILITIES	LIMITATIONS
• C2 up to five ground and air maneuver battalions and supporting CS and CSS units • Conduct range of sustained offensive and defensive combat operations • Conduct covering force operations • Conduct security operations • Penetrate enemy forward defenses and rapidly maneuver to operational depths • Combine effects of inherent maneuver speed and firepower to exploit opportunities for decisive action • Pursue and destroy enemy forces • Conduct defensive operations or delay in large sectors • Rapidly conduct linkup operations • Perform as multifunctional reserve • Perform role as breakout/counterattack force in forcible entry operations • Assist breakout of encircled friendly forces	• Mobility restricted by jungles and dense forests, steep and rugged terrain, and significant water obstacles • Brigade consumes significant quantities of Class III, V, and IX supplies • Strategic mobility limited by available air and sea lift • Bridging capability limited • Heavy dependence on radio and digital communications • Significant logistics support required for long administrative ground moves • Capability for dismounted operations limited • Logistics lines of communications (LOC)-dependent and vulnerable to enemy activity • No forcible entry assault capability • No organic aviation assets • Deliberate decontamination capability limited • Airmobile operations capability limited

warfare, assault support, offensive air support, EW, and control of aircraft and missiles. The ACE varies in size from a reinforced helicopter squadron to one or more MAWs. Like the GCE, the ACE is also task organized with appropriate CS and CSS.

d. CSSE. The CSSE is task organized to provide the necessary CSS to accomplish the MAGTF mission. Based on situational requirements, CSSEs vary in size from an expansive force service support group that supports a MEF to the smaller combat service support detachment (CSSD) that would support a MEU.

6. MEF

The MEF, the largest MAGTF, is the Marine Corps' primary warfighting force. Its composition, functions, and roles in integrated operations are described below:

a. Composition. The MEF may consist of one or more MARDIVs, one or more MAWs, and can be more than one FSSG. A MEF (single division/wing/FSSG) features approximately 55,000 Marine Corps and Navy personnel, 300 fixed- and rotary-wing aircraft, 300 combat vehicles, and 72 artillery pieces.

b. Functions.

(1) The MEF commands, controls, directs, plans, and coordinates air and ground operations of joint forces assigned, attached, or under its operational authority to achieve campaign or major operations' objectives.

(2) The MEF provides the C2 structure for the JFC when designated and properly augmented to perform that function.

(3) The MEF functions as the Marine Corps forces (MARFOR) headquarters when so designated.

(4) The MEF integrates available Air Force, Navy, and Army combat, CS, and CSS into tactical operations, including joint efforts in intelligence, target acquisition, target attack, EW, SEAD, and logistics.

(5) The MEF plans and executes amphibious operations in concert with the United States Navy (USN).

c. AMCI Roles. When designated as the JTF commander or JFLCC, the MEF commander and staff may exercise C2 of and provide appropriate augmentation to assigned Army units. When directed, the MEF provides major combat, CS, CSS units or other augmentation to USA control,

7. MEU

Commanded by a colonel, the MEU includes approximately 2500 Marines and sailors. The MEU GCE is normally an infantry battalion landing team (BLT) reinforced with an artillery battery, amphibious assault vehicles, light armored reconnaissance vehicles, and combat engineers, The MEU ACE is a reinforced helicopter squadron, including a mix of attack helicopters; light, medium, and heavy transport helicopters; and vertical/short takeoff landing (V/STOL) attack aircraft. The MEU service support group (MSSG) can provide 15 days of sustainment. MEUs are normally sea-based aboard an amphibious ready group (ARG) and are forward deployed to meet the operational requirements of the commanders of a combatant command (CINCs). MEUs are the most responsive of MAGTFs, MEUs are trained, equipped, and certified as special operations capable before deployment. Because of its size and sustainability, a MEU generally requires reinforcement for extensive and/or extended operations ashore, The MEU is capable of compositing with additional forces, transitioning to a larger MAGTF, or serving as the enabling force to facilitate the introduction of other forces.

8. MEF (FWD)

Given its inherent flexibility, the MEF (FWD) will likely be the force of choice as the initial element to deploy from a MEF. The standing elements of a MEF staff normally form the basis for the CE of a MEF (FWD). MEF CES are structured to command task-organized MAGTFs that provide the required

JFC capabilities. As a result, the numbers and types of units, aircraft, weapons, and total assigned personnel varies. Because of the flexibility described above, the MEF (FWD) is ideally suited for conducting sustained combat operations as part of a larger joint force.

There is no standard organization for a MEF (FWD). Specific composition depends on the same conditions that dictate the task organization of the DRB described earlier. Figure I-2 reflects a notional MEF (FWD). As with the DRB, the model is not absolute for the units or types and quantities of weapons portrayed but designed to serve as a common point of departure for ensuing discussions. The MEF (FWD) shown is formed around a reinforced infantry regiment, an aircraft group, and a supporting brigade service support element. Table I-2 describes the capabilities and limitations of the MEF (FWD).

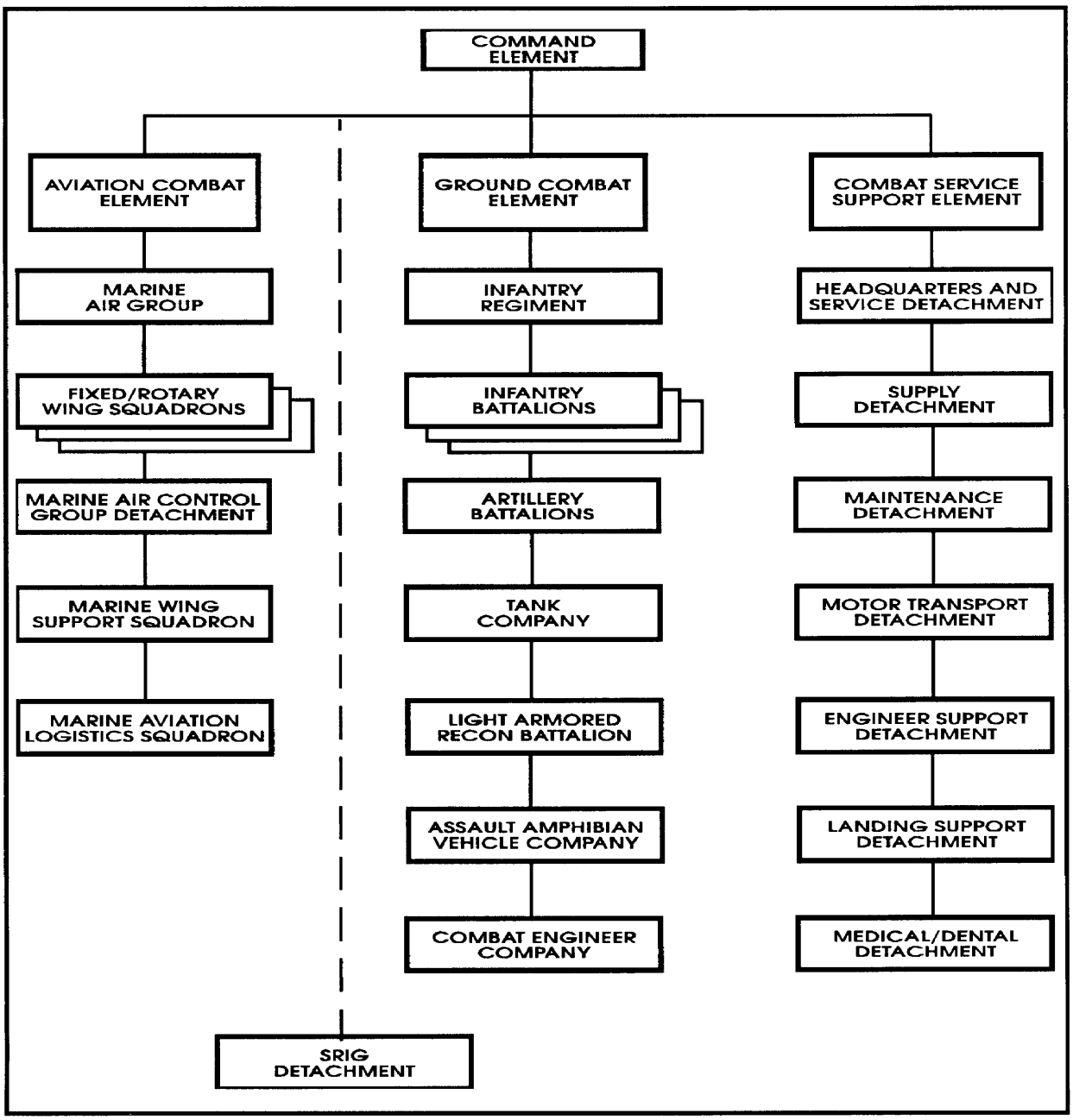


Figure I-2. Notional MEF (FWD) MAGTF

Table I-2. MEF (FWD) Capabilities/Limitations Summary

CAPABILITIES	LIMITATIONS
• C2 several maneuver battalions, a supporting MAW, and associated combat and CSS units • Conduct amphibious assaults, raids, demonstrations, or withdrawals • Seize advanced operating bases • Conduct vertical assaults and envelopments • Conduct sustained combat operations ashore as part of a larger force to achieve campaign or major operations' objectives • Provide close and deep air support and aerial reconnaissance • Achieve local air superiority to support ground operations • Provide aviation assault support • Conduct EW • Conduct dismounted operations in all geographic environs • Conduct mounted operations urban terrain • Coordinate naval support of ground operations • Conduct military operations other than war	• Limited ground capability to counter extensive enemy armor threat • Limited numbers of ground mobility assets constrain tactical mobility • Limited capability to conduct mounted ground maneuver operations • Limited protection and decontamination capabilities in nuclear, biological, and chemical (NBC) environments • Limited indirect counterfire capability • Limited bridging capabilities

9. Fundamentals of AMCI Operations

The basic principle for effectively integrating and employing USA and USMC forces as a joint warfighting team is to maximize the capabilities of one force to counterbalance the vulnerabilities of the other. To achieve that end, requirements for additional external forces and assets must be identified and resourced; command relationships must be established; and the force must be task organized for operational planning and execution.

10. Augmentation Requirements

In some circumstances, the DRB and the MEF (FWD) may fight in the configurations depicted in Figures I-1 and I-2 respectively. In most cases, however, both forces require augmentation to conduct sustained combat operations. The augmentation matrix found in Table I-3 provides a summary of some of the augmentation the DRB may require to operate as part of a MEF. The table also identifies potential sources for the required augmentation assets. Table I-4 provides similar data for the MEF (FWD) when it operates as part of an Army corps. The tables illustrate rather than prescribe; specific requirements are situation dependent. Augmentation requirements are addressed in greater detail in succeeding functionally focused chapters.

11. Command Relationships

A JFC organizes forces based on the mission assigned; objectives and guidance from higher headquarters; and capabilities and strength of the component forces assigned. In the case of AMCI operations, the JFC determines the basis on which subordinate commanders exercise command. Also, the JFC assigns and clearly defines responsibilities and scopes of authority in the directives that establish subordinate commands.

Table I-3. Army DRB External Augmentation Requirements

TYPE AUGMENTATION		FROM USMC	FROM USA
C2	Liaison	X	X
	Communications	X	X
	Military police		X
	Civil affairs	X	X
INTEL	Long range recon	X	X
	Intelligence and electronic warfare (IEW)	X	X
	Communications	X	X
MANEUVER	Combat forces	X	X
FIRE SUPPORT	Multiple Launch Rocket System (MLRS)		X
	EW	X	X
	Target acquisition	X	X
	Naval gunfire spotters	X	
MOBILITY/SURVIVABILITY	Combat engineers	X	X
	Bridging		X
	Chemical		X
AVIATION	Air support (fixed)	X	
	Air support (rotary)	X	X
	Maneuver (rotary)	X	X
AIR DEFENSE	SHORAD/HIMAD	X	X
	C2	X	X
LOGISTICS	Class III operations		X
	Class V operations		X
	Medical support	X	X
	Maintenance		X
	Transport (truck)		X
	Personnel		X
	Terminal operations	X	X
MORTUARY AFFAIRS			X
PSYCHOLOGICAL OPERATIONS			X

Table I-4. MEF (FWD) External Augmentation Requirements

TYPE AUGMENTATION		FROM USMC	FROM USA
C2	Liaison	X	X
	Communications	X	X
	Military police	X	
	Civil affairs		X
INTEL	Long range recon	X	X
	Communications	X	X
MANEUVER	Combat forces	X	X
FIRE SUPPORT	MLRS		X
	IEW/Target acquisition	X	X
	Naval gunfire spotters	X	
MOBILITY/COUNTERMOBILITY	Combat engineers	X	X
	Bridging		X
	Chemical		X
AVIATION	Air support (fixed)	X	
	Air support (rotary)	X	X
	Maneuver (rotary)	X	X
AIR DEFENSE	SHORAD/HIMAD	X	X
	C2		X
LOGISTICS	Class III operations		X
	Class V operations		X
	Medical support	X	X
	Maintenance		X
	Transport (truck)		X
	Personnel	X	
	Terminal operations	X	X
MORTUARY AFFAIRS			X
PSYCHOLOGICAL OPERATIONS			X

Chapter II

COMMAND AND CONTROL

1. Background

This chapter provides an overview of the C2 system, principles of C2, and responsibilities for C2 communications. It also describes the C2 organizations and facilities and C2 communications architecture of both the DRB and MEF (FWD). It concludes with a detailed discussion of techniques and procedures that facilitate the C2 of the joint force.

2. Terminology

The joint lexicon features a variety of terms and acronyms that define the concept of C2. Throughout ensuing discussions, *"command"* refers to the JFC's vested authority as defined in Joint Pub 1-02, *Department of Defense Dictionary of Military and Associated Terms.* C2 indicates the process that JFCs use to plan, direct, coordinate, and control forces to accomplish assigned missions. C2 system; command, control and communications (C3) system; or command, control, communications, and computer (C4) system consist of those integrated systems of doctrine, procedures, organizations, personnel, equipment, facilities, and communications that support the JFC's C2 of the joint force.

3. C2 System

An effective C2 system—

a. Provides the JFC accurate, timely information for developing feasible courses of action and making logical decisions.

b. Translates the JFC's decisions into plans and orders.

c. Communicates those plans and orders to subordinates.

d. Supervises the execution of plans and orders.

e. Communicates subordinate requirements to higher authorities.

4. Principles of C2

The basis for C2 of integrated Army-Marine forces proceeds from the JFC's application of the following principles:

a. Clear command relationships.

b. Assignment of missions and tasks consistent with the capabilities of the respective AMCI forces.

c. Missions and tasks simply stated and to the point.

d. Missions, tasks, and resources in reasonable balance.

e. Functional responsibilities for all players in the C2 process clearly defined.

f. Continuous coordination among staff elements and with the JFC.

g. Essential elements of information integrated into information management and communications systems.

h. Detailed plans prepared for both combat operations and for transitions from combat to other military operations.

5. C2 Communications

C2 communications encompass the means by which the command transmits and receives information and orders. The JFC must understand the capabilities, limitations, and vulnerabilities of the communications systems supporting and operating within the joint force. Communications planning must accommodate potential collateral interference from friendly units as well as interference from

enemy forces that use the same electromagnetic spectrum and the effects of terrain and atmospheric conditions.

a. Service Responsibilities. Service C2 responsibilities normally parallel other command relationships and assigned responsibilities. With regard to specific C2 responsibilities, services—

(1) Provide, operate, and maintain the C2 facilities organic to their own tactical forces, including organic service elements.

(2) Provide, operate, and maintain terminal equipment on defense communications system access circuits, circuits required for communications with elements of other services, and associated circuit facilities that may be assigned or mutually agreed.

(3) Provide, operate, and maintain interoperable and compatible C2 systems for distress, disaster, emergency, and safety as directed by proper authority.

b. Joint Force Responsibilities. The JFC defines specific communications related responsibilities for elements of the joint force. Typical responsibilities for establishing and maintaining communications include—

(1) Senior to Subordinate. A senior unit establishes and maintains communications with subordinate units, including attachments of any size.

(2) Supporting to Supported. A supporting unit establishes communications with the supported unit.

(3) Reinforcing to Reinforced. A reinforcing unit establishes communications with the reinforced unit.

(4) Passing to Passed. In a forward passage of lines, the passing unit establishes communications with the passed (in-place) unit.

(5) Passed to Passing. In a rearward passage of lines, the passed (in-place) unit establishes communications with the passing unit.

(6) Lateral Communications. Responsibility for establishing lateral communications between adjacent units may be fixed by the next higher commander or by standing operating procedures (SOP). When responsibility is not fixed by orders, commanders establish communications on a spatial basis from left to right and from the rear forward.

6. Army C2

The Army's perspective on the C2 of forces centers on a conceptual framework known as *battle command.* Battle command embodies the art of decisionmaking, leading, and motivating soldiers and their organizations to accomplish mission and includes the components of both command and control.

a. Decisionmaking. The Army ascribes to a systematic tactical decisionmaking process described in FM 101-5, *Staff Organization and Operations,* and in the US Army Command and General Staff College's, *The Tactical Decisionmaking Process.*

b. Command. In exercising battle command, the commander envisions the actions over time and space that will achieve the desired end state. During the fight, the commander makes adjustments to create or exploit opportunities and selects the critical time and place to act to achieve decisive results.

c. Control. Unlike the art of command, control reflects an empirical approach to warfighting that falls largely within the purview of staffs. Control implies the science of computing requirements to fight and sustain the battle, identifying variances from initial calculations, correcting deviations from guidance, and measuring, analyzing, and reporting performance. The ultimate

objective of control is to provide the commander with the systems and tools needed to command the force.

7. Army Tactical C2 System (ATCCS)

a. ATCCS is an integrated, ground mobile, and fixed deployable network of common hardware and software for echelons at corps and below. Its purpose is to assist commanders and their staff to obtain a near real-time access to command critical information requirements (task organization, maneuver, engineer, NBC, signal, Army airspace C2, fire support, air defense, intelligence and electronic warfare (IEW), CSS, resources, and enemy situation) through a force level database.

b. The ATCCS architecture includes five constituent battlefield functions analysis systems:

(1) The Maneuver Control System (MCS) is the primary automated decision support/information system supporting the tactical commander and staff. The MCS provides the functional applications necessary to access and manipulate the force level information (FLI) database to satisfy all stated commander's critical information requirements (CCIR) for a specific operation, to effect timely control of current combat operations (deep, close, and rear), and to effectively develop and distribute plans and estimates in support of future operations.

(2) The All Source Analysis System (ASAS) is the intelligence and EW component of the ATCCS. It is a mobile, tactically deployable, computer-assisted intelligence and EW, analysis, reporting, and technical control system. ASAS receives and rapidly processes large volumes of combat information and sensor reports from all sources to provide timely and accurate targeting information, intelligence products, and threat alerts such as collection management, intelligence processing and reporting, high value/high payoff target processing and nominations, and communications processing and interfacing.

(3) The Forward Area Air Defense Command, Control, Communications, and Intelligence (FAAD C3I) System provides the automated interface between the Forward Area Air Defense System (FAADS) and the C2 nodes within the ATCCS. Functional applications include—

(a) Alerting supported field forces of impending air action.

(b) Providing hostile aircraft cueing to forward area air defense (FAAD) units.

(c) Providing rapid dissemination and acknowledgment of air battle management information.

(d) Providing exchange, processing, and display of air defense command information.

(e) Providing an automated decision support for the planning, coordinating, controlling, and executing of air defense support.

(4) The Combat Service Support Control System (CSSCS) provides critical, timely, integrated, and accurate automated logistical information to include all classes of supply and combat health support (CHS), personnel and movement information to CSS, maneuver, theater commanders, and logistic and special staffs.

(5) The Advanced Field Artillery Tactical Data System (AFATDS) provides automated decision support for the fire support (FS) function, to include joint and combined fires. The AFATDS provides a fully integrated FS C3 system, giving the FS coordinator automated support for planning, coordinating, controlling, and executing close support, counterfire, interdiction, and SEAD systems. AFATDS performs all the FS operational functions, to include automated allocation and distribution of fires based on target value analysis.

8. DRB C2 Organization and Facilities

The DRB commander commands and controls the brigade through an echeloned organizational structure that includes the command group, tactical command post (TAC CP), main CP, and rear CP. Tables II-1 through II-4 describe the functions and characteristics of each of these organizations.

a. Command Group. The DRB command group consists of the commander and staff deemed necessary to help command and control the fight. Personnel typically include the intelligence staff officer (S2), operations staff officer (S3), fire support coordinator (FSCOORD), and air liaison officer (ALO). METT-T may dictate inclusion of the brigade engineer, air defense officer, aviation officer, subordinate commanders, or special staff officers. Because the command group fights the battle from the location of the commander, it is a small, highly mobile organization that displaces with the ebb and flow of the tactical situation.

b. TAC CP. The TAC CP conducts ongoing close operations. The TAC CP provides the commander with a small staff composed of S2, S3, fire support, ALO, aviation, air defense, and other personnel as required. The TAC CP operates well forward in the DRB's area of operations (AO), typically within several kilometers of the forward edge of the battle area (FEBA) or forward line of own troops (FLOT), depending on the situation. It affords the commander the capabilities of exercising C2 over the DRB and planning close operations.

c. Main CP. The main CP or tactical operations center (TOC) provide continuity for DRB operations by synchronizing the entire C2 system. The main CP monitors the close fight, plans future operations, conducts deep operations, and coordinates combat, CS, and CSS requirements to support ongoing and future operations. The main CP includes current operations, plans, intelligence, fire support, communications, and Army airspace command and control (A2C2) sections.

d. Rear CP. The rear CP sustains the force during current operations, forecasts future CSS requirements, and conducts rear operations. The personnel or manpower staff officer (S1) controls the rear CP and normally collocates with the forward support battalion (FSB) CP in the brigade support area.

Table II-1. DRB Command Group Functions and Characteristics

PRIMARY FUNCTIONS	• Influence the battle • Issue planning guidance • Conduct ongoing close operations • Disseminate the commander's intent
CHARACTERISTICS	• Comprised of DRB commander and selected personnel • Led by commander • Small size affords reduced physical and electronic signatures • Can relocate to any position on battlefield • Communicates on move

Table II-2. DRB Tactical CP Functions and Characteristics

PRIMARY FUNCTIONS	• Controls ongoing close operations • Provides the commander with combat critical information • Maintains current close operations situation • Disseminates the commander's decisions
CHARACTERISTICS	• Positioned forward in brigade AO • Operates in mounted or dismounted modes • Organized as a single, cohesive cell • Small, highly mobile • Comparatively low electronic signature to provide security • Controlled by brigade S3

Table II-3. DRB Main CP Functions and Characteristics

PRIMARY FUNCTIONS	• Assists the brigade and task force • Plans future operations • Coordinates operations throughout the depth of the AO • Synchronizes CS and CSS assets as directed by the BDE CDR • Executes planned deep attacks • Monitors the close fight • Fights rear operations • Keeps higher headquarters informed • Coordinates with adjacent units • Maintains continuous operations for extended periods • Assumes C2 of close operations if the TAC CP is destroyed
CHARACTERISTICS	• Organized by functional cells • Operates in mounted or dismounted modes • Positioned in brigade rear area • Controlled by brigade executive officer

Table II-4. DRB Rear CP Functions and Characteristics

PRIMARY FUNCTIONS	• Tracks current battle • Sustains current deep and close operations • Forecasts future CSS requirements • Conducts detailed CSS planning • Serves as the entry point for units entering the brigade rear area • Coordinates with the FSB CP (collocate)
CHARACTERISTICS	• Positioned in brigade support area • Collocates with forward support battalion • Operates in mounted or dismounted modes

9. DRB Communications Architecture

Two sources provide communications support for the DRB: the communications platoon organic to the brigade headquarters and a signal section provided by the parent divisional signal battalion.

a. DRB Communications Platoon. Table II-5 describes the capabilities arid limitations of the communications platoon organic to the DRB's headquarters and headquarters company (HHC).

b. Signal Section. A signal section that is nonorganic and resourced from divisional assets also provides communications support to the DRB. The section augments the capabilities of the brigade signal platoon and provides the DRB access and connectivity into the MSE network. Table II-6 describes the capabilities and limitations of the signal section.

Table II-5. DRB Signal Platoon Capabilities/Limitations Summary

CAPABILITIES	LIMITATIONS
• Provide FM radio net control communications • Install, operate, and maintain internal wire communications • Install, operate, and maintain FM radio retransmission to higher HQ • Install, operate, and maintain IHFR communications • Provide tactical facsimile (FAX) capability • Manage COMSEC material • Provide local area network (LAN) management and connectivity into the wide area network (WAN)	• No mobile subscriber equipment (MSE) capability • Limited ability to establish external connectivity • Limited communications redundancy and equipment

Table II-6. DRB Signal Section Capabilities/Limitations Summary

CAPABILITIES	LIMITATIONS
• Provide secure long haul multichannel tactical satellite (TACSAT) communications connectivity into higher HQ communications network • Provide secure net radio interface into the MSE network • Provide MSE automated switching service to network subscribers • Install and maintain MSE network for the DRB • Install, operate, and maintain secure SC TACSAT communications • Provide remote access unit (RAU) coverage sufficient to support the DRB force	• Cannot support full range of MEF MSE requirements • Increased requirement to logistically support additional signal assets

10. USMC C2 Philosophy

To defeat the enemy, the MAGTF's decision and execution cycle must be faster than the enemy's. Therefore, the ultimate objective of Marine Corps C2 is to achieve unity of effort and increase the tempo of operations. Unity of effort and tempo integrate maneuver, firepower, and sustainment to generate the decisive combat power required by Marine warfare doctrine. An increased tempo of operations requires shorter decision cycles and the need to decentralize the command structure:

a. Maneuver warfare requires subordinate commanders make decisions on their own based on their understanding of the commander's intent. Individual initiative and responsibility are of paramount importance.

b. C2 is decentralized, flexible, and dynamic.

c. Mission orders and plans are brief and their execution relies on the judgment and initiative of subordinate commanders.

In MAGTF operations, the commander determines which tasks need personal supervision during the execution of orders and the priority of each task. Control is implemented through deputy MAGTF commanders and staffs. Reconnaissance generally pulls the MAGTF (recon pull) and allows it to exploit enemy weaknesses quickly in order to shatter morale and physical cohesion.

11. MEF (FWD) C2 Facilities

MEF (FWD) combat operations centers (COCs) are the facilities (e.g., buildings, structures, tents, and vehicles) used by the commander and staff at each echelon to plan, direct, control, and coordinate operations of assigned forces.

a. The Main Echelon. The primary interests of the main echelon are directing current operations and planning future operations. The main COC is organized into two sections: the current operations staff and future operations staff.

(1) Current operations staff—

(a) Supervises mission execution (Army or Marine Corps component operations staff officer [G-3]).

(b) Coordinates combat operations (G-3).

(c) Coordinates required combat/service support (Army or Marine Corps component logistics staff officer [G-4]).

(d) Handles close and deep operations occurring within 12-72 hours (G-3, Army or Marine Corps component intelligence staff officer [G-2]).

(2) Future operations staff—

(a) Plans future, close, and deep operations beyond 72 hours (G-3, Army or Marine Corps component civil affairs staff officer [G-5]).

(b) Coordinates the C2 organization and support system (G-3, Army or Marine Corps component signal staff officer [G-6]).

(c) Monitors continuity of MAGTF operations.

(d) Determines friendly/enemy possible courses of action (G-3, G-2).

(e) Develops execution plans with key decision points and alternate plans (G-3, G-5).

(f) Ensures synchronization of operating systems in operation plans, branches, and sequels (all staff).

b. The Rear Echelon. The rear echelon's primary mission is to provide support to forces conducting combat operations. The rear echelon is located close enough to perform duties without engaging in close combat. The rear COC provides C2 over rear-area security operations, terrain management within the rear area, sustainment operations, control of administrative moves, and other associated functions. The rear echelon is often positioned near major ports, airfields, or telecommunications facilities, or it can remain sea-based.

c. The Tactical Echelon. The primary purpose of the tactical echelon (commonly referred to as the *command group)* is to provide the commander with freedom of movement and the information critical to situational awareness. Typically, the tactical echelon consists of the commander and representatives from the intelligence, operations, and communications staff sections. The tactical echelon must have the mobility and C2 support commensurate with its stated purpose.

12. MEF (FWD) Communications

a. Organization. The organization charged with the overall responsibility of MAGTF C3 is the CE. Just as the other elements of the MAGTF are made up of subordinate units that perform various missions and functions, the CE of a notional MEF (FWD) consists of a number of command support organizations as required, but traditionally include—

(1) A headquarters company.

(2) The general staff sections.

(3) A Surveillance, Reconnaissance, and Intelligence Group (SRIG) detachment (discussed in Chapter III).

(4) A reinforced direct support communications company. The DS communications company of the MEF (FWD) comes from the communications battalion found at the MEF. The company is tasked organized to support the functions discussed later.

b. Functions. The elements of the MEF (FWD) must be supported with communications resources whether afloat or ashore. When sea-based, the Navy amphibious task force provides termination into the Naval Telecommunications System (NTS). When ashore, the MEF (FWD) provides entry into the NTS or the Defense Communications System (DCS). Table II-7 shows communications capabilities and limitations associated with the DS communications company assigned to the MEF (FWD) CE.

Table II-7. MEF (FWD) DS Communications Company (Reinforced) Capabilities/Limitations Summary

CAPABILITIES	LIMITATIONS
• Provides CE with SC (VHF, HF, UHF) portable and mobile radio sets, to include SC UHF SATCOM (AN/PSC-3) • Provides CE multichannel (LOS UHF, SHF, and SHF SATCOM) connectivity to subordinates and higher units as part of the communications network. (AN/TRC-170, MRC-142, AN/TSC-85/93) • Provides CE with internal wire, telephones, and phone switching systems (digital and analog), to include STU-III, DSVT, DNVT, AN/TTC-42, SB-3865 and SB-3614 • Provides CE with an AUTODIN entry capability, to include stand alone GENSER and DSSCS personnel computers and follow on possibility of a message center (AN/MSC-63) • Provides CE with a tactical FAX (UXC-7A) capable of radio or wire interface • Provides CE with a secure E-mail to subordinate units using a Banyan Vines LAN. LAN includes direct server to server and dial up capabilities • Provides CE with DCS and or NTS access (DSCS, FLTSATCOM, or HF DCS entry) with (AN/TSC-85, AN/TSC-96, or AN/TSC-120)	• Limited numbers of SC UHF SATCOM radios • Cannot directly connect to MSE network via a SEN, due to signaling format difference. DTGs can only be established between ULCS (AN/TTC-42, SB-3865) and MSE switches (AN/TTC-47/48/39D) using CCIS trunks at NSC and LEN points of entry • Limited communications repair capabilities • Limited communications redundancy in equipment and personnel

Note:
AUTODIN - automatic digital network
CCIS - Common Channel Interswitch Signaling
DCS - Defense Communications System
DSSCS - Defense Special Security Communications System
DNVT - digital nonsecure voice terminal
DSVT - digital subsciber voice terminal
DTG - date time group
FLTSATCOM - fleet satellite communications
GENSER- general service
HF - high frequency
LEN - large extension node
LOS - line of sight
SATCOM - satellite communications
SC - single channel
SEN - small extension node
SHF - super high frequency
STU-III - secure telephone unit III
ULCS - unit level circuit switches
UHF - ultra high frequency
VHF - very high frequency

13. Command Relationships

In general, JFCs establish any of four basic command relationships to facilitate their C2 of the joint force. These include *operational control (OPCON), tactical control (TACON), support, or attachment* as discussed below:

a. OPCON. OPCON may be exercised at any echelon at or below the level of the combatant command. OPCON is inherent in combatant command (COCOM) 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. OPCON includes authoritative direction over all aspects of military operations and joint training necessary to accomplish assigned missions.

(1) OPCON is normally exercised through service component commanders. OPCON in and of itself does not include authoritative direction for logistics or matter of administration, discipline, internal organization, or unit training. OPCON does include the authority to delineate functional responsibilities and geographic AORs of subordinate commanders.

(2) OPCON is also exercised by functional component commanders over assigned and attached forces and other forces as established by JFCs.

b. TACON. TACON may be exercised by commanders at any echelon at or below the level of combatant command. TACON is the detailed and usually local direction and control of movements or maneuvers necessary to accomplish assigned missions or tasks. TACON provides sufficient authority for controlling and directing the application of force or tactical use of combat support assets. TACON does not provide for administrative and logistic support; the commander of the parent unit continues to exercise those responsibilities unless otherwise specified in the establishing directive. TACON is typically exercised by functional component commanders over military capability or forces made available for tasking that are not assigned or attached to the functional component.

c. Support.

(1) A support relationship is established by a superior commander between subordinate commanders when one organization should aid, protect, complement, or sustain another force. The National Command Authorities (NCA) establish such relationships between combatant commanders when deployment and execution orders are issued to ensure the combatant commander tasked to achieve national objectives receives the support needed from other combatant commanders. JFCs may establish support relationships within the joint force to enhance unity of effort for given operational tasks, emphasize or clarify priorities, provide a subordinate with an additional capability, or combine the effects of similar assets.

(a) Mutual Support. Mutual support is the action that units render each other against an enemy because of their assigned tasks, position relative to each other and to the enemy, and inherent capabilities.

(b) General Support. General support is the action that is given to the supported force as a whole rather than to a particular subdivision thereof

(c) Direct Support. Direct support is a mission requiring a force to support another specific force's request for assistance.

(d) Close Support. Close support is the action of the supporting force against targets or objectives that are sufficiently near the supported force as to require detailed integration or coordination of the supporting action with fire, movement, or other actions of the supported force.

(2) Establishing supported arid supporting relationships between components is a useful option to accomplish needed tasks. For example, some naval operations, when conducted to enable or enhance air and land operations, can dramatically increase the successes achieved by the supported forces. This concept applies equally to all dimensions of the joint force. Each subordinate element of the joint force can be supported by other elements.

(3) As defined in Joint Pub 0-2, *Unified Action Armed Forces (UNAAF), "Unless limited by the establishing directive, the commander of the supported force will have the authority to exercise general direction of the supporting effort."* General direction includes the designation of targets or objectives, timing, duration of the supporting action, and other instructions necessary for coordination and efficiency. The supporting commander has the responsibility to ascertain the needs of the supported commander and take such action to fulfill them within existing capabilities, consistent with priorities and requirements of other assigned tasks.

(4) The establishing directive indicates the purpose in terms of the effect desired and the scope of the action to be taken. It should include—

(a) The strength of forces allocated to the supporting mission.

(b) The time, place, and duration of the supporting effort.

(c) The priority of the supporting mission relative to the other missions of the supporting force.

(d) The authority, if any, of the supporting force to depart from its supporting mission in the event of exceptional opportunity or an emergency.

(e) The general or special authority for any operational or other instructions to be issued by the forces being supported or by other authority in the action areas.

d. Attachment. Attachment is the temporary placement of a unit into another organization. Subject to limitations placed by the attachment order, the receiving commander has the same degree of C2 and the same responsibilities for logistics and administration over the unit(s) received as over organic units. The attachment order should specify the supply and maintenance requirements in terms of what the receiving and parent unit(s) will provide.

14. **Organization of Forces**

Once the JFC has established command relationships at the joint force level, the receiving MEF or corps commander may exercise several options in organizing their forces. In addition to the recommended options described below, the JFC may also elect to establish TACON or support relationships in organizing the joint force.

a. Army DRB to MEF Control. Regarding establishing a command relationship between an Army DRB and the MEF, three recommended options exist for the MEF commander designated as JFC:

(1) Attach the brigade to the MEF for employment by the MEF commander as a separate ground combat element.

(2) Attach or provide the brigade OPCON to the MEF GCE commander as a separate maneuver force.

(3) Attach or provide the brigade OPCON to a designated MARDIV to be employed within that division commander's scheme of maneuver. In a multidivision MEF, the MEF commander may act as the GCE commander or may designate a subordinate MARDIV commander as the GCE commander.

b. MEF (FWD) to Army Control. Based on authority prescribed in governing directives and METT-T analysis, the Army commander designated as the JFC may also exercise three basic options when task organizing the MEF (FWD) with Army forces:

(1) Attach the MEF (FWD) to a corps or echelon above corps (EAC).

(2) Attach the MEF (FWD) to an Army division.

(3) Place the MEF (FWD) OPCON to an Army division.

c. Transfer of Units. Army and Marine Corps forces are structured to operate most efficiently using service doctrine and TTP. However, there will be situations where circumstances dictate the need to transfer units at levels below the DRB or MEF (FWD) in order to optimize the capabilities of the joint force and accomplish the mission. *Desert Storm* offers one such example:

Historical Perspective:
Army-Marine Corps Integration During OPERATION DESERT STORM

"At the peak of the fight, the Brigade had 5500 soldiers under its command. I had our three battalions: 3-41 Infantry, 1-67 Armor, and 3-67 Armor. I also had Marine light armor infantry cavalry squadron [sic], the 1-3 Field Artillery, a reinforcing Marine battalion, the 502d Support Battalion, 142 Signal Battalion, A Company, 17th Engineers plus another Marine engineer company, and B Battery, 4th Battalion, 5th Air Defense Artillery from 1st Cav. I think that's all, but it was quite an operation...."

Colonel John Sylvester
Commander, "Tiger Brigade"

15. Liaison

Liaison requirements are specifically discussed in detail because of their importance in contributing to successful integrated operations and reducing instances of fratricide. To be effective, liaison teams must be properly trained, planned for, and integrated into all major headquarters' elements. In joint operations, robust liaison has provided critical linkage between supported, supporting, and adjacent commands and has contributed to the success of those operations. Liaison provides current expertise and representation for critical planning, coordination, and execution. (See Tables II-8 through II-11.)

a. Types of Liaison. The two types of liaisons are command and staff liaisons. Command liaison can enhance command relationships more effectively than a reliance on official communications alone. Staff liaison is essential for integrating, coordinating, and executing operations. Liaison may be performed by a single Marine or soldier or, if appropriate, a team with appropriate administrative and communications support.

b. Duties. Liaison officers (LNOs) advise the sending and receiving commanders. The sending commander is assisted in determining requirements, priorities, and required allocations. The receiving commander is advised on capabilities and doctrine/tactics of the sending command. The status of the sending and receiving commands is monitored to maintain a basis for advising. LNOs act as a 2-way conduit to coordinate and facilitate the flow of support and information between commands.

c. AMCI Liaison Requirements. Commanders must ensure their liaison teams are adequately manned and equipped to execute 24-hour operations and can communicate with their parent elements. The following tables provide recommended liaison exchanges between Army and Marine units during AMCI operations.

Table II-8. Liaison Requirements from DRB to MEF

FUNCTION	DRB to MEF
C2	• To GCE (command liaison)
	• To GCE (G-6 liaison)
INTEL	• To CE SRIG
	• To GCE G-2
MANEUVER	• To GCE G-3
	• To adjacent units as required
FIRE SUPPORT	• To force fires coordination center (FFCC) and senior fire support coordination center (FSCC)
ENGINEER	• To MAGTF engineer
AVIATION	• To ACE
	• To GCE G-3 air
AIR DEFENSE	• To ACE
	• To GCE G-3 air
LOGISTICS	• To FSSG
	• To GCE G-4

Table II-9. Liaison Requirements from MEF to DRB

FUNCTION	MEF to DRB
C2	• To BDE signal officer
INTEL	• To DS MI company as required
MANEUVER	• Lateral exchange as required
FIRE SUPPORT	• To BDE TAC fire support element (FSE) • To main FSE
ENGINEER	• To BDE Main CP
AVIATION	• To BDE TAC • FACs to maneuver battalions as required
AIR DEFENSE	• To BDE main CP
LOGISTICS	• To rear CP forward support battalion (FSB)

Table II-10. Liaison Requirements from MEF (FWD) to Corps

FUNCTION	MEF (FWD) to CORPS
C2	• To corps G-6
INTEL	• To joint intelligence center (JIC)/corps G-2
MANEUVER	• Lateral exchange as required
FIRE SUPPORT	• To Corps FSE • To maneuver units as required
ENGINEER	• To Corps engineer BDE CP
AVIATION	• To Corps operations (G-3 air) • To maneuver units as required
AIR DEFENSE	• To G-3 air
LOGISTICS	• To corps support group
	• To corps G-4

Table II-11. Liaison Requirements from Corps to MEF (FWD)

FUNCTION	CORPS to MEF (FWD)
C2	• To Command (CMD) group
	• To MEF (FWD) G-6
INTEL	• To SRIG
MANEUVER	• Lateral exchange as required
FIRE SUPPORT	• To FFCC and senior FSCC
ENGINEER	• To MEF (FWD) engineer
AVIATION	• To ACE
	• To CE G-3 air
AIR DEFENSE	• To ACE
LOGISTICS	• To FSSG (FWD)
	• To MEF (FWD) G-4

16. AMCI Communications

In order to C2 forces effectively, the commander and staff rely on a communications system that facilitates the passing of information among echelons quickly and accurately, in both secure and nonsecure modes. At the brigade/ regiment level and below, the Army and the Marine Corps use similar equipment (see Table II-12). Communications challenges include interoperability issues, communications procedures, and com - munications security (COMSEC).

Table II-12. Typical Communications Systems Available from Marine Corps DS Comm Co (Reinforced) and DRB Signal Section

EQUIPMENT	MAGTF* (MEF FWD) DIRECT SUPPORT COMM CO	DRB
COMBAT NET RADIO (CNR)/ SINGLE-CHANNEL RADIO (SCR)	MRC-145- (4) PRC-119- (25) VRC-88- (2) PRC-113- (4)	**SINCGARS - PRC- 119, VRC-88, 89, 90, 91, and 92
SWITCHING	TTC-42- (1) SB 3865- (3) SB 3614- (3)	MSE - TTC-47, TTC-48
MESSAGE CENTER	MSC 63A- (1)	
COMSEC	VINSON KY-57 ANDVT KY-99 PACKHILL KY-65A DLED KG-84C	VINSON, DSVT, KY-99
TACTICAL FAX	UXC-7A- (3)	UXC-7A/B
TELEPHONES	DNVT- TA-1042 and 954 DSVT- KY-68 ANALOG- TA-312, 838 and STU-III	DNVT - TA-1042, DSVT - KY-68 ANALOG- TA-312, TA-838, TA-1035 STU-III
MULTICHANNEL	TRC-170 V3- (4) MRC-142- (10)	
UHF TACSAT	MRC-140- (2) PSC-3 -(6) AN/TSC-96- (1)	MST-20 PSC-3
SHF MULTICHANNEL GMF SAT	TSC-93- (2)	AN/TSC-85, AN/TSC-93
HF	MRC-138- (12) PRC-104- (4) AN/TSC-120- (1)	AN/GRC-193, PRC-104
NAVIGATIONAL AIDS MSE	GPS w/GCE	EPLRS NCS (2), SEN (8), RAU (2), R-RAU (2)

* Includes systems from elements of the MAGTF Comm Bn.
** Single-channel Ground and Airborne Radio System (SINCGARS) and VRC-12 types of equipment numbers are the same depending if SINCGARS fielding is complete.

a. Interoperability. USMC and Army units use SC FM radios to communicate at lower unit levels. Both services make use of UHF tactical satellite (UHF TACSAT), although the Marine Corps has fewer TACSAT assets than the Army. The Army employs MSE extensively and when operating with Marine Corps units should consider providing MSE to Marine units at critical interface points. Experience, including that of the "*Tiger Brigade*" working with Marine forces during the Gulf War, has shown that providing MSE to the DRB in addition to SC communications greatly enhances C2 during integrated operations. One technique, as recommended in the Army's white paper on armor support to the Marine Corps, is to augment the DRB with a signal communications company (-) from the division signal battalion to provide MSE connectivity between the TOC and brigade support area (BSA) and their MAGTF counterparts.

b. Communications Procedures and Considerations.

(1) Planning. During this phase, coordination between Army and Marine forces with respect to communications is imperative. Procedural planning coordination deconflicts interoperability problems that may prevent initial C2 effectiveness. Both services have procedures and equipment that are peculiar to their organizations. Discussed below are interoperability-specific procedures that assist in effective C2 execution:

(a) "UHF Voice SATCOM. Upon arrival in the AOR, the DRB or MEF (FWD) should activate the higher headquarters (HHQ) or JTF (MEF or Army Corps) SC SATCOM circuits. The DRB or MEF (FWD) should bring SC SATCOM assets for internal and external uses. Intertheater Communications Security Packages (ICPs) are required. The satellite access authorization message will assign 5 or 25 kilohertz (kHz) channels.

(b) HF Voice. Upon arrival in the AOR, the DRB or MEF (FWD) should activate the HHQ (MEF or Army Corps) SC HF circuits. The DRB or MEF (FWD) should bring mobile and portable equipment for internal and external uses. Use KY-99s and ICP COMSEC. Frequencies and call signs are assigned in accordance with (IAW) the operation plan in concept format (CONPLAN) or JTF joint communications-electronic operating instructions (JCEOI)/ joint signal operating instructions (JSOI).

(c) UHF/VHF Voice. Upon arrival in the AOR, the DRB or MEF (FWD) should activate the HHQ (MEF or Army Corps) SC UHF/VHF circuits. The DRB or MEF (FWD) should bring mobile and portable equipment for internal and external uses. Use ICP COMSEC. Frequencies and call signs are assigned IAW the CONPLAN or JTF JCEOI/ JSOI.

(d) SINCGARS. Upon arrival in the AOR, the DRB or MEF (FWD) activates the HHQ or JTF SINCGARS circuits. ICP trunk encryption key (TEK), transmission security key (TSK), and hopsets are required. The NET IDs are IAW the CONPLAN or JCEOI/JSOI. If ICP TSK and hopsets are not available, the HHQ or JTF must send the DRB or MEF (FWD) a data transfer device (CYZ-1O) for direct transfer of SINCGARS FH data; complete a file transfer with the FH data via a secure means such as a STU-III; and physically transport the file/disk.

(e) Transmission Systems and Telephone Switched Networks. Use SC radio communications throughout the operation between Army and Marine units; however, major subordinate command staffs use telephones to accomplish most coordination. Although interoperable, the Tri-service Tactical Communications Program (TRI-TAC) unit level circuit switches (ULCS) employed by Marine units (SB-3865/TTC-42) and the MSE employed by the Army (TTC-46/47/48/39D) require planners to employ specific techniques and procedures to overcome equipment incompatibilities.

• The first planning consideration is the trunk group data rate used by MSE and ULCS. ULCS will support both modulo 8 (256/512 kilobits per second [kbps]) and 9 (288/576 kbps) trunk group rates. MSE will only support modulo 8 rates. Additionally, the Marine Corps MRC-142 UHF LOS multichannel radio will transmit only CX-11230 modulo 9 trunk groups.

• The second planning consideration is the interswitch trunk signaling formats utilized by MSE and ULCS. Both use the CCIS format between large and medium switches (TTC-39, 42, 46, 47) but use different forms of digital in-band interswitch trunk signaling (DIBITS) to small switches (TTC-48, SB-3865). ULCS cannot directly connect to a SEN (TTC-48). The TTC-42 can directly connect to a TCC-39D, TTC-46, or TTC-47. The SB-3865 can directly connect only to a TTC-42 or TTC-39D.

• The third planning consideration is the type of transmission path used for the interswitch trunk. In addition to the limitation of the MRC-142 modulo 9 trunk rate, greatly modulated frequency (GMF) satellite (AN/TSC-85/93) will not receive a call from MSE if there is a terrestrial link. At present, the flood search routing utilized by the MSE switches precludes the use of a GMF and terrestrial path simultaneously. This is due to a time delay encountered by MSE flood search calls over GMF paths that causes a call to be routed over terrestrial paths. When fielded, the circuit switch task execution plan (TEP) will reduce the impact of this limitation by allowing MSE switches to direct calls down GMF paths. However, once a terrestrial path is established, the GMF path will not be used by MSE originated calls and will serve only ULCS originated calls.

• The fourth planning consideration is the number of area codes utilized to support the telephone switched network. Presently both MSE and ULCS equipment pose limitations on the employment of area codes. The MSE switches are capable of crossing the area code boundary between the ULCS (TRI-TAC) and MSE networks to one gateway switch. In order to connect the MSE network to another UCLS switch, the system requires that the second UCLS switch be in a separate area code. The TTC-42 (UCLS) is only capable of being programmed to accommodate its own area code and two others. With MSE, UCLS, and defense switched network (DSN) each being in separate area codes, this is a critical limitation. The TEP will help alleviate this concern by allowing UCLS and MSE switches to reside within the same area code.

(2) Although there are many ways to accommodate the planning considerations listed, the techniques described below can be employed quickly to provide telephone service between Army and Marine units:

(a) During the initial phases of an operation, Marines can establish a MRC-142 link to the Army and provide long local telephone service using remote multiplayer combiner (RMC) and DSVT/DNVT telephones.

(b) The Army can provide a LOS radio link to the Marines and provide long locals from the MSC network.

(c) A TRC-170 link can be established between Army and Marine units using the TD-1235 to provide long local service in both directions. This will be particularly useful when the ULCS switch is the SB-3865 that cannot directly be connected to the MSE SEN, LEN, or net control station (NCS).

(d) If the TTC-42 is employed by the Marines and the Army employs a NCS, LEN, or TTC-39, an interswitch CCIS trunk group can be established directly between switches.

(e) If Marine units are operating within LOS distance of an Army remote access unit (RAU), the Army can provide mobile subscriber radio terminals (MSRTs) to the Marines.

c. Communications Security. Marine battalions and regiments have COMSEC accounts but generally have only Marine/ Navy versions of COMSEC software. Battalions and regiments do not hold joint software packages like the ICP; however, these packages are available at the MAGTF GE. Consequently, the receiving organization (corps or MEF) must provide applicable COMSEC software and subsequent *"fills"* throughout the duration of the AMCI operation. This may necessitate the acquisition of COMSEC materials above the normal holdings of the receiving force.

17. Fratricide Prevention

Given the complexity inherent in combat operations in general and in integrated operations in particular, commanders at all levels must consciously and deliberately reduce the potential for fratricide. Specific measures for implementation include but are not limited to—

a. Development and disciplined use of common operational graphics and associated control and fire support coordination measures (FSCM) throughout the joint force.

b. Development and disciplined use of an equipment marking system effective during all visibility conditions.

c. Guidance and restrictions governing the authority, use, reporting, marking, and clearing of mines and munitions with high submunition dud rates.

d. Policy regarding naval surface fire support during amphibious operations to ensure safety of amphibious shipping and joint forces operating in the amphibious objective area (AOA).

e. Policy regarding use of special munitions and fuses (e.g., variable time fuse).

f. Weapons employment restrictions.

g. Target identification and engagement criteria.

h. Prohibited targets.

i. Implementation of positive clearance of fire procedures for indirect fire systems and positive identification of ground targets before engagement by air crews.

The primary mechanisms for minimizing the risk of fratricide are disciplined execution of operational plans and SOP; close vertical and horizontal coordination among components and subordinate forces and echelons of the joint force; and acute individual and collective situational awareness.

Chapter III

INTELLIGENCE

1. Background

At the operational level of war, the joint intelligence system concentrates on the collection, identification, location, and analysis of strategic and operational centers of gravity that, if successfully attacked, will achieve joint force objectives. At both the operational and tactical levels, intelligence provides the basis for planning, synchronizing, and conducting joint force operations.

2. Terminology

Joint Pubs 1-02 and 2.0, *Doctrine for Intelligence Support to Joint Operations*, define the key terms and concepts that serve as the foundation for discussion throughout this text. Key terms and concepts include *intelligence operations, intelligence system,* and *intelligence preparation of battlespace (IPB).*

a. Intelligence Operations. Intelligence operations are the variety of intelligence tasks carried out by various intelligence organizations and activities. Predominantly, it refers to either intelligence collection or intelligence production activities of the intelligence cycle. When used in the context of intelligence collection activities, intelligence operations refer to collection, processing, exploitation, and reporting of information. When used in the context of intelligence production activities, it refers to collation, integration, interpretation, and analysis, leading to dissemination of a finished product. The concept for intelligence operations, tailored for the operational mission, results in the availability of all-source intelligence that supports JFC and subordinate commander decisionmaking.

b. Intelligence System. Intelligence system is any formal or informal system for managing data collection, obtaining, processing, and interpreting data to provide reasoned judgments to decisionmakers.

c. IPB. IPB is an analytical methodology employed to reduce uncertainties concerning the enemy, environment, and terrain for all types of operations. IPB builds an extensive database for each potential area where a unit may be required to operate. The database is then analyzed to determine the impact of the enemy, environment, and terrain on operations and presents it in graphic form. IPB is also referred to as *"Intelligence Preparation of the Battlefield"* in Army doctrinal publications.

3. Intelligence Responsibilities

The following discussion highlights intelligence responsibilities for the respective intelligence organizations of the joint force:

a. Senior Intelligence Organization. The senior intelligence organization—

(1) Establishes plans, policies, and overall requirements for the intelligence activities of the command.

(2) Ensures interoperability and responsiveness of intelligence structure.

(3) Articulates, reviews, and monitors intelligence priorities.

(4) Provides subordinate commands with a single, coordinated intelligence picture by fusing available intelligence into all-source estimates and assessments.

(5) Coordinates the intelligence plans and operations of subordinate commanders.

(6) Coordinates the collection plan and employment of joint force collection assets.

(7) Identifies/requests external assistance for intelligence resource shortfalls critical to accomplishing assigned missions.

(8) Establishes and supervises intelligence liaison, coordination, and communications requirements with subordinate, lateral, superior, and national intelligence organizations as appropriate.

(9) Prescribes intelligence security requirements for the entire force.

b. Subordinate Command Intelligence Organizations. Subordinate command intelligence organizations collect, process, produce, and disseminate intelligence to support respective commanders in the employment of their forces to accomplish assigned missions. Within their assigned AO, subordinate command intelligence organizations—

(1) Assess threat capabilities and provide intelligence estimates.

(2) Develop supporting intelligence plans.

(3) Support target development and weaponeering.

(4) Task organic collection assets with special focus on reconnaissance and surveillance operations.

(5) Perform battle damage assessment.

(6) Recommend force protection and counterintelligence measures.

4. DRB Intelligence Operations

DRB intelligence and electronic warfare (IEW) operations provide the commander with the tactical intelligence needed to successfully plan and execute combat operations. The commander uses priority intelligence requirements (PIR) to focus the brigade IEW effort and leverage higher echelons to support decision making and facilitate targeting. IEW operations assist the commander to understand the battlefield, support decisionmaking, and effectively execute combat operations by—

a. Providing indications and warning.

b. Performing intelligence preparation of the battlefield.

c. Performing situation development.

d. Performing target development and supporting targeting.

e. Supporting force protection.

f. Performing battle damage assessment.

See FM 34-1, *Intelligence and Electronic Warfare Operations,* for detailed discussion of Army IEW principles, tasks, and doctrine.

5. DRB IEW Organizations

The DRB is supported by a variety of military intelligence (MI) and non-MI units capable of gathering and reporting information. Non-MI assets include battalion scouts, counterbattery radars, observation posts, and MP patrols. Brigade MI assets consist of a brigade S2 section and a DS MI company from the divisional MI battalion. Additional tactically tailored IEW assets from division, corps, and theater Army MI units can augment the brigade if required to support split-based intelligence operations, provide additional capabilities such as ground-based electronic warfare systems, or support other mission requirements.

a. Brigade Commander. The brigade commander focuses the IEW effort by identifying, clearly articulating, and prioritizing intelligence and targeting requirements. The commander must be responsive to IEW requirements of subordinate commanders and, when necessary, broker those requirements with higher echelons. The commander must

integrate IEW support into the total combined arms effort to effectively accomplish the mission and exploit the full potential of the intelligence system.

b. Brigade S2. The S2 is the commander's senior intelligence officer and principle advisor on the enemy, terrain, and weather. The S2's first and most important responsibility is to provide the intelligence the commander needs for sound and timely decisions. The S2 takes full advantage of intelligence and targeting information available from direct broadcast systems, special purpose intelligence communications, and automated processing systems to meet the commander's requirements. With the staff support, the S2 plans and controls the brigade IEW operation. To synchronize IEW support with the operation and satisfy staff requirements for intelligence, the S2 works closely with other staff elements and supporting MI units.

c. Battlefield Information Coordination Center (BICC). To supply the commander with intelligence and targeting information, the brigade BICC provides the S2 with an organic collection management, analysis, production, and reporting capability. The BICC develops and manages the execution of the brigade reconnaissance and surveillance (R&S) plan. The BICC also reviews subordinate battalion R&S plans, integrates subordinate plans into the brigade plan, and forwards the consolidated R&S plan to the next higher echelon. The BICC maintains current status of all brigade IEW assets, processes incoming intelligence reports, and disseminates information to subordinate elements.

d. Direct Support MI Company. The DS MI company maintains a habitual training and operational relationship with the brigade. The company provides organic automated intelligence processing, enemy prisoner interrogation, counterintelligence, and ground surveillance radar support. Future capabilities will include unmanned aerial vehicle (UAV) control and Joint Surveillance Target Attack Radar System (J-STARS) imagery processing. The comany does not possess organic signal intelligence/ electronic warfare systems; it relies upon higher echelons for this support. The company consists of a headquarters element, an analysis and control team (ACT), and an operations platoon as depicted in Figure III-1.

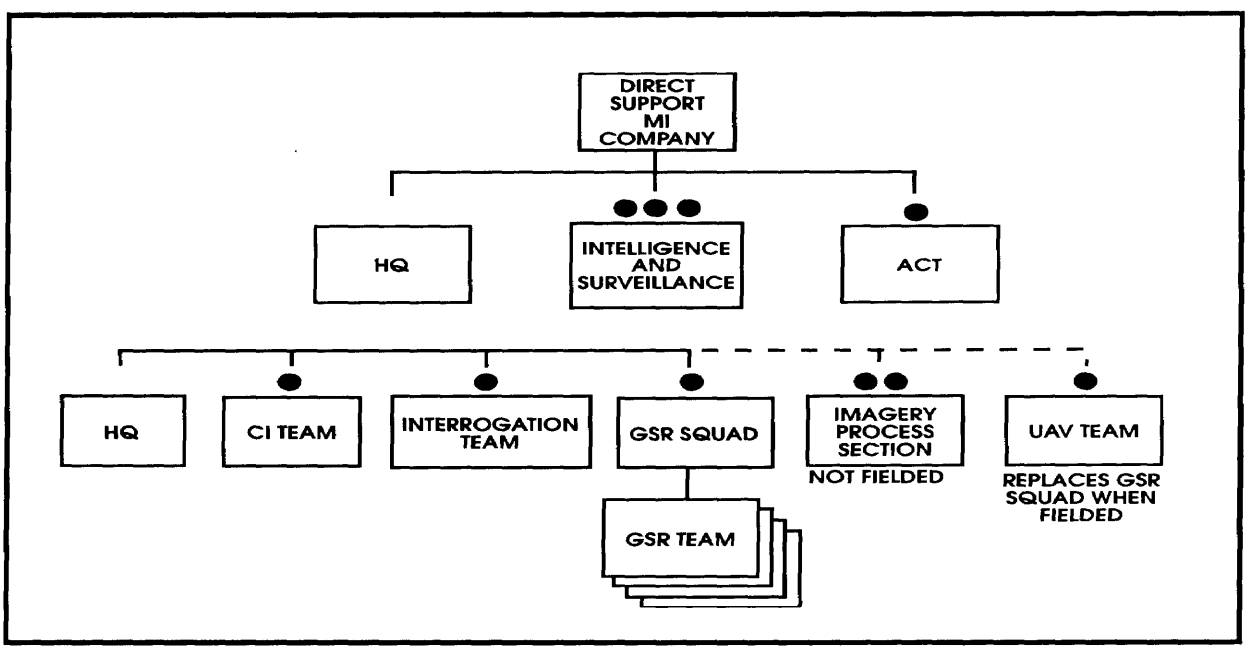


Figure III-1. DRB Direct Support MI Company

The functions of the ACT and operations platoon are—

(1) ACT. The ACT provides the brigade S2 automated intelligence processing, analysis, and dissemination capabilities. Using its ASAS workstation, the ACT provides access to sensitive compartmented information (SCI) databases, reports, graphics, and other intelligence products from higher echelon intelligence organizations such as the division ACE. When augmented with the TROJAN Special Purpose Integrated Remote Intelligence Terminal (SPIRIT), the ACT can support split-based intelligence operations with an intelligence support base located outside the area of operations.

(2) Operations Platoon. The operations platoon provides support and conducts asset management of the company's counterintelligence team, interrogation team, and ground surveillance radar squad. The platoon will possess a UAV section and an imagery processing section when supporting systems are fielded. Table III-1 summarizes the capabilities of the operations platoon.

e. Intelligence Support Base. The division G-2 and MI battalion form the DRB's intelligence support base. The support base is the principle organization in a split-based intelligence operation from which the deployed DRB commander pulls intelligence. It is located in the division garrison or another location outside the AO. The intelligence support base allows the DRB to pull intelligence from its normal intelligence source between the predeployment and operations stages of a force projection operation. This reduces the possibility of intelligence shortfalls that could arise during the deployment phase from reliance on evolving intelligence organizations or relationships. The DRB can continue to receive support from the division ACE in addition to support from intelligence organizations within the theater. Intelligence support from the ACE includes analysis and production of tailored intelligence products; maintaining accessible intelligence databases needed by the DRB; and other intelligence operations that support the DRB. The intelligence support base may also provide the follow-on IEW assets and the deployable intelligence support element (DISE) if the operation involves follow-on Army forces. The intelligence support base complements the theater or JTF intelligence structures; it is not intended to circumvent theater or task force tasking and reporting channels established by the higher echelon Intelligence Director of a joint staff (J-2) or G-2.

6. MEF (FWD) Intelligence Operations

MAGTF intelligence operations provide intelligence support of the decisionmaking processes of the MAGTF commander and subordinate commanders down to the smallest unit level. MAGTF intelligence operations focus on generating tactical intelligence (i.e., intelligence that supports the planning and conduct of tactical operations). Intelligence supports the decisionmaking process by—

Table III-1. DRB Operations Platoon Capabilities

UNIT	CAPABILITY
CI Team (Two 2-man Teams)	Multidiscipline CI (MDCI) analysis, CI operations, and support to force protection
Interrogator-translator (IT) Team	Enemy prisoner of war (EPW) interrogation
UAV Section	UAV-SR control, video display, and tactical identification
Imagery Processing Section	Analysis and dissemination of J-STARS radar imagery

a. Describing the battlespace.

b. Identifying key factors in the battlespace that influence operations.

c. Defining and evaluating the enemy's capabilities.

d. Assessing enemy intentions.

e. Identifying the enemy's center of gravity and critical vulnerabilities.

f. Reducing uncertainty.

Intelligence, operations, and decisionmaking are linked throughout the mission execution cycle. Intelligence shapes the plan and provides the knowledge that facilitates execution. It identifies changes in the situation that modify the plan or trigger decisions during the conduct of the operation. MAGTF intelligence operations satisfy the commander's critical information requirements about the environment and the enemy, facilitate the commander's understanding of the battlespace, identify key enemy vulnerabilities, and enable the planning and execution of successful operations.

7. MEF (FWD) Intelligence Organizations

The MEF (FWD) G-2 section serves as the focal point for MAGTF intelligence operations. The MAGTF G-2 section, supported by a task-organized detachment from the SRIG, provides all-source intelligence support to the MAGTF commander and the major subordinate elements. (Note: MEF intelligence structure is currently undergoing reorganization. In the future, MEF intelligence assets currently assigned to the SRIG may be consolidated in an intelligence battalion. In that case, intelligence and radio battalion detachments vice SRIG detachments would support the MEF [FWD].) In addition, the GCE, ACE, and CSSE all have organic intelligence sections and assets to satisfy their unique intelligence requirements as reflected in Figure III-2.

a. MEF (FWD) G-2 Section. The MEF (FWD) G-2 section plans, coordinates, and integrates intelligence operations. It provides centralized collection, production, and dissemination capabilities for the CE and subordinate elements. In addition, it provides connectivity to national, joint, and supporting force intelligence assets. Figure III-3 depicts the organization of the MEF (FWD) G-2. The intelligence operations branch serves as the focal point for MAGTF intelligence operations. It contains the collections unit, the MAGTF all-source fusion center (MAFC), and the target intelligence unit. During combat operations, the intelligence operations branch staffs the combat information center (CIC). The CIC collocates with the MEF (FWD) COC in the main CP. The CIC receives support from a surveillance and reconnaissance center (SARC) that controls the operations of organic collection assets and from a radio battalion operational control and analysis center (OCAC) that manages SIGINT and ground EW operations. For additional information on MEF G-2 organization and operations see FMFRP 3-28, *Tri-MEF SOP for Field Intelligence Operations.*

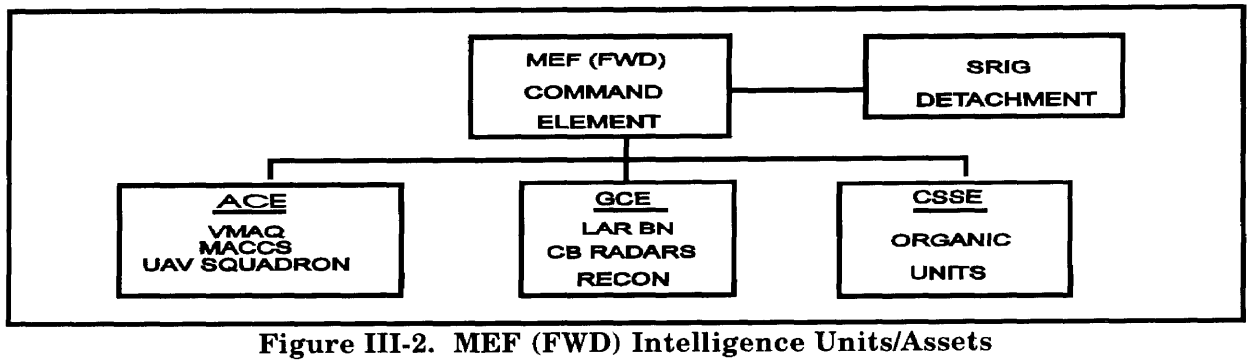


Figure III-2. MEF (FWD) Intelligence Units/Assets

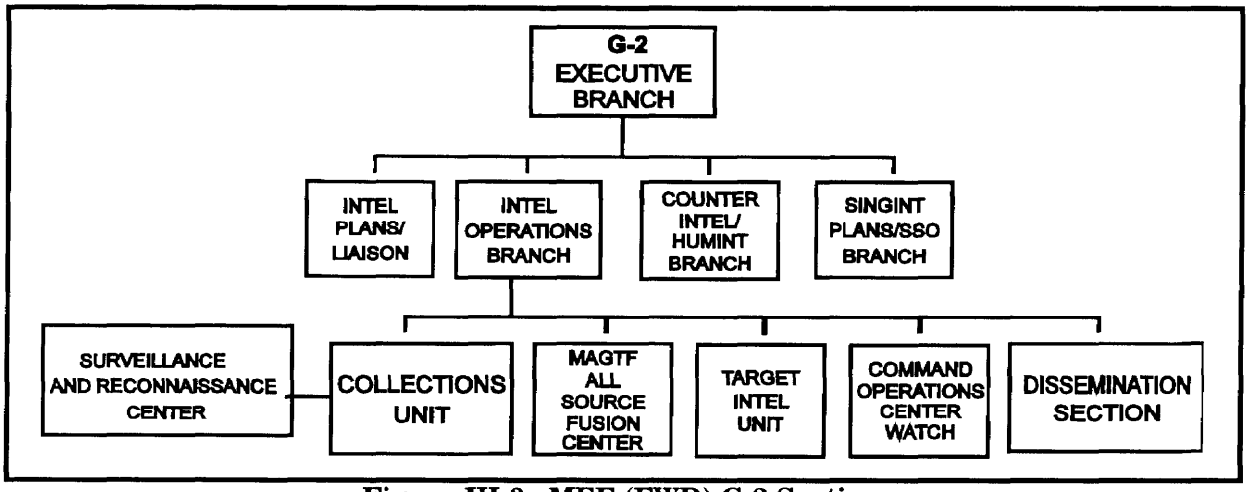


Figure III-3. MEF (FWD) G-2 Section

b. SRIG. The SRIG, depicted in Figure III-4, is organic to a MEF. The SRIG of the parent MEF provides a task-organized detachment to a MEF (FWD). The intelligence assets from the SRIG detachment consist of some or all elements depicted in Table III-2. The table does not reflect the nonintelligence assets of the SRIG detachment to include the air/naval gunfire platoon detachment and the headquarters and service company detachment. In addition, personnel from the SRIG augment the G-2's SARC, automatic frequency control (AFC), and signals intelligence electronic warfare coordination center (SEWCC).

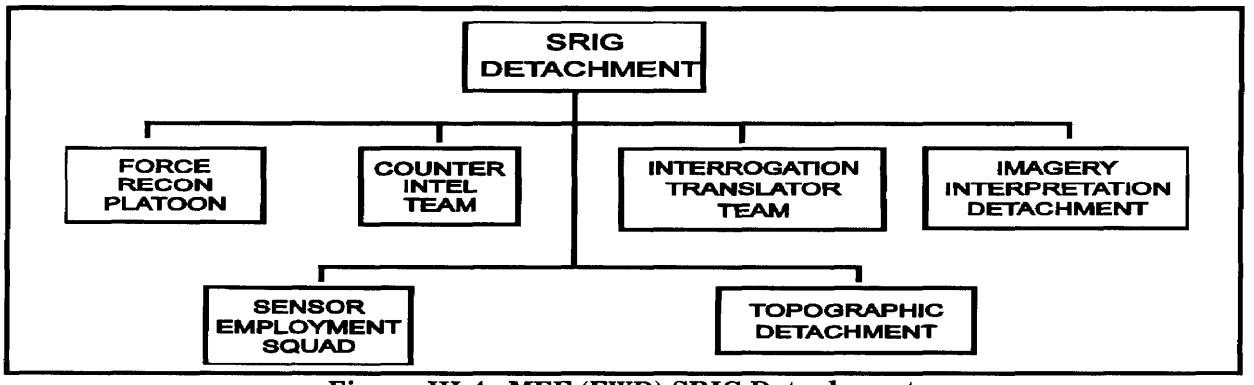


Figure III-4. MEF (FWD) SRIG Detachment

Table III-2. SRIG Intelligence Assets

UNIT	CAPABILITIES	NOTES
Force Reconnaissance Company	Deep ground reconnaissance and surveillance	1 officer/20 enlisted per platoon
Radio Battalion	Ground-based SIGINT and EW COMSEC monitoring	
Force Imagery Interpretation Unit	Imagery interpretation	4-12 interpreters
CI Team	CI and HUMINT operations	5 officers and 9 enlisted specialists per team
IT Unit	Interrogation of EPWs Document translation	8-12 ITs per team
Sensor Control and Management Platoon	Remote ground sensor operations	2 tactical remote sensor systems: 10-12 operators
Topographic Platoon	Geographic intelligence products	1-2 digital terrain analysis and mapping sets; 4-12 analysts

c. GCE. GCE intelligence efforts focus on the planning and execution of ground operations, with particular emphasis on locating, identifying, targeting, and attacking targets of interest to the commander. Organic reconnaissance, surveillance, and target acquisition assets assist this effort. These assets include-

(1) Light armored reconnaissance battalion

(2) Reconnaissance companies and platoons.

(3) Scout/sniper platoons.

(4) Counterbattery radar platoons.

(5) FAC and forward observers.

d. ACE. ACE intelligence operations facilitate friendly air operations and counter enemy air and air defense capabilities. The ACE contributes long-range reconnaissance and surveillance capabilities such as fixed- and rotary-wing aircraft, UAVs, and air surveillance radars.

e. CSSE. CSSE intelligence operations focus on intelligence requirements concerning the terrain, infrastructure, medical threat, and rear-area threat. CSSE subordinate elements provide valuable information on terrain, the transportation network, key facilities, and the indigenous population in the AO.

8. AMCI Intelligence Operations

IEW support to integrated operations builds upon the strengths and similarities of service IEW operations and organizations. The Army and Marine Corps share the common objective of providing the combat commander the intelligence needed to accomplish the mission and conserve fighting strength. Service IEW doctrine, organizations, and systems provide significant degrees of compatibility and interoperability. Effective integration and execution of IEW operations hinge on the clear articulation of service intelligence expectations, capabilities, and limitations. The intelligence cycle described in Joint Pub 2-O and service intelligence doctrine provides a common framework for addressing these issues as they apply to Army and Marine Corps IEW operations.

a. Plan and Direct. Several issues influence effective planning and directing IEW operations. These include-

(1) Liaison. Intelligence liaison is critical to the success of the integrated IEW effort and requires early establishment, particularly between units that have not routinely trained together and possess differing capabilities. As a minimum, liaison teams are exchanged between the MEF or corps G-2 and the subordinate DRB S2 or MEF (FWD) G-2, respectively. If the DRB is subordinate to the MEF GCE, liaison is established between the MEF GCE G-2 and the DRB S2. Additional liaison may be necessary to facilitate joint force collection, production, or dissemination requirements. Liaison teams—

(a) Support planning and control of IEW operations.

(b) Ensure timely two-way flow of critical intelligence between commands.

(c) Broker IEW intelligence and resource requirements of the subordinate command.

(d) Advise the commander on service IEW capabilities, limitations, and employment.

(2) IPB. Commanders and staffs use IPB to understand battlespace and develop operational plans. Both Army and Marine Corps intelligence organizations follow the IPB process as described in FM 34-130, *Intelligence Preparation of the Battlefield.* Some important issues to consider when developing and disseminating IPB products include—

(a) MEF or corps G-2 develops IPB products on the entire battlespace with particular focus to the main effort.

(b) DRB S2 or MEF (FWD) G-2 refines the IPB products provided by the higher echelons to satisfy the requirements of their commanders, staffs, and subordinate elements.

(c) IPB products exchanged between echelons ensure a common picture of the battle space and estimate of the situation.

(3) Intelligence Requirements. The commander's intelligence requirements, concept of operation, and intent drive the intelligence effort. The commander and staff use IPB to identify knowns and unknowns about the enemy, AO, and other factors that influence an operation. The gaps in knowledge identified by the commander and staff become intelligence requirements, The commander designates some of these PIR. Joint Pub 2-0 and FM 34-2, Collection *Management and Synchronization Planning,* discuss how intelligence requirements are generated and the roles they play in directing the intelligence system. Considerations in developing and satisfying intelligence requirements for integrated operations include-

(a) MEF and corps intelligence requirements must support and be sensitive to needs of subordinate commands. For example, the MEF commander may need additional information on the enemy's antiarmor capability against Ml Abrams tanks to support the DRB mission. Similarly, the corps commander may ask for more intelligence on enemy air defense threat to Marine AV-8 Harrier aircraft supporting the MEF (FWD).

(b) Intelligence requirements should address the priority for processing, production, and dissemination as well as collection.

(c) Intelligence requirements are satisfied first by organic assets. Requirements that exceed the capability of organic assets are submitted to higher echelons.

(d) Battle damage assessment requirements must be included and prioritized against the commander's other intelligence requirements.

(4) Additional intelligence planning considerations include—

(a) Planning for intelligence communications transition to facilitate execution of branches or sequels to the plan or to accommodate shifting of the main effort from one force to another.

(b) Identifying and establishing procedures and protocols for information that exchange between processors (databases, text, secondary, imagery, voice, and video).

(c) Identifying databases each service possesses or has access to; determining which database(s) will support the operations, and if necessary, merging them into a single database and ensuring access by the entire force.

(d) Considering balancing availability of service-unique systems or capabilities between echelons or services. This may require the provision of additional resources by each service. Ultimate responsibility for allocating resources rests with the senior commander. Resources and capabilities are distributed based on the needs of the total force. For example, the bulk of Marine radio battalion assets may be committed to support the DRB when the DRB is designated the main effort. Conversely, it may be appropriate to employ the DRB's single J-STARS ground station module (GSM) at the MEF level during a particular phase of the operation.

(e) Providing the focal point for subordinate command access to national or joint intelligence. The senior commander will request and allocate resources required to support this access.

b. Collect. The integrated collection effort must—

(1) Coordinate IEW operations to optimize capabilities of collection assets and reduce duplication of effort.

(2) Integrate supporting national and theater intelligence collection assets into the collection plan.

(3) Establish procedures for tracking and handing off high payoff targets between services and echelons.

(4) Establish procedures for cross-cueing Army and Marine collection assets.

(5) Maximize available linguist capabilities. Shortages of military linguists trained in the target language may require cross-leveling Army and Marine linguists between CI, interrogation, and signal intelligence units of the other service.

Tables III-3 and III-4 portray the collection capabilities for both the DRB and the MEF (FWD) respectively.

c. Process. At the tactical level, processing, and producing intelligence are often indistinguishable. Where processing can be separated, the G-2 or S2 must prioritize by focusing on the needs of the commander. For example, when processing film or transcribing intercepted communications, personnel must understand which portion of the film or recording must be completed first and why.

Table III-3. DRB Collection/EW Capabilities

RESOURCE	NOMINAL RANGE 10km 20km 30km 40km 50km 100km
GROUND RECONNAISSANCE	
SCOUTS/FISTS	
OH-58D*	
RADARS AND SENSORS	
Q36 Radar	
Q37 Radar*	
EH-60*	
HUMINT	
CI Team	N/A
IT Team	N/A
JOINT FORCE SUPPORT	
J-STARS (Ground Station Module)	
Aerial Visual Reconnaissance	

*If deployed with DRB

Table III-4. MEF (FWD) Collection/EW Capabilities

RESOURCE	NOMINAL RANGE 10km 20km 30km 40km 50km 60km
GROUND RECONNAISSANCE	
Force Reconnaissance	(100km)
Light Armored Reconnaissance	
Division/Regt Reconnaissance	
AERIAL VISUAL RECONNAISSANCE	
Manned Aircraft	(300km)
UAV-SR	(100km)
SIGINT/EW	
VMAQ	
Radio Bn	
HUMINT	
CI Team	N/A
IT Team	N/A
RADARS AND SENSORS	
CB Radars	
Tactical Remote Senor System	

d. Produce. The intelligence production effort must—

(1) Establish reporting criteria and thresholds that produce timely and relevant intelligence keyed to the commander's intelligence and targeting requirements. The intelligence synchronization matrix, attack guidance matrix list, and high payoff target list are examples of tools used to support joint targeting efforts,

(2) Establish common methodology and criteria for producing the battle damage assessment and supporting the combat assessment function.

(3) Minimize the number and frequency of periodic reports such as intelligence summaries and reports.

e. Disseminate. The ability to move information and disseminate critical intelligence between commands is essential, The intelligence communications and processing architecture require developing and resourcing before operations begin. Additional communications equipment, intelligence broadcast terminals, and personnel may be required to balance capabilities between services and fully exploit the full potential of IEW systems. Considerations include—

(1) The MEF CE or corps G-2 assumes responsibility for establishing a communications and processing architecture that ensures rapid exchange of critical, time-sensitive intelligence, and targeting information.

(2) To support reporting perishable information of immediate value, the commander establishes communications paths and procedures. For example, to facilitate timely and effective target engagement, long-range reconnaissance reporting of high payoff targets in the enemy rear area or signal intelligence reporting of enemy artillery targeting friendly forces are linked with specific attack systems.

(3) Processing requirements must address interoperability between the Army, Marine Corps, joint, and national intelligence processing systems such as the Army ASAS, Marine Corps Intelligence Analysis System (IAS), Joint World Wide Intelligence Communications System (JWICS), and Joint Deployable Intelligence Support System (JDISS).

(4) Connectivity and capacity must support the flow of SC I and GENSER requirements. These requirements include voice, text, data, and graphic intelligence reports and products.

(5) The JFC must resource and/or allocate limited systems between Army and Marine Corps units; that is, J-STARS GSM, UAV ground control stations (GCSs) and remote video terminals (RVT), Digital Terrain Analysis and Mapping System (DTAMS), Tactical Remote Sensor System Suite, and TROJAN SPIRIT to accomplish operational objectives.

Chapter IV

MANEUVER

"Commanders with a poor understanding of the essence of maneuver; i.e., the union of efforts, prefer, most of all, to divide the area of their maneuver uniformly among their subordinates and demand the same results from all. It is a misfortune to be subordinated to such a 'corridor' commander. **A** *completely opposite picture obtains with a good, efficient leadership ...."*

Mikhail Tukhachevsky

1. Background

Integrated maneuver provides the JFC the opportunity to capitalize on the synergistic effects of a joint force. Specifically, such maneuver forces the enemy to orient combat power against multiple directions and dimensions; permits the rapid shifting of forces to multiple locations as required by the tactical situation; and provides the JFC with flexible, lethal options to shape and fight the battle to achieve joint objectives. Seizing, retaining, and exploiting the initiative through integrated maneuver in either offensive or defensive settings interrupts the enemy's operational maneuver; spoils the timing of tactical operations by forcing an early culmination or diversion of resources; and ultimately creates opportunities for decisive defeat.

2. DRB Ground Maneuver Organizations

A notional DRB's ground maneuver organization may consist of a combination of a mechanized (mech) infantry battalion and 2 tank battalions grouped under the command of the brigade headquarters as described in Chapter II. The brigade's maneuver elements fight the battle by destroying or disrupting enemy forces and seizing and holding terrain. Based on the estimate of the situation and METT-T, the DRB commander task organizes the battalions into mech heavy, tank heavy, or balanced task forces tailored to accomplish specific missions. As a rule, the commander cross-attaches units at the battalion level. This is the lowest level provided a commander and staff with the necessary communications, logistics, and other support to ensure proper command and control of tailored combined arms formations.

a. Mechanized Infantry Battalion. The mech battalion consists of a HHC and four rifle companies as *depicted* in Figure IV-1. All battalion combat vehicles have cross-country mobility and armor protection. Once the battalion is configured as a task force, the task force commander may further task-organize companies into company teams for combat operations.

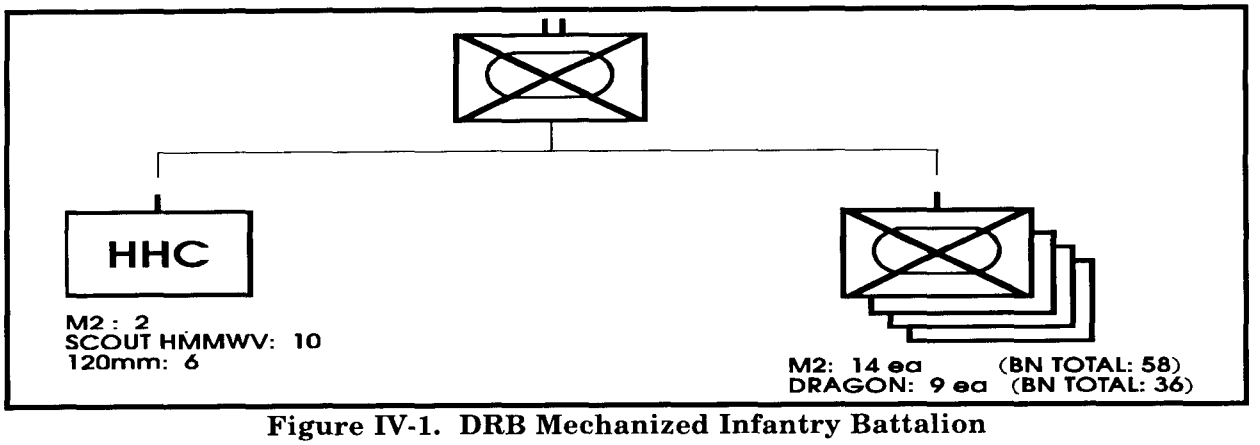


Figure IV-1. DRB Mechanized Infantry Battalion

(1) Rifle Companies. Each of the battalion's 4 rifle companies consist of a company headquarters with 2 M2 Bradley fighting vehicles (BFVs) and 3 rifle platoons of 4 M2s each. The M2 Bradley tube-launched optically-tracked wire-guided (TOW) system and 25mm chain gun combine to provide a significant antiarmor capability as reflected in Table IV-1.

(2) HHC. The HHC contains the staff sections, scouts, heavy mortars, and CSS elements.

(a) Scouts. The scout platoon features 10 high-mobility multipurpose wheeled vehicles (HMMWVs) organized into a command and control section and 4 scout sections consisting of 2 vehicles each. Equipped with electrooptics that enhance reconnaissance and surveillance capabilities, the scouts serve as the TFC's eyes for situation development and awareness. Route, zone, and area reconnaissance and screening missions also assist movement of battalion units and facilitate task force command and control on the battlefield.

(b) Heavy Mortars. The battalion's 6 heavy 120mm mortars reside on the heavy mortar platoon, The platoon consists of a platoon headquarters, 2 M577 command post-mounted fire direction centers, and 2 sections of M120mm mortars of 3 tubes each. The platoon's ability to conduct split-platoon operations greatly enhances the options available to the TFC in providing immediately responsive indirect fires in support of committed companies/teams. (See Table IV-2.)

b. Tank Battalion. The tank battalion consists of a HHC and 4 tank companies as depicted in Figure IV-2. Like the mech battalion, once configured as a task force, the commander may elect to task organize at the company level.

Table IV-1. M2 Bradley Fighting Vehicle Characteristics

# PER UNIT	WEAPONS	MAXIMUM EFFECTIVE RANGE	AMMUNITION ON BOARD	FUEL USE (GAL/HOUR)	CAPACITY (GALLONS)	RANGE (MILES)	MAX SPEED	OVERCOMES OBSTACLES
14 per Mech Infantry Company	TOW	3750	7	Idle: 8.4	175	300	HWY: 41	Vertical Step: 3'
	25mm Chain Gun	APDS:1700 HEI-T:3000	225 675					
	7.62mm Coax MG	900	2340	XCTRY: 18.0			XCTRY: 30	Trench Crossing Width: 8'4"
	Smoke Grenade	30	16	Secondary Roads: 8.6				
	Passive Sight	2000+					Water: 4.5	

Table IV-2. M1064A3 (120mm) Mortar Characteristics

# PER UNIT	WPNS	MAX EFFECTIVE RANGE(M)	AMMUNITION ON BOARD		FUEL USE (GAL/HR)	FUEL (GAL)	RANGE (MILES)	MAX SPEED	OVERCOMES OBSTACLES
6 per HHC Mortar Platoon	120mm Mortar	HE: 7200	48	69	Idle: 1.0	95	300	40	Vertical Steps: 2'
		ILL: 7100	14		XCTRY: 6.2				Trench Crossing Width: 5'6"
		WP: 7200	7		Secondary Roads: 8.9				
	50 Cal	1200-1600	2000						

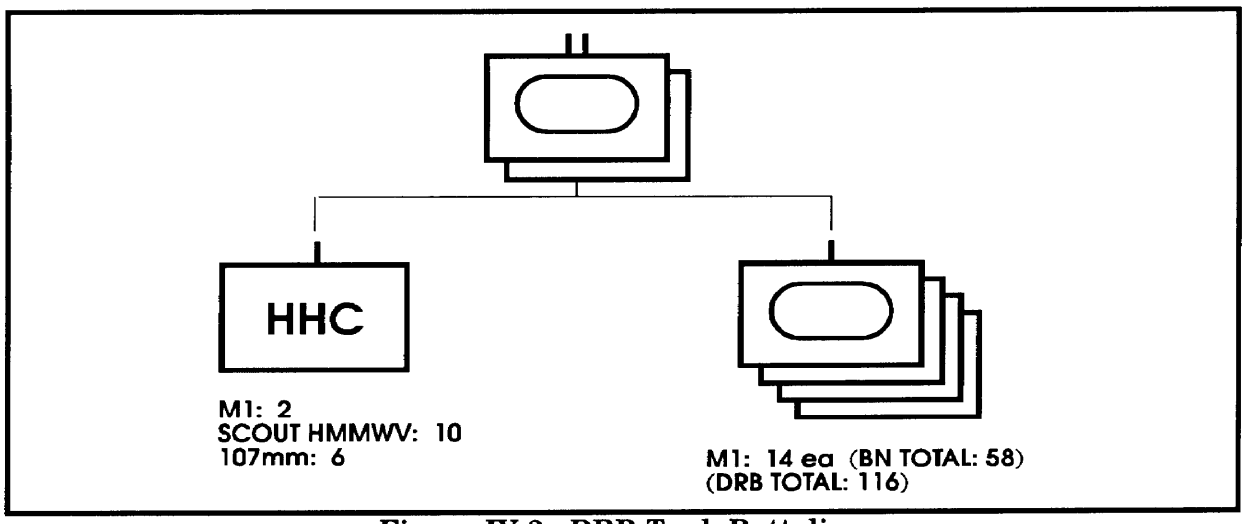


Figure IV-2. DRB Tank Battalion

(1) Tank Company. Each of the battalion's 4 tank companies consist of a company headquarters with 2 M1A1 Abrams tanks and 3 tank platoons with 4 MIs each, for a total of 14 tanks per company. The M1A1 provides the DRB with the optimum antiarmor capability. (See Table IV-3.)

(2) Tank Battalion HHC. The HHC mirrors that found in the mech battalion as described above.

c. Other Supporting Organizations. Although not ground maneuver organizations, the DRB's attached military police (MP) and chemical platoons support brigade operations.

(1) MP Platoon. MP support for the DRB resides in the MP platoon attached to the brigade HHC. The platoon's 4 squads perform the range of MP missions: 1 squad provides security at the brigade's main CP; 1 squad operates the EPW collection point; and the remaining 2 squads conduct battlefield circulation control and area security operations throughout the brigade's rear area; all contribute to law and order operations.

(2) Chemical Platoon. The DRB's attached chemical platoon provides the brigade with chemical reconnaissance support, a smoke generation capability, and the capacity to conduct limited, hasty, and deliberate decontamination operations.

Table IV-3. M1A1 Abrams Tank

# PER UNIT	WEAPONS	MAXIMUM EFFECTIVE RANGE(M)	AMMUNITION ON BOARD	FUEL USE (GAL/HR)	CAPACITY (GALLONS)	RANGE (MILES)	MAX SPEED	OVERCOMES OBSTACLES
14 per Tank Company	120mm	3500	40	Idle: 8.5	504.4	298	HWY: 41.5	Vertical Step: 3'6"
	50 Cal	1200-1600	900	XCTRY: 56.6			XCTRY: 30	
	7.62mm Coax MG	900	11,400					Trench Crossing Width: 9'
	Smoke Grenade	30	24	Secondary Roads: 44.8				
	Thermals	2000+						

3. Maneuver of the DRB

The DRB can execute the range of offensive and defensive operations. The brigade fights by task organizing its ground maneuver battalions into combined arms' task forces that prosecute the close fight. Task forces move, attack, delay, and defend according to the brigade commander's intent and concept of operation. Although focused primarily on the close fight, the brigade can command and control deep operations given aviation and combat support assets. As discussed in Chapter III, the MEF must provide the brigade in-depth intelligence about the enemy so the brigade can exploit enemy weaknesses and maintain the initiative. The brigade performs security operations by assigning tasks to its task forces and by using available augmentation assets such as Army aviation. Task forces employ organic scouts and attached resources for reconnaissance and security missions in support of the task force and brigade commanders. DRB rear operations consist of protecting units behind committed task forces, ensuring continuous combat and CSS, maintaining freedom of movement for uncommitted forces, and securing the brigade command posts and support areas.

a. Tactical Maneuver.

(1) IPB. IPB focuses on the brigades' primary zone and objective area. The brigade IPB must also extend beyond its boundaries given the probability that the brigade will revert to reserve or be directed into an adjacent zone during an operation. IPB must detail lateral routes and cross-country avenues of movement that connect primary approaches. Avenues that parallel main axes also merit consideration for use during meeting engagements and in bypassing enemy defenses.

(2) Maneuver Techniques. Within the zone, the brigade commander concentrates attacks against enemy weaknesses along an avenue that offers rapid access to the objective area. The brigade will not normally clear its zone unless specifically directed. When in contact with an enemy force requiring attack by more than one task force, the brigade employs the task forces as maneuver and base of fire elements. Task forces and uncommitted units remain within supporting distances of each other in brigade formations. Although such mutual support does not require mutual observation, it does mean that the brigade commander must retain the ability to concentrate task forces when and where required. Committed task forces maneuver in zones wide enough to allow them some freedom of action and far enough apart to give the brigade multiple routes of advance. Task forces should be able to mass fires in a single terrain compartment when attacking, acting as the brigade base of fire, or when defending. Uncommitted task forces normally follow the brigade's main attack closely to support within 30 minutes. (See Table IV-4.)

Table IV-4. DRB Maneuver Spacial Requirements

UNIT	OFFENSE (km) (Zone Width)	DEFENSE (km) (Sector Width)
DRB (Main Effort)	5-15	3-15
DRB (Supporting Effort)	5-25	5-25
Task Force (Main Effort)	4-8	4-8
Task Force (Supporting)	4-8	4-8
Brigade Support Area	7 km (Open)	5 km (Restrictive)
Brigade Depth		25-50

(3) Spatial Considerations. Plans officers should assign the DRB a zone of action that contains at least 2 task force size corridors. The zone should contain terrain that allows the TFCs to maneuver their company teams and, at the same time, permit the DRB commander to mass those task forces abreast when required. Ideally, the zones will also contain at least 1 good quality road to support rapid movement of uncommitted units behind lead units and facilitate logistics for sustainment of operational momentum. Table IV-5 provides some general *rules of thumb* for use by planners in allocating terrain to the DRB when developing plans and supporting operational graphics; METT-T will dictate actual employment options.

(4) Control Measures. The brigade uses measures assigned by the MEF to control its operations. Graphical control measures should extend beyond objective areas and to its flanks to facilitate execution of on order or subsequent missions. The DRB augment assigned graphics with task force assembly areas, attack positions, zones, sectors, objectives, axes, battle positions, fire support coordination measures, phase lines, and other control measures as necessary to execute the brigade commander's intent and concept of operation. The brigade also employs check points, target reference points, and on-order positions, axes, and objectives to facilitate modifying the maneuver plan during operational execution.

b. Tactical Movement Rates. Table IV-6 defines unopposed movement rates.

Table IV-5. Unopposed Movement Rates

TYPE TERRAIN	DISMOUNTED INFANTRY	ARMORED/MECHANIZED
Unrestricted	4 kmph (Day) 3.2 kmph (Night)	24 kmph (Day) 24 kmph (Night with lights/passive)
Restricted	2.4 kmph (Day) 1.6 kmph (Night)	16 kmph (Day) 8 kmph (Night, blacked out)
Severely Restricted	1.0 kmph (Day) 0.1 to 0.5 kmph (Night)	1.0 kmph (Day) 0.1 to 0.5 kmph (Night)

Table IV-6. M1/M2 Road March Rates

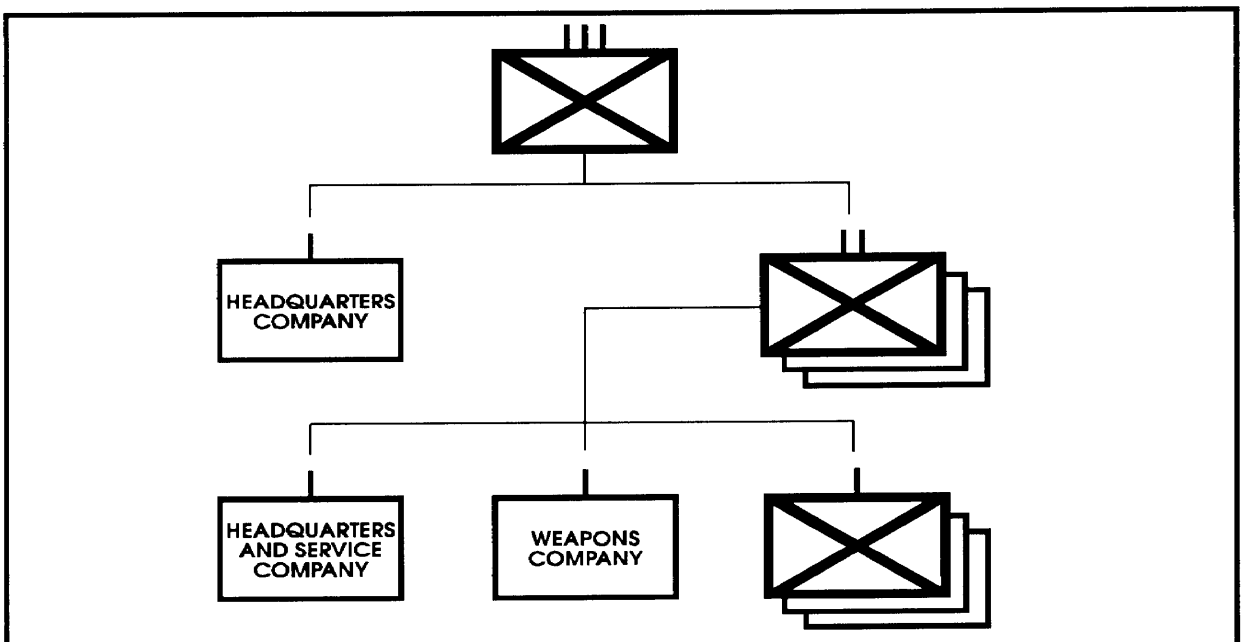
WHEN	PAVED ROAD	GRAVEL ROAD	TANK TRAIL	GO TERRAIN
Day	65 kmph	60 kmph	50 kmph	40 kmph
Night (White Lights)	65 kmph	60 kmph	50 kmph	40 kmph
Night (Red Lights)	60 kmph	50 kmph	40 kmph	35 kmph

4. MEF (FWD) Maneuver Organizations

A notional MEF (FWD) GCE is structured around a Marine infantry regiment, The infantry mission is to close with and destroy the enemy by fire and maneuver. The regiment consists of a headquarters company and 3 rifle battalions as shown in Figure IV-3. Major supporting elements include an artillery battalion, a tank company, a light armored reconnaissance battalion, and an assault amphibian vehicle (AAV) company.

a. Artillery Battalion. The MEF (FWD) artillery battalion provides indirect fires for supported units of the regiment. See Chapter V for detailed discussion.

b. Tank Company. The tank company supports the MEF (FWD) by destroying enemy forces, fortifications, material, and by providing antimechanized fires in support of committed units, Marine and Army armor and mechanized infantry doctrine are similar; however, in some cases, Marine armor units are task organized below the company level. Since the Marine Corps has few tank battalions, it rarely employs them tank pure; rather, they are typically task organized to reinforce infantry units. Thus, in contrast to the Army's concept of employment that generally attempts to achieve mass by task-organizing tank units no lower than company level, Marine commanders may employ tanks individually to support committed infantry units when required. The MEF (FWD)'s supporting tank company consists of 17 M1A1s organized with a headquarters (2 tanks) and 3 platoons of 5 tanks each.



UNIT	USMC OFF	USMC ENL	USN OFF	USN ENL	TOTAL
INFANTRY REGIMENT	174	3451	11	205	3841
REGIMENT HQ CO	24	298	2	7	331
INFANTRY BATTALION (X3)	44	859	3	66	972
HQ AND SERVICE CO	21	182	3	66	272
WEAPONS COMPANY	5	149			154
RIFLE COMPANY (X3)	6	176			182

Figure IV-3. Marine Infantry Regiment

c. LAR Battalion. LAR units conduct reconnaissance, security, and economy of force missions. LAR units avoid sustained combat as their value is derived from a high degree of mobility. This mobility enables them to operate on extended frontages at considerable distances from the main force and to strike sudden blows at enemy weak points. LAR's firepower, combined with mobility, make it an effective means of conducting delay actions over considerable fronts and depths. Figure IV-4 portrays the LAR battalion.

d. AAV Company (AAV). AAVs transport the surface assault elements of the landing force from amphibious shipping to inland objectives in a single lift during the amphibious assault, provide support to mechanized operations ashore, and provide combat support for other operations requirements. During operations ashore, AAV units are used principally to improve the tactical mobility of infantry and engineer units. Additionally, AAVs provide the supported unit with limited firepower and armor protection.

5. Maneuver of the MEF (FWD)

> ***"Maneuver is the employment of forces to secure an advantage—or leverage—over the enemy to accomplish the mission. Tactical maneuver aims to gain an advantage in combat. Operational maneuver, on the other hand, impacts beyond the realm of combat. In fact, it aims to reduce the amount of fighting necessary to accomplish the mission."***
>
> **FMFM 1-1, *Campaigning***

The following view of maneuver describes the Marine style of command and control in that every effort is made to speed the tempo of planning and execution:

FMFM 1, *War-fighting,* states— *'The traditional understanding of maneuver is a spatial one; that is, we maneuver in space to gain a positional advantage. However, in order to maximize the usefulness of maneuver, we must consider maneuver in time as well; that is, we generate a faster operational tempo than the enemy to gain a temporal advantage. it is through maneuver in both dimensions that an inferior force can achieve decisive superiority in the necessary time and place."*

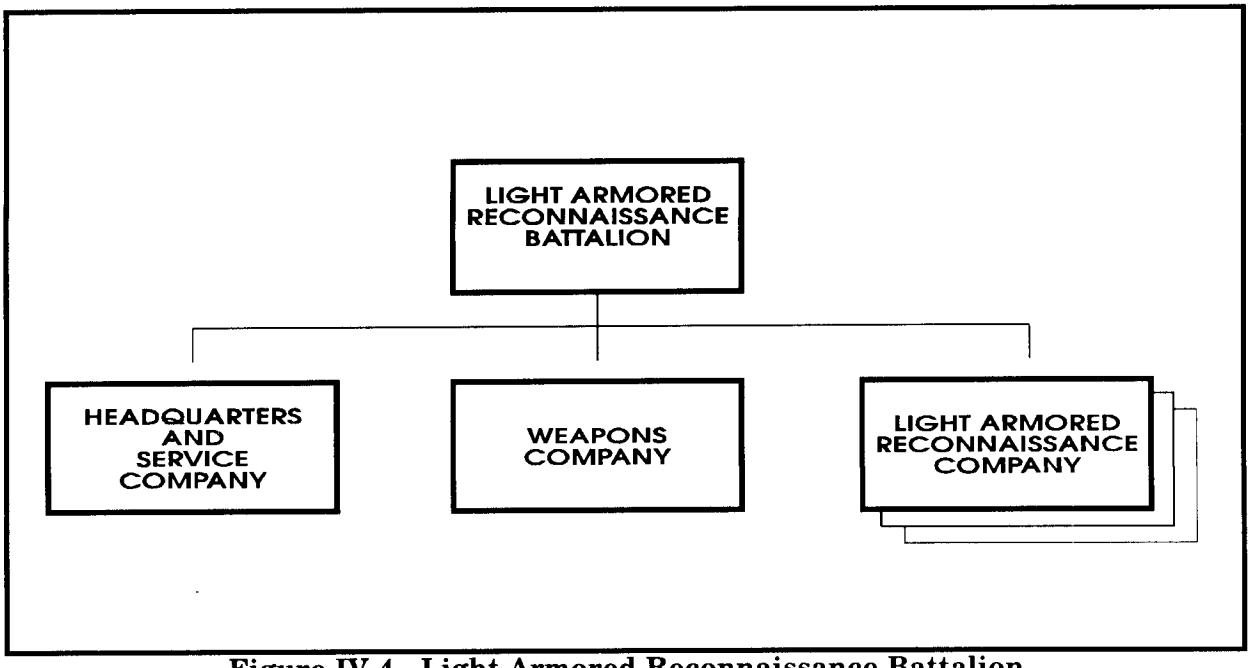


Figure IV-4. Light Armored Reconnaissance Battalion

a. Tactical Maneuver. The AAVs, combined with other assets available within MEF (FWD), enable the commander to configure tailored mechanized forces as discussed below:

(1) Organization. A mechanized force is organized around a nucleus unit. The force is constructed as tank heavy, infantry heavy, or balanced. A tank heavy unit is employed when the shock action of armor is called for by the enemy situation and facilitated by more open terrain. An infantry heavy unit is employed when the shock action of armor is less important or when the operation is conducted in more restricted terrain such as mountainous or built-up areas. When the enemy situation is unclear and maximum flexibility is desired, a balanced force of generally equal proportions is employed.

(2) Elements of a Mechanized Force. A mechanized infantry force in the Marine Corps consists of infantry units mounted in AAVs. AAVs are the Marine Corps' armored personnel carriers; therefore, infantry will normally not fight mounted. Tanks are normally attached or placed OPCON of the mechanized unit, or the mechanized unit is attached or placed OPCON of the tank unit. This allows the commander to task-organize forces per METT-T. The mechanized or tank force is supported by artillery and air and reinforced with LAV, engineer, and air defense units as appropriate, per METT-T.

b. Tactical Mobility. Mechanized assets in the Marine Corps are limited in number and transportation capability; therefore, the GCE commander will seldom mechanize the entire force. As a result, a mechanized force requires a major portion of the MEF (FWD)'s mobility assets. Marine infantry mobility is limited during dismounted operations. Infantry unit mobility is enhanced during mechanized or helicopterborne operations with the use of AAVs or MEF (FWD) aviation assets. Organic to the GCE for support of movement and maneuver are artillery and combat engineer units that also possess surface mobility assets. Mobility assets are not specifically dedicated to any one element of the MAGTF; rather assets are allocated by the MAGTF/GCE commander based on operational requirements. Table IV-7 illustrates MEF (FWD) mobility assets and capabilities.

c. Helicopterborne Operations. Helicopterborne operations are an integral part of MEF (FWD) operations and provide the joint force with significant capabilities regarding both tactical movement and maneuver. Assault helicopters provide the MEF (FWD) commander the mobility to achieve tactical surprise and to move forces regardless of terrain, obstacles, or barriers. This mobility allows the commander to rapidly maneuver forces to achieve positional advantage over the enemy and quickly apply combat power where and when needed, The inherent speed, maneuverability, and firepower of attack helicopters further enhance the commander's ability to quickly mass combat power to destroy enemy forces. Chapter VII discusses helicopterborne operations in further detail.

Table IV-7. MEF (FWD) Mobility Assets

MOBILITY ASSET	MAX NUMBER AVAILABLE	# PAX
CH53	28	30
CH46	48	15
LVTP (AAVs)	109	20
Mxxx (Trucks)	TBP	TBP
KC-130*	6	92

*** Normally used for refueling operations**

6. Integrated Maneuver and Complementary Capabilities

Chapter I detailed the capabilities and limitations of the Army DRB and MEF (FWD) at the macro level. Tables IV-8A through IV-8F reflect the complementary operational capabilities of the MEF (FWD) and Army DRB across a range of combat operations. In addition to providing plans officers a menu of employment options, the tables further underscore the recurring theme that the capabilities of one force counterbalance the limitations of the other.

Table IV-8A. AMCI Operations Complementary Capabilities

OPERATION	MEF (FWD)	DRB
Amphibious Operations	• Conduct amphibious assaults, raids, demonstrations, and withdrawals	
	• Conduct air operations in support of forcible entry and follow-on combat operations	
		• Support amphibious operations (except assault phase) as mobile defensive, counterattack, or breakout force
	• Transition to follow-on offensive operations	• Transition to follow-on offensive operations
Passage of Lines	• Assist in C2 of passage	• Assist in C2 of passage
	• Clear obstacles from attack positions through passage lanes/mark mines	
	• Overwatch passage	• Overwatch passage
	• Infiltrate to tactical depth	
		• Act as MEF multifunctional reserve
		• Transition rapidly to exploit successful passage

Table IV-8B. AMCI Operations Complementary Capabilities

OPERATION	MEF (FWD)	DRB
Movement to Contact	• Conduct air reconnaissance, offensive air cover, antiair, and EW operations	• Conduct reconnaissance in force
	• Conduct covering force operations	• Conduct covering force operations
	• Conduct security operations	• Conduct security operations
	• Fight meeting engagement	• Fight meeting engagement
	• Seize assigned objectives	• Seize assigned objectives
	• Quickly transition to attack or defense	• Quickly transition to attack or defense
	• Execute vertical assault to seize objectives	
	• Clear and secure restricted terrain	
	• Fix/defeat enemy dismounted forces	• Fix/defeat enemy mounted forces
		• Act as multifunctional reserve

Table IV-8C. AMCI Operations Complementary Capabilities

OPERATION	MEF (FWD)	DRB
Attack	• Conduct dismounted hasty or deliberate attack as main/supporting effort	• Conduct mounted hasty or deliberate attack as main/supporting effort
	• Perform economy of force operations	• Perform economy of force operations
	• Fix/defeat bypassed enemy forces	• Fix/defeat bypassed enemy forces
	• Conduct offensive air operations	
	• Conduct dismounted attacks over restrictive terrain	
	• Seize objectives through vertical envelopment/assault	
	• Conduct military operations on urbanized terrain (MOUT)	
		• Conduct deep air maneuver operations with Army aviation augmentation
		• Act as multifunctional combined arms reserve
		• Rapidly concentrate combat power to exploit enemy weaknesses
		• Attack to linkup with friendly forces
		• Isolate objectives
		• Defeat enemy mobile reserves
	• Support deception	• Support deception

Table IV-8D. AMCI Operations Complementary Capabilities

OPERATION	MEF (FWD)	DRB
Breaching Operations	• Secure the near side	• Secure the near side
	• Prebreach/breach obstacles	
	• Support breaching and assault forces with overwatching suppressive fires	• Provide support, breaching, and/or assault forces
		• Conduct in-stride or deliberate breaching operations
	• Prepare/mark lanes	• Prepare/mark lanes
	• Infiltrate enemy defenses	
	• Clear enemy defending obstacles	
	• Conduct/support deception operations	• Conduct/support deception operations
River Crossing Operations		• C2 crossing operation
	• Secure the near side	• Secure the near side
	• Conduct far side reconnaissance	
	• Provide overwatching fires	• Provide overwatching fires
	• Execute waterborne assault crossing to secure the far side	
	• Execute vertical assault to seize objectives/secure the far side	
		• Conduct crossing with engineer augmentation
	• Conduct/support deception operations	• Conduct/support deception operations

Table IV-8E. AMCI Operations Complementary Capabilities

OPERATION	MEF (FWD)	DRB
Defend		• Execute covering force mission
	• Conduct counterreconnaissance operations	• Conduct counterreconnaissance operations
	• Conduct security operations	• Conduct security operations
	• Conduct range of defensive air operations	
		• Conduct limited deep operations
	• Conduct raids, ambushes, or spoiling attacks	• Conduct raids, ambushes, or spoiling attacks
	• Block dismounted enemy avenues of approach; block mounted routes in restricted terrain	• Block enemy avenues of approach
	• Execute vertical assault to seize key objectives	
	• Conduct positional defense	• Conduct mobile or area defenses
	• Occupy positions in depth, including strong points	• Defend in depth
	• Respond to rear-area threats	• Respond to rear-area threats
		• Act as multifunctional reserve
	• Conduct MOUT	
	• Perform economy-of-force role	• Perform economy-of-force role
	• Assist in deception	• Assist in deception

Table IV-8F. AMCI Operations Complementary Capabilities

OPERATION	MEF (FWD)	DRB
Retrograde	• Delay along likely enemy dismounted avenues of approach	• Execute delay in depth
	• Assist disengagement using air assets	• Assist disengagement using air assets if augmented with aviation
	• Conduct limited counterattacks to assist disengagement	• Counterattack to assist disengagement
	• Block/reinforce subsequent delay positions	• Block/reinforce subsequent delay positions
		• Maneuver rapidly to prevent enemy envelopment
	• Cut enemy LOCs; attack enemy combat support and CSS units/assets	• Cut enemy LOCs; attack enemy combat support and CSS units/assets
		• Perform rear guard function; protect withdrawal of main body
		• Act as multifunctional reserve
	• Assist with execution of obstacles planned in depth	• Assist with execution of obstacles planned in depth
	• Secure critical nodes	• Secure critical nodes
	• Conduct MOUT	

a. Planning Considerations. Commanders and their staffs must recognize the differences inherent in the ground maneuver elements of the joint force. These differences fall in primarily three arenas, subsequently referred to as the-mobility *differential, survivability differential,* and *firepower differential.* Operations planning should accommodate these differences accordingly.

(1) Mobility Differential. The DRB can move much faster (in short bursts and for sustained periods) than the GCE can. This differential stems from cross-country capabilities/speed of DRB's organic vehicles. The GCE, in mounted operations, uses AAVs and trucks to carry infantry; artillery units use trucks to tow organic howitzers, Rapid movement is achieved during helicopterborne operations. AAVs are not designed for sustained rapid overland movement. Figure IV-5 shows planning movement rates for various type units.

Degree of Resistance Attacker to Defender Ratio	PREPARED DEFENSE						HASTY DEFENSE/DELAY					
	UNRESTRICTED TERRAIN		RESTRICTED TERRAIN		SEVERELY RESTRICTED TERRAIN		UNRESTRICTED TERRAIN		RESTRICTED TERRAIN		SEVERELY RESTRICTED TERRAIN	
	Armor/Mech	Inf	Armor/Mech	Inf	Armor/Mech	Inf	Armor/Mech	Inf	Armor/Mech	Inf	Armor/Mech	Inf
Intense Resistance 1:1	.6	.5	.5	.3	.16	.1	1.0	.8	.8	.5	.4	.2
Very Heavy 2:1	.9	.6	.6	.4	.3	.2	1.5	1.0	1.0	.7	.6	.3
Heavy 3:1	1.2	.7	.75	.5	.5	.3	2.0	1.2	1.3	.9	.8	.5
Medium 4:1	1.4	.8	1.0	.6	.6	.5	2.4	1.4	1.75	1.1	.9	.8
Light 5:1	1.5	.9	1.1	.7	.7	.6	2.6	1.6	2.0	1.2	1.0	.9
Negligible 6+:1	1.7+	1.0+	1.3+	.8+	.8+	.6+	3.0+	1.7+	2.3+	1.3+	1.1	1.0

Source: Adapted from CACDA Jiffy III War Game, Vol II, Methodology

[1] **Units cannot sustain these rates for 24 hours. These rates are reduced by 1/2 at night.**

[2] **The relative combat power ratio must be computed for the unit under consideration.**

[3] **When there is surprise, multiply these figures by a surprise factor as follows:**
-- Complete Surprise X5 (e.g., Germans at the Ardennes in 1944, Arabs in 1973).
-- Substantial Surprise X3 (e.g., German Invasion of Russia in 1941, Israeli invasion of Sinai in 1967).
-- Minor Surprise X1.3 (e.g., Allied Normandy landing in 1944, Pakistani attack on India in 1971).
The effects of surprise last for 3 days, being reduced by 1/3 on day 2 and 2/3 on day 3.

[4] **Prepared defense is based on defender in prepared positions (24 hours or more).**

[5] **Hasty defense is based on 2 to 12 hours preparation time.**

[6] **The ratios used here are to determine the degree of resistance. There is no direct relationship between advance rates and force ratios. However, sustained advances probably are not possible without a 3 to 1 ratio. Advance is possible against superior forces but cannot be sustained.**

[7] **Rates greater than 6 to 1 will result in advance between these and the unopposed rates.**

Figure IV-5. Planning Movement Rates

(2) Survivability Differential. Because of its vast number of armored assets, the DRB has greater overall armored protection than the GCE. Except for the M1A1s (and LAVs to some extent), Marine vehicles (including the lightly armored AAVs) are methods of transportation and normally not used for mounted combat. Towed artillery is also more vulnerable to counterfire than SP artillery.

(3) Firepower Differential. Marines rely upon organic air assets much more than the Army does. The DRB relies primarily upon direct fire weapons; mortars; attached artillery; and, when attached, attack helicopters.

b. Maneuver Employment Options. The following employment options maximize the complementary capabilities the MEF (FWD) and DRB provide the joint force through the execution of integrated operations.

(1) DRB and the MEF. The DRB is effective either as the main or supporting effort in both offensive or defensive situations. It is particularly well suited to perform reserve roles because its mobility and firepower allow it to strike the enemy at the critical time and place to seize or regain the initiative through the destruction of the enemy force. Also, the DRB can stop penetrations or incursions into the MEF rear area.

(2) MEF (FWD) and the Corps. The MEF (FWD) presents the Army Corps with a wide array of employment options and provides the commander with significant capabilities not available within the corps. When employed as a MAGTF, the MEF (FWD) gives the commander the flexibility of an *"enabling force"* to create opportunities for corps mechanized assets to exploit. The MEF (FWD) is highly effective when conducting amphibious operations in littoral contingency areas. The MEF (FWD) is also capable of conducting sustained operations ashore by attacking enemy light forces in all types of terrain, seizing key terrain, and defending against mechanized enemy forces in close terrain. The MEF (FWD) provides the Army commander a formidable force during periods of darkness or limited visibility and in restrictive terrain. It is also well suited for conducting special purpose operations to include reconnaissance, ambushes, raids, feints, demonstrations, and counter-reconnaissance.

c. Weapons Systems. Table IV-9 reflects the types and quantities of weapons systems typically found in the MEF (FWD) and Army DRB. The table does not include secondary weapon systems (i. e., machine guns on tanks, etc.). The exact number and type of systems depend on the actual force package provided for a particular contingency. The table further underscores the complementary nature of Army and Marine Corps forces and concomitant benefits derived from integrated operations.

Table IV-9. Major Weapons and Aircraft Summary

WEAPON SYSTEM	MEF (FWD)	ARMY DRB
Tanks (Abrams)	15	126
BFVs	-	54
AAVs	109	-
LAVs	27	-
MLRS	-	9
155mm Howitzers	18-30	24
107mm Mortars	-	18
81mm Mortars	24	-
60mm Mortars	36	-
MK-19 40mm Grenade Launchers	114	30
TOW Launchers (not including LAV or BFV mounted)	72	-
Dragon Launchers	72	9
Hawk Missile Launchers	12	-
Avenger Missile Teams	-	12
Stinger Missile Teams	45	5
AV-8Bs	20	-
F/A-18A/Cs	24	-
F/A-18Ds	12	-
EA-6Bs	6	-
CH-53E	28	-
AH-64 (when DRB is augmented)	-	24
AH-1W	12	-
CH-46E	48	-
UH-60 (when DRB is augmented)	-	8
UH-1	12	-
OH-58C (when DRB is augmented)	-	6
KC-130	6	-

Chapter V

FIRE SUPPORT

1. Background

This chapter focuses on the force multiplier of fire support. It defines fire support and related terms to establish a common point of reference for subsequent discussions. It also highlights diverging service perspectives on selected fire support coordinating measures and offers fire support TTP to support integrated combat operations.

2. Terminology

a. Fire Support. The term *"fire support"* is not defined in approved joint doctrine. Service publications define it as follows:

(1) Army. FM 100-5, *Operations*, defines fire support as *"the collective and coordinated employment of the fires of armed aircraft, land- and sea-based indirect fire systems, and electronic warfare systems against ground targets to support land combat operations at both the operational and tactical levels. Fire support is the integration and synchronization of fires and effects to delay, disrupt, or destroy enemy forces, combat functions, and facilities in pursuit of operational and tactical objectives. "*

(2) USMC. FMFRP 0-14, *Marine Corps Supplement to the DOD Dictionary of Military and Associated Terms,* defines fire support as *"assistance to elements of the MAGTF engaged with the enemy rendered by other firing units, including (but not limited to) artillery, mortars, naval surface fire support, and offensive air support."*

(3) Proposed Joint Definition. Given the general Army-Marine Corps definition consensus reflected above, this text defines fire support as *the collective and coordinated use of indirect-fire weapons, armed aircraft, sea surface fires, and other lethal and disruptive means in support of a battle plan.*

b. Supporting Arms. Joint Pub 1-02 defines supporting arms as *"air, sea, and land weapons of all types employed to support ground units."* FMFRP 0-14 proposes a modification that reads *"weapons systems of all types employed to provide fires to the commander."*

c. Firepower. Joint Pub 1-02 defines *firepower* as "*the amount of fire which may be delivered by a position, unit or weapon system; the ability to deliver fire."* The *Universal Joint Task List* cites *employ firepower* as a fundamental operational task. Conceptually, *employ firepower* means "*to apply the amount of fire which may be delivered by joint forces through all available means and systems. The collective and coordinated use of target acquisition data, direct and indirect fire weapons, armed aircraft of all types, and other lethal and nonlethal means against ground targets in support of JFC objectives. This task includes, artillery, mortar, and other non line-of-sight fire, naval gunfire, close air support, and electronic countermeasures. It includes strike, air defense, antiair/surface/subsurface defense and naval surface fire support, counterair, and air interdiction. Firepower includes all types of ordnance. "*

3. Fire Support Coordinating Measures

The Army and Marine Corps recognize and use a common set of FSCM intended to expedite the attack of targets, protect the force, safeguard noncombatants and sites of religious or cultural significance, preserve infrastructure, and set the stage for future operations. Two notable exceptions include differing service interpretations of the fire support coordination line (FSCL) and NFA as discussed below. Accordingly, operations plans and orders must clearly articulate the intent regarding use of these two particular FSCM.

a. FSCL. In defining the FSCL, Joint Pub 1-02 states: *"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 effects on or to the rear of the line." The* Army interprets the term "supporting element" (undefined as a joint term) to mean subordinate elements. For example, elements subordinate to a corps may fire beyond a corps established FSCL irrespective of boundaries; adjacent units from another corps may not. The Marine Corps interprets *supporting elements* to mean an element of a supporting force as defined in Joint Pub 1-02 rather than a *subordinate element.* The Marine Corps subscribes to the Joint Pub 3-O, *Doctrine for Joint Operations,* description of the FSCL as a permissive fire support coordinating measure established by commanders to ease coordination requirements for attack operations within their area of operations by forces not under their control, such as naval gunfire or air interdiction and that it applies to all superior, subordinate, supporting, and other affected commanders. Joint Pub 3-O includes an expansive discussion on the FSCL and provides the following amplifying guidance: *"Forces attacking target beyond an FSCL must inform all affected commanders in sufficient time to allow necessary reaction to avoid fratricide, both in the air and on the ground . . . . Coordination of attacks beyond the FSCL is especially critical to commanders of air, land, and special operations forces. Their forces may now be operating beyond an FSCL or may plan to maneuver on that territory in the future. Such coordination is also important when attacking forces are employing wide area munitions or munitions with delayed effects. Finally, this coordination assists in avoiding conflicting or redundancy attack operations. In exceptional circumstances, the inability to conduct this coordination will not preclude the attack of targets beyond the FSCL. However, failure to do so may increase the risk of fratricide and could wastes limited resources.*[y]

b. No Fire Area, Marine Corps doctrine states that *"typically the host country establishes an NFA. On arrival of military forces, the force commander coordinates the location of an NFA with local authorities."* In Army doctrine, tactical units—normally corps or divisions—establish NFAs.

4. A Common Perspective

Great commonality exists when viewing Army and Marine Corps perspectives on fire support, particularly regarding field artillery *(artillery* in Marine terminology) doctrine, tactics, and employment principles. The discussions that follow explore areas where those perspectives diverge and offer recommendations on how the JFC can effectively employ fire support to support intent and concept of operations.

5. DRB Fire Support Operations

Field artillery units provide cannon, rocket, and missile fires in support of designated commanders and operations as directed. Field artillery commanders and fire support agencies at corps through company levels advise and assist respective maneuver commanders with integrating, coordinating, and executing all means of available fire support to support combat operations.

a. Field Artillery Command Structure. Field artillery is organized at corps, division, and brigade levels with a specific command and control structure that enables the field artillery commander to accomplish dual responsibilities as a FSCOORD and an artillery commander. There is a field artillery headquarters and headquarters battery (HHB) in each corps artillery, division artillery, field artillery brigade, and each close support field artillery battalion such as the DRB's supporting artillery battalion. At each level, the HHB provides both a CP for the command and control of field artillery units and the nucleus of a FSE that operates as part of the supported maneuver CP. Both are supervised on a full-time basis by the field artillery commander's designated representatives. S3 operations officers

normally run the artillery CPs; deputy fire support coordinator (DFSCOORD) at corps and division levels and fire support officers (FSOs) at brigade level and below supervise FSEs. Table V-1 depicts Army fire support coordination organizations and FSCs from corps down to company levels.

b. DRB Fire Support Coordination Organizations and Coordinators. The commander of the DS artillery battalion also functions as the brigade FSCOORD. The commander of the DS artillery battalion establishes a fire support section comprised of a FSO, fire support noncommissioned officer (NCO), and several fire support specialists that operate from an M577 CP vehicle as part of the brigade's main CP. The fire support section serves as the nucleus of the brigade's FSE. Additional members of the FSE may include an Air Force ALO, a Marine air and naval gunfire liaison company (ANGLICO) supporting arms liaison team (SALT), an engineer representative, a chemical officer, and the S3 air. Each maneuver battalion tactical operations center features a similarly configured FSE. The FIST coordinates fire support at the company level. A FIST headquarters supports each company of a tank battalion. The FIST for the mechanized infantry battalion consists of a FIST headquarters (FIST chief serves as company FSO) and 3 forward observer (FO) parties per company. Although FSEs and FISTs are organic to artillery organizations, once deployed they remain with supported maneuver units regardless of the tactical missions assigned to their parent artillery units. FISTS operate from the M981 fire support team vehicle (FIST-V) equipped with the ground/vehicular laser locator designator (G/VLLD); FO parties operate with and are transported by their supported maneuver platoons. Figure V-1 illustrates the DRB's supporting fire support coordination organizational structure. Also depicted are the brigade's 3 combat observation and lasing teams (COLTs). COLTs do not serve a specific fire support coordination function; however, because they are valuable assets designed to maximize the brigade's employment of smart munitions, command and control of the COLTS is normally retained at the brigade level.

c. DRB Fire Support Attack Assets.

(1) Field Artillery. Each committed maneuver brigade in the USA has a habitually associated field artillery battalion in direct support. Although the DRB currently receives its direct support artillery fires from an M109A3-equipped howitzer battalion, that battalion will transition to the M109A6 *"Paladin"* howitzer. In either case, the MLRS battery (if attached as assumed for the purposes of this publication) provides reinforcing fires. Figure V-2 depicts the DRB's supporting field artillery organization.

(a) M109A6 *"Paladin"* Howitzer. The Paladin affords the force a more responsive, longer range, more survivable, and easily maintainable cannon system than its predecessor, the M109A3. An automatic fire control system includes position

Table V-1. Army Fire Support Coordination Organizations and Coordinators

ECHELON	FIRE SUPPORT ORGANIZATION	FSCOORD
Corps	FSE	Corps Artillery Commander
Division	FSE	Division Artillery Commander
Brigade	FSE	Field Artillery (FA) Battalion Commander
Battalion	FSE	Fire Support Officer
Company	Fire Support Team (FIST)	FIST Team Chief

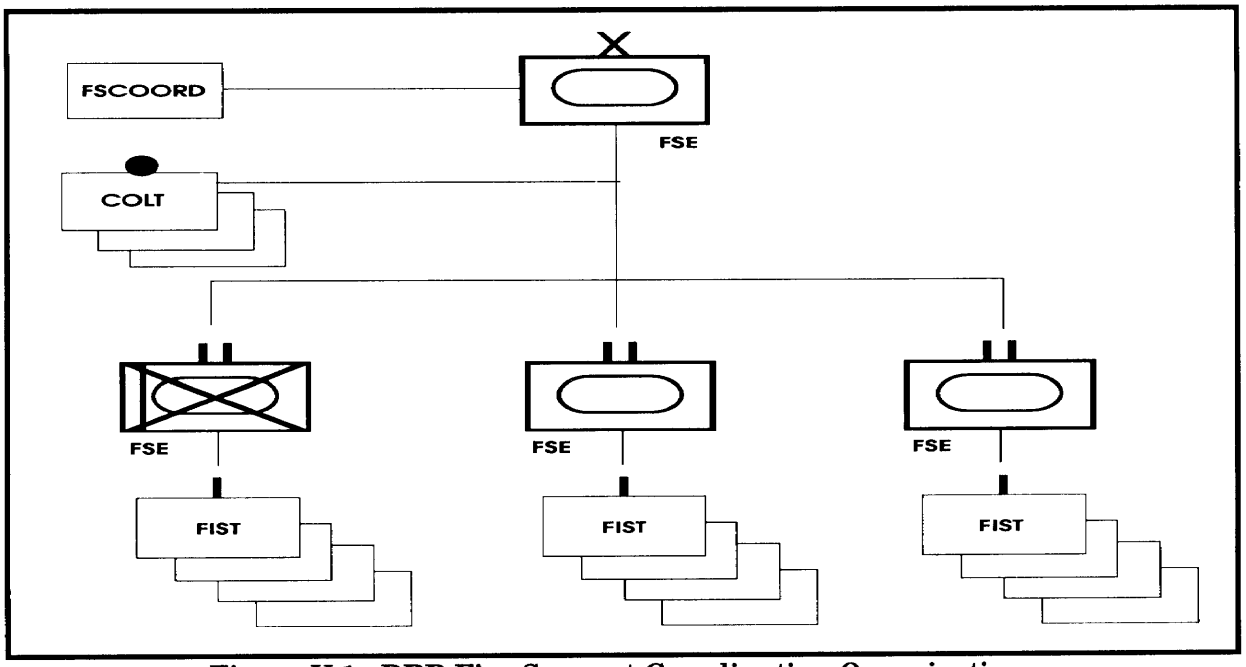
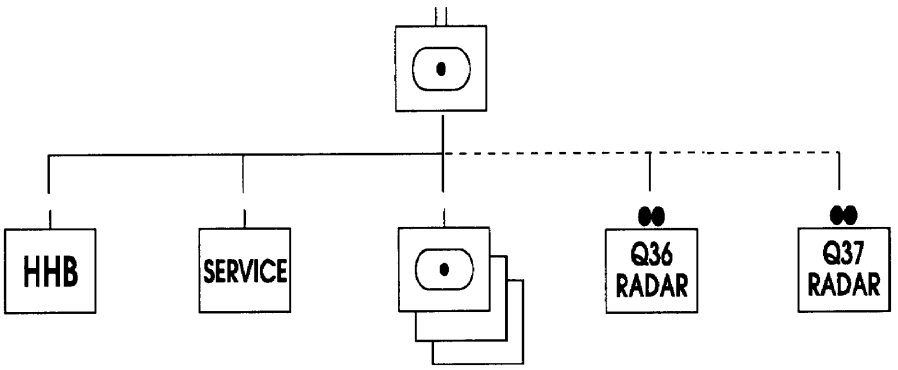


Figure V-1. DRB Fire Support Coordination Organizations



Notes:

HHB provide the personnel and equipment to perform fire support coordination for the DRB (4 FSEs; 12 FIST-Vs; 3 COLTs) and to C2 the battalion's attached, organic, and reinforcing units.

Service battery provides all classes of supply (less Class VIII) and services to support organic and attached units.

Firing batteries have 8 howitzers (M109A3/A6s), 8 field artillery ammunition vehicles (M992 FAASVs), and 2 FDCs (M577s) organized in 2 platoons capable of semi-autonomous operations. (Total of 24 howitzers in battalion)

Battalion tactical operations center commands and controls attached radars.

Figure V-2. DRB Field Artillery Organizational Structure

navigation and a ballistic computer that does on-board technical fire direction that enables it to respond to calls for fire in less than 2 minutes. Its range advantage over the M109A3 is 23.1 to 18.5 km for unassisted projectiles and 30 to 23.5 km for rocket assisted projectiles. Because the Paladin can rapidly occupy a firing position, shoot, and displace, its vulnerability to counterfire is significantly reduced.

(b) Multiple Launch Rocket System (MLRS). The MLRS is a highly mobile, rapid-fire, surface-to-surface, free-flight rocket, and guided missile system designed to complement cannon artillery to attack the enemy deep and to strike at counterfire, air defense, and high payoff targets.

"Capabilities. MLRS provides the commander with a significant capability for executing counterfire, interdiction, and assisting in SEAD. The MLRS is well suited for attacking large area targets; recommended target sets include personnel, self-propelled artillery, air defense systems, infrastructure and lightly protected combat, combat support, and CSS systems. To support deep operations, the Army Tactical Missile System (ATACMS) capable MLRS battery provides the JFC the capability to attack high payoff targets at ranges from 25 to 165 km. The system can also assist in joint suppression of enemy air defenses (J-SEAD) to support air interdiction and/or deep operations.

• Firepower. The firepower comparison between the MLRS and the 155mm howitzer shown in Table V-2 reflects the increased attack potential that MLRS provides the joint force.

• Interoperability. The MLRS interfaces with many types of command and control systems. The fire direction center at platoon, battery, and battalion levels can interface directly with the Tactical Fire Direction System (TACFIRE), light TACFIRE (LTACFIRE), the Interim Fire Support Automation System (IFSAS), digital message devices, other FDCs, the Cannon Battery Computer System (BCS), the AFATDS, the Airborne Target Handover System (ATHS), and the GSM—the ground link to J-STARS.

• System Characteristics. MLRS features an on-board, self-location, directional control, ballistic computation, and digital communications system in one piece of equipment. The system consists of M270 launchers; launcher pods; ammunition resupply vehicles and trailers; and a command, control, and communications system. Each launcher has the on-board capability to receive a fire mission, self-locate, compute firing data, orient on the target, and deliver up to 12 rockets, All 12 rockets can be fired in less than 60 seconds at single or multiple aimpoints. Rockets can be fired individually or a designated number can be fired at specified intervals. To improve response time and facilitate target engagement, the MLRS interfaces directly with target acquisition assets.

Table V-2. Firepower Comparison of MLRS and 155mm Howitzer

	MLRS	M109A3(155mm)
Range*	32 km	18.5 km
Submunition	644 per rocket	88 per round
Equivalent	1 rocket	7.32 rounds
Equivalent	1 launcher load (12 rockets)	3.6 battalion volleys (88 rounds)
Equivalent	1 battery (9 launchers, 108 rockets)	33 battalion volleys (792 rounds)
*** For dual purpose improved conventional munitions**		

• Ammunition Resupply. Ammunition resupply of the battery's 9 launchers occurs with the 12 M985 heavy expanded mobility tactical trucks (HEMTTs) and 12 M989A1 heavy expanded mobility ammunition trailers (HEMATs) assigned to the battery's ammunition platoon. Each HEMTT/HEMAT combination can carry 48 rockets (8 pods).

• Organization. Figure V-3 depicts the organizational structure of the DRB's supporting MLRS battery.

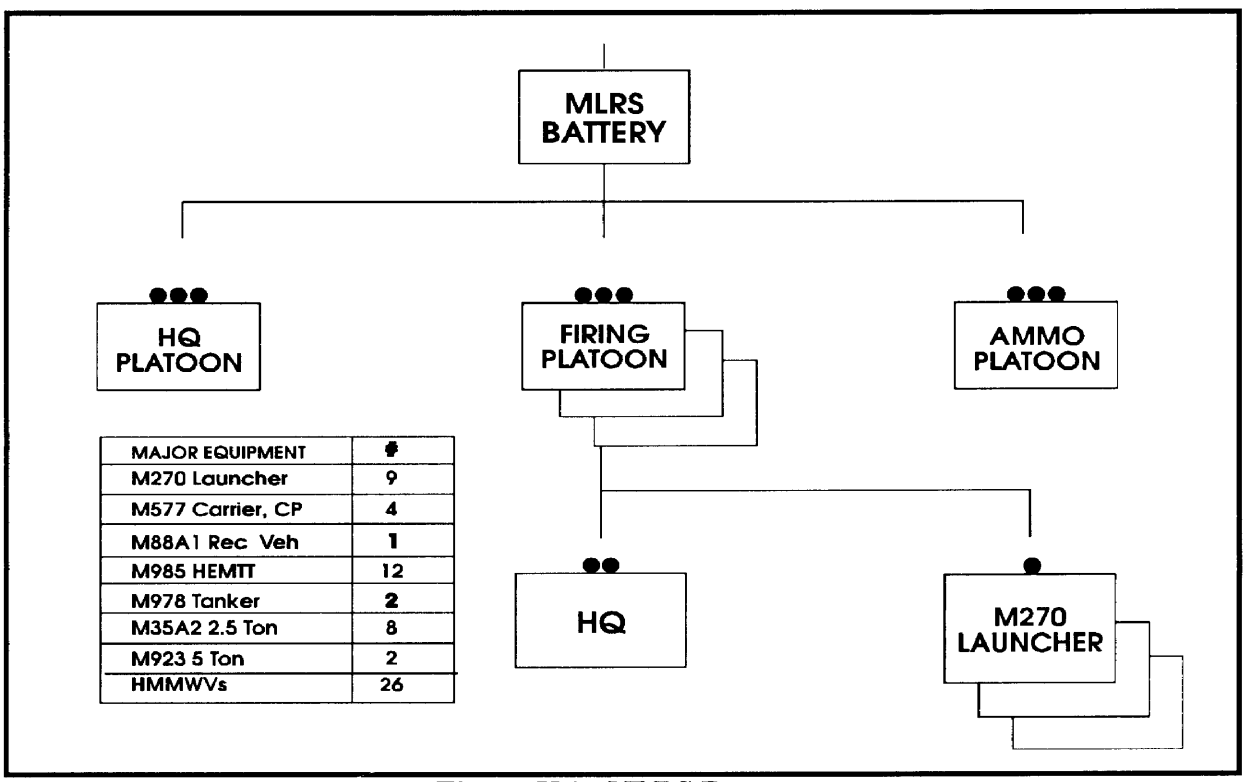
(2) Mortars. Each of the DRB's 3 ground maneuver battalions features a company of 6 120mm mortars. The company provides dedicated, immediately responsive fires in support of battalion/task force operations.

(3) Electronic Warfare Assets. Chapter III described DRB electronic warfare systems and assets capabilities.

(4) USAF Air Support. USAF fixed-wing air support is coordinated through the brigade and battalion ALOs/S3 air and corresponding tactical air control parties (TACPS). See Chapter VII for additional discussion.

(5) Naval Support. *See paragraph 7c* for naval surface fire support and naval air support of DRB operations.

d. DRB Target Acquisition Assets. The DRB features a variety of target acquisition assets ranging in scope from the FISTS, to access, to national-level collection assets. As reflected in Figure V-1, the DRB has a full complement of FISTS attached to the maneuver companies and 3 COLTS available for employment at brigade level. An AN/TPQ-36 weapons-locating radar may support the artillery battalion's operations; target acquisition range more than doubles (from 24 to 50 km) if the AN/TPQ-37 weapons-locating radar is available for support. The DRB may also have aerial assets (OH-58D helicopters) from supporting Army aviation units. Finally, the brigade has a direct link to targeting intelligence developed by higher headquarters through the intelligence architecture described in Chapter III.



MAJOR EQUIPMENT	#
M270 Launcher	9
M577 Carrier, CP	4
M88A1 Rec Veh	1
M985 HEMTT	12
M978 Tanker	2
M35A2 2.5 Ton	8
M923 5 Ton	2
HMMWVs	26

Figure V-3. MLRS Battery

6. Army Aviation

The DRB may be augmented by Army aviation assets as described in Chapters I and VII. Attack helicopters are most effective when employed in mass (battalions or companies) in an air maneuver role against enemy armor or artillery formations or against other high payoff combat, combat support, or CSS target sets. The division's aviation brigade's primary mission is engage and destroy threat armored and mechanized forces. When necessary, Army aviation can provide fire support for ground maneuver units, coordinate and adjust indirect fires, conduct joint air attack team operations, and command and control deep operations.

7. MEF (FWD) Fire Support Operations

a. MEF (FWD) Fire Support Coordination Agencies and Coordinators. MEF (FWD) fire support coordination agencies include the FFCC at the MEF (FWD) CE and FSCCs at each battalion level and higher maneuver force of the GCE. All agencies are staffed with representatives of the various supporting arms. A force fires coordinator (FFC) directs the operations of the FFCC; fire support coordinators (FSCs) exercise responsibility for respective FSCC operations. Once established, FSCCs coordinate directly with FSCCs of adjacent and higher units. Table V-3 details MAGTF fire support coordination agencies and coordinators from MEF to company levels.

(1) MEF (FWD) FFCC. The MEF (FWD) commander task organizes the FFCC with the personnel, equipment, and communications required to support operational requirements. The MEF (FWD) FFCC plans fires to support deep operations, participates in planning joint deep operations, and coordinates those operations with GCE close operations through the GCE FSCC. The GCE FSCC identifies and submits additional fire support requirements in the form of targets and requests for reinforcing fires to the MEF (FWD) FFCC. The MEF (FWD) FFCC receives the GCE's target nominations and coordinates the GCE's requests for fire support from external agencies (e.g., coordinating Army MLRS mission support for the GCE). The MEF (FWD) FFCC also coordinates ACE and CSSE fire support requirements, including SEAD and fire support for rear operations respectively.

(2) GCE FSCC. The GCE commander employs FSCC to conduct fire support coordination. The GCE FSCC plans fires, conducts targeting, and integrates deep supporting fires with maneuver. Close supporting fires require detailed integration and coordination and are primarily the concern of lower echelons. To enable the efficient employment and coordination of Marine aviation with ground operations, the direct air support center (DASC) is typically collocated, either physically or electronically, with the GCE's senior FSCC. If the DASC/FSCC collocation is not possible, the DASC may establish an air support liaison team (ASLT) at the FSCC to facilitate coordination. The tactical linkage between the GCE and ACE is maintained through TACPs organic to GCE units. The GCE directly interfaces with other elements of the MEF (FWD) as required. Conflicts that cannot be resolved directly are resolved by the MEF (FWD) FFCC.

Table V-3. MAGTF Fire Support Coordination Agencies and Coordinators

ECHELON	FIRE SUPPORT COORDINATION AGENCY	FIRE SUPPORT COORDINATOR
CE	FFCC	FFC (Special Staff Officer)
Div	FSCC	FSC (Artillery Regiment Commander)
Regt	FSCC	FSC (Arty Liaison Officer)
Bn	FSCC	FSC (Weapons Company Commander)
Company	N/A	Company Commander

b. MEF (FWD) Fire Support Assets.

(1) Artillery. The MEF (FWD) normally deploys with a supporting artillery battalion comprised of a headquarters battery, 3 to 5 6-gun M198 howitzer batteries, and attached meteorological and radar support. The headquarters battery includes the battalion headquarters and the administrative and logistical elements required to support battalion operations. Figure V-4 depicts a notional MEF (FWD) artillery battalion.

(2) Mortars. Each of the MEF's (FWD) 3 rifle battalions (and the LAR battalion) features 8 81mm mortars in its organic weapons company. There are 4 60mm mortars organic to the weapons platoon of each rifle company.

c. Naval Surface Fire Support. When naval fire support is available and the general tactical situation permits its use, naval firepower can provide large volumes of devastating, immediately available, and responsive fire support to combat forces operating near coastal waters. Long-range missiles and carrier-based naval aviation also enable the JFC to extend reach well beyond littoral regions to attack targets at operational depths. The general mission of naval surface fire support (NSFS) is to provide fires by Navy surface gun, missile, and electronic warfare systems in support of units tasked with achieving the commander's objectives.

(1) Naval Gunfire Ships. Naval gunfire ships may be assigned one of two missions: *direct support (DS)* or *general support (GS).*

(a) DS. DS makes ship fires responsive to the needs of a battalion or regiment size ground force, Destroyers equipped with 5-inch guns usually execute this mission. A ship assigned a DS mission delivers planned and on-call (targets of opportunity) fires in support of the ground force. A supporting arms observer, normally a naval gunfire spotter from the ANGLICO for the DRB or a member of a shore fire control party (SFCP) organic to Marine units, requests and adjusts on-call fires. Note that naval gunfire direct support does not equate to artillery direct support. A direct support ship, for example, responds to calls for fire from units other than the supported unit when ordered to do so by the fire support group commander or by division or brigade naval gunfire officers.

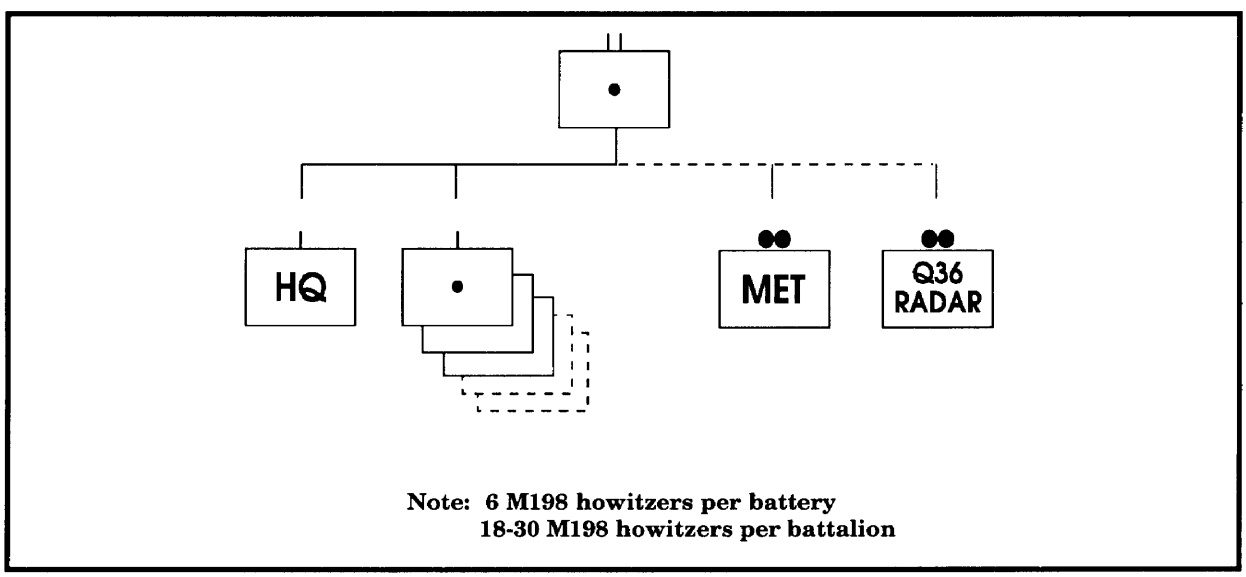


Figure V-4. Notional MEF (FWD) Artillery Battalion

(b) GS. Cruisers with 5-inch guns normally assume general support missions to provide fires in support of regiment or larger-size ground forces. Aerial observers or designated battalion spotters generally request and control the fires of GS ships. GS ships also execute planned fires IAW schedules of fires.

(2) Organization of the ANGLICO. The ANGLICO is a Marine organization. In a joint operation, the ANGLICO will send liaison teams to the other joint players. The company's 3 organic brigade air and naval gunfire platoons are organized to plan, request, coordinate, and control naval gunfire and naval air support for the supported DRB. The DRB receives support from at least 1 brigade platoon. Platoons consist of 2 SALTS. Under normal conditions, these SALTS support 2 of the maneuver battalions. The SALT consists of 2 SALT officers and 6 enlisted. Two firepower control teams (FCTs) are available to support maneuver companies to request, observe, and adjust naval fire support. Each FCT has laser designation capabilities. Figure V-5 portrays the organization of the ANGLICO.

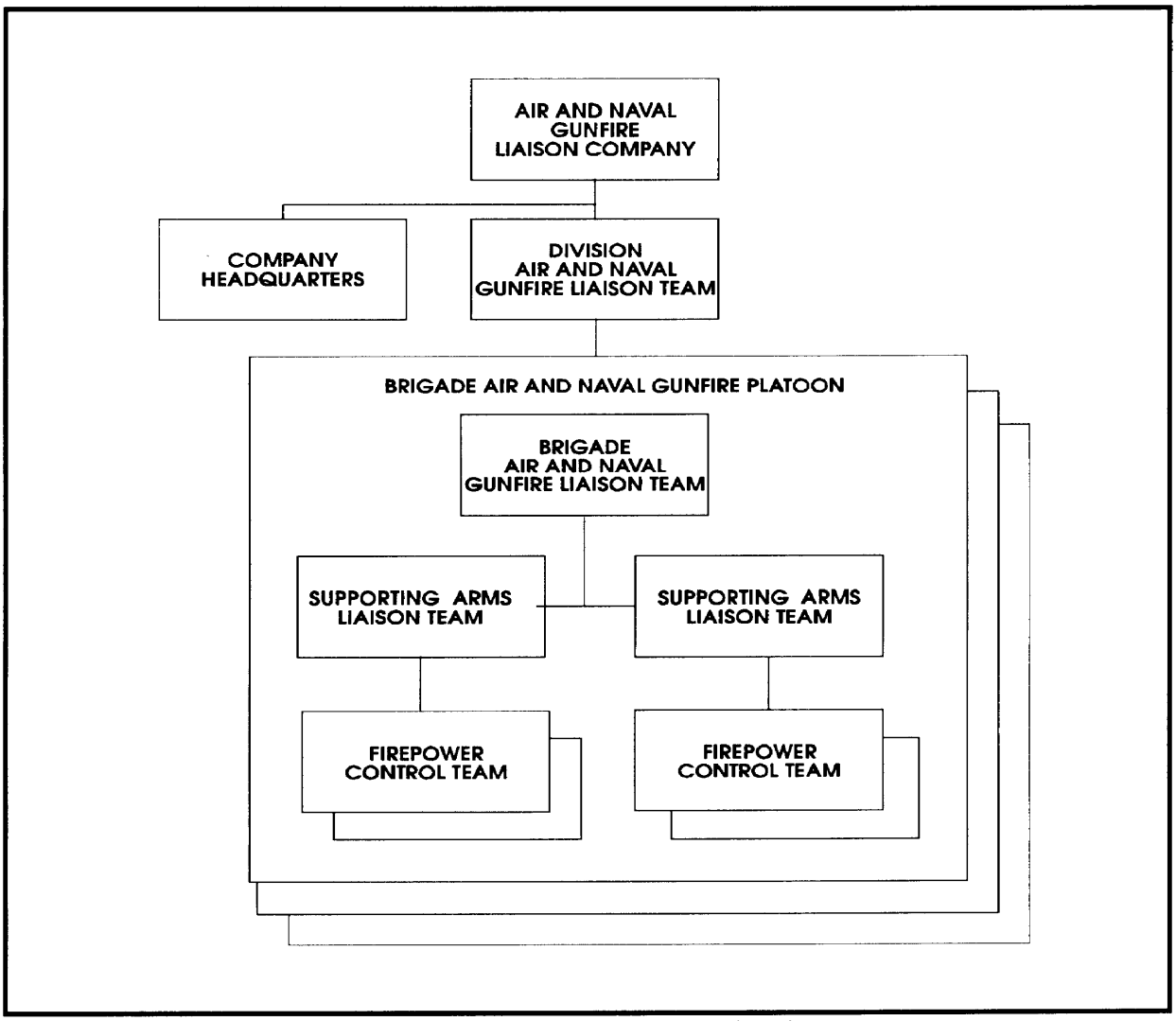


Figure V-5. ANGLICO Organization

d. Marine Aviation. Marine aviation, operating as part of the concerted air-ground effort, provides the MEF (FWD) or joint force commander a significant capability to destroy, deceive, or disrupt the enemy. The MEF (FWD) uses the Marine Air Command and Control System (MACCS) to control aircraft and missiles.

(1) MACCS. The MEF (FWD) FFCC is linked to the ACE MACCS through the tactical air command center (TACC). Paramount to the employment of the MACCS is the requirement for the MEF (FWD) FFCC to have connectivity with the ACE TACC and the GCE FSCCs to be collocated or electronically connected with a MACCS agency. Such connectivity promotes the integration of MEF (FWD) air and ground assets into a combined arms effort. Figure V-6 depicts MACCS/FFCC/FSCC relationships.

(2) Air Tasking Cycle. The MAGTF air operations tasking process evolves around a 24-hour cycle. The process culminates with the production and subsequent execution of the air tasking order (ATO). If the operation is being conducted under a JFC, the MAGTF air tasking cycle will conform to the established joint air tasking cycle procedures.

e. MEF (FWD) Target Collection Assets. The MEF (FWD) CE determines and coordinates the employment of information and intelligence collection assets such as reconnaissance assets, UAVs, and other target acquisition assets within the MEF (FWD). To ensure integration and continuous coverage, coordination is also made with joint and/or allied forces. Table V-4 defines MEF (FWD) target acquisition assets.

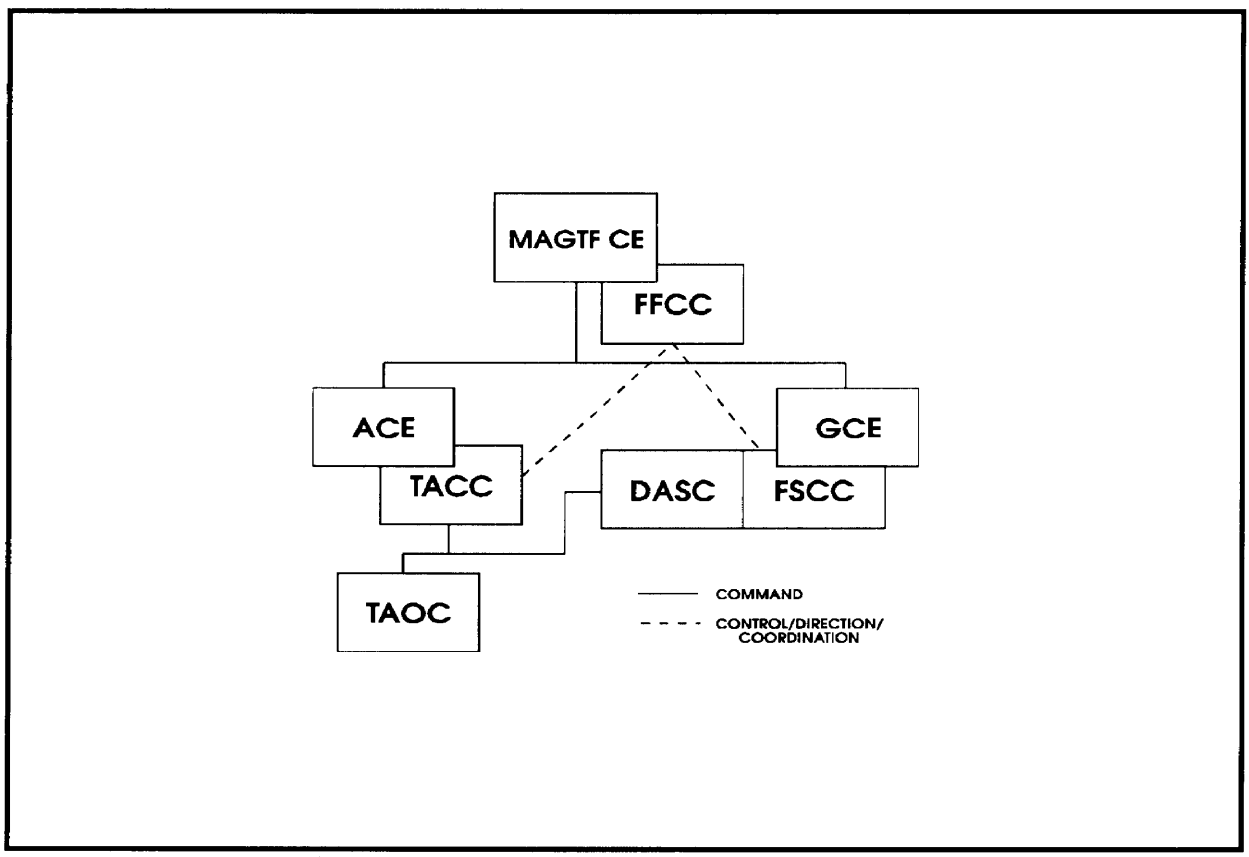


Figure V-6. MACCS/FFCC/FSCC Relationships

Table V-4. MEF (FWD) Target Acquisition Assets

CE	GCE	ACE
UAVs Deep reconnaissance units SIGINT Photographic and satellite sources HUMINT Adjacent units External sources	Forward observers Forward air controllers (FACs) Naval gunfire spotters Ground intelligence sensors Weapons locating radar Combat troops Reconnaissance units	Forward air controller (airborne) (FAC[A]) Aerial observers Other aircraft (including reconnaissance and EW)

8. Integrated Fire Support Operations

a. Task Organizing Artillery Assets. Successful fire support planning and execution in part hinges on the JFC's ability to task organize available fire support assets. The following highlights the fundamentals of organizing fire support assets for combat, describes the process of artillery organization for combat, and defines the seven inherent responsibilities in executing artillery tactical missions.

(1) Fire Support Fundamentals—

(a) Provide adequate fire support to committed maneuver units.

(b) Weight the main effort.

(c) Provide the commander with immediately available fire support.

(d) Retain maximum feasible centralized control.

(e) Provide fire support for future operations.

(2) Artillery Organization for Combat. Artillery organization for combat consists of the 2-step process of establishing command relationships and assigning tactical missions.

(a) *Step 1.* The appropriate commander establishes a command relationship for supporting artillery units of either attached, OPCON, or TACON.

(b) *Step 2.* On the recommendation from the fire support coordinator, the maneuver commander assigns tactical missions of direct support, reinforcing, general support reinforcing, or general support to artillery units.

• DS. DS is the most decentralized tactical mission wherein an artillery unit provides close and continuous fire support to a specific maneuver unit.

• Reinforcing (R). An artillery unit with a reinforcing mission augments the fires of another artillery unit with a DS mission. This mission weights an effort and provides additional responsive fires to the supported maneuver commander. An artillery unit can reinforce only one other artillery unit at a time.

• GSR. An artillery unit with a GSR mission furnishes fires for the entire force within its range and reinforces the fires of another artillery unit as a second priority.

• GS. GS, the most centralized mission, retains artillery to support the force as a whole and provides the commander with immediately available firepower to influence the battle.

(3) Inherent Responsibilities. Table V-5 describes the seven inherent responsibilities of field artillery tactical missions that guide the planning and operational employment of artillery assets during integrated operations.

b. Characteristics of MEF (FWD) and DRB Artillery. Table V-6 provides commanders and staffs with a ready reference that delineates the characteristics of artillery weapons systems available to the MEF (FWD) and DRB.

Table V-5. Inherent Responsibilities of Artillery Standard Tactical Missions

AN ARTILLERY UNIT WITH A MISSION OF—	DIRECT SUPPORT	REINFORCING	GENERAL SUPPORT REINFORCING	GENERAL SUPPORT
Answers calls for fire in priority from—	1. Supported unit 2. Own observers[1] 3. Force artillery HQ	1. Reinforced artillery 2. Own observers[1] 3. Force artillery HQ	1. Force artillery HQ 2. Reinforced unit 3. Own observers[1]	1. Force artillery HQ 2. Own observers[1]
Has as its zone of fire—	Zone of action of supported unit	Zone of fire of reinforced artillery	Zone of action of supported unit to include zone of fire of reinforced artillery unit	Zone of action of supported unit
Furnishes FOs/FISTs and FSSs)[2]—	Maneuver companies of supported unit. Provides temporary replacements for casualties.	No requirement	No requirement	No requirement
Establishes liaison with—	Supported Unit (To Bn level)	To reinforced artillery unit HQ	To reinforced artillery unit HQ	No requirement
Establishes communications with—	FSOs/FSCs and supported maneuver unit HQ	Reinforced artillery unit HQ	Reinforced artillery unit HQ	No requirement
Is positioned by—	DS artillery unit commander or as ordered by force artillery HQ	Reinforced artillery unit or as ordered by force artillery HQ	Force artillery HQ or reinforced artillery unit if approved by force artillery HQ	Force artillery HQ
Has its fires planned by—	Develops own fire plan	Reinforced artillery unit HQ	Force artillery HQ	Force artillery HQ

1. Includes all target acquisition means not deployed with supported unit (e.g., radar, aerial observers)
2. USA: A FSS for each maneuver brigade/battalion and FIST for each maneuver company are trained and deployed by the FA unit. The FIST for the mechanized infantry consists of a FIST headquarters and 3 forward observer parties per company. The FIST for the armor company consists of a FIST headquarters only. Once deployed, FISTs and FSSs remain with the supported maneuver unit throughout the conflict.

Table V-6. Characteristics of MEF (FWD) and DRB Artillery

UNIT	WEAPON	# WEAPONS	RANGE (M)	AMMO TYPES	FUSES
MEF (FWD)	M198 155mm Towed Howitzer	18-30/Bn (6/Btry)	22,400* 30,000 (RAP)	HE, RAP, Illum, ICM, DPICM, ADAM, RAAM, HC, WP, Copperhead	CP, PD, VT, MTSQ, MT
DRB	M109A3 155mm SP Howitzer	24/Bn (8/Btry)	18,100* 23,500 (RAP)	HE, RAP, Illum, ICM, DPICM, ADAM, RAAM, HC, WP, Copperhead	CP, PD, MT, MTSQ, VT
DRB	M109A6 155mm SP Howitzer (Paladin)	24/Bn (8/Btry)	24,000* 30,000 (RAP)	HE, RAP, Illum, ICM, DPICM, ADAM, RAAM, HC, WP, Copperhead	CP, PD, MT, MTSQ, VT
DRB	MLRS	9/Battery 27/Bn	32,000	DPICM (M77)	Electronic Time
DRB	ATACMS	(Same as above)	165 km	APAM (M74)	Electronic Time

* The ranges are for HE with M203 propellant. Maximum ranges differ by propellants used.

c. Counterfire Operations.

Given the vulnerability of our forces—particularly our *"light"* combat forces and our combat and combat service support units—to enemy artillery, the JFC and subordinate commanders and staffs must devote special attention to providing effective counterfire against an artillery-rich foe. The USMC does not have organic MLRS or Q-37 radar to assist in providing counterfire; Marine commanders rely primarily on organic artillery units, Marine aviation, and attached/OPCON MLRS provided by the Army for counterfire. The most effective counterfire system will often be the MLRS. To maximize the capabilities of the MLRS battery, direct *"sensor-to-shooter"* linkage may be established from specific sensors to the MLRS battery. Linking the battery with a Q-36 or (preferably) a Q-37 provides the commander with a responsive counterfire capability to locate and attack firing enemy indirect fire systems. When the MEF (FWD) must rely on Marine aviation for long-range counterfire, *"sensor-to-shooter"* linkage can be established with a quick-fire channel connecting an air officer in the target processing center directly to a TAC(A). A proactive counterfire strategy links sensors (such as a USMC UAV) with the MLRS or other attack means in order to locate, attack, and eliminate enemy artillery before it enters the fight.

d. MLRS Support of USMC Operations. Task organizing the MEF or MEF (FWD) with supporting MLRS units provides respective commanders with a significantly enhanced indirect fire capability to conduct counterfire operations. The discussion below addresses command and control of MLRS units under MEF control, describes required communications linkages, and highlights planning considerations for MLRS employment.

(1) Command and Control. The MEF commander may elect to employ attached MLRS unit(s) in general support of the MEF or assign other tactical missions to support MEF ground units. When operating under USMC control, MLRS units should be placed within the artillery organization but could be tasked to support the MEF (FWD) as a whole. The senior artillery headquarters establishes the tactical mission of the MLRS unit by assigning it a GS mission or nonstandard GSR or R missions. The senior fire direction center exercises tactical fire control over attached MLRS units; the senior artillery commander or S3 directs the positioning of GS and GSR MLRS units and associated radars under regimental control of the artillery headquarters.

(2) Communications. The MLRS unit operates on the following external nets when supporting USMC operations:

(a) Regimental Command Net (HF).

(b) Regimental Tactical Net (VHF).

(c) Regimental Fire Direction Net (VHF).

(d) Radar Telling Net (VHF), as required.

(e) Regimental Survey/Met Net (VHF), as required.

(f) Regimental Communication Coordination Net (HF/VHF).

(3) Employment Considerations. The employment of the MLRS unit will be similar to the employment of a Marine artillery battalion with a GS mission. MLRS operations are characterized by rapid emplacement, engagement, and displacement of widely dispersed launchers. Specific planning considerations include—

(a) Sustained Operations/Launcher Response Time. Schedules of fire must be coordinated so the battery can manage launcher posture and/or response time. Because of maintenance, personnel, and other factors, *"rule of thumb"* is to plan fires for no more than 6 launchers at one time. If

a surge condition arises, the unit can be tasked to provide a higher number. If all available launchers fire on a schedule, temporary loss of the asset (20 to 45 minutes) can be expected while the launchers move to reload points, reload, and return to firing points.

• Launcher Response Posture. On the basis of METT-T, the force commander's guidance, ammunition resupply, and launcher maintenance status, the commander determines how unit launchers are postured. A launcher response posture is its readiness to respond to fire missions. The terms *hot*, *cool*, and *cold* indicate launcher response posture.

• • *Hot* status indicates the launcher is fully capable of firing. Status is based on the launcher's electrical and mechanical systems, not on its location or ammunition load.

• • *Cool* status indicates a launcher is capable of firing but only after a warm-up period of about 8 minutes.

• • *Cold* status indicates the launcher is not mission-capable for maintenance reasons or that one or more essential systems are shut down for maintenance, preventive maintenance checks and services (PMCS), crew rest, and so forth. If a *cold* launcher is mission-capable, it may take 30 minutes or more for it to respond.

• Tactical Posturing. The battery directs the platoons to maintain a specific number of launchers in a *hot* status. This is based on guidance from the controlling FA headquarters, METT-T, total launchers available, ammunition available, crew rest, and fatigue. The platoons usually rotate their launchers through *hot* status, changing individual launchers and maintaining the total number of required *hot* launchers.

(b) Fire Planning. The MLRS uses two basic types of fire missions in support of close operations: planned (scheduled) and targets of opportunity (unscheduled). Given the different platoon positions described above, at least 30 minutes may be required for the entire MLRS battery to execute a fire plan. In scheduling MLRS fires, each launcher is given a separate line on the scheduling worksheet.

(c) Positioning. MLRS fights as close to the FLOT as possible in order to maximize its 32 km range and offset the range advantage enjoyed by some enemy indirect fire systems. METT-T availability of ground maneuver units to protect MLRS, the scheme of maneuver, and a degree of risk acceptable to the commander dictate employment and positioning decisions.

(d) Increased Target Processing Requirements. Because of the additional target production from radars accompanying attached MLRS, the Marine target processing center may require augmentation by target processing sections to efficiently process targets.

(e) Ammunition Expenditure. MLRS ammunition consumption requires intense management by planners, operations personnel, and logisticians. Requirements for current and projected operations are balanced against the controlled supply rate; MLRS support and appropriate controls are established accordingly. The *missile profile*, the measure of effort expected of a system under various levels of combat intensity, provides one methodology of determining the anticipated consumption rates for MLRS units (see Table V-7). These levels of intensity include—

• Supported level of effort expended per day over an extended period of combat for a committed force; it is normally expected to occur 75 percent of the time for MLRS units.

• Surge level of effort required when a committed force faces a main attack; it is expected to occur less than 20 percent of the time for MLRS units.

Table V-7. MLRS Ammunition Planning Figures

LEVEL	# ROCKETS/LAUNCHER/DAY	# MISSILES/BATTERY/DAY
Supported	80-130	2-16
Surge	150-235	15-17
Peak	195-310	17-20

• Peak level of effort during an intense period of combat. Direct support and/or reinforcing artillery within a selected brigade area are likely candidates; it is expected less than 5 percent of the time for MLRS units.

(f) Maintenance Support. MLRS units attached to the MEF must deploy with the appropriate automotive and missile maintenance personnel, equipment, and repair parts required to conduct sustained combat operations. The MEF possesses no capability to support specialized MLRS equipment.

(g) Troop Safety. Troop safety considerations normally preclude employment of MLRS in proximity to friendly personnel. Danger close for MLRS M26 rockets is 2 km at maximum range. For planning purposes, MLRS fires are generally directed no closer than 2 km beyond the FLOT. The potential for unexploded ordnance (UXO) in areas where large volumes of MLRS fires have occurred must be considered from both troop safety and maneuver/movernent standpoints during operational planning and execution.

e. Close Air Support (CAS) Operations.

(1) CAS for the DRB when deployed with the MEF. Army forces normally receive CAS from the Air Force and are provided with Air Force liaison parties that request, coordinate, and control available Air Force CAS. The key consideration for providing Marine or Navy CAS to the DRB is sufficient numbers of terminal controllers from the MAGTF.

(a) ANGLICO Support. Terminal controllers normally come from ANGLICO in the form of FCTs that are trained and equipped to provide planning advice and CAS terminal control for Marine aviation. Likely, the DRB will receive an ANGLICO brigade liaison platoon consisting of a BLT, 2 SALTS, and 4 FCTs. The BLT acts as the principal staff coordinator for Navy and Marine Corps CAS and naval gunfire for the DRB commander. SALTS operate at the battalion/task force level and each has 2 FCTs that support committed companies. The SALT officer in charge (OIC) (either a naval aviator or flight officer) plans, requests, coordinates, and (when required) controls Navy and Marine Corps CAS or NSFS for DRB task forces. The FCT, comprised of 1 officer (a universal spotter) and 5 enlisted Marines, plans and controls CAS and NSFs for the forward companies of a task force.

(b) CAS Request Flow, SALTS submit requests for preplanned Navy and Marine CAS through fire support coordination agencies in the maneuver chain of command, first to the BLT at the DRB FSE, next to the division FSCC for consolidation, then to the MEF FFCC for approval, and ultimately to the ACE via the Marine TACC for planning and execution if approved by the MEF. Requests for immediate Navy and Marine Corps CAS are submitted by the FCT to the DASC on the tactical air request (TAR) Net (HF). The SALT monitors this net and provides any coordination necessary at that level. Terminal control of CAS aircraft supporting the DRB is normally provided by ANGLICO FCTs. In the absence of an observer, Marine air may be controlled by the company FSO, ALO, or Air Force FAC. Chapter VII provides additional detail on CAS request procedures.

(c) Considerations. Although the brigade liaison platoon normally consists of

2 SALT teams, Desert Storm after action reports recognized the need for 3 SALTs per brigade team rather than 2. DRB commanders must also consider the force protection issue when receiving supporting ANGLICOs; SALTs are equipped with HMMWVs and do not enjoy the protection afforded by the Abrams tank and Bradley fighting vehicle.

(2) CAS for the MEF (FWD) When Deployed with a Corps. The MEF (FWD) possesses CAS-capable aircraft and the means to coordinate and control those aircraft. Except in exceptional circumstances, Marine aviation remains under the OPCON of the MAGTF commander. Chapter VII addresses procedures for requesting air support when the MEF (FWD) requires support that exceeds the capability of the MEF (FWD) ACE.

f. Naval Surface Fire Support of the DRB.

(1) Procedures during Amphibious Assaults. During amphibious phases of a joint operation, a naval task force provides interface with the DRB FSE through the ship-based supporting arms coordination center (SACC). The SACC is responsible for coordinating all fires during the assault. To facilitate the coordination of fires in support of the landing force assault to shore, the SACC augments with personnel and equipment from the MAGTF FFCC and the senior GCE FSCC. Normal coordination is through the Artillery Command Fire (CF) or Fire Direction (FD) Nets. The Landing Force Fire Support Coordination Net (HF) can serve as a backup. To minimize dependence on ship-to-shore communications and because higher echelons may not be ashore, units conduct lateral coordination when fires clearance must be obtained from only one other landing force unit. When ashore and prepared, the FFCC assumes responsibility for fire support coordination from the SACC. The change in responsibility depends on which agency possesses the best capability to coordinate and is contingent on the commander, amphibious task force (CATF) decision.

(2) Procedures Ashore. The BLT maintains communications on the NGF Support and/or NGF Control Net (HF) and the Brigade Command I and II Nets (VHF). These nets provide communications for the planning and coordination of NSFS between the NSGS ships, the GCE FSCC, the BLT, and SALTs. These nets support day-to-day planning among these agencies. The SALTs and FCTs maintain communications on the SALT Local (VHF) and NGF Ground Spot (HF) Nets. The SALT at the battalion FSE monitors any requests for NSFs on the NGF Ground Spot Net and coordinates as necessary with the BLT. Figure V-7 illustrates general support naval gunfire requests at the DRB level.

Army personnel also request and conduct fire support missions using naval gunfire in the absence of ANGLICO personnel. The naval gunfire communications interface includes a designated naval gunfire ground spot net with a frequency of 2-30 MHz HF. Compatible communications equipment includes: USMC—PRC-104, GRC-193, MRC-138; USA—GRC-106, GRC-193, and Single-channel Ground and Airborne System (SINCGARS) family of radios; USAF—PRC-104, MRC-107/108, GRC-206.

g. Naval Air Support of the DRB. Navy aircraft provide support to the DRB when available. The primary missions of Navy aircraft are fleet air defense and offensive attack. When designated to support the DRB, Navy aircraft are placed in a general aircraft sortie pool for tasking by the Navy TACC. Communications and control of Navy aircraft are the same as for Air Force aircraft. Air interdiction (AI) sorties are tasked by the Navy TACC. CAS sorties require the same positive control as Air Force CAS during the actual strike. As with Air Force CAS, the Air Force FAC, ANGLICO, or Army FIST provide the required control. The DRB must be operating in an AOA or receiving its

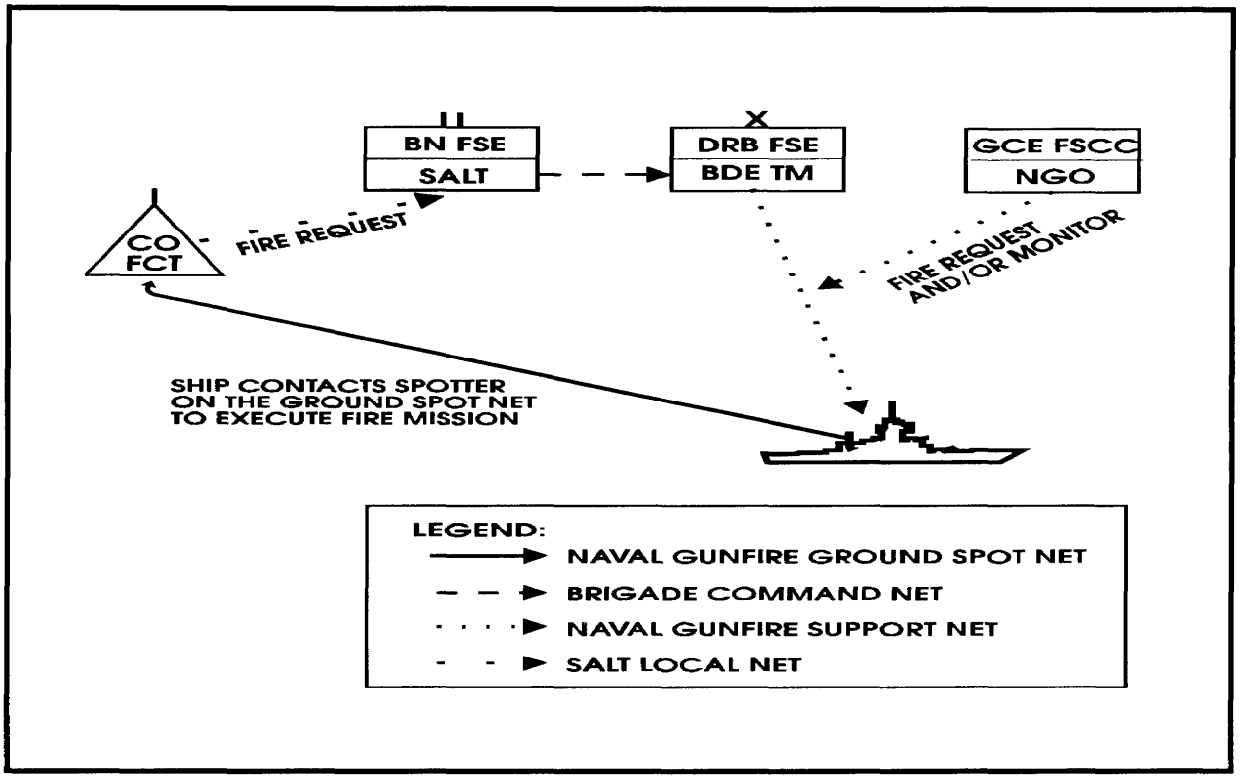


Figure V-7. DRB General Support Naval Gunfire Requests

primary tactical air support from the Navy. In this case, the naval air commander would likely be the air component commander. An Army battlefield coordination element (BCE) may be required to deploy to the CATF's TACC to perform the full functional interface and coordination as it does with the Air Force air operations center (AOC).

h. Artillery Communications. The artillery unit's ability to communicate is arguably the greatest single factor in determining whether or not the unit will accomplish its mission. The discussion below defines the external operating nets for the artillery battalions supporting the MEF (FWD) when operating with a corps and for the DRB when operating with a MEF respectively:

(1) MEF (FWD) Under Corps Control. Table V-8 identifies the external nets that the MEF's (FWD) supporting M 198 artillery battalion must operate in when the MEF (FWD) fights as part of a corps. The table assumes the artillery battalion performs a tactical mission of direct support for the MEF's (FWD) GCE. However, there may be occasions (e. g., when the MEF [FWD] is assigned a reserve mission) when the assignment of reinforcing, general support reinforcing, or general support missions may be appropriate.

(2) MEF (FWD) under MEF (FWD) Control. Table V-9 identifies the external nets the DRB's supporting artillery battalion must operate in when the DRB fights as part of a MEF (assuming artillery regimental headquarters is present). The table presumes the artillery battalion will only perform a tactical mission of direct support for the DRB. However, there may be occasions (e.g., when the DRB is assigned a reserve mission) when the assignment of reinforcing, general support reinforcing, or general support missions may be appropriate.

Table V-8. MEF (FWD) Artillery External Communications Net Structure When Operating with Corps

EXTERNAL NETS	DS GCE	R	GSR	GS
Force FA Command (VHF) (V)	X		X	X
Force FA Operation/Fire 1, 2, 3 (VHF) (V or D)	X	X	X	X
Force FA Command Fire (HF-SSB) (V/FAX)	X	X	X	
Force FA Target Acquisition/Intelligence (VHF) (V)				X
Force FA Survey (VHF) (V)	X[2]	X[1,2]	X[1,2]	X[2]
Force FA Administrative/Logistics (VHF) (V)				A
Maneuver Unit Operations	X	X		
Maneuver Unit Fire Support (VHF) (V)	Internal	X[2]	X[2]	A
Reinforced Battalion Command (VHF) (V)		X	X	
Reinforced Battalion Operations/Fire (VHF) (V or D)		X	X	
[1] ReinforcedUnit Survey Net X=Subscriber V=Voice Net [2] Primary External Net A= As Required D=Digital Net				

Table V-9. DRB Artillery External Communications Net Structure When Operating with MEF

EXTERNAL NETS	DS RB	R	GSR	GS
Artillery Regimental Command Net (HF)	X	A	X	X
Artillery Regimental Tactical Net (VHF)	X	X	X	X
Artillery Regimental Fire Direction Net (VHF)	X	X	X	X
Radar Telling Net (VHF)	A	A	X	X
Regimental Survey/Met Net (VHF)	X[2]	X[1,2]	X[1,2]	X[2]
Regimental Communication Coordination Net (HF/VHF)	A	A	A	A
Reinforced Artillery Battalion Fire Direction Net (VHF)		X	X	
MAGTF/Landing Force Artillery Command/Fire Direction (VHF)	A	A	A	A
Artillery Conduct of Fire Net (HF)	A	A	A	A
Maneuver Unit Operations/Intelligence (VHF)	X	X		
[1] Reinforced Unit Survey Net X=Subscriber [2] Primary External Net A=As required				

Chapter VI

ENGINEER OPERATIONS

1. Background

To succeed on a dynamic battlefield, the joint force and subordinate commanders must ensure the ability of the joint force to maneuver freely and to maximize the effects of its fires. At the same time, the joint force must deny the enemy that capacity. Engineers provide commanders with significant capabilities to assist in multiplying the battle effectiveness of both maneuver and fires.

2. Terminology

USMC doctrine recognizes four primary combat engineer functions: *mobility, countermobility, survivability,* and *general engineering.* The Army considers *topographic engineering* to be a fifth primary engineering function that supports the Defense Mapping Agency and all services as well. The following definitions of the four functions common to both services are provided to ensure clarity. The source documents for the definitions include Joint Pub 1-02; *Universal Joint Task List (UJTL);* and FMFRP 0-14.

a. Mobility. To provide freedom of maneuver for personnel and equipment on the battlefield/combat area without delays due to terrain or obstacles. Mobility is a quality or capability of military forces that permits them to move from place to place while retaining the ability to fulfill their primary mission.

b. Countermobility. To delay, channel, or stop offensive movement by the enemy in order to destroy its forces directly or indirectly by enhancing the effectiveness of friendly weapons systems.

c. Survivability. To protect personnel, equipment, and supplies from enemy and friendly systems and natural occurrences while simultaneously deceiving the enemy.

d. General Engineering. Intensive effort by engineer units that involves high standards of design and construction as well as detailed planning and preparation. It is that wide range of tasks in rear areas that serves to sustain forward combat operations.

3. DRB Operations

a. DRB Command and Control. The DRB deploys with its habitually associated engineer battalion. The mission of the battalion is to increase the combat effectiveness of the brigade by accomplishing mobility, survivability, and limited general engineering tasks. Based on METT-T analysis, additional engineer units can be requested from division, corps, and echelons above corps (EAC) to increase these engineer capabilities. The efforts of all engineers working in the brigade sector will be coordinated by the brigade engineer. The engineer battalion commander acts as a battalion commander and as the brigade engineer; the assistant brigade engineer serves as the commander's full-time representative on the DRB staff at the brigade TOC. Engineers advise the DRB and subordinate commanders and staffs on engineer unit capabilities and employment and on engineering impacts regarding respective unit plans and operations. Engineers also plan, coordinate, and supervise staff activities of assigned, attached, and supporting engineer units. The engineer battalion also provides a battalion task force command and control element for specific combat operations and can reorganize and fight as infantry when augmented with weapons and fire control elements. The battalion is most effective, however, when employed to perform engineering tasks in support of brigade and/or joint force operations.

b. Organization. The DRB engineer battalion consists of a HHC and 3 engineer companies (see Figure VI-1). The DRB commander normally task organizes forces with a supporting engineer company. However, METT-T may dictate that 1 or more companies be retained in general support of the brigade or placed in support of a particular task force to weight the DRB main effort. Table VI-1 provides a recapitulation of the organic DRB engineer battalion equipment.

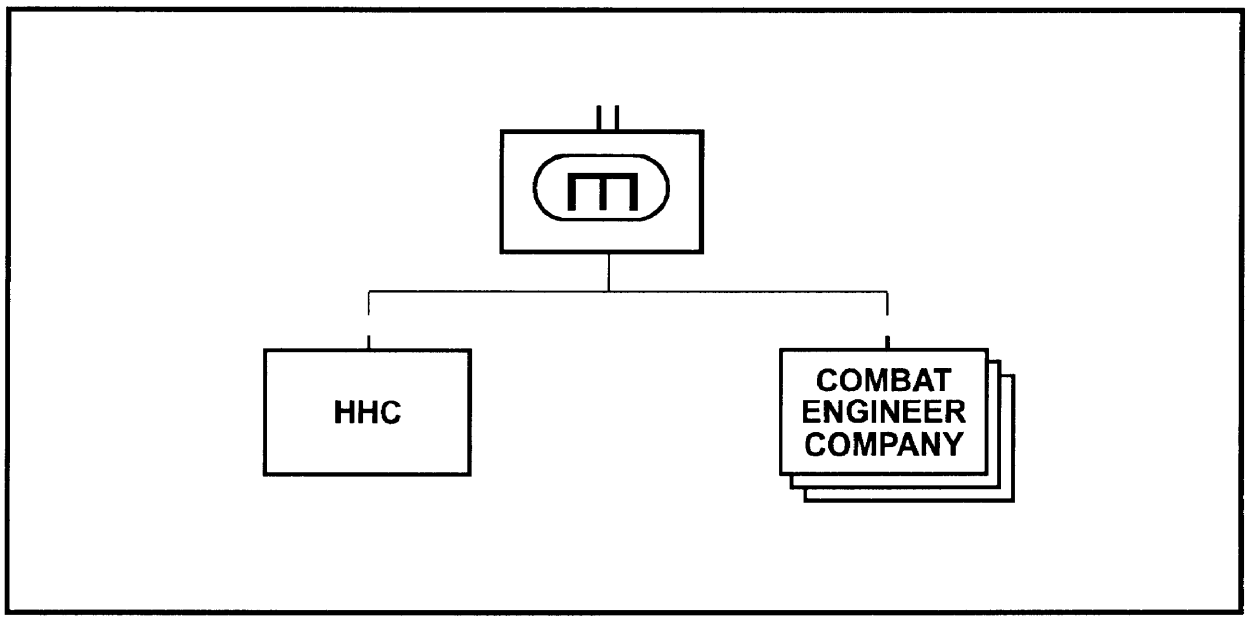


Figure VI-1. DRB Engineer Battalion

Table VI-1. DRB Engineer Battalion Equipment

TYPE EQUIPMENT	#	TYPE EQUIPMENT	#
M577 command post	6	Cargo (HEMTT)	8
Small equipment excavator (SEE)	6	Fueler (HEMTT)	4
Armored vehicle launched bridge (AVLB)	12	5-ton dropside cargo truck	3
Armored combat earth mover	21	2.5-ton cargo truck	11
Armored personnel carriers (M113 APCs)	28	1.5-ton trailer	26
Combat engineer vehicles (CEVs)	6	Maint contact TRK	3
Ammunition carriers (M548)	6	Wrecker, HEMTT	1
Mine clearing line change (MICLIC)	12	Shop equipment light truck	1
Volcano	6	HMMWV	27
Vehicle, tracked recovery (M88 heavy)	2	Mobile kitchen trailer Water trailer	2 4
Chemical agent alarm	18	Reconnaissance boat	7
Decontamination apparatus	1	Demolition set	24
Mine detectors	60	M60-series launcher	12
Radio sets AN/GRC/VRC/PRC 46/47/49/64/77/160	108	Radio set AN/GRC 106	1
Chainsaw	30	Carpenters tool kit (platoon and squad)	24

4. MEF (FWD) Engineer Operations

a. MEF (FWD) Command and Control. A MEF (FWD) may have as many as 4 separate engineer units as reflected in Figure VI-2. All of these units provide mobility, countermobility, survivability, and general engineering support based on size and capabilities. MAGTF engineer units' organization and equipment allow performance of a variety of missions and tasks in any environment. Engineer units of the MEF (FWD) are staffed, structured, and equipped to perform engineer assignments appropriate to their anticipated employment. The capabilities of given engineer units are largely dependent on the type and quantity of equipment they possess.

b. Command Element Engineer. The MEF (FWD) CE has an engineer officer on the staff. The engineer officer's duties are to advise and inform the MAGTF commander regarding the capabilities and best use of various engineer units within the MAGTF. The engineer officer provides CE level support, guidance, and coordination. A unit's normal capability is enhanced by tasking additional (or various) engineer units to reinforce.

c. GCE Engineers. Combat engineers organic to the GCE provide close combat engineer support by performing mobility, countermobility, and limited survivability tasks. They are integrated into combat formations and provided amphibious assault vehicle support or light armored vehicle transport to make them as survivable and mobile as the forces they are supporting. Combat engineers have the secondary mission to fight as infantry.

(1) GCE Engineer Organization. Normally, a reinforced company from the combat engineer battalion (CEB) of the Marine division supports a MEF (FWD) GCE as depicted in Figure VI-3. The CEB commander acts as a company commander and the GCE engineer. The CEB commander advises the GCE and subordinate commanders on engineer unit capabilities, employment, and operational impacts and plans and coordinates activities of attached and supporting engineer units.

(2) Equipment. Table VI-2 details some of the equipment assigned to an engineer company that supports a MEF (FWD) GCE.

d. ACE Engineers. Two assigned Marine wing support squadrons (MWSSs) support the ACE of a MEF (FWD). One MWSS normally supports the fixed-wing components of the ACE, while the other MWSS provides support to the rotary-wing component.

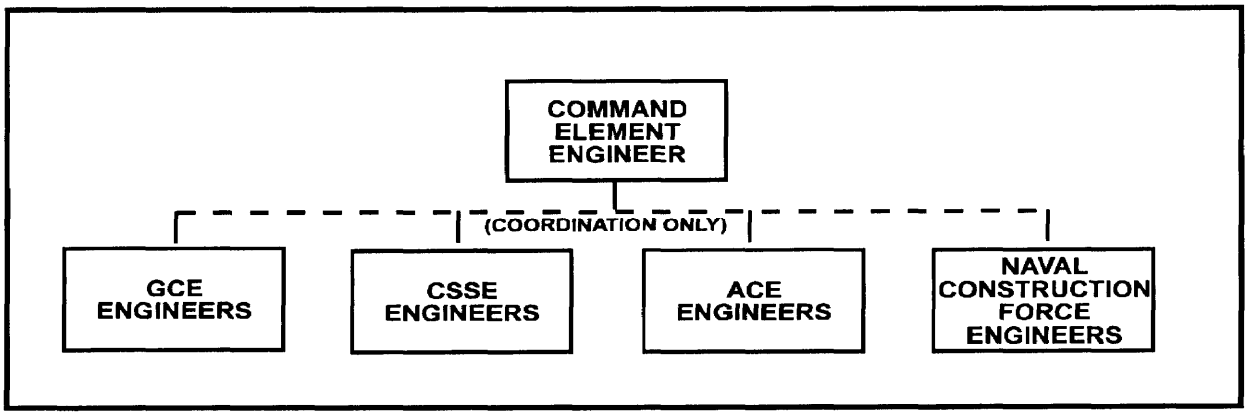


Figure VI-2. Notional MEF (FWD) Engineers

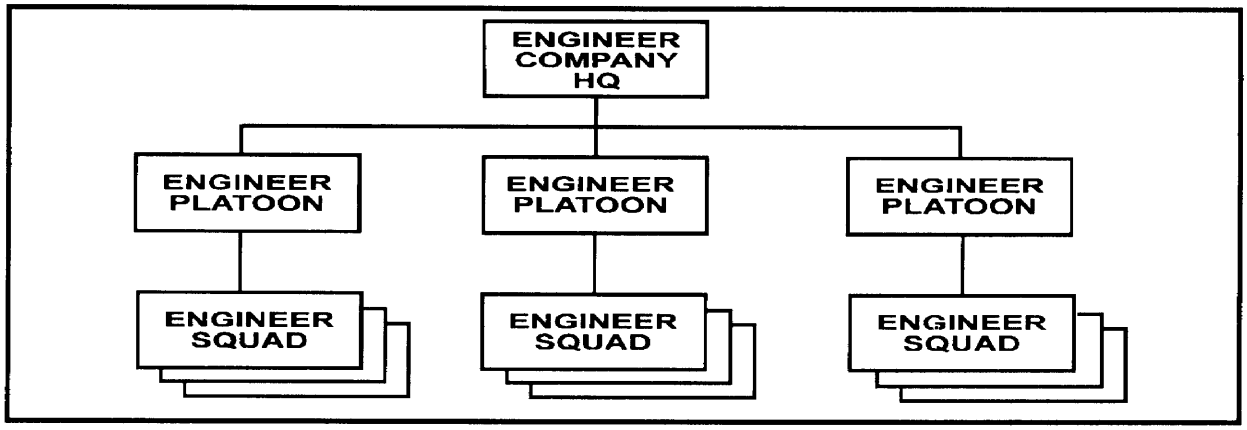


Figure VI-3. MEF (FWD) GCE Engineer Company

Table VI-2. Notional Combat Engineer Company (Reinforced) Equipment in Support of a MEF (FWD) GCE

NOMENCLATURE	QTY	NOMENCLATURE	QTY
AN/GRC 160	1	Chainsaw	9
AN/PRC 77	15	Carpenter kit	3
2 1/2 yd general purpose bucket	2	Pioneer kit	9
250 CFM	1	Armored combat excavator	2
Conventional mine laying system	4	T-5 bulldozer	2
Decon apparatus	1	D7G bulldozer	2
Demo kit	9	SEE tractor	3
Mine detector	9	TRAM	2
10k forklift	2	M923 5-ton truck	3
Line change/trailer	9	M929 5-ton dump truck	3
Minefield marking system	1	M998 HMMWV	12

(1) MWSS Organization. The engineer operations division of the MWSS provides the engineer capability (minus bulk fuel support) to the ACE as shown in Figure VI-4.

(2) MWSS Engineer Equipment. The table of equipment for the MWSS varies depending on which component of the ACE it supports, Engineers located in the airfield operations division receive, store, and dispense aviation and ground fuels. As directed, CSSE engineer assets may augment MWSS elements. Tasks include constructing vertical/short takeoff and landing sites, repairing, improving, and maintaining roads within the ACE tactical area of responsibility, shelter construction, and limited rapid runway repair, Tables VI-3A and 3B provide summaries of some of the engineer equipment available to the fixed- and rotary-wing MWSSs respectively.

e. CSSE Engineers. CSSE engineers are a reinforced company from the engineer support battalion (ESB) of the FSSG that normally supports a MEF (FWD) CSSE. This company provides general engineering support to the MAGTF. The engineer company commander acts as the company commander and the CSSE engineer. The engineer company commander advises the CSSE on engineer unit capabilities and employment and on engineering aspects of plans and operations. The engineer company commander also plans and coordinates the activities of attached and supporting engineer units. Figure VI-5 illustrates CSSE engineer organization. Table VI-4 recaps CSSE engineer equipment.

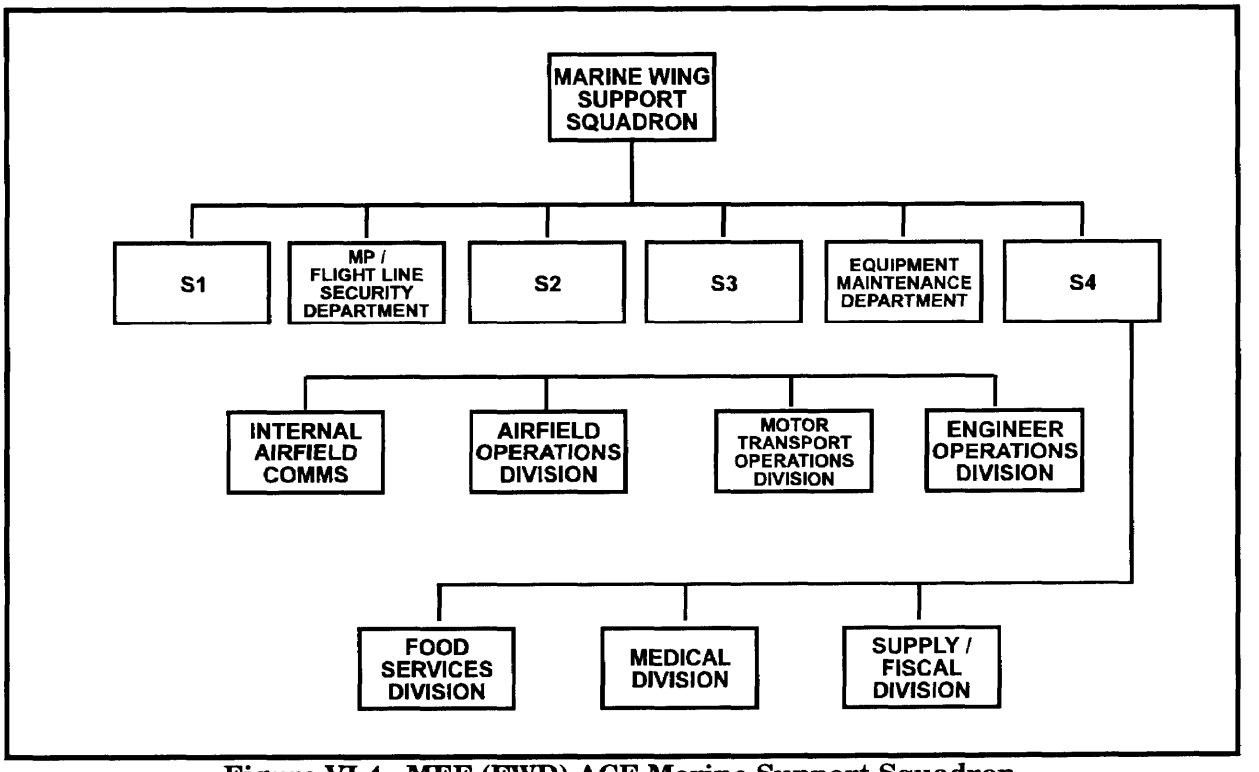


Figure VI-4. MEF (FWD) ACE Marine Support Squadron

Table VI-3A. MWSS (Fixed-Wing) Engineer Equipment (NAI)

NOMENCLATURE	QTY	NOMENCLATURE	QTY
Shower unit	5	Vibratory compactor roller	2
2 1/2 yd general purpose bucket	4	15 kw power distro system	10
5 CFM compressor	2	30 kw power distro system	4
50,000 lb container handler	2	100 kw power distro system	2
250 CFM compressor	2	Survey set	1
30-ton crane	2	3000 gal collapsible water tank	44
Drafting equipment set	1	T-5 bulldozer	2
Decon apparatus	2	D7G bulldozer	4
Chainsaw	5	Runway sweeper	2
Demo kit	1	MC 1150E tractor	2
Mine detector	2	644E tractor	9
Floodlight set	10	SEE tractor	2
Tactical airfield fuel dispensing system	6	Forklift extendible boom	12
Road grader	2	4000 lb forklift	6
Helicopter expedient refueling system (HERS)	2	Reverse osmosis water purification unit (ROWPU)	9
Excavator	1	Medium freshwater purification unit 3000 LMT	2
Field laundry	4	Water chiller	5
Light set (large)	3	Welding machine	2
Light set (small)	2	Petroleum testing kit	6
10,000 lb forklift attachment	9	3 kw generator set	12
SIXCON pump fuel module	4	10 kw generator set	5
Fuel SIXCON	18	30 kw generator set	14
350 cu ft refrigerator	11	60 kw generator set	6
Refrigeration unit	11	100 kw generator set	4
100 cu ft refrigeration unit	10	D7G ripper attachment	2

Table VI-3B. MWSS (Rotary-Wing) Engineer Equipment (NAI)

NOMENCLATURE	QTY	NOMENCLATURE	QTY
Shower unit	5	Vibratory compactor roller	2
2 1/2 yd general purpose bucket	4	15 kw power distro system	10
5 CFM compressor	2	30 kw power distro system	4
50,000 lb container handler	2	100 kw power distro system	2
250 CFM compressor	2	Survey set	1
30-ton crane	2	3000 gal collapsible water tank	44
Drafting equipment set	1	T-5 bulldozer	2
Decon apparatus	2	D7G bulldozer	4
Chainsaw	5	Runway sweeper	2
Demo kit	1	MC 1150E tractor	2
Mine detector	2	644E tractor	9
Floodlight set	10	SEE tractor	2
Tactical airfield fuel dispensing system	6	Forklift extendible boom	12
Road grader	2	4000 lb forklift	6
HERS	2	ROWPU	9
Excavator	1	Medium freshwater purification unit 3000 LMT	2
Field laundry	4	Water chiller	5
Light set (large)	3	Welding machine	2
Light set (small)	2	Petroleum testing kit	6
10,000 lb forklift attachment	9	3 kw generator set	12
SIXCON pump fuel module	4	10 kw generator set	5
Fuel SIXCON	18	30 kw generator set	14
350 cu ft refrigerator	11	60 kw generator set	6
Refrigeration unit	11	100 kw generator set	4
100 cu ft refrigeration unit	10	D7G ripper attachment	2

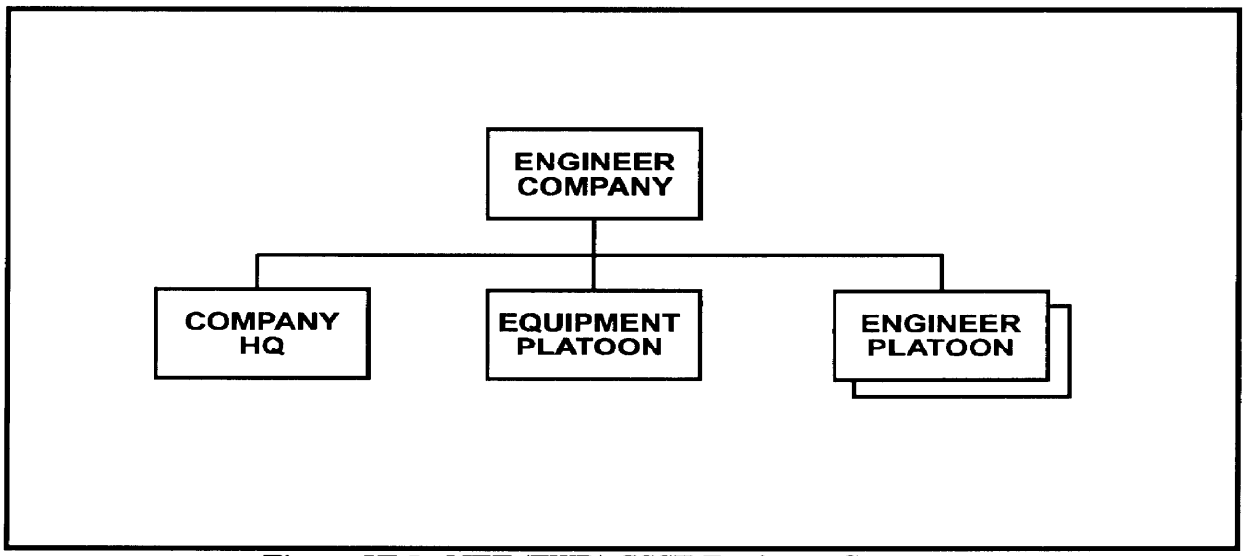


Figure VI-5. MEF (FWD) CSSE Engineer Company

Table VI-4. Notional Engineer Company (Reinforced) Equipment in Support of a MEF (FWD) CSSE

NOMENCLATURE	QTY	NOMENCLATURE	QTY
Shower unit	2	Assault trackway kit	10
2 1/2 yd general purpose bucket	3	D7G ripper attachment	1
250 CFM compressor	1	Chainsaw	9
Drafting equipment set	1	T-5 bulldozer	2
Conventional mine laying system	4	3000 gal collapsible water tank	17
Decon apparatus	1	D7G bulldozer	2
Demo kit	9	Water SIXCON	5
Mine detector	9	644E tractor	2
Floodlight set	2	SEE tractor	4
Armored combat earthmover	4	Carpenters kit	3
10,000 lb forklift attachment	2	Fuel SIXCON	3
3 kw generator set	15	Water purification set	2
10 kw generator set	2	Chainsaw	9
30 kw generator set	10	Forklift extendible boom	1
60 kw generator set	2	Water chiller	2
Line charge/trailer	9	Pioneer kit	1
Minefield marking system	1	ROWPU	2
Large light set	1	Medium freshwater purification unit (MFWPU) 3000 LMT	2

f. Naval Mobile Construction Battalion (NMCB). The NMCB of the naval construction force (NCF) normally supports a MEF (FWD). The NMCB mission is to provide highly skilled construction support to include—construction of ammunition supply points; airbases; ports; petroleum, oils, and lubricants (POL) storage and distribution sites; and storage facilities. NMCB units are neither trained nor equipped for close combat engineer support tasks such as obstacle breaching.

5. Integrated Engineer Operations

Tables VI-5A through VI-5D compare the engineering capabilities of both DRB and MEF (FWD) engineers regarding the four common primary engineering functions of mobility, countermobility, survivability, and general engineering.

Table VI-5A. Mobility Tasks

PRIMARY ENGINEER FUNCTION	DRB	MEF (FWD)			
MOBILITY TASKS	ENGR BN	GCE	CSSE	ACE	NCF
Tactical recon	x	x	x		
Breach obstacles	x	x	x		
Combat roads/trails	x	x	x	x	x
Assault bridging	x	x	x		
Follow-on bridge construction			x		x
HLZ/DZ preparation	x	x	x	x	x
Improve beaches			x		x
Rapid runway repair			x	x	x
Unexploded ordnance disposal	x		x	x	

Table VI-5B. Countermobility Tasks

PRIMARY ENGINEER FUNCTION	DRB	MEF (FWD)			
COUNTERMOBILITY TASKS	ENGR BN	GCE	CSSE	ACE	NCF
Tactical recon	x	x	x		
Construct log posts/cribs	x	x	x		
Construct abatis	x	x	x		
Wire obstacles	x	x	x	x	
Conventional mine emplacement	x	x	x		
Scatterable mine emplacement	x				
Road/runway cratering	x	x	x	x	
Bridge demolition	x	x	x		
Construct antitank ditches	x	x	x		x

Table VI-5C. Survivability Tasks

PRIMARY ENGINEER FUNCTION	DRB	MEF (FWD)			
SURVIVABILITY TASKS	ENGR BN	GCE	CSSE	ACE	NCF
Construct fighting positions	x	x	x	x	x
Construct bunkers/C2 nodes	x	x	x	x	x
Assist in deception operations	x	x	x	x	x

Table VI-5D. General Engineering Tasks

PRIMARY ENGINEER FUNCTION	DRB	MEF (FWD)			
GENERAL ENGINEERING TASKS	ENGR BN	GCE	CSSE	ACE	NCF
Survey/drafting	x		x	x	x
Aircraft revetment	x		x	x	x
Bulk fuel			x	x	x
Water purification			x	x	
Field sanitation/hygiene			x	x	x
Tactical electric			x	x	x
Well drilling			x	x	x
Port repair					x
Forward operating base construction and maintenance			x	x	x
Mobile electric power			x	x	x
Expeditionary airfield construction				x	x

a. Planning Considerations. Coordinated engineer planning ensures that engineer combat resources support the scheme of maneuver, fire support plan, and combat service support plan. Common planning also ensures equipment compatibility, maintenance, and supportability.

(1) Offense. Planning considerations peculiar to the offense include—

(a) Engineer force mobility and integration into maneuver formations to ensure the momentum of the attack.

(b) Arrangements for breached lane handoff from forward breaching units to following engineers for lane improvement and obstacle clearing.

(c) Replacement bridges for armored launchers, follow-on tactical bridging, lift capability for line-charge reloading, and lane marking materials to replenish marking systems.

(d) Common lane marking system for breaching operations.

(e) Increased general engineering requirements as length of line of communications (LOCs) and CSS requirements increase. Plan on-call rapid mining and obstacle emplacement to protect flanks and disrupt enemy counterattacks. Assist in force protection from counterattacks once the force seizes objectives.

(f) Transition to Defense. Class IV and V materials require long lead times to obtain.

(2) Defense. Engineer planning considerations specific to the defense include—

(a) An obstacle system that not only attacks the enemy where desired but also assists counterattacks and facilitates future operations.

(b) Large amounts of materiel and engineer munitions that require time and transport to move.

(c) Early identification of critical engineer tasks. Terrain preparation requires time for completion. Engineers must be employed while planning is in progress.

(d) Engineer organization for combat that allows for rapid transition to offensive operations. The reserve must always have a designated force of engineers. Obstacles must not preclude friendly spoiling attacks or counterattacks.

(e) Engineer units remain committed and work on the commander's priority tasks. Although engineers are positioned with reserve forces, engineer units are not held in reserve.

(3) Retrograde. Specific retrograde engineer planning considerations include—

(a) Centralized control/decentralized execution. Increased numbers of reserved obstacles ensure successful passages of delaying forces.

(b) Obstacles that support weapon systems. Obstacles must not impede future mobility but support movement from battle position to battle position and placed in depth.

(c) Obstacle priorities to key choke points, delay positions, and flanks. The next consideration is developing obstacles directly assisting planned withdrawals to successive delay positions, generally along the delay positions. Special attention must be given to obstacles that cover flanks and lightly held areas to prevent surprise.

(d) Use of existing obstacles. Reinforcing obstacles must offer the best return for the effort invested.

(e) Deception integrated into planning effort.

(f) Designation of reserved demolition obstacle guard with an engineer firing party (or designated backup) to ensure destruction of critical targets, such as bridges along major avenues of approach, prior to enemy capture.

b. Considerations for Task-Organizing Engineers. Considerations for task-organizing available joint force engineer units include—

(1) Maneuver units without engineer support normally receive engineer companies in support.

(2) Support relationships are normally GS in the MEF rear and DS to committed maneuver units.

(3) Activities of engineers working in an area are coordinated by the brigade engineer regardless of the type of relationship.

(4) Engineer materials to support engineer operations are furnished by the supported unit regardless of command/ support relationship. Doctrinal logistical support responsibilities are defined in Table VI-6.

(5) Administrative/logistical support provided to attached engineer unit.

(6) Attached or OPCON engineer units further attached or placed OPCON to another engineer or maneuver unit or given a support relationship to a maneuver unit.

(7) The supported unit furnishing engineer materials to support engineer operations, regardless of command/support relationships. Table VI-6 defines doctrinal logistical support responsibilities and describes the inherent responsibilities associated with specific command and support relationships; these responsibilities guide operational planning and the employment of Army and Marine Corps engineer outfits.

c. Liaison Requirements. Constant liaison and reliable communications are

Table VI-6. Engineer Command and Support Relationships and Inherent Responsibilities

AN ENGINEER ELEMENT WITH RELATIONSHIP OF—	GENERAL SUPPORT (GS)	DIRECT SUPPORT (DS)	OPCON	ATTACHED/ ASSIGNED
Is commanded by—	Parent unit	Parent unit	Supported unit	Supported unit commander
Maintains liaison and communications with—	Supported and parent units	Supported and parent units	Supported and parent units	Supported unit
May be task organized by—	Parent unit	Parent unit	Supported unit	Supported unit commander
Can be—	Used only to support the parent force as a whole. May be given an area or a task assignment	Dedicated support to a particular unit. May be given task or area assignments.	Placed OPCON to other engineer/ maneuver units or made DS to brigades/MAGTFs or task forces.	Further attached OPCON or DS to brigades, MAGTFs, task forces, or retained GS.
Responds to support requests from—	Parent unit	Supported unit	Supported unit	Supported unit
Has its work priority established by—	Supported unit	Supported unit	Supported unit	Supported unit
Makes its spare work effort available to—	Parent unit	Parent unit	Supported unit	Supported unit
Forwards requests for additional support through—	Parent unit	Parent unit	Supported unit	Supported unit
Receives logistic support from—	Parent unit	Parent unit	Parent unit	Supported unit

necessary for integrated engineer operations. Liaison personnel—

(1) Advise supported commander of capabilities, limitations, employment, and status of supporting engineer units/assets.

(2) Exchange target lists/folders as required.

(3) Maintain/update status of obstacles, emplacement of conventional and scatterable minefield.

(4) Monitor/share intelligence on status of enemy units, capabilities, activities, to include enemy obstacles.

(5) Plan specific arrangements for breached lane handoff from forward breaching units to following engineers for lane improvement and obstacle clearing.

(6) Develop and implement a common lane marking system for breaching operations.

(7) Plan and coordinate engineer efforts for extensive obstacle emplacement well in advance of operations.

d. Reporting, Recording, and Marking Requirements. Emplacing units must report each obstacle and minefield, intent, (i. e., barrier or obstacle plan) initiation, and completion. Record both friendly and enemy minefield because of their lethality to both friendly forces and noncombatants. Records and reports impact upon current operations and post-hostilities' clearance operations. Reporting, recording, and marking of minefield must be accomplished by the guidance found in Joint Pub 3-15, *Joint Doctrine for Barriers, Obstacles, and Mine Warfare.*

(1) Reports.

(a) Conventional Minefield. Three reports govern minefield emplacement: Report of Intention, Report of Initiation, and Report of Completion. Transmit reports to the authorizing headquarters for integration with terrain intelligence. Fused intelligence products flow through intelligence channels.

(b) Scatterable Minefields. The speed and responsiveness of scatterable-mine employment require accurate, uniform, and timely reports. Emplacing units report all information on mine employment for dissemination to affected units. Reporting requirements apply to all service delivery systems. If scatterable mines are emplaced within a land force commander's boundaries, regardless of the location of the FSCL, the emplacing unit immediately disseminates a scatterable-minefield warning message (SCATMINWARN) to all potentially affected units. See Figures VI-6 and VI-7 for sample SCATMINWARN reports. The high potential for unexploded ordnance and concomitant fratricide and mobility degradation dictates timely warning during planning and execution phases.

LINE	MESSAGE
ALPHA	EMPLACING SYSTEM
BRAVO	AT YES/NO
CHARLIE	AP YES/NO
DELTA	# AIM POINTS/CORNER POINTS
ECHO	GRID COORDINATES OF AIM POINTS/CORNER POINTS AND SIZE SAFETY ZONE
FOXTROT	DTG OF LIFE CYCLE

Figure VI-6. Sample SCATMINWARN Report

LINE	MESSAGE
ALPHA	ARTY
BRAVO	YES
CHARLIE	YES
DELTA	ONE
ECHO	MB 10102935 500M
FOXTROT	081610Z - 081920ZOCT90

Figure VI-7. Sample SCATMINWARN Report for Artillery Mission

(c) Joint Minelaying Operations (MINEOPS). Use the MINEOPS report to detail the location, characteristics, and status of component minelaying operations. Use the same report to request, task, modify, report, plan, and approve minelaying operations.

(d) Obstacles Other than Mine. fields. Use the Sensitive Information Report to provide information on barriers and obstacles (other than minefield) that may have an impact on current planning or operations.

(2) Records. The following required records facilitate troop safety, future operations, and postcombat clearing operations:

(a) Conventional and Scatterable Minefields. Emplacing units prepare and forward minefield records for all conventional minefield emplaced using the Minefield Record Report format. Record unit defensive minefield on the Hasty Protective Minefield Record.

(b) Retention of Records. The JFC assumes responsibility as the command repository for all minefield reports and records.

(3) Marking.

(a) Conventional Minefields. Specify the methodology for marking conventional minefields-both friendly and enemy—in the overarching OPLAN/OPORD. Fencing minefield may be appropriate in both circumstances to protect the force.

(b) Scatterable Minefields. Ground forces mark ground-emplaced scatterable minefield using accurate positioning or survey data. Air-emplaced scatterable mines pose a particular challenge and involve inherent risk to the joint force. Units operating near such mines must know minefield emplacement times, self-destruction duration periods, and aim points or lateral boundaries of the safety zones. Units finding minefield mark and report them to protect follow-on forces.

(4) Enemy Minefields. Tactical units report any detection, encounter or knowledge of enemy minefield, or mining activities to higher headquarters using the fastest possible means.

(a) Spot reports provide the tactical commander the initial source of barrier, obstacle, and minefield intelligence.

(b) Transmit detailed information on enemy minefield through service components to the joint force headquarters using the enemy minefield report.

(c) Exchange information between components using the joint Mine Countermeasures Report (MCMREP). The

report provides the location and status of all mining operations, including breaching and clearing.

(d) Specify marking procedures in OPLAN/OPORD to define limits of breached path, lane, or gaps, as well as the boundaries of the mined area.

e. Unexploded Ordnance (UXO). UXO affects planning and execution of combat operations. Type of munitions employed, self-destruct times, and submunition density must be viewed with respect to the forces that encounter them. Joint Pub 3-0 states *"Coordination of attacks beyond the FSCL is especially critical to commanders of air, land, and special operations forces. Their forces may now be operating beyond an FSCL or may plan to maneuver on that territory in the future. Such coordination is also important when attacking forces are employing wide-area munitions or munitions with delayed effects."* Preventing undue constraints on movement of forces and maneuver elements require planning and reporting.

(1) Planning. The use of submunitions primarily has an impact on land operations. Close coordination between component commanders and the JFC is required before any use of submunitions by any delivery means. Planning considerations include—

(a) Preplanning, deconflicting, and coordinating with other components.

(b) Minimizing impacts of residual effects on friendly operations:

• Future use of current enemy controlled terrain including airfields/ airstrips.

• Dismounted operations required in the area (special operations forces, security operations, etc.).

• Availability of engineer/EOD support?

(c) Impact on terrain management:

• Will friendly troops transit/ occupy the area?

• Locations of proposed main supply route?

• Restricted areas—proposed logistics base sites.

(d) Communications requirements: Information requirements and availability of automation and communications equipment to rapidly disseminate information.

(2) Reporting. Just as units emplacing obstacles and minefields are responsible for immediate reporting of those obstacles and minefield, units should be responsible for reporting UXO hazard areas created through use of submunition ordnance. See Appendix C for UXO Spot Report format. Once reported, UXO hazard areas are treated as another minefield or obstacle. As such, UXO information requires processing, plotting, and disseminating to higher, lower, and adjacent units.

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.

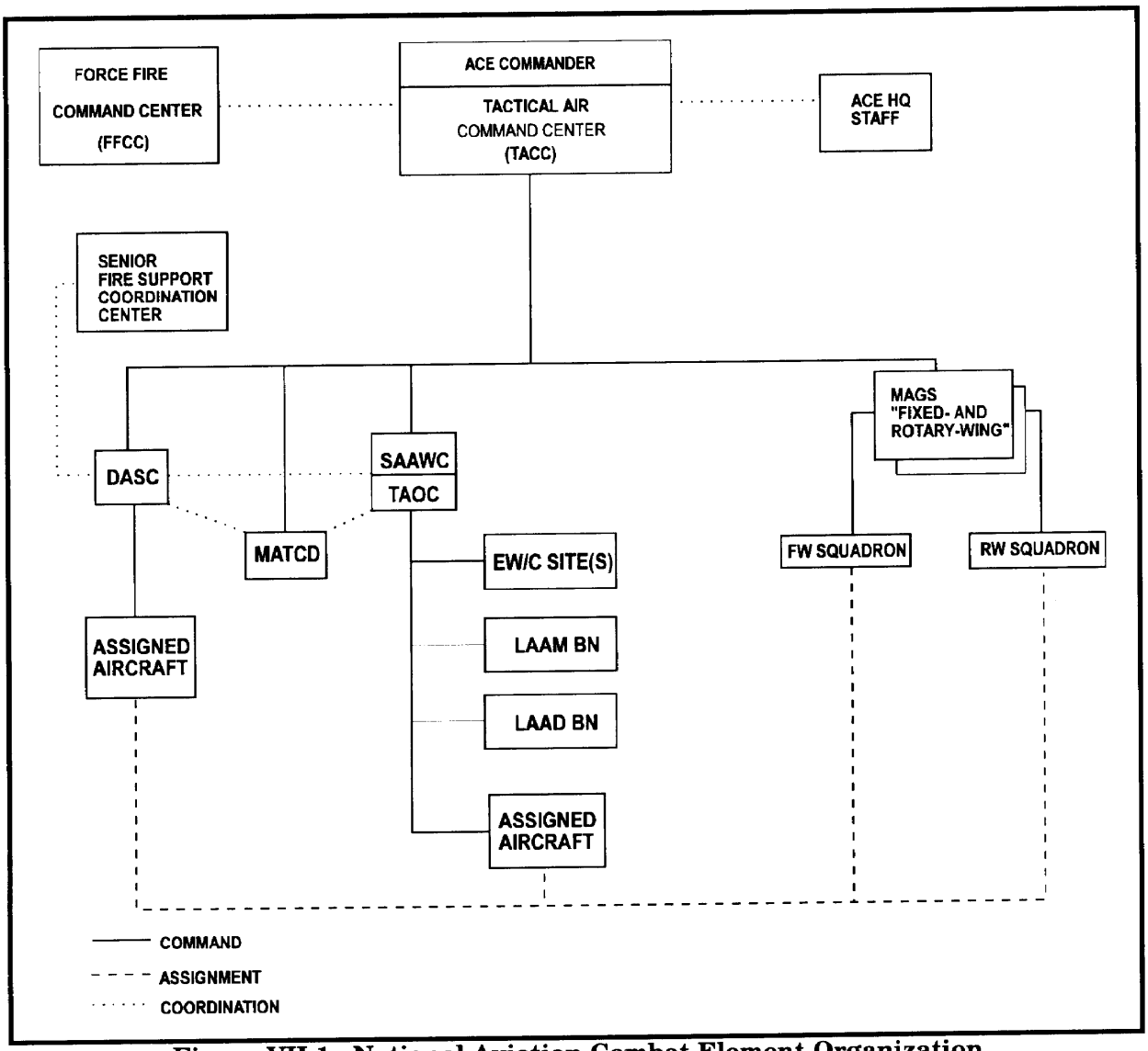


Figure VII-1. Notional Aviation Combat Element Organization

(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.

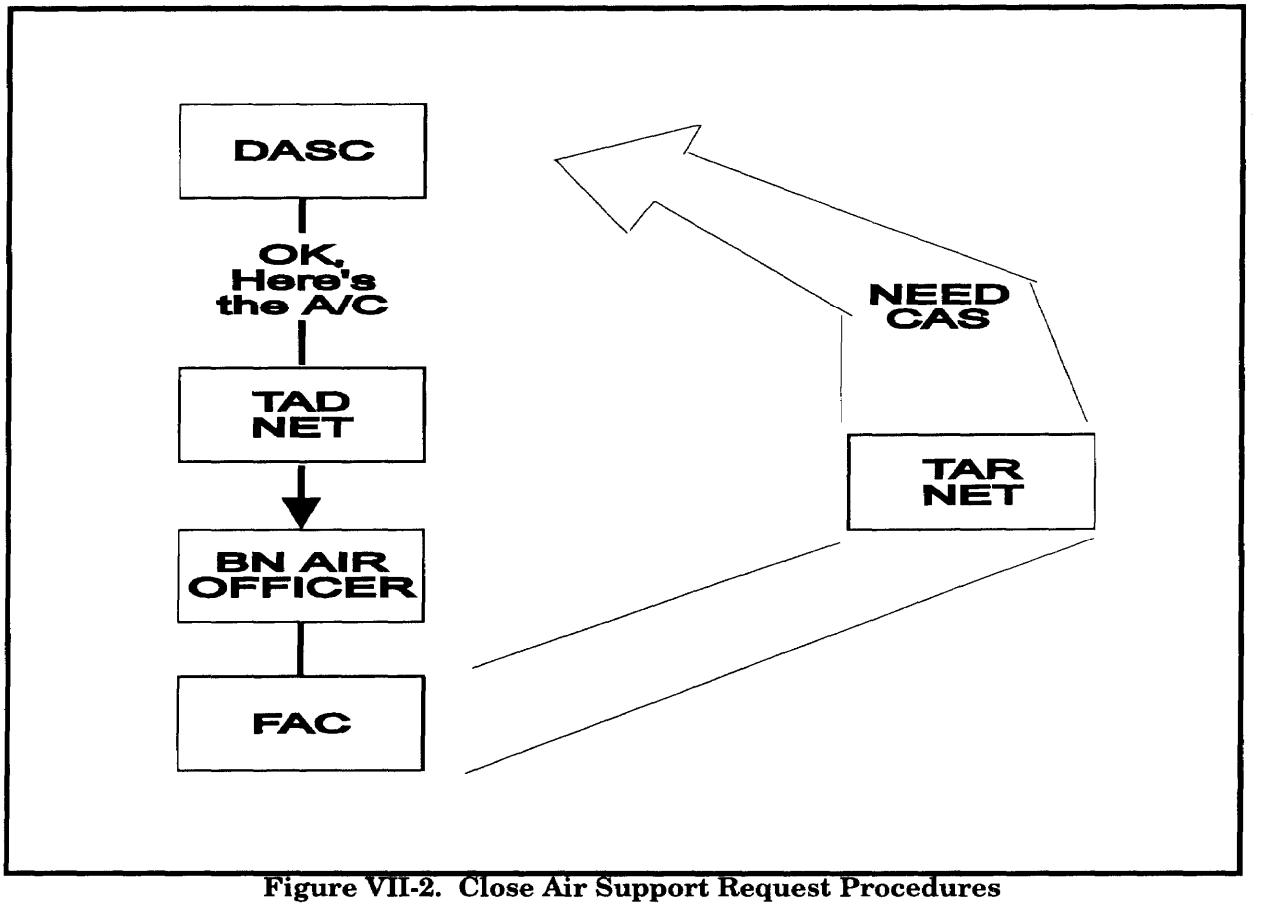


Figure VII-2. Close Air Support Request Procedures

(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.

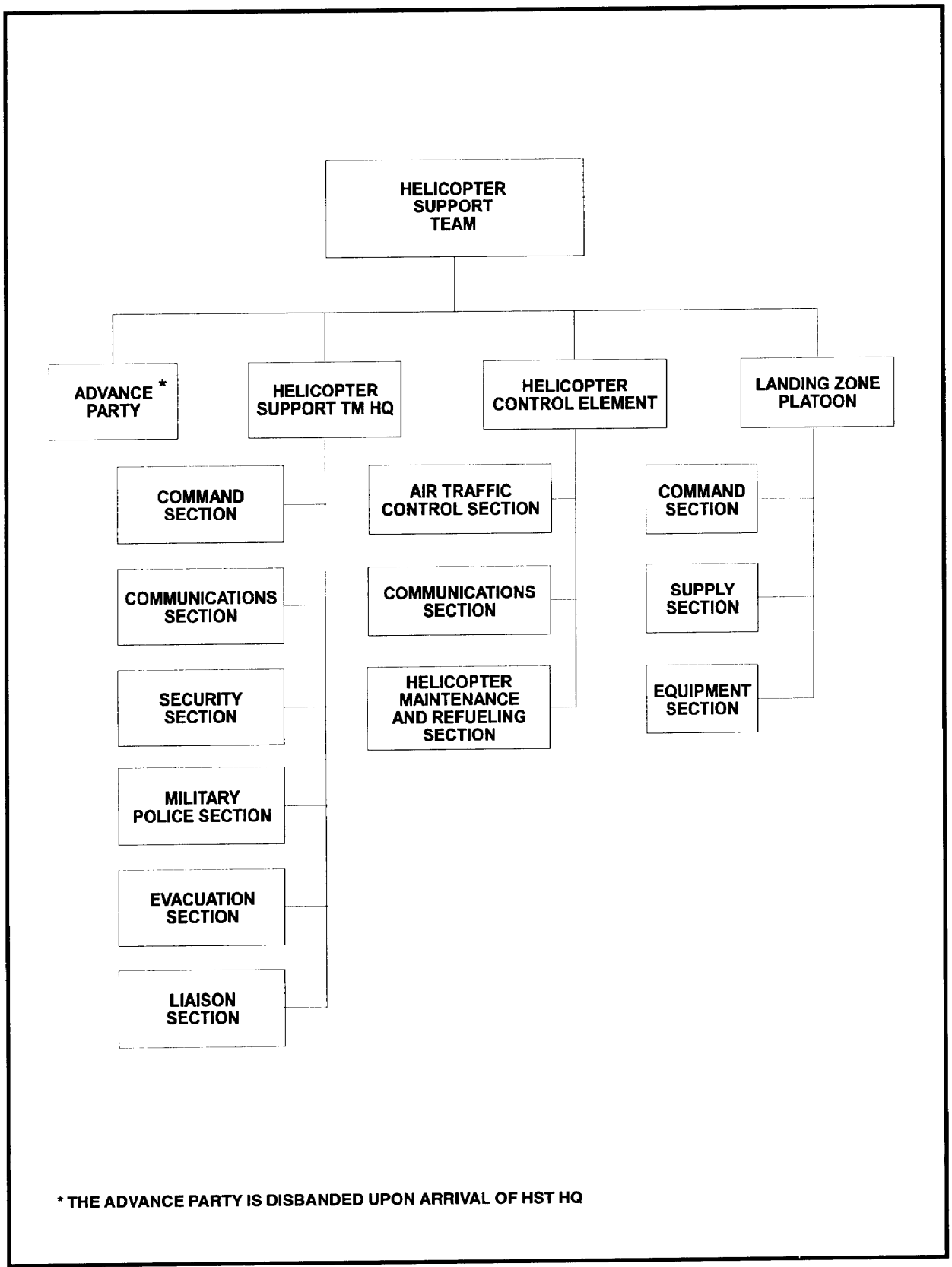


Figure VII-3. Helicopter Support Team

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.

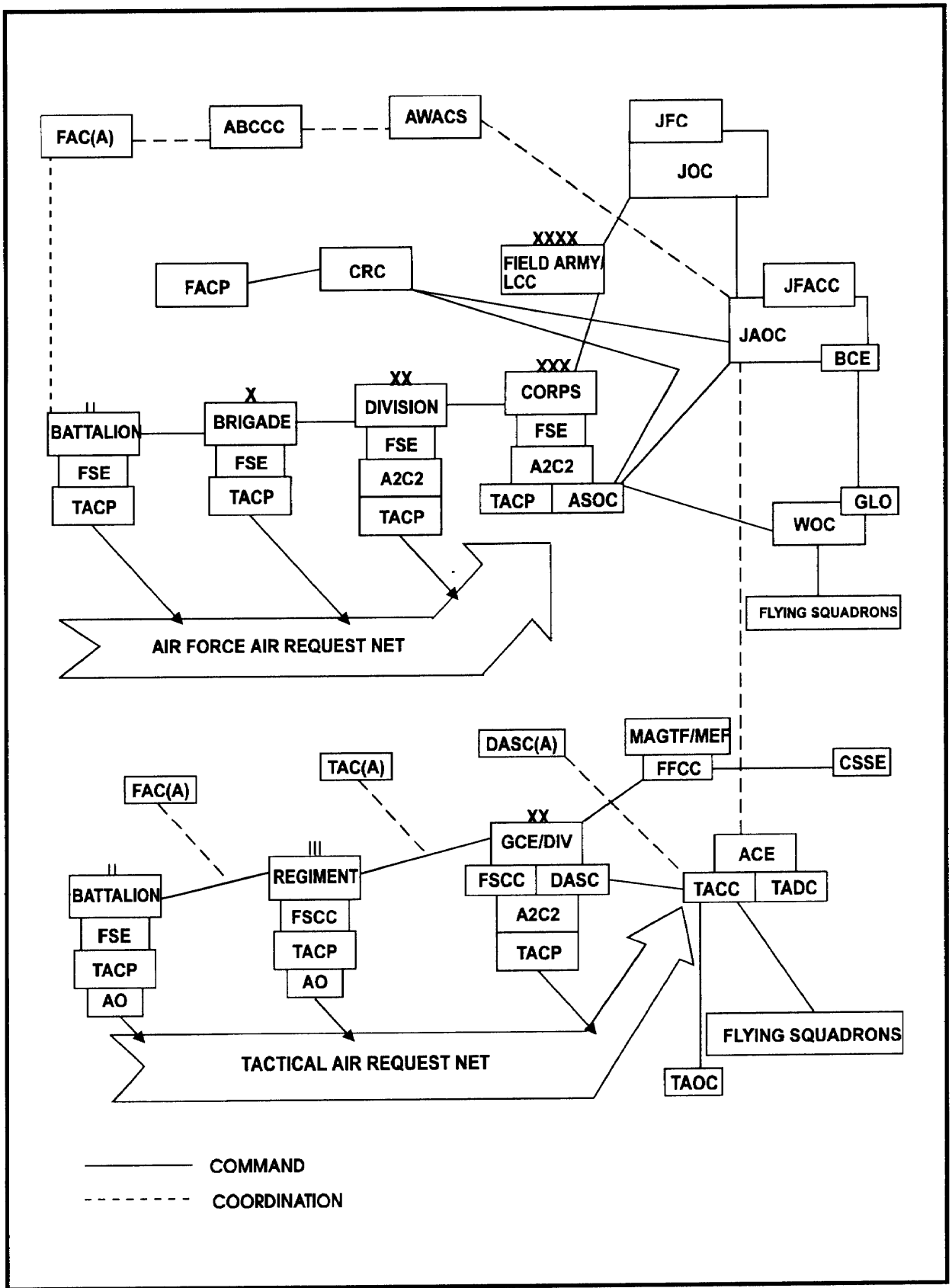


Figure VII-4. USAF/USMC Air Operations Connectivity

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.

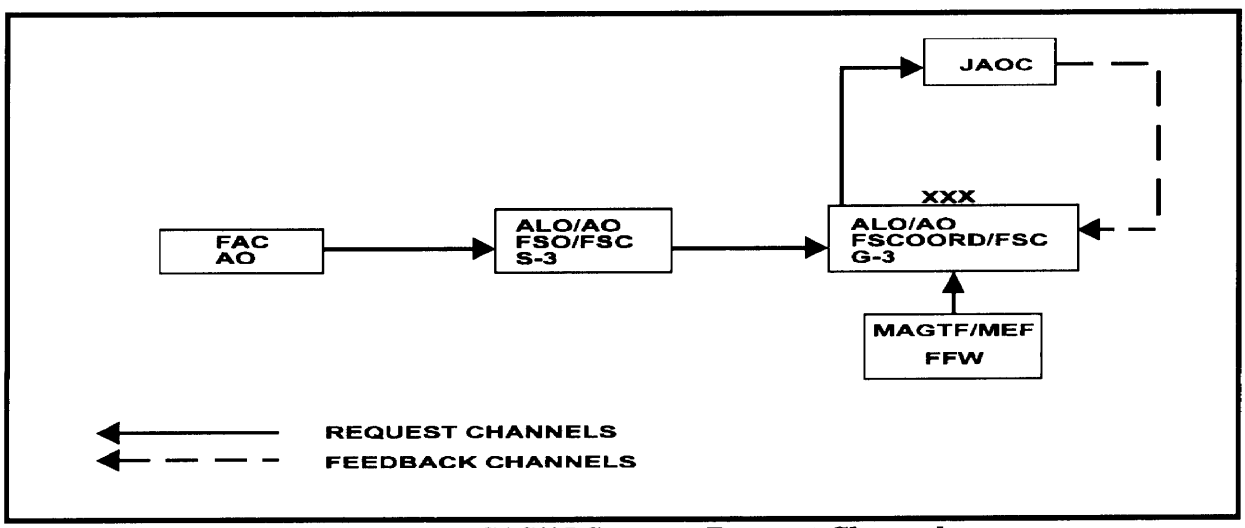


Figure VII-5. CAS/AI Support Request Channels

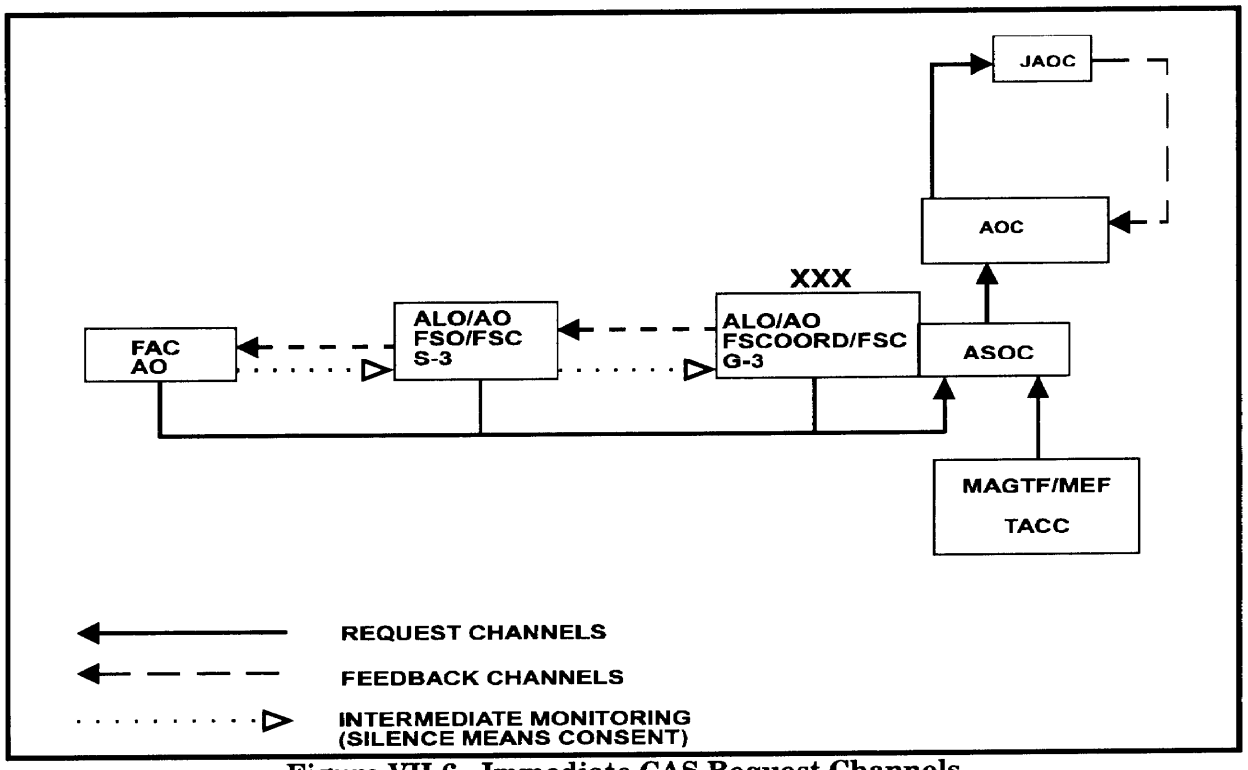


Figure VII-6. Immediate CAS Request Channels

(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.

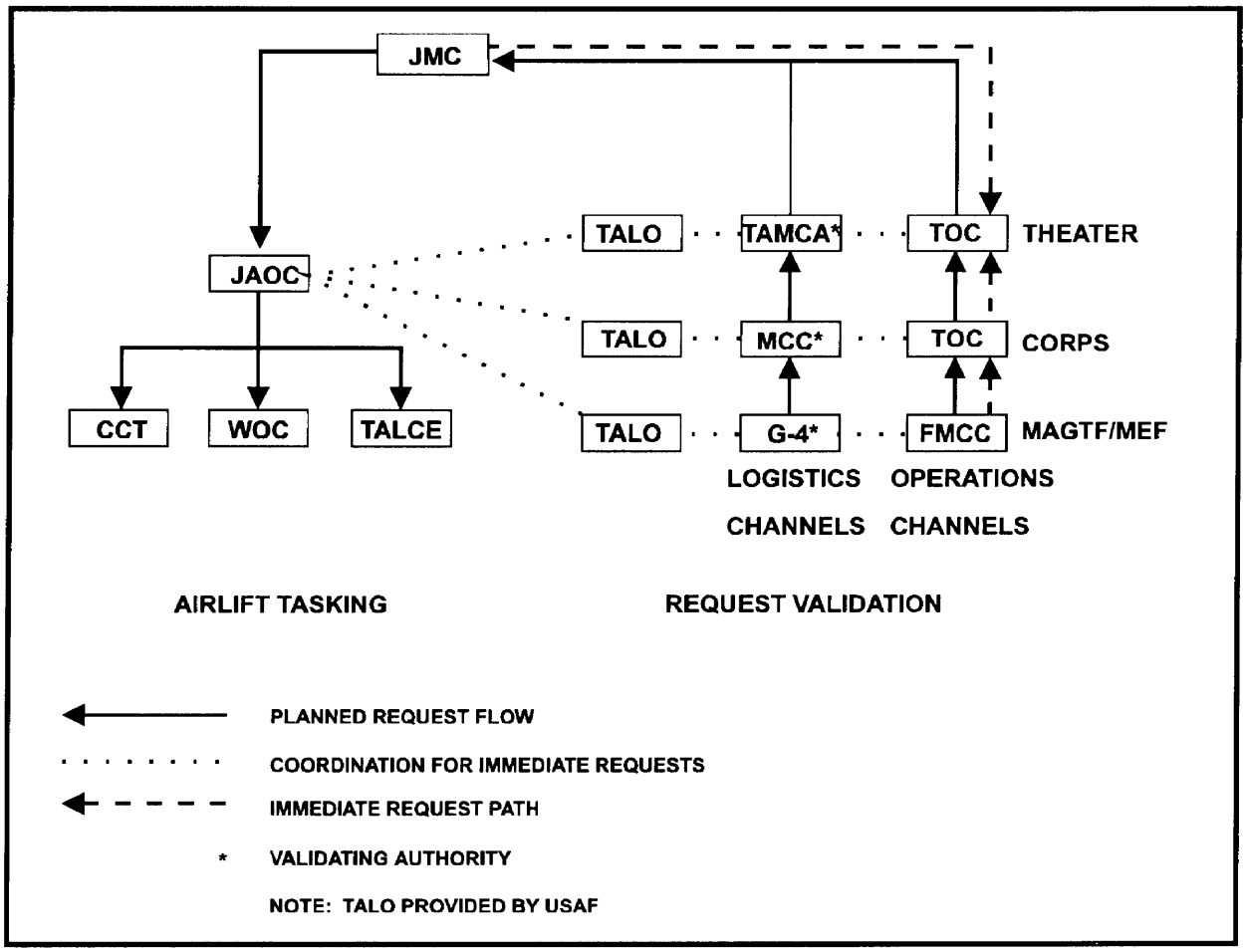


Figure VII-7. Request Channels for Airlift Support

(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.

Chapter VIII

AIR AND MISSILE DEFENSE

1. Background

In air and missile defense operations, both the Army and the Marine Corps use the same basic doctrine, principles, employment guidelines, and IFF procedures. Air and missile defense are all defensive measures designed to destroy attacking aircraft or missiles in the earth's envelope of atmosphere or to nullify or reduce the effectiveness of such attacks. Air defense and missile defense operations provide force protection and contribute to the joint force's freedom of action. Air defense operations provide for protection of friendly forces, bases, lines of communication, and selected geopolitical assets through passive air and missile defense, active defense, and offensive operations, supported by a command, control, communications, computers, and intelligence (C4I) system. Protection encompasses the employment of aircraft, interceptor missiles, surface-to-air systems, weapons not primarily used in an air defense role, deception, operations security (OPSEC), cover and concealment, dispersion, early warning, and electronic protection.

2. Terminology

The following Joint Pub 1-02 terms serve as a common basis for approaching integrated air and missile defense operations:

a. Passive Air Defense. Passive air defense encompasses 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.

b. Active Air Defense. Active air defense is direct defensive action taken to nullify 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.

c. Air Defense Action Area. Air defense action area is an area and the airspace above it within which friendly aircraft or surface-to-air weapons are normally given precedence in operations except under specified conditions.

d. Air Defense Area. Air defense area is a specifically defined airspace for which air defense must be planned and provided.

e. Air Defense Artillery. Air defense artillery is weapons and equipment for actively combating air targets from the ground.

f. Air Defense Identification Zone (ADIZ). ADIZ is airspace of defined dimensions within which the ready identification, location, and control of airborne vehicles are required.

g. Air Defense Operations Area. Air defense operations area is an area and the airspace above it within which procedures are established to minimize mutual interference between air defense and other operations. It may include designation of an air defense area, air defense action area, ADIZ, and/or firepower umbrella.

h. Firepower Umbrella. Firepower umbrella is an area of specified dimensions defining the boundaries of the airspace over a naval force at sea within which the fire of ships' antiaircraft weapons can endanger aircraft and within which special procedures have been established for the identification and operation of friendly aircraft.

i. Weapons Engagement Zone (WEZ). WEZ is airspace of defined dimensions within which the responsibility for engagement of air threat normally rests with a particular weapons system.

(1) Fighter Engagement Zone (FEZ). FEZ is that airspace of defined dimensions within which the responsibility for engagement of air threats normally rests with fighter aircraft.

(2) High-altitude Missile Engagement Zone (HIMEZ). HIMEZ is that airspace of defined dimensions within which the responsibility for engagement of air threats normally rests with high altitude surface-to-air missiles.

(3) Low-altitude Missile Engagement Zone (LOMEZ). LOMEZ is 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.

(4) Short-range Air Defense Engagement Zone (SHORADEZ). SHORADEZ is that airspace of defined dimensions within which the responsibility for engagement of air threats normally rests with short range air defense weapons.

(5) Joint Engagement Zone. Joint Engagement is that airspace of defined dimensions within which multiple air defense systems (surface-to-air missiles and aircraft) are simultaneously employed to engage air threats.

j. Weapons-free Zone. Weapons-free zone is an air defense zone established for the protection of key assets or facilities, other than air bases, where weapons systems may be fired at any target not positively recognized as friendly.

3. DRB Operations

The mission of Army ADA is to protect the force and selected geopolitical assets from aerial attack, missile attack, and aerial surveillance.

a. Army Air and Missile Defense Equipment. Two categories of weapons comprise the Army's land based ADA arsenal. The first category, high-to-medium altitude air defense (HIMAD) systems include the Patriot and Hawk systems. These systems detect, interrogate, track, and perform fire control functions at extended ranges and in virtually all weather conditions, day or night. Although these systems are not found at the DRB level, HIMAD coverage may be available from the MEF when Army units operate under its control, the Army corps, or echelons above corps. Forward area air defense systems including the Bradley Stinger Fighting Vehicle (BSFV), Avenger system, and Stinger Man-portable Air Defense System (MANPADS) provide low altitude air defense coverage of selected combat, combat support, or combat service support units and critical assets. Table VIII-1 describes the types and characteristics of Army air defense weapons systems.

Table VIII-1. Types and Characteristics of Army Air Defense Weapons

WEAPON	NUMBER SYSTEMS/UNIT	RANGE
Patriot	48/Corps Bn	50 km - Air Breathing Threat TBM - Classified
Hawk	18/Corps Bn	40 km
BSFV (Stinger)	24/Div Bn 8/Btry	4 km
Avenger (Stinger)	54/Corps Bn 24/Div Bn 8/Btry	4 km
MANPADS (Stinger)	40/Div Bn 8-12/Btry	4 km

b. DRB Air Defense Equipment. The DRB employs the BSFV, Avenger, Stinger MANPADS, and sensors as described below:

(1) BSFV. The BSFV combines the mobility and armor protection of the Bradley fighting vehicle with the air defense capabilities afforded by the Stinger missile. The BSFV affords the crew survivability and the speed commensurate with the mechanized force it supports. The Stinger team maintains a basic load of 6 missiles. The team must dismount to engage aerial platforms.

(2) Avenger. The Avenger is a lightweight, highly mobile and air transportable surface-to-air missile system mounted on the HMMWV. Operated by a 2-man crew, the Avenger can provide 24-hour air defense coverage against UAVs, rotary-wing and low altitude fixed-wing aircraft. The fire unit integrates 8 Stinger missiles in 2 turret-mounted launch pods, a .50-caliber machine gun, FLIR, eye-safe laser rangefinder, IFF, heads-up optical sight, and a computerized fire control system. The gyrostablized turret permits the gunner to launch a missile or fire the machine gun on the move or from a stationary position. The Stinger missiles carried on the Avenger weapon system are also capable of being reconfigured in a MANPADS configuration.

(3) Stinger. Stinger is a man-portable, shoulder-fired, infrared-homing (heat seeking) guided missile system. It requires no control from the gunner after firing. Stinger has an IFF subsystem that aids the gunner and team chief in identifying friendly aircraft. Limited visibility operations at night restrict the gunners' ability to see and identify the target.

(4) Sensors. The ground based sensor (GBS) provides the air defense unit with automated target acquisition and air track identification (including IFF). The GBS provides 360-degree azimuth coverage for target acquisition and tracking of fixed- and rotary-wing aircraft and UAVs out to a range of 40 km. It provides target location and the capabilities of acquisition and tracking in electronic countermeasures (ECM) and clutter. The FAAD C3I system processes detected targets and, if appropriate, alerts and cues forward area air defense system fire units or MANPADS teams. A 5-ton cargo truck or HMMWV (for the downsized version) serves as the prime mover for the 24-hour, all weather-capable GBS.

c. DRB ADA Organization. The ADA battalion commander tailors the DRB ADA organization to meet the situation. A typical heavy division's DRB ADA battery normally consists of 2 BSFV platoons (4 BSFVs per platoon—total 8 BSFVs); 1 MANPADS platoon (total 10 MANPADS); a sensor section (total 2 sensors) from the battalion headquarters; a maintenance platoon; and a headquarters platoon. The battery is augmented by 1 or more Avenger platoons if the threat (e.g., cruise missile or UAVs) warrants this task organization. An Avenger platoon has 4 Avenger weapon systems. The ADA battalion commander may send the assistant division air defense officer (ADADO) and FAAD C3I capabilities to allow engagement and force operation linkage to external EW sources.

d. Command and Control (Divisional Air Defense Units Only). Based on recommendations from the senior supporting air defense commander, the maneuver brigade commander determines the priorities for air defense coverage, allocation of available air defense assets, and air defense command and support relationships. The battery commander (or senior supporting air defense commander) supports brigade operations based on the unit mission, commander's intent, and concept of operations. Successful synchronization of brigade operations hinges on including the ADA officer early and continuously in the planning process. (See Figure VIII-l.)

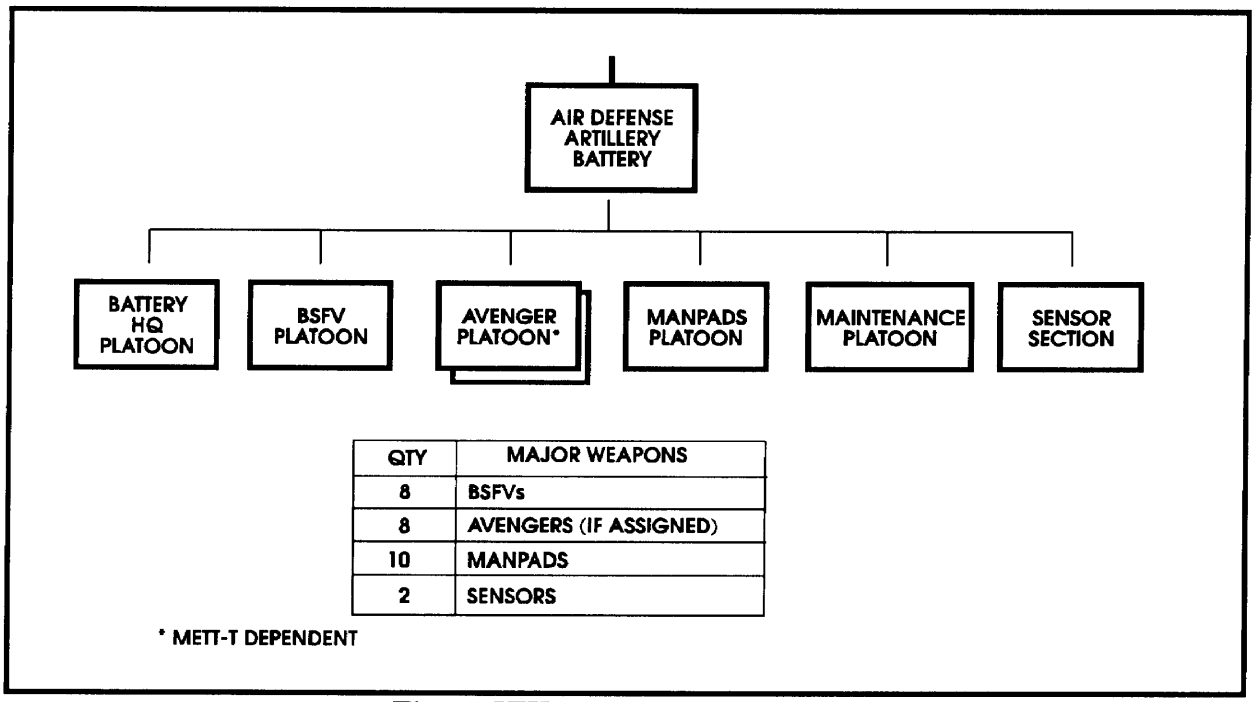


Figure VIII-1. DRB ADA Battery

e. Operations.

(1) Passive Air Defense. The entire DRB has a role in passive air defense. Measures taken to minimize the effects of hostile air actions include the use of cover, concealment, camouflage, deception, dispersion, and protective construction. Early warning is essential in alerting the maneuver force that hostile air action is imminent and protective measures must be initiated. Early warning is accomplished by planning, deploying, and employing sensors with the appropriate communications networks. Sensors are generally employed along air avenues of approach to observe named areas of interest and decision points normally designated by the brigade S2. During offensive operations, sensors are employed throughout a zone to provide early warning. Covering and security forces' task organization normally include FAAD sensors and Avenger for early engagement of threat aerial platforms, with particular focus on surveillance platforms.

(2) Active Air Defense. Maneuver brigades conducting combat operations use organic or attached assets to directly attack hostile aircraft and missiles. These assets include friendly tanks, crew-served weapons, intelligence and electronic warfare systems, attack helicopters, and specific air defense weapons systems.

(3) FAAD C3I System. DRB air defense systems operate within the larger air defense system that governs division and corps level air defense operations, The FAAD C3I provides automated assistance in FAAD operations. The FAAD C3I system consists of the following subsystems: air battle management operations center (ABMOC), A2C2, sensor/C2, battery command posts, platoon/section command posts, and fire units.

(a) Equipment. These subsystems are equipped with computers, displays, voice, and data communications equipment to aid the accumulation, processing, and distribution of a correlated air picture and C3I data. To accomplish the radio frequency communications among the subsystems deployed within an area of operations, the digital data components of the subsystem are connected by SINCGARS/

Enhanced Position Location Reporting System (EPLRS) and the Joint Tactical Information Distribution System (JTIDS).

• JTIDS. JTIDS receives air track data from external track sources.

• EPLRS. EPLRS is used for internal data communications. It also nets the sensor/C3I subsystems, the ABMOC, and the A2C2 to exchange air track data, formulates an air picture, and subsequently disseminates air track data, plus battle management data, to all levels of command posts and fire units simultaneously.

• SINCGARS. SINCGARS provides voice and data communications capabilities.

• Simplified Handheld Terminal Unit (SHTU). SHTU performs subsystem functions in command and control and provides the air picture to the section CPs and fire units.

(b) Early Warning. The ABMOC and air defense A2C2 receive air tracks from external sources such as the Airborne Warning and Control System (AWACS) and HIMAD air defense units. The ABMOC transmits those tracks to sensors tactically located throughout the battlefield. The sensors receive that data and correlate with their own data (40 km GBS) and send that data to units for engagement. Voice procedures still accomplish early warning to maneuver forces: battery to brigade and platoon to battalion.

4. MEF (FWD) Operations

All MAGTFs conduct air and missile defense as part of the AAW function as described in Chapter VII. Successful AAW gains and maintains air superiority. AAW is based on destruction in depth and begins as far forward as possible with offensive AAW. Offensive AAW attacks enemy aircraft and missile assets before they launch or assume an attacking role. Destruction or neutralization of enemy airfields, radars, and air defense systems is achieved through preemptive measures, SEAD, and local air superiority. Air defense is conducted to destroy or nullify the effectiveness of enemy air, missile attacks, and surveillance against MAGTF forces and/or facilities. MAGTF air defense is classified as either passive or active.

a. Passive Air Defense. Passive air defense reduces the effects of enemy air attack or surveillance. Passive measures include such indirect techniques as cover, concealment, camouflage, and deception.

b. Active Air Defense. Active air defense is direct action conducted against enemy air assets that are in an attacking or surveillance role. Active air defense employs fixed- and rotary-wing aircraft, missiles, artillery, and electronic warfare.

5. Command and Control

The ACE commander, through his TACC, coordinates MAGTF AAW. Mutual support and centralized command and coordination/ decentralized control facilitate AAW. Mutual support is accomplished by positioning AAW weapons so that each air target is within range of several air defense systems, both concurrently and sequentially. Centralized command and coordination permit the best use of available forces while decentralized control permits minimum reaction time and maximum flexibility. The sector antiair warfare coordination (SAAWC) manages the MAGTF's air defense battle. Depending on the size of the MAGTF area of operations, there may be more than one SAAWC. Under SAAWC guidance, the TAOC provides control of AAW assets and AAW surveillance of assigned airspace. AAW surveillance and control are augmented through separately established early warning/control sites. Like the SAAWC, one or more TAOCs with accompanying early warning control site(s) are employed within a MAGTF's area of operations. Factors influencing the number

of TAOCs and early warning control sites employed within an area of operations include the geographical size, terrain features impacting on radar acquisition, and anticipated air activity in the area. Figure VIII-2 portrays the MAGTF air defense system.

a. The SAAWC. The SAAWC operates from a SAAWC operations facility that normally collocates with the TAOC. The operations facility furnishes the SAAWC and staff the capability to coordinate and direct TAOC operations to survey and direct MAGTF AAW assets within its assigned area, The facility receives representatives from various MACCS organizations, but primarily from the TAOC. The SAAWC executes responsibilities for coordination and management of all active AAW assets within assigned area through these functional representatives.

b. The TAOC. The TAOC provides control, management, and surveillance of assigned assets and airspace. TAOC personnel detect, identify, and control the intercept of hostile aircraft and missiles. Early warning control sites are established to supplement organic TAOC radar coverage if required. The SAAWC coordination of overall AAW operations facilitate the ability of the TAOC to concentrate on real-time control of fighter aircraft and surface-to-air weapons.

6. MEF (FWD) Air and Missile Defense Organizations and Equipment

a. Assets. Organic ACE assets include fixed- and rotary-wing aircraft and surface-to-air missiles (SAMs). The fixed- and rotary-wing aircraft are organic to ACE aircraft squadrons; missile assets are organic to Hawk and Stinger AAW units.

(1) Aircraft. Almost any of the fixed- or rotary-wing ACE aircraft have some AAW capability. As a minimum, any aircraft may be tasked as an AAW surveillance platform. Attack helicopters may be employed as AAW

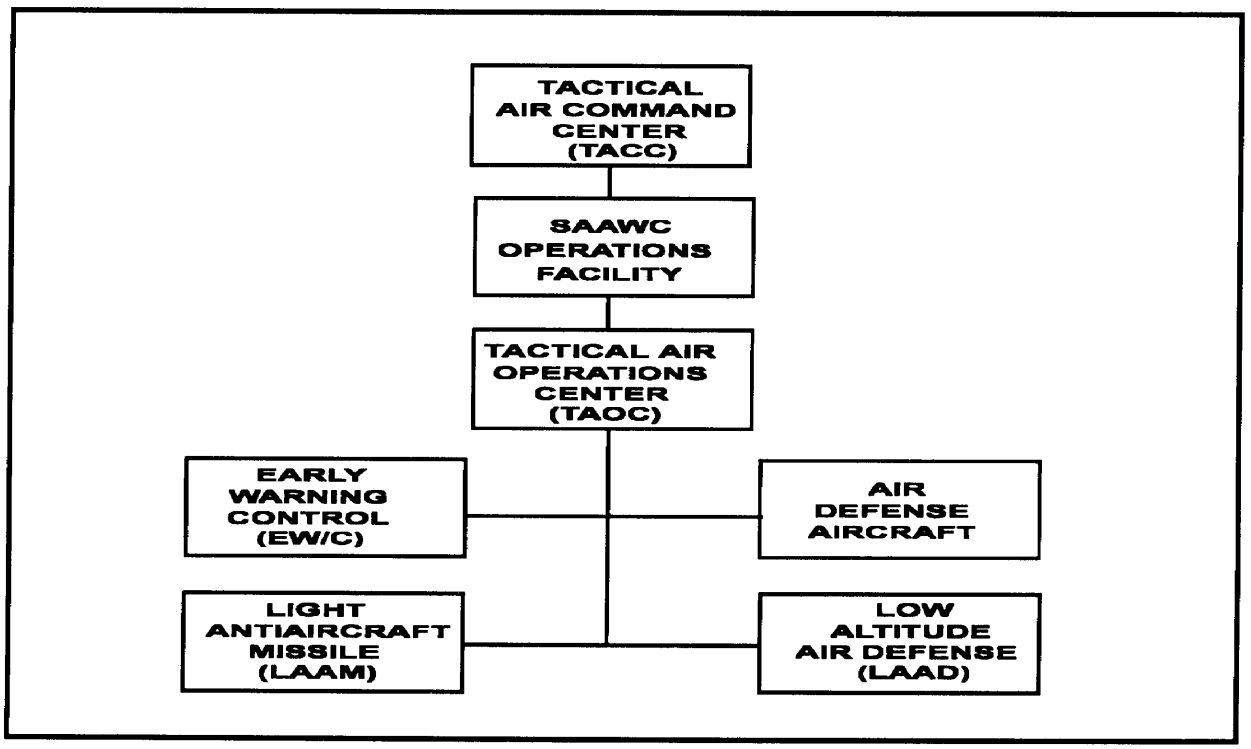


Figure VIII-2. MAGTF Air Defense System

assets when armed with air-to-air weapons. The primary MAGTF fixed-wing AAW asset is the F/A-18 Hornet; however, the AV-8 Harrier may be employed in a secondary AAW role. Employment of fixed- and rotary-wing aircraft in AAW roles will be dependent on the existing situation. Chapter VII detailed MAGTF aircraft capabilities.

(2) Surface to Air Missiles. MAGTF SAM capabilities are organic to the LAAM and low altitude air defense (LAAD) units.

(a) LAAM Units. LAAM units are equipped with the Hawk surface-to-air missile system. LAAM units provide all-weather, day and night, medium-range air defense. The LAAM battalion is composed of a headquarters and service battery and 3 firing batteries. Each firing battery includes 2 firing platoons of 2 firing sections each, and 1 sensor acquisition section (SAS). The SAS has 1 continuous wave acquisition radar (CWAR), 1 pulse acquisition radar (PAR), and 2 high-power illuminator radars (HIPIR). Each firing platoon includes 3 launchers with 3 missiles per launcher. Each platoon is capable of engaging 2 targets simultaneously. Though task organized to meet anticipated air threat, 1 or more LAAM firing batteries normally support a MEF (FWD) (12 Hawks per battery); a LAAM battalion (36 Hawks) normally supports a MEF. When paired with the TAOC's AN/TPS-59 long-range air surveillance radar, the Hawk system has a limited capability to engage short-range theater ballistics missiles.

(b) LAAD Units. LAAD firing units currently employ MANPADS and the Avenger missile system. LAAD units provide low-altitude, short-range air defense for forces in forward combat areas or other assigned areas. The LAAD battalion consists of a headquarters and service battery and 2 firing batteries. Each of the 2 firing batteries has 3 firing platoons equipped with 15 Stinger teams each. Smaller MAGTFs (i.e., MEUs) are supported by platoons as appropriate to METT-T considerations. MEF (FWD) and MEF-sized MAGTFs are supported by LAAD batteries and battalions, respectively. Organic HMMWVs provide firing teams high mobility. Fire team leaders exercise final firing authority for LAAD teams.

b. AAW Surveillance and Control Systems. MAGTF AAW surveillance and control systems are limited to ground-based systems. Ground-based surveillance capabilities include TAOC and MATCD surveillance radars, Hawk acquisition radars, electrooptic systems, and LAAD team visual surveillance.

(1) The long-range radars of the TAOC provide range surveillance out to 300 nautical miles (NM), limited by LOS and earth curvature restrictions. They provide primary radar azimuth, range, and altitude information up to 100,000 feet (ft). In addition, they provide identification of friendly aircraft through electronic interrogations. The TAOC's primary air surveillance radar is being modified to provide a 400 NM, 500,000 ft altitude ceiling capability to provide the MAGTF an organic TBM detection capability.

(2) The shorter-range radars of the TAOC, which can deploy as gap-filler radars for the longer range radars, are limited by the same LOS factors. They provide primary radar azimuth and range up to 150 NM. They also have a capability to electronically identify friendly aircraft.

(3) The short-range MATCD surveillance radars provide primary and secondary radar azimuth, range, and altitude information in the airfield areas.

(4) The Hawk search radar provides roughly the same surveillance capability as the shorter-range TAOC radars (120 km) with an altitude coverage to 55,000 ft. Secondary radar is provided by a separate platform with limited IFF discrete decode capability.

(5) The Hawk low-altitude acquisition radar provides excellent low-level surveillance coverage in azimuth and ranges out to 80 km and up to 10,000 ft.

(6) The Hawk tracking radar is limited in its surveillance function by field of view, operator load, weather, and other environmental factors; therefore, it is only an augmenting system.

(7) LAAD visual acquisition is particularly good against low-altitude targets when teams are placed along ingress routes and given limited sectors to cover. Altitude, weather, and environmental factors severely limit their surveillance capability.

7. Integrated Air and Missile Defense Operations

a. Command and Support Relationships. Relationships between air defense units and other units may be either command or support. The JFC establishes relationships based on the estimate of the situation and the recommendation of the area air defense commander (AADC).

(1) Command Relationships.

(a) Operational Control. The parent organization retains administrative and logistic responsibilities, unless the order states otherwise, when placing an air defense unit OPCON to another unit. OPCON is appropriate for tactical operations of generally short duration requiring dedicated air defense.

(b) Attachment. The supported force provides administrative and logistic support to attached air defense units. An air defense unit may be attached to a maneuver unit on an extended, independent operation where the parent air defense battalion cannot provide effective support.

(c) Further Attachment or OPCON. When possible, air defense units attached or OPCON to maneuver units are further attached or placed under the operational control of an air defense unit within the maneuver force.

(2) Support Relationships.

(a) Direct Support. A direct support mission furnishes a specific element of the joint force dedicated air defense support.

(b) Reinforcing. An air defense unit with a reinforcing mission augments the coverage of another air defense unit committed to a specific element of the force. Assigning this mission commits both the reinforcing and reinforced air defense units to that specific element.

(c) General Support Reinforcing. A general support reinforcing mission results in an air defense unit supporting the force as a whole with a second priority to augmenting the coverage of another air defense unit.

(d) General Support. Air defense units with general support missions support the force as a whole.

Table VIII-2 describes the recommended command and support relationships and inherent responsibilities to guide the planning and operational employment of air defense outfits.

b. Organizing for Combat.

(1) Organizing air defense units for combat proceed from the application of four basic employment principles of *weapons mass, weapons mix, mobility,* and *integration* to METT-T conditions.

(a) Weapons Mass: The allocation of a sufficient amount of air defense resources to destroy the enemy air threat to the defended asset.

Table VIII-2. Inherent Responsibilities of Air Defense Standard Tactical Missions

An air defense unit with a mission of—	Has air defense priority established by—	Have the air defense units located by—	Have the air defense units positioned by—	Establishes liaison with—	Establishes communications with—
General Support (GS)	(1) The supported commander. (2) The supported commander through the reinforced air defense commander	The commander assigning the mission in coordination with the supported force ground commander	The air defense fire unit commander in coordination with the local ground commander	As required by commander assigning GS mission	As required by commander assigning GS mission
General Support Reinforcing (GSR)	The supported commander through the reinforced air defense commander	The commander assigning the mission in coordination with the supported force ground commander	Air defense fire unit commanders in coordination with the reinforced air defense unit commander and the local ground commander	As required, but including the reinforced air defense commander	As required, but including the reinforced air defense unit
Reinforcing (R)	The supported commander through the reinforced ADA commander	The reinforced air defense commander in coordination with the supported force ground commander	Air defense fire unit commanders with approval of the reinforced air defense unit commander and the local ground commander	As required, but including the reinforced air defense commander	As required, but including the reinforced air defense air defense unit
Direct Support (DS)	The supported commander	The DS air defense commander with approval of the local ground commander	Air defense fire unit commanders with the approval of the local ground commander	Supported unit commander	Supported unit

(b) Weapons Mix: The employment of a complementary family of weapons, wherein the capabilities of one system offset the limitations of another system.

(c) Mobility: The ability of a unit to maneuver as easily as the unit it is supporting.

(d) Integration: Synchronized employment of air defense units and systems within the concept of operation and scheme of maneuver.

(2) Considerations for Air Defense Task Organization. The joint force seeks to deploy the best possible weapons mass and mix to support the scheme of maneuver. The supported force's mission, commander's intent, and concept of operation drive force task organization. Additional considerations include—

(a) Proportional weighing of the main effort.

(b) Allocation of available assets to protect critical force assets in priority.

(c) C3 capabilities.

(d) Logistics supportability: Can the ADA unit support itself completely or will it need assistance from the supported unit?

(e) Impact of other air defense assets in the area of operation.

(f) Air defense assets are not held in reserve.

(g) Preclusion of excessive unit movement.

(h) Assigned mission consistent with situation.

(i) Task organization accommodates transitions to branches or sequels to the operational plan.

c. Liaison.

(1) DRB-MEF Liaison Requirements. The DRB requires 2 liaison teams to establish necessary air defense liaison with the MEF. Recommended team personnel include a company grade officer, an experienced noncommissioned officer, and one enlisted specialist; team equipment consists of an AM/FM radio-equipped HMMWV. One team collocates with the SAAWC operations facility/TAOC as subject matter experts on the DRB's air defense capabilities and employment and facilitates information flow and exchange. A second team collocates with the Marine TACC to assist in airspace coordination and air defense planning and operational execution.

(2) MEF (FWD) Corps Liaison Requirements. The MEF (FWD) normally provides 2 liaison elements to the corps that facilitate planning and advice on the MAGTF's air defense capabilities and employment. One element collocates with the corps A2C2 element at the corps main to assist in air defense planning; the second collocates with the corps ADA brigade TOC to coordinate air defense execution.

d. Air Defense Control Measures.

Joint Pub 3-56.1 governs use of air defense control measures germane to USA-USMC operations. Figures VIII-3 and VIII-4 depict dissemination of measures during integrated operations between the MEF and DRB and between the corps and MEF (FWD) respectively.

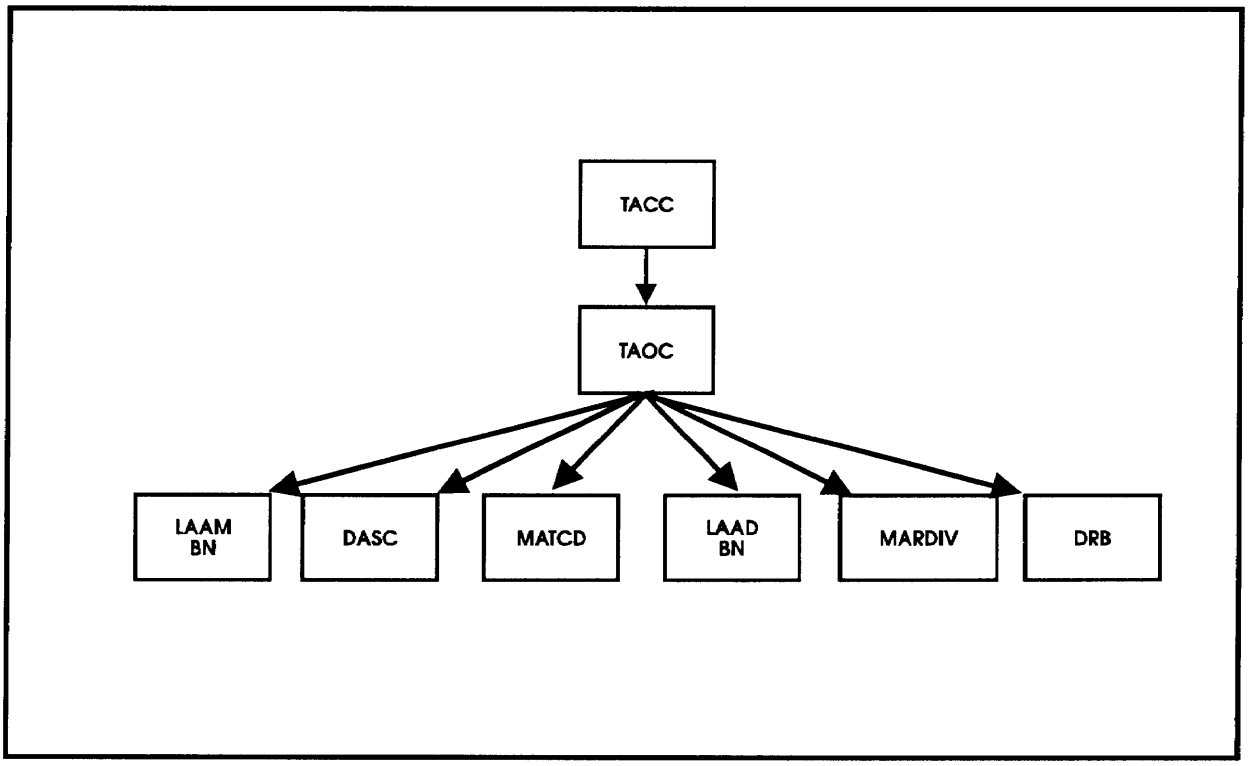


Figure VIII-3. MEF Air Defense Control Measures Dissemination

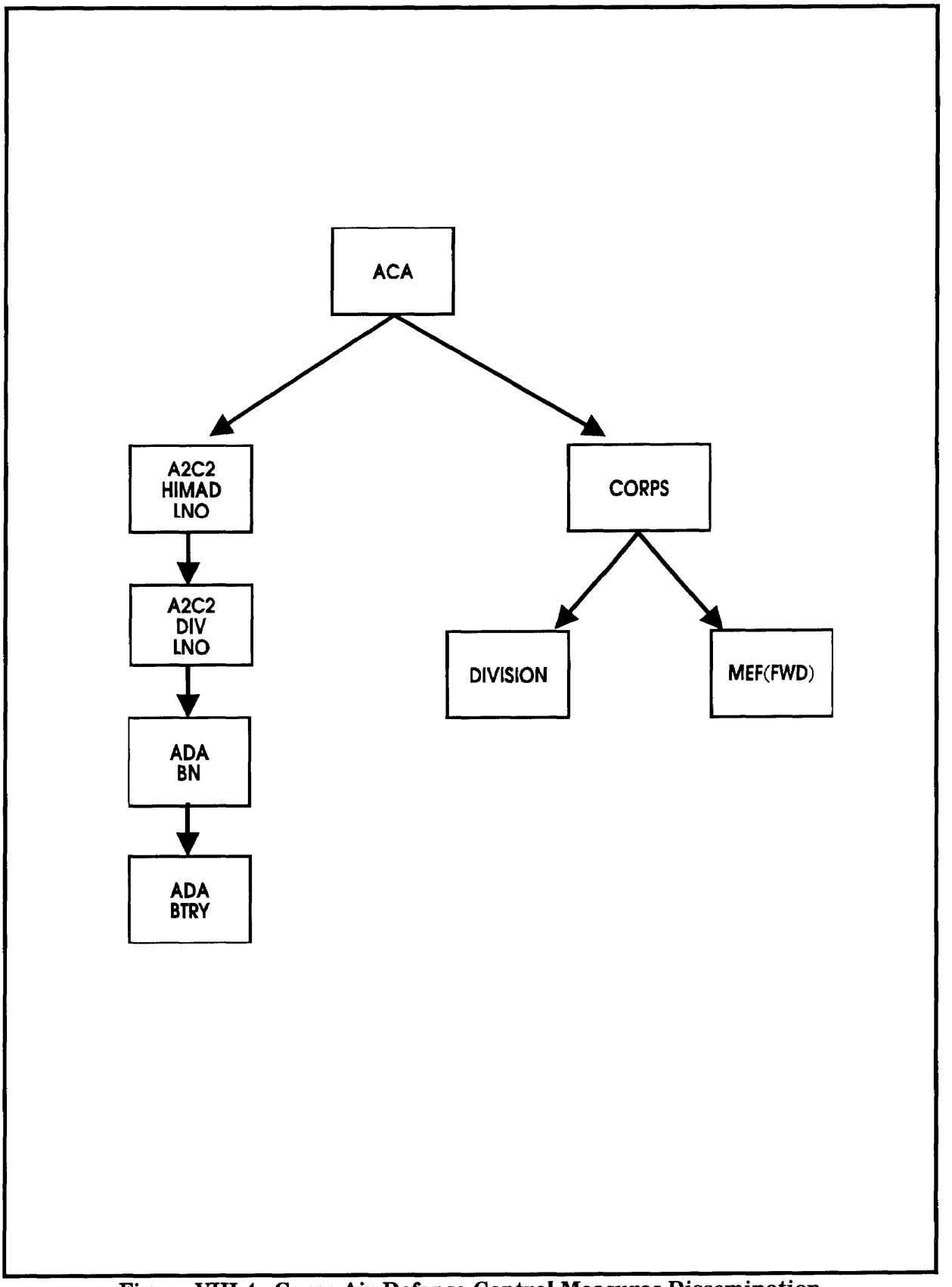


Figure VIII-4. Corps Air Defense Control Measures Dissemination

Chapter IX

LOGISTICS

1. Background

This chapter defines the authority and responsibilities for and control of logistics within and supporting the joint force and defines the six functions of logistics. It also describes DRB and MEF (FWD) logistics organizations and operations and concludes with integrated logistics operations using the six logistics functions as the framework for discussion *(supply, maintenance, health services, transportation, services, and general engineering).*

2. Authority for Logistics Operations

Unity of effort and unity of command demand that a single command authority be vested with the responsibility and the authority for logistics to support AMCI operations. The purpose is to improve efficiency and effectiveness and to prevent unnecessary duplication of logistics effort among the service components.

a. Delegation of Directive Authority. The CINC may delegate directive authority for logistics with the joint force area of responsibility to the JFC (i.e., the CINC may *delegate directive authority for a common support capability).*

b. Exercising Directive Authority. There are three methods of exercising directive authority.

(1) Cross Servicing. Cross servicing logistics is that function performed by one military service in support of another military service for which reimbursement is required from the service receiving support.

(2) Common Servicing. Common servicing logistics is that function performed by one military service in support of another military service for which reimbursement is not required from the service receiving support.

(3) Joint Servicing. Joint servicing logistics is that function performed by a jointly staffed and financed activity in support of 2 or more military services.

c. Staff Supervision and Control. JFC must carefully supervise and control logistics operations. JFC may employ various means to supervise and control logistics; for example—

(1) Coordinate the total logistics effort through service components and other subordinate commands as required.

(2) Establish joint boards and offices as authorized and required to exercise control of logistics assets and functions and promote economy of effort and efficiency of operations.

(3) Establish policies consistent with authority and existing joint publications.

(4) Coordinate with other supporting commands to achieve long term sustainment of forces.

(5) Prescribe and allocate common-user resources to components and subordinate commands.

(6) Use interservice support and common or cross servicing agreements to eliminate unnecessary duplication.

(7) Establish and coordinate priorities and programs to ensure effective use of supplies, facilities, and personnel.

(8) Assume temporary operational control of all logistics forces in exigent circumstances IAW Joint Pub O-2.

(9) Review adequacy of service components' requirements consistent with service directives.

(l0) Synchronize the concept of logistics with the concept of operations and ensure unity of effort.

d. Commanders of Service Component Commands. Service component commanders exercise responsibility for logistics for their forces. Specifically, service component commanders—

(1) Provide logistics for assigned forces within the command except as provided by common or cross servicing.

(2) Forward logistics requirements to or through the JFC as required.

(3) Communicate directly with appropriate service departments on all logistics matters except as directed by the JFC.

(4) Identify logistics forces required to support operational planning and execution.

(5) Time-phase logistics to support operational execution.

(6) Use standard service planning factors as outlined in approved publications except as otherwise directed.

(7) Provide qualified personnel to serve on joint boards and offices as required.

(8) Advise JFC of logistics capabilities and limitations and projected critical shortfalls.

3. Joint Logistics Functions

The Army recognizes six tactical logistics functions: *man, arm, fuel, fix, move, and sustain soldiers and their systems.* The Marine Corps recognizes the six logistics functions defined in joint doctrine: *supply, maintenance, health services, transportation, services, and general engineering.* To ensure a common approach to logistics operations, the joint standard is the basis used for all discussions throughout this manual. Joint Pub 4.0, *Doctrine for Logistics Support of Joint Operations,* describes the functions as follows:

a. Supply. Supply systems acquire, manage, receive, store, and issue the materiel required by the operating forces to equip and sustain the force from deployment through combat operations and their redeployment. Table IX-1 defines the classes of supply that serve as the basis for the discussions throughout the text.

Table IX-1. Classes of Supply

CLASS	SUPPLIES
I	Subsistence and gratuitous health and comfort items
II	Clothing, individual equipment, tents, organizational tool sets and kits, hand tools, and administrative supplies and equipment
III	Petroleum fuels, lubricants, hydraulic and insulating oils, preservatives, liquids and gases, bulk chemical products, coolants, de-icer and antifreeze compounds, components and additives of petroleum and chemical products, and coal
IV	Construction materials including installed equipment and all fortification and barrier materials
V	Ammunition of all types (including chemical, radiological, and special weapons), bombs, explosives, mines, fuses, detonators, pyrotechnics, missiles, rockets, and propellants
VI	Personal demand items such as soap, toothpaste, writing materials and other nonmilitary sales items
VII	Major end items such as launchers, tanks, mobile machine shops, and vehicles
VIII	Medical materiel, including repair parts peculiar to medical equipment
IX	Repair parts and components to include kits, assemblies, and subassemblies (reparable or nonreparabale) that are required for maintenance support of all equipment
X	Material to support nonmilitary program such as agriculture and economic development (not included in Classes I through IX)
MISC	Water, maps, salvage, and captured material

b. Maintenance. Maintenance includes actions taken to support combat readiness and effectiveness by sustaining weapons systems and equipment in a fully mission capable condition as effectively, responsively, economically, and as far forward as the situation permits. Maintenance keeps materiel in a mission capable condition, restores equipment to a serviceable condition, or updates and upgrades equipment through modification. Maintenance includes—inspecting, testing, servicing, classifying, repairing, replacing, reclaiming, modifying, converting, calibrating, rebuilding, and overhauling. Table IX-2 defines the levels of maintenance.

c. Health Services. Health services include evacuation, hospitalization (to include medical treatment), medical logistics, casualty collection, health maintenance, casualty treatment, medical laboratory services, blood management, vector control, preventive medicine services, veterinary services, dental services, and the required command, control, and communications of medical operations. Levels of care referred to in subsequent discussion are defined as follows:

(1) Level I. Level I support encompasses that medical support and treatment provided by designated individuals or elements organic to combat, combat support, combat service support, or designated medical units. This echelon of care includes—

(a) Immediate lifesaving measures.

(b) Disease and nonbattle injury prevention.

(c) Combat stress control preventive measures.

(d) Casualty collection.

(e) Evacuation from supported units to supporting medical treatment units.

(f) Return of sick and injured to duty after recovery.

(2) Level II. Level II includes Level I support plus resuscitative and surgical measures to stabilize casualties for further evacuation, decontamination of NBC casualties, and temporary medical replacement and medical resupply of Level I units.

(3) Level III. Level III care includes Level II support plus emergency life and limb saving surgery, hospitalization, and temporary medical replacement and medical resupply of Level II units.

(4) Level IV. Level IV care includes Level III health services and adds definitive treatment and hospitalization of casualties and temporary medical replacement and medical resupply of Level III units.

d. Transportation. Transportation is the movement of units, personnel, equipment, and supplies from the point of origin to the final destination.

e. Services. Other services associated with nonmaterial support activities that consist of various functions and tasks provided by service troops and the logistic community and support of the force (i.e. aerial delivery, laundry, clothing exchange and bath, and graves registration).

f. General Engineering. General engineering provides the construction, damage repair, and operation and maintenance of facilities or logistics enhancements required to provide shelter, warehousing, hospitals, water and sewage treatment, and water and fuel storage distribution to enhance provision of sustainment and services.

4. DRB Logistics Organizations

Logistics organizations supporting the DRB include the DRB forward support battalion and augmentation provided by the parent division and the corps.

a. DRB FSB.

(1) The FSB provides the DRB with all classes of supplies, heavy maintenance support, medical evacuation and treatment operations, and field services activities. The FSB also provides limited support to non-DRB units located in the brigade AO. The FSB is the single point of contact for support to the brigade and for support operations within the brigade's AO. All FSB units are 100 percent mobile using organic transportation.

(2) The battalion consists of a headquarters and headquarters detachment (HHD), supply company, maintenance company, and medical company as shown in Figure IX-1.

(a) Supply Company. The FSB supply company supports the DRB by receiving, storing, and issuing Classes I, II, III, IV (less construction), and VII supplies and by operating an ammunition transfer point (ATP). Table IX-2 identifies the supply company's capabilities and major equipment.

(b) Maintenance Company. The FSB's maintenance company provides DS maintenance and common repair parts supply support to the DRB's attached and supporting units including all equipment except medical, COMSEC, airdrop, avionics, aircraft, aircraft armament, and ammunition. The company provides tailored tank, mechanized, and artillery maintenance support teams (MSTs) that provide on-site maintenance for the supported task forces and for the artillery and engineer battalions. The company normally maintains an authorized stockage list of approximately 1000 lines of repair parts and provides reparable exchange (RX) of selected items to

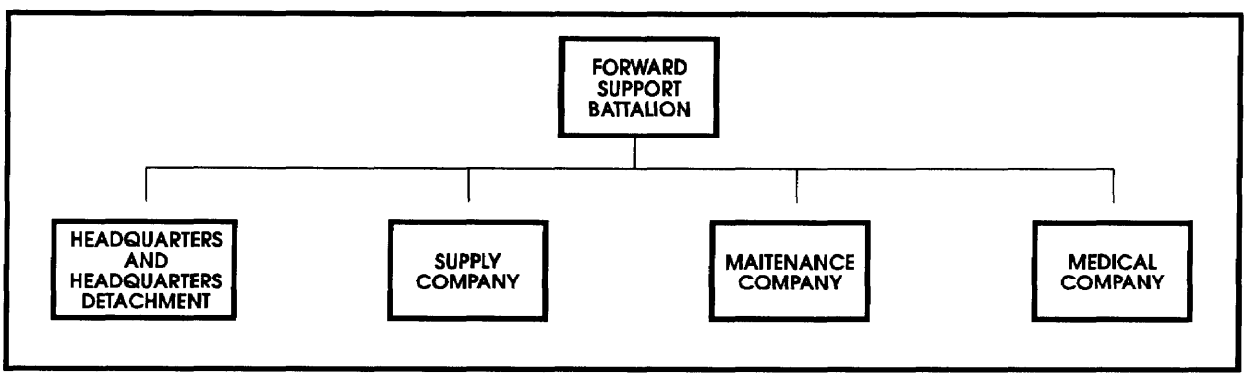


Figure IX-1. Forward Support Battalion

Table IX-2. FSB Supply Company Capabilities/Major Equipment

SUPPLY CLASS	TYPE SUPPORT	CAPABILITY
Class I	Receive/store/issue	16.0 short ton (STON)
Class II	Receive/store/issue	8.8 STON
Class III (P)	Receive/store/issue	.8 STON
Class III (Bulk)	Store/issue	58,600 gal/day
	Distribute	94,200 gal/day
Class IV	Receive/store/issue	7.9 STON
Class V	Transload	550 STON/day
Class VII	Receive/store/issue	5.4 STON
Salvage	Establish/operate salvage and collection points	
Major Equipment	10 5000-gal tankers	
	14 5-ton tractors	
	8 6000-lb fork lift, rough terrain	

support the items stocked in combat prescribed load lists (PLLs) of supported units. When required, the company provides backup organizational maintenance to supported units.

(c) Medical Company. The medical company consists of a company headquarters, treatment platoon, and ambulance platoon supported by 5 HMMWV ambulances and 5 Ml13 armored ambulances. The company provides division- and unit-level health service support to all units operating in the DRB AO on an area basis. The company performs the following functions:

• Treatment of patients with minor diseases and illnesses, triage of mass casualties, initial resuscitation and stabilization, advanced trauma management, and preparation for further evacuation of patients incapable of returning to duty.

• Ground evacuation for patients from battalion aid stations and designated collection points.

• Emergency dental care.

• Emergency medical resupply to units in the brigade area.

• Receipt/issue/storage of 1.6 short ton (STON) of Class VIII supplies.

• Patient holding for up to 40 patients able to return to duty within 72 hours.

b. DRB Logistics Augmentation. Augmentation for the DRB's FSB primarily comes from 2 sources: the parent division's main support battalion (MSB) and a CSG(-). Exact organization and composition is dictated by other division missions the MSB is supporting, host nation (HN) augmentation availability, and infrastructure capability of the specific theater of operations. The augmentation must provide support that exceeds the capability of both the DRB FSB and the MEF, to include back-up DS and GS logistics for the DRB and other supporting Army forces.

c. MSB Augmentation. The main support battalion of the DRB's parent division provides assets that deploy with and augment the DRB's FSB. Table IX-3 details the specific types of equipment that may be included in such an augmentation package. For command and control purposes, the package could either be configured into a 5th company under FSB control or the individual sections could be further attached to the FSB's organic companies.

Table IX-3. MSB Augmentation of DRB

Q UANTITY	TYPE AUGMENTATION
10	5000-gal tankers
10	22.5-ton tractor-trailers
2	6000 lb fork lifts, rough terrain
4	10 litter HMMWV ambulances
As Required	MSTs and shop vans to support DS maintenance and Class IX PLL/ASL requirements for— • Aviation equipment • Chemical equipment • Communications equipment • COMSEC equipment • Engineer equipment • TACFIRE/MLRS/fire support control equipment • TOW, DRAGON, and ITV missile systems • Night vision devices

d. Other Division Augmentation. The parent division also provides the following augmentation to assist in coordinating and supporting the DRB's logistics requirements:

(1) Section from the division's materiel management center (DMMC) to assist in supply and maintenance management.

(2) Section from the division ammunition office (DAO) to coordinate, control, and manage Class V stocks for the brigade.

(3) Personnel services detachment with functional representatives to perform/ assist in replacement operations, casualty management, mortuary affairs, legal services, postal services, public affairs, and finance. Detachment sections collocate with the DRB, CSG(-), or FSSG as appropriate.

(4) Medical operations cell from the division medical operations center to provide medical support planning, medical evacuation and regulating, and coordinate Class VII/ blood resupply.

(5) Medical field support cell from the MSB's medical company to provide Level III health services including preventive medicine, intratheater medical supply, medical equipment maintenance, biomedical equipment maintenance, and combat stress control.

e. CSG(-). The multifunctional CSG(-) provides support for the DRB that exceeds the capabilities of the DRB FSB, attached MSB slice, and those of the MEF. The CSG(-) collocates with the FSSG and furnishes backup DS and GS logistics functions for the brigade. The CSG(-) also provides the logistics framework for deployment of follow-on Army forces and for the transition back to Army corps control. Because CSGs are tailored to support nondivisional and divisional requirements, their task organization varies. Figure IX-2 depicts a *"sample"* organization of a CSG(-).

A brief recapitulation of the mission, capabilities, and major equipment of the units reflected in Figure IX-2 follows. The text references complete unit tables of organization and equipment; all or any subelements of these units may be used in developing the tailored CSG(-). Many of these same units would be used as *"building blocks"* to develop a composite logistics organization tailored to augment the capability of the MEF (FWD)'s CSSE when operating with a corps.

(1) HHC. The CSG(-) headquarters provides command, control, staff planning, and supervision of 3 to 7 assigned or attached battalions and any separate companies. It exercises technical supervision over mission operations of subordinate units. The headquarters company supports all personnel and equipment assigned and attached to the HHC.

(2) Port Transportation Group. The port transportation group assists in seaport of debarkation (SPOD) operations and provides the motor transportation support to the CSG(-), and in some cases, directly to DRB units. See FM 55-1, *Army Transportation Services in a Theater of Operations,* for details.

(3) Corps Support Battalions (CSBs). Figure IX-2 depicts two CSBs that provide the requisite command and control for the companies assigned to the CSG. One CSB consists of primarily transportation units; the other is multifunctional in nature.

(4) Field Services Company (DS).

(a) Mission. To provide field services, to include laundry, shower and limited clothing repair operations.

(b) Capabilities. Provides laundry service at the rate of 15 lbs per person, per week and shower service as the tactical situation permits in support of 17,500 personnel.

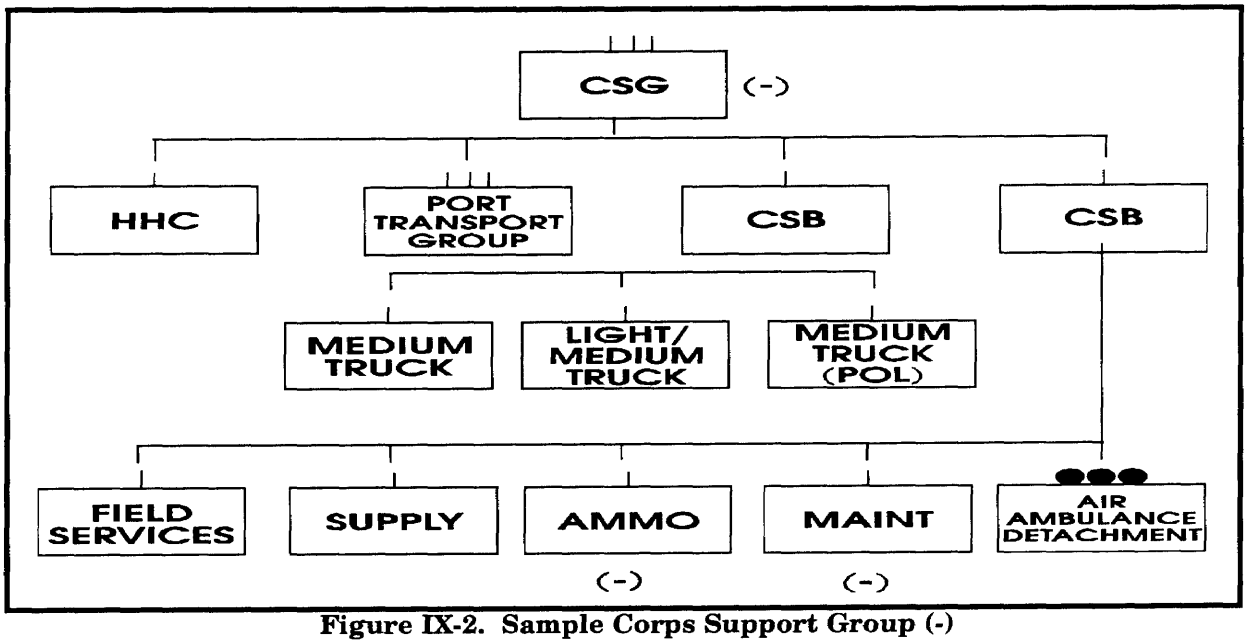


Figure IX-2. Sample Corps Support Group (-)

(c) Major Equipment. 8 5-ton cargo trucks and 9 2.5-ton cargo trucks.

(5) Supply Company

(a) Mission. To operate a direct support supply facility to support 18,500 personnel.

(b) Capabilities include-

• Receiving, storing, issuing, and accounting for 168 STON of Class I, II, III (P), IV, and VII supplies.

• Storing 174,000 gallons of bulk POL a day; distributing 81,000 gallons a day.

• Producing 60,000 gallons of water each at 4 water points; treating 146,150 gallons of contaminated water.

(c) Major Equipment. Table IX-4 defines the company's major pieces of equipment.

Table IX-4. Supply Company (DS) Major Equipment

QTY	TYPE EQUIPMENT	QTY	TYPE EQUIPMENT
4	Forward area water supply points	4	Filter separator, 350 GPM
12	Semitrailer, flatbed, 22.5-ton	40	Tank, collapsible, 3000-gal, water
9	Semitrailer, tanker, 5000-gal	6	Tank, trailer, mounted, 600-gal POL
1	10,000 lb forklift, rough terrain	2	Trailer, water, 400-gal
3	4000 lb forklift, rough terrain	17	Trailer, 1.5-ton
4	Truck, tractor, M915	3	Truck, 2.5-ton
5	Tank and pump units, 1200-gal truck	6	Truck, 5-ton, dropside
4	Tank, collapsible, 3000-gal semitrailer mounted fabric tank (SMFT)	13	Truck, tractor, 5-ton
4	ROWPU, 3000 GPH	4	FSSP, 60,000-gal
12	Tank, collapsible, 10,000-gal, POL	4	350-gal/minute pumping assembly

(6) Medium Truck Company.

(a) Mission. To move supplies and equipment from corps/FSSG supply units/stockage points to users.

(b) Capabilities. Local haul 2700 or line haul 1350 STON daily.

(c) Major Equipment. 60 M915 line haul tractors; 120 M871 22.5-ton semitrailers.

(7) Light-Medium Truck Company.

(a) Mission. To move personnel and general noncontainerized cargo.

(b) Capabilities. Local haul 1200 or line haul 600 STON daily.

(c) Major Equipment. 10 5-ton tractors; 25 22.5-ton semitrailers; 50 5-ton dropside cargo trucks.

(8) Medium Truck Company (POL).

(a) Mission. Wholesale delivery of bulk POL to POL supply units.

(b) Capabilities. Local haul 900,000 or line haul 450,000-gal daily.

(c) Major Equipment. 60 line haul tractors; 60 5000-gal semitrailer tankers.

(9) Ammunition Company.

(a) Mission. To receive, store, warehouse, combat configure, and issue conventional ammunition.

(b) Capabilities. Establish and operate 3 ASPs capable of receiving and issuing 840 STON and configuring 560 STON of ammunition (total lift capability of 2350 STON); 1 ammunition transfer point (ATP) capable of rewarehousing 970 STON.

(c) Major Equipment. Table IX-5 details the ammunition company's major equipment.

(10) Maintenance Company.

(a) Mission. To provide direct support and backup maintenance and repair parts supply service.

(b) Capabilities. Table IX-6 describes maintenance company capabilities.

(c) Major Equipment. Table IX-7 recaps maintenance company major equipment.

Table IX-5. Ammunition Company (DS) Major Equipment

QTY	TYPE EQUIPMENT	QTY	TYPE EQUIPMENT
9	6000 lb forklift, rough terrain	8	10-ton truck, tractor
6	5-ton crane, rough terrain	3	40-ton semitrailer, lowbed
12	Truck, cargo, 5-ton	3	Trailer, palletized loading
5	25-ton semitrailer, lowbed	8	Truck, cargo 2.5-ton
6	Truck cargo, heavy palletized loading system (PLS) transporter		

Table IX-6. Maintenance Company (DS) Capabilities

CAPABILITY	CAPABILITY
Automotive repair	Communications-electronics equipment repair
Computer repair	Engineer equipment repair
Fabric repair	Power generation equipment repair
Small arms repair	Refrigeration repair
Metal working	Special electronics devices repair
Chemical equipment repair	

Table IX-7. Maintenance Company (DS) Major Equipment

QTY	TYPE EQUIPMENT	QTY	TYPE EQUIPMENT
1	Semitrailer, lowbed, 25-ton	14	Truck, cargo, dropside, 2.5-ton
2	Semitrailer, van, repair parts, 6-ton	1	Truck, cargo, dropside, 5-ton
2	Semitrailer, van, ship, 6-ton	18	Truck, tractor, 5-ton
15	Semitrailer, van, supply, 12-ton	1	Truck, van, expansible, 5-ton
1	4000 lb fork lift, rough terrain	5	Truck, van, shop, 2.5-ton
7	Truck, cargo, 2.5-ton	1	Semitrailer, electric repair shop equipment
1	10,000 lb fork lift, rough terrain	4	Truck, contact maintenance
1	Crane, 5-ton, rough terrain	3	Semitrailer, electronic shop
8	Semitrailer, flatbed 22.5-ton		

(11) Air Ambulance Detachment.

(a) Mission. To evacuate patients to and between medical treatment facilities or to airheads for further evacuation out of theater.

(b) Capabilities. Provide immediate aeromedical evacuation of all categories of patients, consistent with evacuation priorities and other operational considerations. Operates 6 air ambulances, each configured to carry 4 litter patients and 1 ambulatory patient. Maintain aircraft with organic/attached aviation unit maintenance personnel and equipment.

(c) Major Equipment. 6 UH-60 Blackhawk aircraft.

(12) Other Corps Augmentation. The corps would also provide the following augmentation to assist in coordinating and supporting the logistics requirements for Army forces supporting the MEF:

(a) Split-based section from the corps materiel management center (CMMC) to assist in coordination of supply operations.

(b) Split-based section from the corps movement control center (CMCC) to coordinate transportation operations.

(c) Forward support platoon from a corps medical logistics battalion (forward) to support medical units with medical supplies and blood support.

5. DRB Logistics Operations

DRB logistics operations occur in general terms as described below. Discussions focus primarily at the CSG(-) level and below.

a. Supply.

(1) Class I. During initial deployment, units consume the meal, ready-to-eat (MRE). As conditions permit, a variety of group rations (A-, B-, and T-rations) augment and modify the initial MRE-only ration cycle. The ultimate objective is to provide soldiers with a minimum of 1 hot A- or B-ration meal per day.

(2) Class II, III (P), IV, and Maps. Units maintain basic loads of Class II, III (P) and IV supplies. Resupply of using units occurs through the FSB and CSG(-) supply companies.

(3) Class III Operations. The brigade S4's POL forecasts form the basis for CSG(-) and corps/MEF distribution plans. Using 5000-gal tankers the CSG(-) pushes fuel directly to the FSB supply company's Class III supply point located in the brigade support area. Battalions draw and transport bulk Class III from the fuel supply point to supported elements using organic assets such as the 12 2500-gal HEMTT fuelers and 7

truck-mounted 1200-gal tank and pump units belonging to the tank and mechanized infantry battalions respectively.

(4) Class V Operations. Supply of ammunition of all types is based on a required supply rate (RSR) and a controlled supply rate (CSR). Availability drives the CSR. Based on command guidance the CSR provides the basis for Class V distribution to using units. The CSG(-) pushes ammunition from the JTSA or CSA to an ASP located in the rear of the AO or directly to the ATP located in the BSA. The FSB manages the ATP. Combat units use organic assets such as the tank battalion's 10 HEMTT ammunition trucks to draw and transport C1ass V from the ATP to the users.

(5) Class VII. Class VII resupply to using units occurs based on battle loss reports and priorities established by commanders. The CSG(-) delivers equipment to the FSB supply company or directly to users at the battalion level.

(6) Class VIII (Medical) Resupply. The CSG(-) transports medical supplies to the FSB medical company. The medical company further distributes using support medical elements, Ground and air ambulances effect emergency resupply of Class VIII materials via backhaul.

(7) Class IX. See maintenanc discussion below.

b. Maintenance.

(1) Ground Systems Maintenance. Maintenance support occurs as far forward as possible. The FSB provides dedicated DS maintenance support to brigade units and area support to other units. The FSB maintenance company provides a MST to each maneuver battalion, as well as to the DS artillery and engineer battalions. The company also maintains 15 days of ASL repair parts to augment the limited combat PLL of repair parts maintained by supported battalions. The CSG(-) provides backup automotive and missile maintenance support to unit MSTs. Repair parts not available through the CSG(-) or FSSG generally flow from CONUS depots via air lines of communications (ALOC) to the CSG(-) for further distribution to the FSB and supported units.

(2) Aviation Maintenance.

(a) The Army aviation maintenance system focuses on ensuring maximum availability of mission-capable aircraft. Maintenance support occurs in three levels: AVUM, AVIM, and depot maintenance. Each aviation element owns an organic AWM capability backed up by higher echelon AVIM units.

(b) Air Ambulance Detachment Maintenance. Aviation maintenance for the air ambulance detachment is accomplished primarily by the AWUM personnel organic to the aeromedical unit. A slice of AVIM personnel from the corps AVIM will accompany that unit and provide backup and limited AVIM support to AWUM personnel. The maintenance capability consists of battle damage assessment and repair, contact maintenance, and line replaceable unit/ module replacement. Phase maintenance on aircraft is normally not possible until a more robust aviation maintenance capability exists, such as the aviation augmentation packages described in Chapter VII.

c. Health Services. Medical units organic to maneuver battalions provide Level I medical support to units in the brigade's forward areas. The FSB medical company provides Level II support to the brigade and Level I support to units without organic medical assets; it also provides backup Level I support and ground evacuation support to the battalions. The air ambulance detachment (which may be attached to and collocated with the DRB medical company) provides the DRB with an aeromedical evacuation capability as described earlier.

d. Transportation. The FSB has no assigned DS transportation assets. The DRB

requests external transportation support through the CSG(-) movement control cell. The CSG supports DRB requests for external assistance with the truck companies available to the CSG(-). The movement control cell requests assistance from the MEF FSSG when requirements exceed CSG capabilities.

e. Services. The DRB has no organic laundry or bath capability, water assets, or graves registration capabilities; it depends on the CSG(-) and MEF for all field services support.

(1) Field Services. The CSG(-) field services company, augmented with a mortuary affairs collection section, provides laundry and shower support and mortuary affairs support respectively for the brigade.

(2) Water Storage and Distribution. The CSG(-) supply company supplies the FSB with water.

f. General Engineering. The DRB engineer battalion's capability to perform general engineering tasks is limited; external support is required.

6. MEF (FWD) Logistics Organizations

The FSSG provides logistics support for the MEF. The FSSG performs those functions which exceed the organic capabilities of the supported units. The FSSG commander, normally a brigadier general, serves as the principal logistics advisor to the MEF commander. The FSSG consists of the FSSG headquarters plus 8 permanent battalions. These battalions include a headquarters and service battalion, a supply battalion, a maintenance battalion, a motor transport battalion, an engineer support battalion, a medical battalion, a dental battalion, and a landing support battalion. Based on the mission, the commander task organizes these battalions into CSSDs. These CSSDs provide support to the combat units of Marine divisions and to forces operating in MEF rear areas.

a. MEF (FWD) CSSE. The CSSE of a MEF (FWD) derives from the MEF's FSSG. The notional MEF (FWD) CSSE depicted in Figure IX-3 consists of a detachment from each battalion in the FSSG and organization is based on mission.

(1) Headquarters and Service (H&S) Detachment. The H&S detachment provides command, control, administration, communications, and automated data processing (ADP) to the CSSE. It provides supporting services to the MEF (FWD) in the amphibious assault and subsequent operations ashore, to include such services as GS data processing, disbursing, postal, exchange service, military police, information systems, legal service support, civil affairs support, graves registration, and limited communications support.

(2) Supply Detachment. The supply detachment exercises responsibility for stock control, cross servicing, and civilian contracting for all classes of supply except bulk fuel, and aviation/aircraft related supply support. This support includes receiving, storing, assembling, inspecting and issuing ordnance, parts, equipment and reparable to ground elements, and providing medical supply support and intermediate level maintenance on all medical and dental equipment of the MEF (FWD).

(3) Maintenance Detachment. The maintenance detachment provides DS maintenance support to elements of the MEF (FWD). This support includes providing DS maintenance contact teams to forward elements, furnishing backup DS maintenance support that exceeds the capabilities of the contact teams, tracked vehicle recovery, evacuation, and calibration/repair of electrical and mechanical equipment.

(4) Motor Transport Detachment. The motor transport detachment provides organic medium and heavy motor transport support, augmenting GCE and ACE organic capabilities on a mission-type basis.

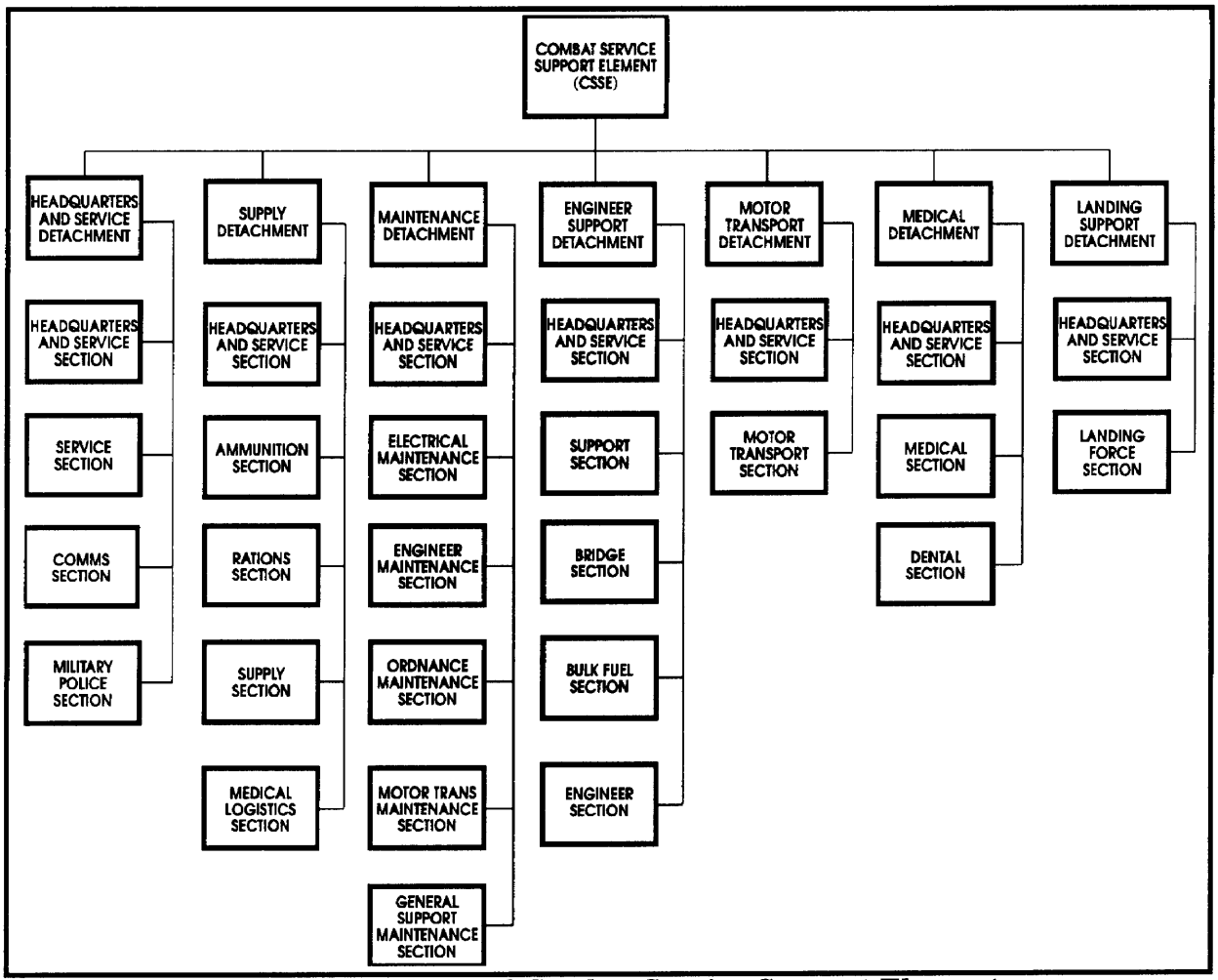


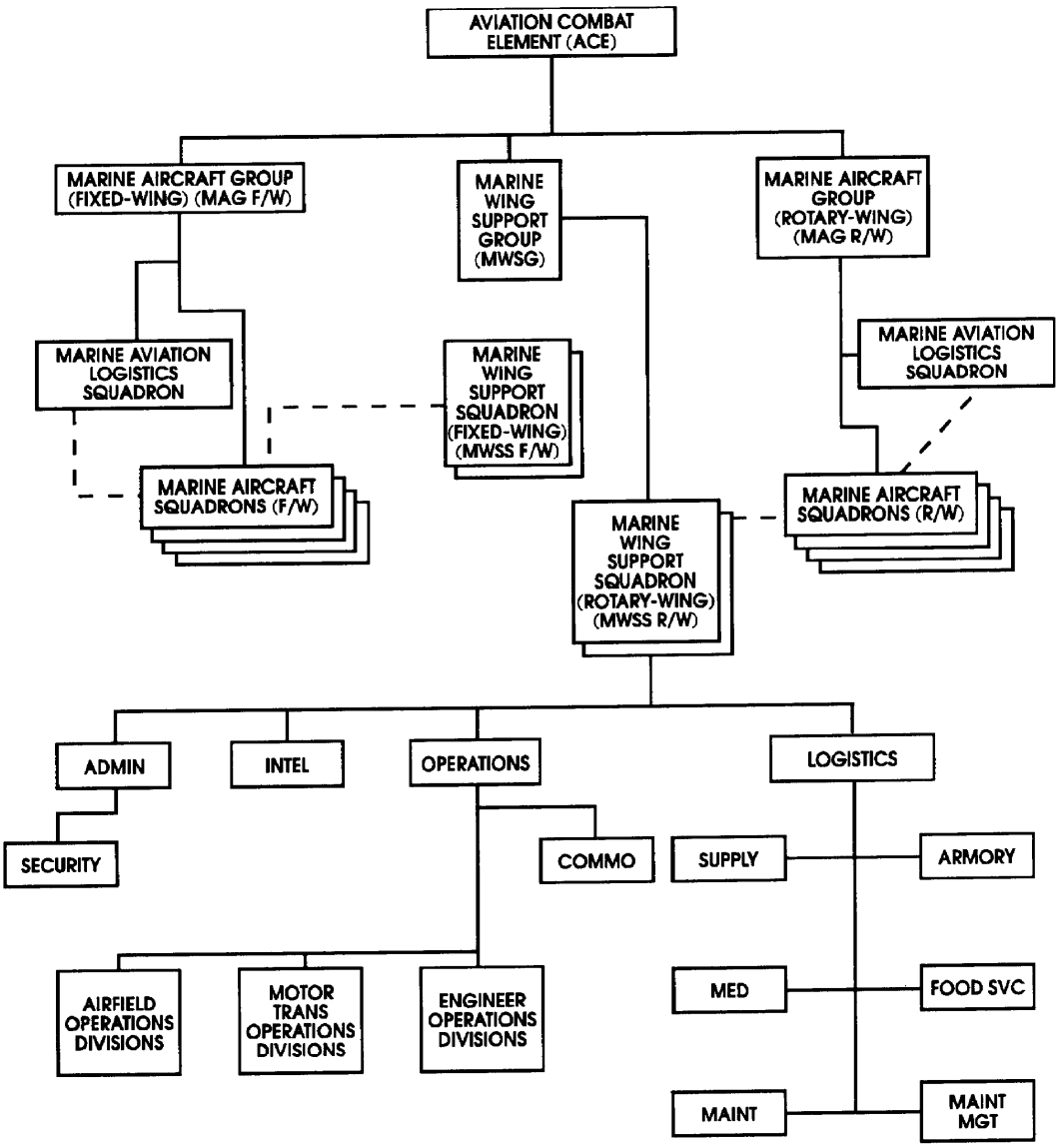
Figure IX-3. Notional Combat Service Support Element

(5) Engineer Support Detachment. The engineer support detachment furnishes general organic engineering support, including horizontal and vertical construction fortification, construction, repair and maintenance of aviation facilities, facilities maintenance, engineer reconnaissance, and deliberate demolition and obstacle removal. See Chapter VIII for detailed discussions.

(6) Medical/Dental Detachment. The medical/dental detachment, staffed with US Navy medical personnel, provides casualty collection, emergency treatment, temporary hospitalization, specialized surgery, and evacuation support for the MEF (FWD).

(7) Landing Support Detachment. The landing support detachment provides landing support to the MEF (FWD) and subordinate elements in the assault and subsequent operations ashore. The landing support consists of communications, materials handling equipment, helicopter support, beach and terminal port operations, and the establishment of temporary storage areas on the beach.

b. ACE. The ACE's aviation logistics organizations include Marine aviation logistics squadrons (MALS) and MWSS as illustrated in Figure IX-4. Organizational functions are addressed within the context of the six logistics functions discussed below. The MWSS provides airfield operations support including fuel, crash-fire-rescue (CRF), ammunition storage, limited runway repair, personnel support, engineer support, and ground transportation within the airfield.



- - - - - Aviation Logistics Support. Consists of aviation supply, intermediate maintenance of aircraft, aviations armament, ordnance, and support equipment.

- - - - - Aviation Ground and Combat Service Support. Consists of airbases support functions and CSS functions for ground supply, maintenance, transportation, engineering, health services, and services.

Figure IX-4. Aviation Combat Element Logistics Organization

7. MEF (FWD) Logistics Operations

MEF (FWD) logistics operations occur in general terms as described below:

a. Supply. MAGTF sustainment occurs through a mix of accompanying supplies and resupply. Accompanying supplies are an integral part of the MAGTF logistics load in virtually all situations. Operational factors and/or supply availability may require readjusting accompanying and resupply balances. The minimum baseline for a MEF (FWD) accompanying supplies is 30 days. The availability of aviation ordnance, ground material, and bulk POL fluctuates and is theater-dependent. Resupply begins with force employment. It is scheduled to commence before expending of accompanying supplies and to continue through the entire period as established by the supported theater combatant commander's guidance. Accompanying supplies are a combination of supplies aboard maritime prepositioning ships (MPS), supplies accompanying the amphibious forces, and additional items shipped from CONUS or key locations around the world. The Marine Corps logistics system is designed to support most general MAGTF requirements from on-hand supplies through the CSSE. The naval supply system provides aviation-peculiar support through MALS. Subsistence items and POL are provided by the DLA. Theater ground ammunition assets are stored in Army or Navy ammunition depots; air ordnance resides in Navy depots before issue. External support may be provided to meet MEF (FWD) requirements. Wartime Host Nation Support and Interservice Support Agreements may also be established.

b. Maintenance. MAGTF maintenance is conducted at the organizational and intermediate levels only. Depot-level maintenance is conducted at Marine Corps logistics bases in the CONUS.

(1) Maintenance at Organizational and Intermediate Levels. During combat operations, ground force maintenance focuses on battle damage repair, salvage, removal/replacement of critical repair parts, and performance of essential preventive maintenance. Ground and air organizational maintenance is conducted by equipment operators and trained maintenance personnel. Intermediate ground maintenance is conducted by the CSSE. This is normally accomplished by sending repair teams conducting on-site repairs or evacuating equipment that cannot be repaired in place. Air intermediate maintenance is conducted by supporting maintenance activities for the fixed- and rotary-wing squadrons.

(2) Aviation Maintenance. To support the task-organized combat element aircraft, the Marine Corps uses the Marine Corps Aviation Logistics Support Program (MALSP). The MALSP enables the individual identification of personnel, equipment, and parts required to support each type, model, or series of fixed- and rotary-aircraft in the ACE. The personnel are assigned, as required, to the fixed-wing or rotary-wing MALS to support MAGTF-assigned aircraft squadrons. The supporting equipment and parts are tailored into support packages. The first of these, the fly-in support package (FISP) accompanies the aircraft fly-in echelon. The FISP contains organizational-level maintenance support. The second package is the contingency support package (CSP). The CSP contains appropriate intermediate-level maintenance support. When the MAGTF is initially supported by a maritime prepositioning ship squadron (MPSRON), the ACE receives support from an aviation logistics support ship (TAVB). In this case, a small organizational-level FISP will be constituted to support organizational maintenance until arrival of the TAVB and MPSRON.

c. Health Services. USMC health services support is similar to that of the Army. Level I care occurs at battalion level. The medical detachment at the CSSE provides Level II care. Combat zone fleet hospitals and hospital ships based at the FSSG or offshore furnish Level III care.

Level IV care capabilities exist at the communications zone fleet hospital. MEF (FWD) health service functions include health maintenance, casualty collection and treatment, temporary hospitalization, and casualty evacuation. The Navy provides all MEF (FWD) medical and dental personnel. Medical personnel are organic to all combat and combat support units of battalion/ squadron size or larger. Medical material support is provided by the CSSE. Medical capabilities and evacuation facilities are concentrated in combat organizations, especially infantry, where most combat casualties are expected. Each combat and combat support battalion has the organic Navy medical personnel and capability to establish one or more aid stations. For example, an infantry battalion has up to 2 doctors and 65 Navy corpsmen. Within the ACE, the MWSSs have organic medical personnel and equipment needed to establish an airfield aid station. In addition, each squadron has a flight surgeon assigned. Tailored medical support in the MWSS provides limited dental, laboratory, x-ray, and pharmacy support. The CSSE provides medical and dental coordination, direct support, administration, and maintenance to the MAGTF. The CSSE detachment coordinates medical and dental requirements planning and provides limited casualty collection, surgical support, hospitalization, medical evacuation, x-ray, laboratory, pharmacy, and blood bank support. Medical unit functions also include preventive medicine and identification of human remains. The CSSE medical logistics unit provides Class VIII supply and intermediate maintenance support.

d. Transportation. MEF (FWD) organic transportation support consists of ground and air transportation assets as described below. The CSSE commander normally exercises responsibility for MEF (FWD) movement control.

(1) GCE/ACE Motor Transport. Motor transport assets within the GCE and ACE are limited. Motor transport for both elements above their organic capabilities are provided by the CSSE as GS to the MAGTF. Organic GCE motor transport is limited and employed primarily for organic tactical mobility. Organic motor transport for the ACE is provided by the MWSS positioned at each airfield. All organic ground transportation assets within the GCE and ACE may be consolidated to provide transport to the MAGTF when not used for tactical mobility.

(2) CSSE Assets. CSSE ground transportation assets are used to link ports, supply centers, terminals, and other CSS facilities. They are also used to augment organic GCE and ACE capabilities. General-use CSSE assets may include 5-ton trucks and logistic vehicle system (LVS) vehicles.

(3) Air Transport. An ACE normally contains significant helicopter assets that can conduct equipment, cargo, and personnel movement operations. The ACE KC-130 may also provide limited intratheater air transportation; however, its primary role is an air-to-air refueler. See Chapter VII for additional discussion.

(4) Landing Support Operations. Landing support operations include beach and port terminal operations, air delivery support, helicopter support teams, departure/ arrival airfield, and rail operations. Navy augmentation to the landing support organizations facilitate the ship-to-shore assault movements from amphibious ships to locations ashore.

(5) Embarkation. Embarkation is the process of putting personnel or vehicles and their associated stores and equipment into ships or aircraft. Embarkation is an extremely important planning requirement. Embarkation and movement in a theater of operations are accomplished with amphibious ships, strategic sealift, and strategic airlift. See Joint Pub 3-02.2, *Joint Doctrine for Amphibious Embarkation Operations*, for additional details.

e. Services. Services include the functions of postal operations, dispersal, law enforcement, enemy prisoner of war management, information systems management, utilities support, legal services support, civil affairs, and graves registration. For field services support that exceed the capabilities of MEF (FWD) assets (e.g., bath and laundry services that exceed the capability of the engineer support detachment or graves registration requirements that exceed supporting Navy corpsman capacities), the MEF (FWD) requires augmentation by Army assets.

f. General Engineering. In addition to providing the MEF (FWD) with mobility support, the CSSE engineer support unit capabilities include camp construction and maintenance; electrical power supply and distribution; construction design; bulk fuel reception, storage, and issue; potable water production and storage; and explosive ordnance disposal. Chapter VI discussed engineer operations in detail.

8. Integrated Logistics

Topical discussions on integrated logistics operations include command and control of logistics operations; detailed applications of the six logistics functions during DRB and MEF (FWD) cross service operations; and logistics reporting procedures.

a. Command and Control of Logistics Operations.

(1) DRB Under MEF Control. Based on Operation Desert Storm experience, the CSG(-) should be attached to the MEF and under the operational control of the MEF FSSG. This command relationship provides command and control the CSG(-) and requires the MEF to provide security and terrain management. Figure IX-5 depicts the command and control logistics when the DRB operates under the control of the MEF.

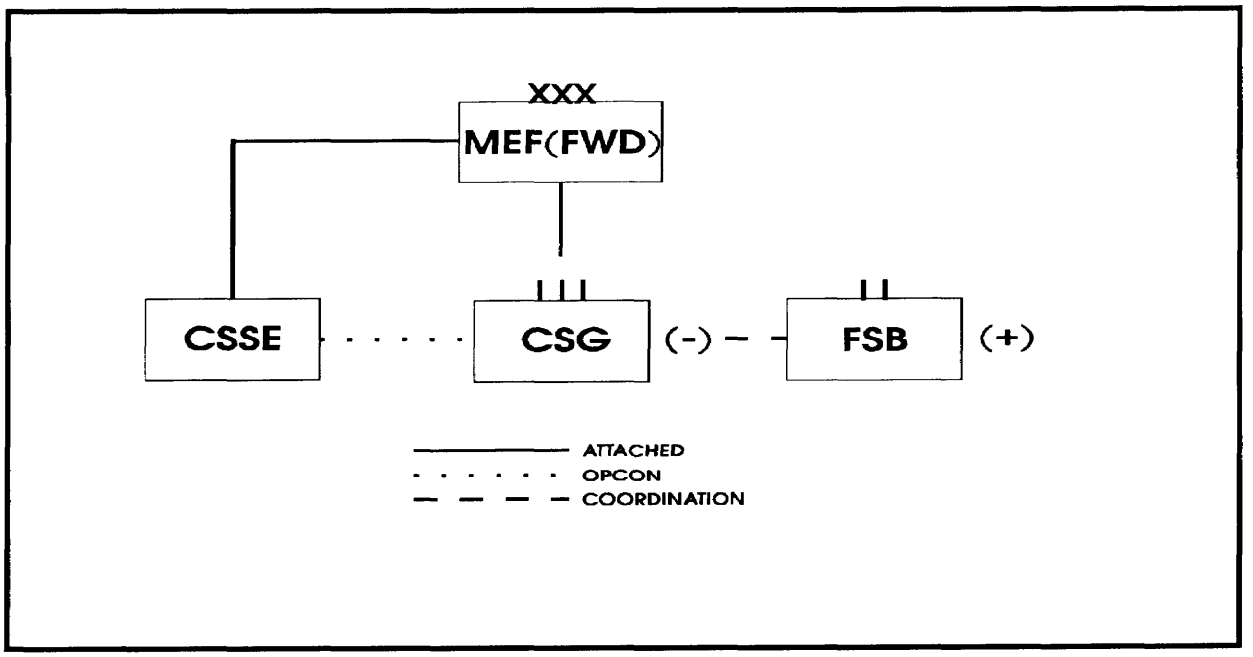


Figure IX-5. Logistics C2 DRB Under MEF

(2) MEF (FWD)Under Corps Control.

(a) Augmenting the MEF (FWD) with Logistics Support. With the exception of selected Class II, V (primarily aviation), VII, and IX supplies and maintenance requirements peculiar to USMC equipment, the Army can provide the majority of logistics support required by the MEF (FWD) that exceeds the capability of the CSSE. Figure IX-6 depicts a notional CSB constituted to provide that support. CSB tailoring is contingent not only upon the support required by the MEF (FWD); its task organization would also accommodate support requirements for any additional Army elements placed under the control of or in support of the MEF (FWD). For example, the CSB would be task organized with additional Class III and Class V capabilities to support a field artillery brigade placed in support of the MEF (FWD).

(b) Command and Control. Figure IX-7 reflects the command and control relationship of logistics elements when the MEF (FWD) operates as part of a corps.

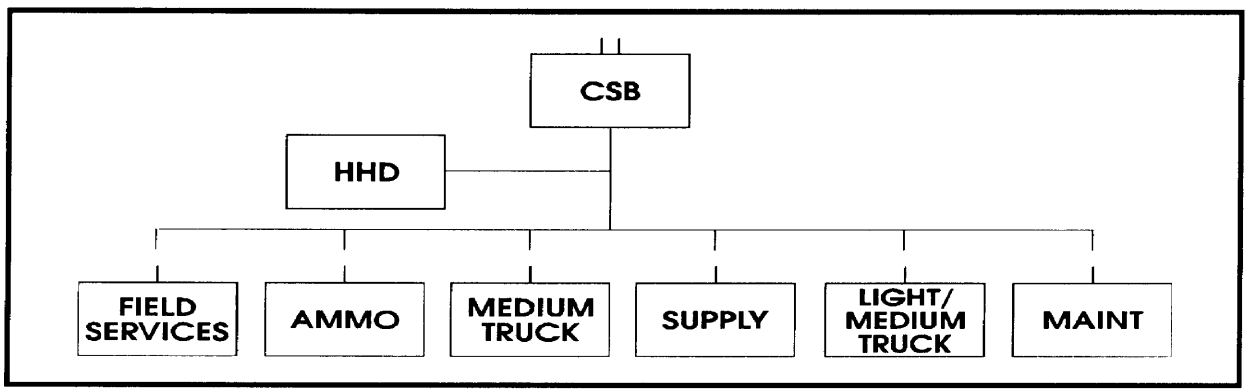


Figure IX-6. Notional Combat Support Battalion in Support of MEF (FWD)

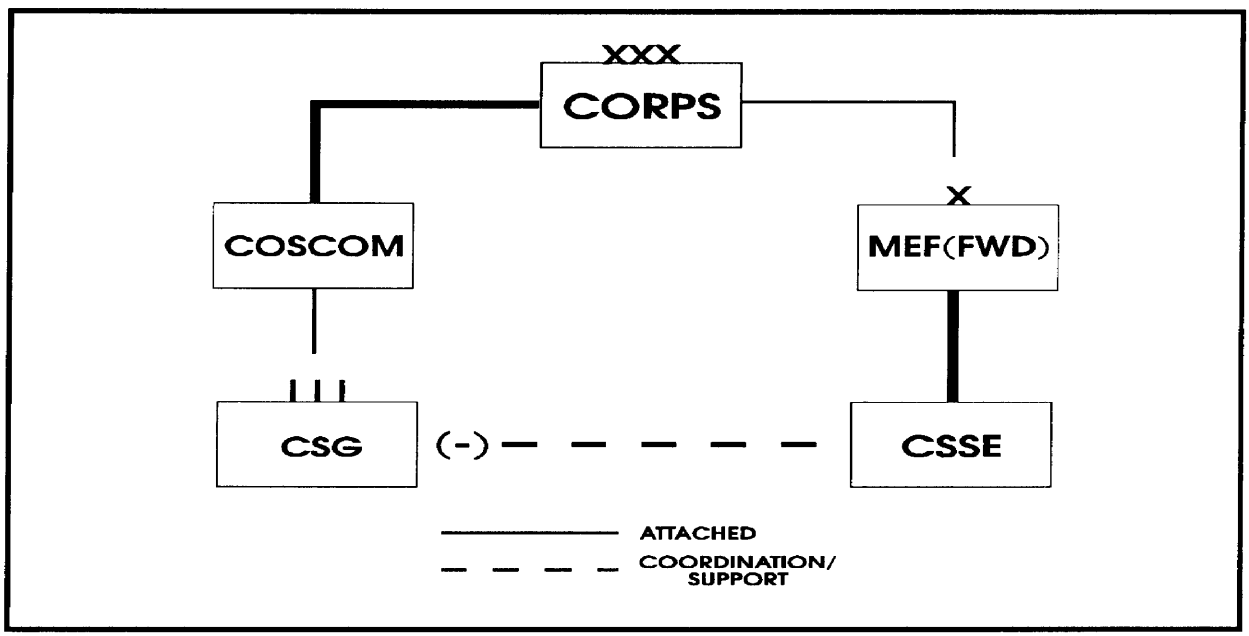


Figure IX-7. MEF (FWD) Logistics C2 When Under Corps Control

(3) Liaison. Regardless of the command and control relationship established, a logistics liaison team should be provided to the new controlling headquarters. The team coordinates support and ensures information flow between the unit and the controlling headquarters. Minimum information includes—

(a) Critical fuel and ammunition requirements.

(b) Status of each class of supply to include water.

(c) Maintenance requirements and backlog.

(d) Class IV, V, and IX requirements and availability.

(e) Movement requirements and available transportation assets to include aircraft.

(f) Availability of medical treatment and evacuation assets.

(g) Locations of support elements.

(h) Status of support personnel.

(i) Anticipated support problems.

(j) Compatibility of automated equipment.

(k) Unique equipment.

(4) Command, Control, Communications, Computers, and Intelligence Support (C4I). Joint force C4I support planning must consider and accommodate logistics requirements in order to synchronize and fully support operational execution. Similarly, C4I contingency plans define backup automated and manual capabilities that ensure uninterrupted logistical support of ongoing operations.

b. Supply Operations.

(1) Class I.

(a) DRB Under MEF Control. During the initial phase of an operation, rations are pushed forward based on personnel strength, unit locations, type of operations, and feeding capabilities of supported units. As the situation permits, Class I support transitions from a *"push"* system to a *"pull"* system. Units submit requisitions to the FSB's forward Class I supply point where all requests are consolidated and submitted to the supporting materiel management center Class I section at the CSG(-). From there, requests flow to the MEF FSSG. The FSSG throughputs the requested rations to the FSB's ration breakdown point located in the brigade support area (BSA). At the BSA rations are broken down for issue to requesting units. Requesting units use organic transportation to move rations from the BSA to forward units.

(b) MEF (FWD) Under Corps Control. Until a decision is made to transition to a pull resupply system, rations are pushed to the MEF (FWD) based on the considerations described above. Once the transition occurs, the MEF (FWD) sends consolidated ration requests to the supporting CMMC Class I section for further transmission to the corps support command (COSCOM). Corps units deliver rations to the CSSE for breakdown and further distribution to supported units.

(2) Class II, III (P), IV and VII.

(a) DRB Under MEF Control. Supply requests flow from the requesting unit through supply channels to the CSG(-) supply company. Common items requests are passed to the supporting CSSD. If a requested item is available, the CSSD transports it to the user through unit distribution when possible, otherwise supply point distribution may be required. If the

item is not on hand, the CSSD passes the requisitions to the FSSG for further processing. Once the requisition is filled, the FSSG normally provides the transportation to deliver supplies and equipment to the subordinate CSSD. Surface transportation is the norm; high priority supplies may be delivered by air to the user based on asset availability. Service-unique supplies are processed through the split-based CMMC at the CSG(-).

(b) MEF (FWD) Under DRB Control. User supply requests flow to the CSSE supply detachment at the MEF (FWD) level. The supply detachment passes requests it cannot fill to the CSB supply company, which fills the request or passes it to the CMMC. The CMMC fills the request or passes it to the theater Army materiel management center (TAMMC) for procurement through a national inventory control point (NICP). Corps units throughput supplies to the CSSE for further distribution to supported units.

(3) Class III.

(a) Petroleum operations are particularly difficult to orchestrate in a joint operational setting. POL considerations include—

• Forecasting requirements and establishing an adequate storage and distribution system.

• Monitoring consumption and submitting requirements for bulk fuels and packaged products.

• Defining responsibility for storage and land distribution of POL; operations and maintenance of pipelines and related facilities when required; packaging of bulk fuels; and provision of petroleum laboratory facilities for quality control in support of all forces deployed.

• Planning for augmentation by commercial bulk POL distribution capability, transportation assets, and collapsible tanks and containers.

• Establishing aerial resupply in support of operations until surface resupply can be established.

(b) DRB Under MEF Control. The FSSG does not have the capability to store, transport, or distribute the amount of Class III that the DRB will consume. During operations, a tank battalion requires tactical refueling approximately every 6 hours. Table IX-8 provides some expected consumption rates for the DRB and MEF (FWD) ground equipment during different types of operations. Figures are for illustration purposes only; many factors affect actual consumption rates. At the SPOD, an Army tactical petroleum terminal (TPT) element off-loads bulk fuel from ships. Fuel that exceeds naval storage capabilities can be stored by a corps petroleum supply company with a storage capacity of some 2.5 million gallons. The CSG(-)'s medium truck company (POL) transports bulk fuel directly to the FSB.

(c) MEF (FWD) Under Corps Control. The MEF (FWD) CSSE may establish a rearm/refuel point (RRP) to support a mechanized or other rapidly moving force. The corps pushes fuel from the COSCOM to designated RRPs, where combat units draw and transport Class III support forward to their units using organic assets.

Table IX-8. Illustrative Class III Consumption Rates

UNIT	OFFENSE	DEFENSE	RESERVE
DRB	160,000	150,000	50,000
MEF (FWD)	65,000	44,000	20,000

(4) Class V (Ammunition) Operations. There is a significant difference between Army and USMC combat ammunition logistics support doctrine. Because of the large quantities of Class V munitions consumed during combat operations, Army units employ the PLS for resupply operations. The PLS is the centerpiece of a transportation-intensive, continuous throughput system. Limited forward stocking of Class V occurs. USMC logistics doctrine places considerably more emphasis on stocks uploaded on organic vehicles in the combat force and less emphasis on a structured distribution system.

(a) DRB Under MEF Control. An Army ammunition accountability detachment (port) element provides accountability, surveillance, and safety support for incoming shipments of ammunition at the SPOD. The CMMC section provides data to the NICP and manages in-theater ammunition stocks. The configuration of stocks arriving in the AO determines the requirements for handling and transloading stocks. If stocks arrive in containers, ammunition units require container handling equipment, ammunition handlers, and container-capable transportation to move ammunition from the port to designated storage areas. If stocks arrive on pallets, they are transloaded by smaller non-container units using forklifts. Army transportation units deliver stocks from the SPOD to the JTSA. Shipment from the storage area to forward ASPS or directly to the DRB ATP may be effected by PLS vehicles carrying combat-configured Class V loads or by conventional cargo transporters and trucks.

(b) MEF (FWD) Under Corps Control. Resupply of combat units occurs through the CSSD. The corps pushes Class V to the RRP established by the CSSD. Supported units transport ammunition from the RRP forward elements using organic transportation.

(5) Class VIII.

(a) DRB Under MEF Control. A medical logistics distribution team from the forward support platoon of the medical logistics battalion provides Class VIII medical resupply to the DRB medical company and to the medical units at echelons above brigade. The CSG(-) supports the team with transportation support for Class VIII. The team coordinates with the CSSE supply detachment (medical logistics element) battalion on all medical supply matters.

(b) MEF (FWD) Under Corps Control. The corps medical logistics battalion supports the medical resupply needs requested from the CSSE supply detachment (medical logistics element).

(6) Class IX.

(a) DRB Under MEF Control. Both Class IX requests that cannot be satisfied from PLL or ASL stocks and stock replenishment requests flow through maintenance channels to the maintenance battalion at the CSG(-). If the repair part is a common service item, the request goes to the MEF FSSG supply system for further processing. The FSSG obtains required repair parts and delivers them to the CSG(-). The CSG(-) delivers the parts to the FSB maintenance company for subsequent pickup by requesting units. If the repair part is an Army-peculiar item, the CMMC passes the request directly to the NICP for processing. Parts typically arrive via air lines of communications for reception and processing by the FSSG, CSG(-), and/or the FSB.

(b) MEF (FWD) Under Corps Control. Requests for repair parts from using units flow to the maintenance detachment located at the MEF (FWD)'s CSSE. Further processing of common item requests occurs through the CSB's maintenance battalion. The CSB delivers repair parts to the CSSE for further distribution to using units.

Requests for service-unique repair parts flow from the CSB through corps to the Marine Corps Unified Materiel Management System.

(7) Class X. Materials to support nonmilitary programs are requested and obtained through supply channels on an as-needed basis based on civil-military requirements articulated through command guidance.

c. Maintenance Operations. Commanders exercise responsibility for coordination of maintenance within their commands. Maintenance priorities must focus on mission-essential weapon systems that can be rapidly returned to combat readiness. Whenever practical, maintenance facilities for joint or cross service use should be established, and interservice use of salvage assets should be emphasized. Service-peculiar items that require maintenance support normally remain the responsibility of service component commanders.

(1) DRB Under MEF Control. As described earlier, maintenance support teams provide on-site maintenance to DRB units. Backup automotive and missile support maintenance occurs at the FSB. If required, equipment is evacuated to the CSG(-) for repair or other disposition. The CSSE also provides backup maintenance support on common items.

(2) MEF (FWD) Under Corps Control. Intermediate-level maintenance support is performed at established RRPs. Support includes repair of subassemblies, assemblies, and major end items for return to lower echelons or supply channels. Maintenance requirements for common equipment that exceed the capability of the maintenance detachment are supported by the CSB(-). Requirements for USMC-peculiar equipment that cannot be supported by the detachment CSB(-) or corps must either be evacuated and/or replaced through Class VII resupply.

d. Health Services.

(1) Planning Medical Service Support. Planning medical support for the force requires detailed integration and coordination. Medical support planning addresses how the operation is medically supported to assist in achieving the overall mission. Medical planning considerations include—

(a) Evaluating each service component's medical capability and deployable medical systems (DEPMEDS).

(b) Providing, where practical, for joint use of available medical assets to support operational execution.

(c) Selecting appropriate sites for field hospitals that facilitate timely care and support, provide appropriate protection, and support battlespace management.

(d) Evaluating transportation assigned and available to recover, move and evacuate wounded personnel; planning interservice evacuation procedures, to include air movement to hospitals afloat.

(e) Projecting and providing for the amounts of medical supplies and blood required to sustain committed units.

(f) Evaluating NBC decontamination capability for patients and chemical protective facilities.

(g) Treating of EPW, civilian internees, and detainees.

(h) Providing medical support for CSAR operations.

(i) Ensuring effective medical supply and resupply operations in general and blood support and resupply in particular.

(j) Providing dental services.

(2) DRB Under MEF Control. Casualties requiring treatment beyond that provided at brigade level are evacuated to combat zone fleet hospitals or hospital ships.

(3) MEF (FWD) Under Corps Control. Health services requirements that exceed the MEF (FWD) organic capabilities are supported by echelon care facilities provided by the corps medical brigade.

e. Transportation Operations.

(1) Transportation considerations include but are not limited to the following:

(a) Emergency movement of forces into combat.

(b) Emergency resupply of ammunition, fuel, water and food to forces in combat.

(c) Movement of emergency medical supplies.

(d) Emergency evacuation of casualties.

(e) Programmed routine resupply to combat operations.

(f) Evacuation of EPW and civilians.

(g) Recovery and salvage of damaged or destroyed weapon systems.

(2) DRB Under MEF Control. The CSG(-) features a substantive capability for supporting transportation requirements that exceed DRB organic assets. Requests for USMC air transportation support flow through channels described in Chapter VII.

(3) MEF (FWD) Under Corps Control. Requests for transportation support flow to the motor transport detachment located at the CSSE. Task-organized assets support mobility and transportation requirements as required in the priority established by the MEF (FWD) commander. The CSSE passes requests that exceed the capability of available assets to the supporting CSB. The CSB commits assets from attached truck companies as required to support prioritized requirements.

f. Services. Services for both the DRB and MEF (FWD) will be provided on a support basis.

g. General Engineering.

(1) Regarding general engineering operations, service components—

(a) Identify civil engineering support requirements to support assigned forces.

(b) Provide resources for completion of civil engineering support programs.

(c) Negotiate contract construction for all services if designated as construction agent for the geographic area concerned.

(d) Use standard service department planning factors unless otherwise directed.

(e) Provide or coordinate logistics for the maintenance and repair of facilities, utilities, and routes as assigned by the JFC.

(f) Assume responsibility for maintenance and repair of facilities and infrastructure in a geographic area where it has exclusive operational interest.

(g) Maintain external and access routes and utilities required by all services when the command-wide distribution system or network is operated by that service component.

(2) DRB Under MEF Control. The DRB's extremely limited general engineering capability demands the DRB's augmentation by Army corps engineer units, the MEF's subordinate engineer units, or attached Navy mobile construction battalion(s) to perform required general engineering tasks. Support is provided on a mission basis or by designating a support relationship as described in Chapter VI between the supporting unit and the DRB.

(3) MEF (FWD) Under Corps Control. When required, a corps provides the MEF (FWD) with engineer support from the corps engineer brigade. Such support ranges in scope from single specialized company-sized units to multifunctional engineer groups comprised of 2 or more engineer battalions. As described above, support occurs on a mission-specific basis or formalized through the establishment of command relationships.

9. Logistics Status Reporting

Logistics status reports provide the CJTF critical input for making decisions in a dynamic operational setting. Functional logistics areas where recurring or special reporting requirements are detailed include—

a. Status of deploying forces.

b. Personnel summary reports.

c. Logistics status reports for all classes of supply and for selected, critical commodities.

d. Projected resource requirements for probable execution of selected contingency options.

e. Materiel readiness status of weapons systems, vehicles, and equipment.

f. Status of JTF transportation assets.

g. Medical status of the force.

h. Status of JOA infrastructure.

i. Status of support of civil-military operations.

Additional guidance on standardized logistics reporting will be provided through emerging joint doctrine and joint tactics, techniques, and procedures associated with the global command and control system.

Appendix A

UNITED STATES ARMY CORPS

1. Background

Corps are the largest tactical units in the US Army—the instruments by which higher echelons of command conduct maneuver at the operational level.

a. Functions.

(1) Corps plan and conduct operations in consonance with other elements of the joint force to achieve campaign objectives.

(2) Corps integrate available Air Force, Navy, and Marine combat, combat support, and CSS forces into tactical operations. This includes joint efforts in intelligence, target acquisition, target attack, EW, and SEAD.

(3) Corps collect intelligence, anticipate enemy activities and intentions, and plan future operations a minimum of 72 hours out.

(4) Corps plan and conduct deep and rear operations to support close operations.

(5) Corps plan and conduct deception operations in consonance with the deception plan of the higher echelon.

(6) Corps plan and conduct operations other than war.

b. Operational Context. While a corps could deploy as an independent unit, such employment would be limited in both scope and duration. Normally, corps will function under the control of higher echelons (such as field armies and army groups in developed theaters), as land components of a unified or subunified command, or as the Army element of a JTF with the corps commander serving as the JTF commander. As such, corps play a key role in translating the broad strategic and operational objectives of higher echelons into the specific and detailed tactics used to achieve those objectives.

2. Corps Structure

The US Army tailors corps for the theater and mission for which they are deployed. There is no standard organizational structure of a corps. The following discussion highlights types of combat, combat support, and CSS organizations that may comprise a corps. Figure A-1 outlines a notional corps organization.

a. Divisions/Attached Maneuver Brigades. A corps normally fights from 2 to 5 divisions. Divisions are fixed-combined arms organizations capable of performing any tactical mission and are largely self-sustaining. The corps may also command and control 1 or more attached maneuver brigades (e.g., light infantry, air assault).

b. Armored Cavalry Regiment. The armored cavalry regiment (ACR) consists of organic air and armored cavalry units supported by organic field artillery, air defense, engineer, military intelligence, chemical, and CSS units. The ACR operates as combined arms teams over wide areas that perform reconnaissance, security, and economy of force operations for the corps. The ACR can also perform the range of combat operations ascribed to the DRB in this manual and may also be a force selected to operate under the command and control of a MEF. The TTP detailed for the DRB's integrated employment with the MEF apply mainly to the ACR as well; differences may be accommodated through liaison and staff coordination. Figure A-2 depicts heavy ACR's organization and major weapons systems.

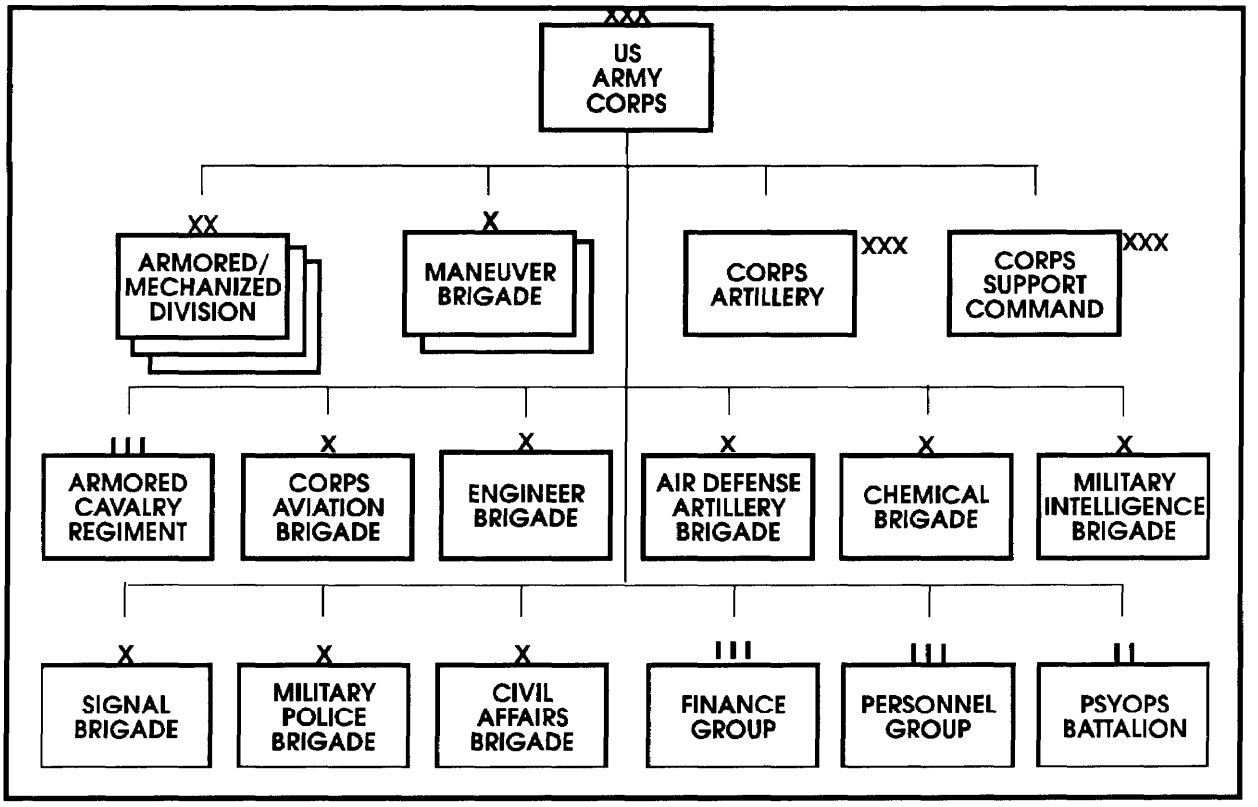
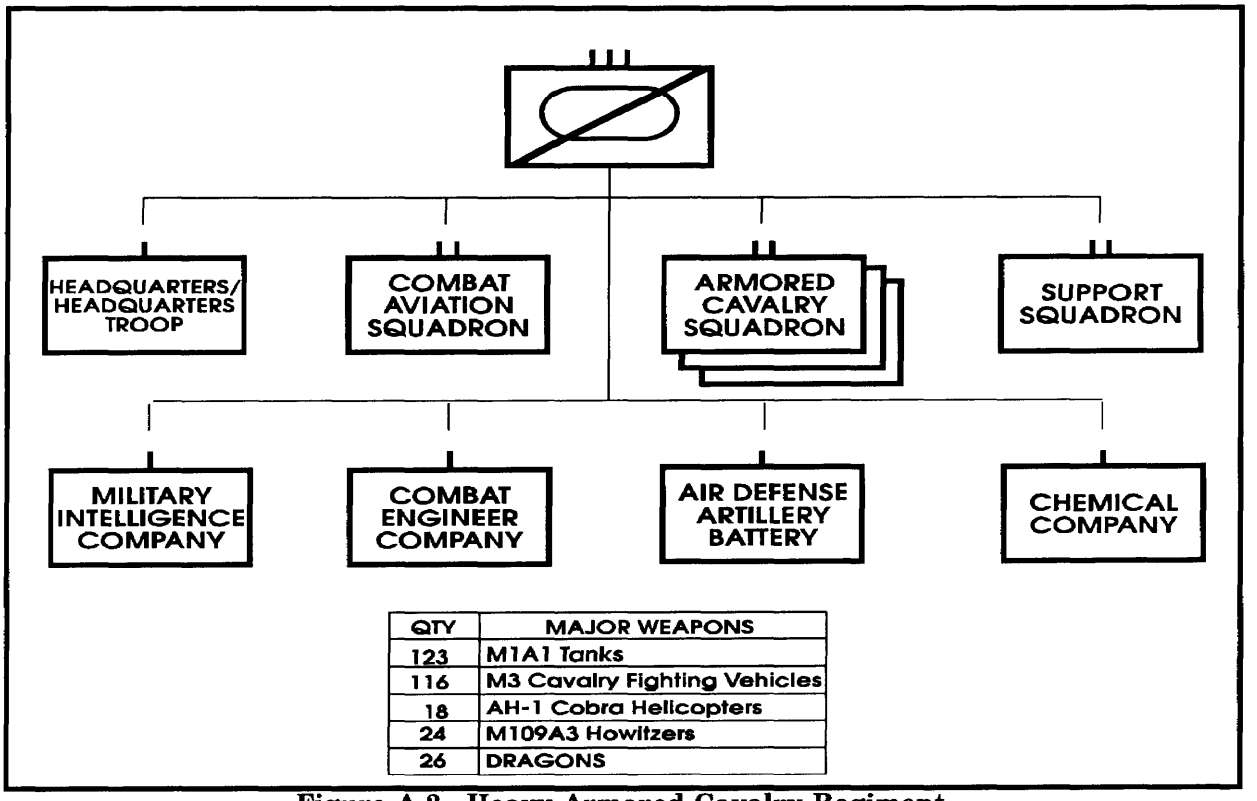


Figure A-1. Notional US Army Corps



QTY	MAJOR WEAPONS
123	M1A1 Tanks
116	M3 Cavalry Fighting Vehicles
18	AH-1 Cobra Helicopters
24	M109A3 Howitzers
26	DRAGONS

Figure A-2. Heavy Armored Cavalry Regiment

c. Corps Aviation Brigade. The corps aviation brigade provides the corps commander with a significant capability for prosecuting air maneuver and deep operations. The brigade features a varying number of attack helicopter battalions (of 24 AH-64 Apaches each) that possess exceptional capabilities for night operations and a mix of assault, medium-lift, and observation helicopters. The brigade requires support from the corps support command for maintenance, ground transportation, and Classes III and V sustainment.

d. Corps Artillery. The corps artillery includes all the artillery cannon and MLRS/ATACMS battalions that are not organic to maneuver units. These battalions are normally configured into field artillery brigades allocated as needed to augment the fires of committed maneuver units or retained under corps control to provide general support fires. Artillery supports the corps fight throughout the depth of the battlefield by delivering ATACMS fires at operational depths, supporting corps deep operations with SEAD fires, fighting the counterfire battle, providing weight to the close fight when and where needed, and supporting rear operations as required.

e. Military Intelligence Brigade. The military intelligence brigade contains operations, tactical exploitation, and aerial exploitation battalions. The military intelligence brigade provides intelligence and operations security in general support of the corps and augments the intelligence capabilities of corps' subordinate units. The brigade collects and analyzes information from multiple sources, including signal, imagery, and human intelligence assets. The brigade's intelligence assets provide the corps with the ability to "*see deep*" into the enemy rear area and disrupt enemy command, control, and communications at critical times during the battle. The operations battalion provides an analysis and control element to the corps headquarters that assists the G2 in intelligence and counterintelligence planning, analysis, production, and dissemination. It also supports the G3 in electronic warfare, operations security, and deception planning.

f. Engineer Brigade. The engineer brigade controls engineer units of the corps that are not organic to the maneuver units. The brigade provides mobility, counter-mobility, survivability, and general engineering support to the corps and augments the engineer support of committed maneuver and other subordinate units. The brigade may contain combat engineer battalions, combat engineer battalions (heavy), combat support equipment companies, assault float bridge companies, and tactical bridge companies. The brigade may form engineer groups to command and control engineer units when the size of the brigade requires the use of intermediate headquarters. A topographic engineer company in direct support of the corps from the EAC topographic engineer battalion provides terrain analysis and develops, produces and disseminates special topographic products such as overprints of standard Defense Mapping Agency Mapping, charting, and geodesy products.

g. Air Defense Artillery Brigade. The air defense artillery brigade contains units with weapons systems designed to counter air threats from low, medium, and high altitudes. Subordinate battalions employ a combination of gun and missile systems. Corps air defense battalions usually conduct tactical operations in support of corps priorities but may be tasked to reinforce subordinate unit air defense units. Corps air defenses are synchronized with both subordinate and EAC units. These latter systems normally include aircraft involved in defensive counterair operations of US and allied air forces; long-range, high-altitude missile systems of theater surface-to-air missile units; and the supporting command and control network of the integrated theater air defense network.

h. Signal Brigade. The signal brigade provides the installation, operation, and maintenance of communications within and between the corps command and control facilities, as well as an extensive communications network that connects all elements of the corps. To accomplish this, the brigade uses radio and wire communications to transmit voice, digital data, and facsimile into an integrated tactical communications system.

i. Chemical Brigade. The chemical brigade commands, controls, and coordinates chemical support operations of attached chemical units and provides those units with administrative and logistical support. The brigade evaluates and determines decontamination, NBC reconnaissance, and smoke support requirements for the brigade; the brigade commander then recommends NBC mission priorities to the corps commander. Based on corps commander guidance, the brigade provides smoke generator, NBC reconnaissance, and NBC decontamination support within the corps areas. Chemical battalions within the brigade support corps units in specified command or support relationships.

j. MP Brigade. The MP brigade commands and controls several MP battalions that provide battlefield circulation control, area security, enemy prisoner of war and civilian internee operations, and law and order for the corps. It conducts reconnaissance and surveillance to ensure security of main supply routes and area reconnaissance of other key areas in the corps rear, The brigade normally provides response forces to counter threats to the rear area that exceed the organic capabilities of combat support and CSS units but do not require commitment of significant ground combat units. The brigade augments the organic MPs of committed maneuver units as required and may also operate in support of USAF units in air base ground defense operations. The brigade may conduct close liaison and mutually supporting operations with host-nation civil/military police to accomplish assigned missions.

k. Civil Affairs Brigade. The functional composition of civil affairs (CA) forces varies with the mission, availability, and qualification of CA personnel and supported command preferences. CA forces support JFC, service, or functional component commanders. US Army Reserve CA forces are separately organized into commands, brigades, and battalions. CA commands and brigades do not have organic subordinate units and battalions do not have subordinate companies. CA forces are attached to subordinate component commanders for employment at operational and tactical levels. The attached CA forces support the various commanders in accomplishing theater CMO objectives. Generally, CA units are regionally aligned, (i. e., CENTCOM, EUCOM, PACOM, SOUTHCOM, USACOM) with a CA (RC) brigade supporting a corps. There is only **1** active duty battalion with 5 companies each regionally aligned. It is a worldwide contingency unit.

1. Psychological Operations Battalion. Psychological operations (PSYOP) tactical support units (tactical support groups (TSG) (RC), tactical support battalions (TSB), and tactical support companies (TSC) are primarily responsible for support to corps and below maneuver units. These units may be task organized under a psychological operations task force (POTF) or joint psychological operations task force (JPOTF) when operation at the CINC or JTF level. Within the JTF the POTF/JPOTF is a separate functional command similar to a joint special operations task force. A corps not operating as a JTF is normally supported by a PSYOP regional support company and a PSYOP TSB with 3 companies (1 per division). They conduct loudspeaker operations and disseminate PSYOP materials developed by the PSYOP regional support units. In the course of conducting their primary missions, these units collect and report PSYOP relevant information.

They have the capability to provide limited PSYOP material development, production, and dissemination. These activities are conducted on an *"as-required"* basis with the authorization of and under guidelines established by the headquarters of the PSYOP task organization. PSYOP regional and tactical support units are capable of supporting civil affairs units in accomplishing many of the corps' CMO objectives. Another PSYOP contribution to the support of corps operations is the PSYOP enemy prisoner of war (EPW) and civilian internee battalion (EPWB). This battalion with its 2 EPW/counterintelligence (CI) companies (EPWC) operates under the OPCON of the PSYOP tack organization headquarters and attached to the MP prisoner of war command (MPPWCOM). These PSYOP EPW/CI units support the PSYOP task organization by collecting and reporting PSYOP relevant information gathered by screening, interviewing, and surveying EPW/CI camp populations and recording EPW audio surrender appeals. They support MTTWCOM by performing PSYOP staff planning and conducting PSYOP in support of camp operations and augmenting MP forces responsible for processing, monitoring, and controlling the populations at EPW/CI camps established at corps.

m. Corps Support Command. The corps support command (COSCOM) serves as the locus for logistics activities in the corps. The COSCOM provides supply, field services, transportation (mode operations and movement control), maintenance, and medical support to the divisions and nondivisional units of the corps. The COSCOM contains a mix of subordinate units tailored to support the size and configuration of the corps. The COSCOM organizes tailored corps support groups to support the logistics requirements that exceed the organic capabilities of major subordinate units.

n. Finance Group. The finance group provides all finance support and exercises command and control over all finance units within the corps. No division-level finance units exist; a network of units provide military pay, disbursing, travel, and commercial vendor services on an area support basis.

o. Personnel Group. The personnel group serves as the command and control headquarters for all personnel service battalions and separate companies in the corps areas, as well as for replacement companies, postal companies, and bands. Personnel service companies furnish divisional and nondivisional units with strength management, personnel accountability, strength reconciliation, replacement distribution, casualty reporting, postal operations, and morale support.

3. Corps Operations

a. Corps Area of Operations. The echelon above corps normally designate the corps area of operations for both offensive and defensive operations. In addition to flank and rear boundaries, a corps forward boundary could be used to depict the geographic extent of its responsibilities. The corps normally divide its area of operations geographically into subareas to execute deep, close, and rear operations. The use of boundaries and other control measures in both linear and nonlinear environments facilitates both corps operational command and control and the delineation of responsibilities to corps subordinate elements.

b. Close Operations. Corps close operations encompass the current battles and engagements of its major maneuver elements, together with the combat support and combat service support activities currently supporting them. The corps close operations include the deep, close, and rear operations of its committed divisions; separate maneuver brigades; and/or armored cavalry regiment. Not all activities that are part of close operations are necessarily

taking place near the line of contact. For example, counterfire directed against enemy artillery that support enemy regiments of divisions in contact comprise a component of close operations. Similarly, security operations, such as covering and screening forces, are part of close operations. Conversely, not all activities occurring near the line of contact are part of the close operations. Target acquisition assets, for instance, may locate in the areas where close operations are taking place but may be supporting deep operations. The outcome of the corps close fight will ultimately determine the success or failure of the corps battle. The corps deep and rear operations focus primarily on creating conditions favorable to the corps winning its close operations.

c. Deep Operations. Corps deep operations include those activities directed against enemy forces not currently engaged in close operations but capable of engaging in or influencing future close operations. Maneuver forces, fire support, and supporting C4I systems combine to plan and execute deep operations. Deep operations create leverage in the close fight. Corps planners project future operations and determine what conditions the corps can create and exploit to defeat the enemy to accomplish operational objectives. Deep operations depend on careful analysis of enemy capabilities to interfere with friendly operations and enemy vulnerability to attack. Those enemy forces—including related command and control systems—that can participate in time and space against projected operations provide relevant targets for attack. Based on the recommendations of the corps staff, the commander determines deep operations objectives and designs them to shape future close operations. Objectives in attacking enemy forces in depth designed to significantly alter the tempo of enemy operations. This reduced tempo isolates close operations on terms favorable to the corps. Attacks to disrupt commitment of follow-on enemy forces into battle, synchronized with attacks against command and control systems and other operationally significant targets, can produce decisive effects or create conditions for close operations to achieve decisive effects. To realize the maximum payoff from these attacks, deep operations are integrated within the overall concept of operation.

d. Rear Operations. Corps rear operations consist of those activities from the corps rear boundary forward to the rear boundaries of committed maneuver units. The corps conducts rear operations to the corps freedom of maneuver and continuity of operations, including logistics and command and control. Continuous reconnaissance and timely intelligence collection and dissemination are essential for successful rear operations. Rear operations must include clear command and control arrangements, dedicated fire support, and designated combat forces to respond to rear-area threats as appropriate.

Appendix B

MARINE AIR-GROUND TASK FORCES (MAGTFs)

1. Background

The MAGTF is an integrated air-ground team, at the operational and tactical levels, under the direction and control of a single commander. The MAGTF is task organized to accomplish assigned missions and designed to exploit combat power of closely integrated air-ground operations.

2. Operational Characteristics

a. The missions assigned to MAGTFs should make use of their primary characteristics that are—

(1) Expeditionary nature.

(2) Strategically mobile.

(3) Forcible entry capable.

(4) Environmentally versatile.

(5) Capability for independent action.

(6) Operationally flexible.

(7) Compatible with naval, joint, and combined operating forces.

(8) Forward or sea based.

b. While MAGTFs are organized primarily to support naval operations, many have participated in a number of major land operations. In support of a land operation, MAGTFs are employed in the following ways:

(1) Strategic deception forcing the opponent to disperse forces along all vulnerable littorals.

(2) Raids destroying installations, units, or individuals which may have a significant bearing on the course of the campaign.

(3) Forcible entry establishing beachheads or airheads, to gain enclaves for introduction of large scale US forces.

(4) Extractions evacuating threatened forces or individuals.

(5) Strategic reserve exploiting opportunities and counterthreats that develop during the campaign.

(6) Reinforcement assisting in conducting land operations as part of a joint or combined force.

(7) Naval operations controlling a landward flank of a naval operation.

3. Types of MAGTFs

MAGTFs range in size from a SPMAGTF that can number in size from 100 to 3000 Marines, to a MEF that can number from 35,000 to 100,000 Marines. There are 4 types of MATGFs; the MEF, the MEF (FWD), the MEU, and the SPMAGTF. The MEF (FWD) is addressed in Chapter I. This appendix addresses the remaining 3 types of MAGTFs.

a. The MEF.

A MEF is the largest and most capable MAGTF. The MEF is normally comprised of *at least* a reinforced Marine division, a MAW, FSSG, and SRIG. To effectively employ several divisions and aircraft wings with appropriate CSS, the MEF possesses the command and control organization. MEFs are capable of conducting the full range of amphibious operations as well as—

(1) Reinforcement of a committed MAGTF or other force.

(2) Sustained combat operations ashore.

(3) Seizure or defense of advance naval bases.

(4) Military operations other than war (MOOTW).

(5) Noncombatant evacuation operations.

The above elements of the MEF consist of the following subelements:

(1) Marine division.

(a) One headquarters battalion.

(b) Three infantry regiments.

(c) One artillery regiment.

(d) One tank battalion.

(e) One light armored reconnaissance battalion.

(f) One assault amphibious vehicle battalion.

(g) One combat engineer battalion,

(2) MAW.

(a) One to 4 Marine aircraft groups (fixed- and rotary-winged that include VMFA, VMFA(AW), VMA, VMAQ, VMGR, HMLA, HMH, and HMM squadrons).

(b) One Marine air control group (MACG).

(c) One Marine wing support group.

(d) One Marine wing headquarters squadron.

(e) One Marine aerial refueler transport squadron.

(f) One Marine tactical electronic warfare squadron.

(3) FSSG.

(a) One Landing support battalion.

(b) One supply battalion.

(c) One maintenance battalion.

(d) One motor transport battalion.

(e) One engineer support battalion.

(f) One medical battalion.

(g) One dental battalion.

b. MEU. A MEU is capable of conventional selected maritime special operations of duration in support of a combatant. The forward deployed MEU is organized and equipped to provide the naval or JFC with a rapidly deployable, sea-based force with 15 days of sustainment optimized for forward presence and crisis response missions. The MEU may also serve as an enabling force for follow-on MAGTFs or other larger forces (i.e., an Army corps) in the event the situation or mission requires additional capabilities and resources. The MEU is comprised of a CE, a reinforced infantry battalion, reinforced helicopter squadron, and MEU service support group (MSSG). The MEU is capable of conducting limited amphibious operations as well as—

(1) Noncombatant evacuation operations.

(2) Security operations (independent or in support of a larger force).

(3) Tactical recover of aircraft and personnel (TRAP).

(4) Direct action.

(5) MOOTW

(6) In-extremis hostage rescue (limited).

The above mentioned elements of the MEU consist of the following subelements:

(1) CE.

(a) ANGLICO detachment.

(b) Force reconnaissance platoon.

(c) Radio battalion detachment.

(d) Low altitude air defense detachment.

(e) Air support liaison team.

(f) Seal detachment.

(2) GCE.

(a) One reinforced rifle battalion.

(b) One artillery battery.

(c) One TOW section.

(d) One AAV platoon.

(e) One reconnaissance platoon.

(f) One LAR platoon.

(g) One combat engineer platoon.

(3) ACE.

(a) One Marine medium helicopter squadron.

(b) One Marine heavy helicopter detachment.

(c) One Marine light/attack helicopter detachment.

(d) One Marine attack squadron (Harriers) detachment.

(4) MSSG.

(a) Supply detachment.

(b) Maintenance detachment.

(c) Transportation detachment.

(d) Engineer detachment.

(e) Medical/dental detachment.

(f) Landing support detachment.

(g) Administrative detachment.

c. SPMAGTF. The SPMAGTF is usually a small, task-organized force configured to accomplish missions that the MEF, MEF (FWD), or MEU are not appropriate. It can be configured, trained, and equipped to conduct a wide variety of conventional and other operations. It can be deployed by a wide variety of means, to include amphibious or commercial ships and tactical or strategic airlift. These forces are typically composed of Marines highly trained in day/night operations to include insert/extract, raid, and strike operations. They may possess extensive surveillance and reconnaissance capabilities. SPMAGTF missions include mobile training teams, security assistance operations, and small independent action forces.

Appendix C

REPORTING FORMATS

1. The mine operations report messages in this appendix are US message Text Formats. The unexploded ordnance (UXO) spot report is from FM 21-16/FMFM 13-8-1.

2. Mine Countermeasures Report (MCMREP).

MCMREP MESSAGE TEXT FORMAT

SEG OCC RPT SETID

C EXER/_____/.....//
1 EXERCISE NICKNAME 2 EXERCISE MESSAGE ADDITIONAL IDENTIFIER
M [1-56 ANBS] O [1-16 ANBS]

Set 1 Purpose: THE EXER SET PROVIDES THE DESIGNATED CODE NAME OR NICKNAME, IF THE MESSAGE SUPPORTS AN EXERCISE.

O
OPER/_____/.....//
1 OPERATION CODEWORD 2 PLAN ORIGINATOR AND NUMBER 3 OPTION NICKNAME
4 SECONDARY OPTION NICKNAME
M [1-32 ANBS] O [1-23 ANS] O [1-23 ANBS]
O [1-23 ANBS]

Set 2 Purpose: THE OPER SET PROVIDES THE DESIGNATED CODE NAME OR NICKNAME, IF THE MESSAGE SUPPORTS AN OPERATION.

M
MSGID/_____/_____/.....//
1 MESSAGE TEXT FORMAT IDENTIFIER 2 ORIGINATOR 3 MESSAGE SERIAL NUMBER
4 MONTH NAME 5 QUALIFIER 6 SERIAL NUMBER OF QUALIFIER
M [1-20 ANBS] M [1-30 ANBS] O [1-7 ANBS]
O [3 A] O [3 A] O [1-3 N]

Set 3 Purpose: THE MSGID SET PROVIDES THE MESSAGE IDENTIFICATION AND ORIGINATOR.

O R
REF/_____/_____/_____/
_____/...../...../.....R...../.....//
1 SERIAL LETTER 2 TYPE OF REFERENCE 3 ORIGINATOR 4 DATE AND/OR TIME OF REFERENCE 5 SERIAL NUMBER OF REFERENCE 6 SPECIAL NOTATION
7 SIC CODE OR FILING NUMBER
M [1 A] M [1/20 ANBS] M [1-30 ANBS] M [6/13 AN)
O [1-10 ANBS] O [5 A] O [1/10 ANBS]

Set 4 Purpose: THE REF SET PROVIDES BOTH USMTF AND NON-USMTF REFERENCES.

C AMPN/________________//
1 FREE TEXT
M [1-U ANBS]

Set 5 Purpose: THE AMPN SET PROVIDES ADDITIONAL INFORMATION ON THE PRECEDING REF SET. ADDITIONALLY, THE AMPN SET PROVIDES IDENTIFYING INFORMATION FOR A NON-USMTF REFERENCE.

C NARR/ //
1 FREE TEXT
M [1-U ANBS]

Set 6 Purpose: THE NARR SET PROVIDES ADDITIONAL INFORMATION ON THE PRECEDING TWO OR MORE REF SETS. ADDITIONALLY, THE NARR SET PROVIDES IDENTIFYING INFORMATION FOR NON-USMTF REFERENCES.

O R
MXPN/______________________________/______________________________/.../
..../......................................./
..../..............................//
1 SHIP OR SUBMARINE TYPE 2 SHIP OR TASK DESIGNATOR 3 SHIP LOCATION
4 VERIFIED COURSE/SPEED IN KNOTS 5 VERIFIED DAY-TIME 6 VERIFIED BEARING AND DISTANCE 7 EXERCISE MINE FLARE COLOR
M [2/4 A] M [1/30 ANBS] O [6/36 ANBS]
O [11-16 ANS] O [8 AN] O [9-16 ANS]
O [3-6A]

Set 7 Purpose: THE MXPN SET REPORTS MINE EXPLOSION INFORMATION.

O
MDETDAT/../............................/.......................................
..../...
..../................................//
1 DETECTING VESSEL TYPE 2 SHIP NAME 3 MINE COORDINATES
4 VERIFIED COURSE/SPEED IN KNOTS 5 VERIFIED DAY-TIME 6 NUMBER OF MINES DETECTED 7 MINE INDEX TYPE
O [2/4 A] O [1-30 ANBS] O [6/36 ANBS]
O [11-16 ANS] O [8 AN] 0 [1-3 N]
O [2-9 AN]

Set 8 Purpose: THE MDETDAT SET REPORTS INFORMATION ON DETECTED MINES.

O R MOPS/_________________________/.............................//
1 MCM OPERATION TYPE 2 VERIFIED MONTH DATE-TIME
M [3-8 A] O [11 AN]

Set 9 Purpose: THE MOPS SET REPORTS INFORMATION ON THE TYPE OF MCM OPERATION IN PROGRESS.

O
MTASK/_____/_____/.....
...../.....R...../.....R...../
1 MCM TASK ORDER NUMBER 2 UNIT OR SHIP TASKED 3 Q-ROUTE NUMBER OR MCM AREA NAME 4 TIME MODIFIER 5 VERIFIED EFFECTIVE TIME
M [5-6 AN] M [1/30 ANBS] O [1/20 ANBS]
O [2-3 A] O [8/11 AN]

Set 10 Purpose: THE MTASK SET PROVIDES INFORMATION ON THE MCM TASK.

O R
MINE/_____/...../...../
1 MINE INDEX TYPE 2 MINE REFERENCE NUMBER 3 LAYING REFERENCE NUMBER (LRN) 4 MINE COORDINATES 5 NAVIGATION SYSTEM CODE 6 VERIFIED DAY-TIME 7 MINE STATUS
M [2-9 AN] O [4-7 ANS] O [2-15 ANS]
O [6/36 ANBS] O [1-2 N] O [8 AN]
O [6/17 ANS]

Set 11 Purpose: THE MINE SET PROVIDES INFORMATION ON MINES.

O R MSUM/_____/.....//
1 MINE REFERENCE NUMBER 2 VERIFIED MONTH DATE-TIME
M [4-7 ANS] O [11 AN]

Set 12 Purpose: THE MSUM SET PROVIDES A SUMMARY OF MINEFIELDS.

O R MTYPE/_____/.....//
1 NUMBER OF MINES BY TYPE 2 MINE INDEX TYPE
M [1-3 N] O [2-9 AN]

Set 13 Purpose: THE MTYPE SET PROVIDES INFORMATION ON THE NUMBER AND TYPE OF MINES.

O
PGRSS/_____/...../...../
...../...../
...../
...../
...../...../
...../
...../.....R...../

1 Q-ROUTE SEGMENT 2 MCM OPERATION SUFFIX 3 MCM OPERATION STAGE NUMBER 4 PERCENTAGE OF TASK COMPLETED 5 VERIFIED MONTH DATE-TIME 6 VERIFIED AGGREGATE ACTUATION WIDTH IN METERS OR YARDS 7 VERIFIED SWEEP OR DETECTION WIDTH IN METERS OR YARDS 8 SWEEP OR DETECTION PROBABILITY 9 VERIFIED TRACK SPACING IN METERS OR YARDS 10 VERIFIED SWEPT DEPTH IN METERS OR FEET 11 VERIFIED STANDARD DEVIATION IN METERS OR YARDS 12 NUMBER OF RUNS PER TRACK

M [7-14 ANS] O [1 A] O [2 N]
O [2 N] O [11 AN]
O [5-6 AN] O [5-6 AN]
O [4 NS] O
[5-6 AN] O [3-6 AN]
O [5-6 AN] O [6-8 ANS]

Set 14 Purpose: THE PGRSS SET PROVIDES INFORMATION ON THE PROGRESS OF THE MCM TASK.

O R
NOOP/_____/...../
...../
...../
1 SHIP NAME 2 VERIFIED DAY-TIME OF DEFECT 3 VERIFIED DAY-TIME ESTIMATED OPERATIONAL 4 VERIFIED MONTH DATE-TIME OF RELATED NAVOPDEF
M [1-30 ANBS] O [8 AN] O [8 AN]
O [11 AN]

Set 15 Purpose: THE NOOP SET PROVIDES INFORMATION ON NONOPERATIONAL SHIPS.

O R
UWCOND/_____/...../
...../...../
...../
...../
...../
...../...../
1 UNDERWATER LOCATION 2 VERIFIED DAY-TIME 3 OCEANOGRAPHIC BOTTOM TYPE 4 REVERBERATION LEVEL 5 VERIFIED UNDERWATER VISIBILITY IN YARDS OR METERS 6 VERIFIED TIDAL STREAM COURSE/ SPEED IN KNOTS 7 VERIFIED UNDERWATER DEPTH IN METERS OR FEET 8 VERIFIED UNDERWATER SOUND VELOCITY 9 VERIFIED THERMAL LAYER DEPTH IN METERS OR FEET
M [6/36 ANBS] O [8 AN] O [1 A]
O [2-3 A] O [3-5 AN]
O [11-16 ANS] O [3-7 AN]
O [5-8 AN] O [3-7 AN]

Set 16 Purpose: THE UWCOND SET PROVIDES INFORMATION ON UNDERWATER CONDITIONS.

O CONMARK/_____/...../
...../...../
1 CONTACT MARKER DESIGNATOR 2 LOCATION 3 VERIFIED BEARING AND DISTANCE 4 VERIFIED DAY-TIME OF POSITION
M [4/7 ANS] O [6/36 ANBS] O [9-16 ANS]
O [8 AN]

Set 17 Purpose: THE CONMARK SET PROVIDES INFORMATION ON A CONTACT MARKER.

O MZONE/_____/_____/
_____/
.....R...../.....R...../
/

1 TYPE OF MINE ZONE 2 VERIFIED DAY-TIME MINE ZONE RISK STATUS 3 MINE ZONE RISK STATUS 4 VERIFIED DAY-TIME OF MINE ZONE PREDICTED STATUS RISK 5 PREDICTED MINE ZONE RISK STATUS
M [1-20 ANBS] M [8 AN] M [3/10 AB]
O [8 AN]
O [3/10 AB]

Set 18 Purpose: THE MZONE SET PROVIDES INFORMATION ON THE STATUS OF THE MINE ZONE.

C AMPN/________________//
1 FREE TEXT
M [1-U ANBS]

Set 19 Purpose: THE AMPN SET PROVIDES INFORMATION THAT PERTAINS TO THE MINE ZONE STATUS.

M R MBUOY/______________________/.../.../
..../..//
1 MCM BUOY TYPE 2 MCM BUOY LOCATION 3 BUOY DESIGNATOR 4 VERIFIED DRAG ERROR 5 MCM BUOY MALFUNCTION TYPE
M [4-10 ANBS] O [6/36 ANBS] O [4-7 AN] O [9-12 ANS]
O [4-8 A]

Set 20 Purpose: THE MBUOY SET PROVIDES INFORMATION ON MCM BUOYS.

O MAP/______________________________________/../
...............R.../...................................R............................./...............R............//
1 MAP OR CHART SERIES DESIGNATOR 2 MAP OR CHART SUFFIX NUMBER 3 MAP OR CHART SHEET NUMBER 4 MAP OR CHART EDITION NUMBER 5 GEODETIC DATUM
M [1-12 ANS] O [2 N] O [1-14 ANS]
O [1-6 ANS] O [4-25 ANBS]

Set 21 Purpose: THE MAP SET PROVIDES THE MAP REFERENCES FOR THE MCM REPORT.

O LOGSIT/.../../
..../.../
..../
..../..............................//
1 REMAINING FUEL OIL IN PERCENT 2 REMAINING WATER IN PERCENT 3 REMAINING PROVISIONS IN PERCENT 4 REMAINING LUBE OIL IN PERCENT 5 REMAINING AMMUNITION IN PERCENT 6 REMAINING NUMBER OF MINE DISPOSAL WEAPONS/CHARGES 7 VERIFIED MONTH DATE-TIME
O [2 N] O [2 N] O [2 N]
O [2 N] O [2 N] O [1-3 N]
O [11 AN]

Set 22 Purpose: THE LOGSIT SET PROVIDES INFORMATION ON THE LOGISTICS SITUATION.

O ASORT/.../../
..../../..................................../
..../../
..../.../
..../...//

1 SORTIE IDENTIFICATION NUMBER 2 MCM EQUIPMENT 3 FLIGHT TIME IN HOURS AND TENTHS 4 TOW TIME OUT OF TRACK 5 OP TOW TIME 6 STREAM TIME IN MINUTES 7 RECOVERY TIME IN MINUTES 8 TASK HOURS LOST DURING SORTIE 9 TRANSIT DISTANCE IN NAUTICAL MILES 10 MISSION ABORT CASUALTY INDICATOR 11 TOTAL TURN TIME (1-30 MIN)

O [1-3 N] O [1-2 N] O [4 NS] O [3 NS] O [4 NS] O [2 N] O [2 N] O [1-2 N] O [1-2 N] O [2-3 A] O [1-2 N]

Set 23 Purpose: THE ASORT SET REPORTS THE RESULTS OF A MINE COUNTERMEASURES AIR SORTIE.

C AMPN/_____//
1 FREE TEXT
M [1-U ANBS]

Set 24 Purpose: THE AMPN SET PROVIDES INFORMATION ON THE MCM EQUIPMENT USED IN THE AIR SORTIE.

O ASUM/……/……/……/……/……/
/

1 TOTAL NUMBER OF SORTIES 2 NUMBER OF HELOS IN OPERATION 3 HOURS IN REPORTING PERIOD 4 HOURS SCHEDULED OFF-TASK 5 WEATHER DOWN TIME

O [1-2 N] O [1-2 N] O [1-3 N] O [1-3 N] O [1-3 N]

Set 25 Purpose: THE ASUM SET PROVIDES AIR SUMMARY INFORMATION.

O DIVDAT/……/……/……/……/……//

1 MINE REFERENCE NUMBER 2 ARM THRUST 3 PERCENT OF MINE BURIED 4 WATER DEPTH IN METERS 5 BOTTOM CURRENT IN TENTHS OF KNOTS 6 SAND RIDGE HEIGHT IN TENTHS OF METERS

O [4-7 ANS] O [1 A] O [1-3 N] o [1-3 N] O [3 NS] O [3 NS]

Set 26 Purpose: THE DIVDAT SET PROVIDES INFORMATION OBTAINED BY DIVERS.

O ENVIRN/……/……/……/……/……//

1 LOCATION 2 VERIFIED MONTH DATE-TIME 3 WAVE PERIOD IN SECONDS 4 SEA WAVE HEIGHT 5 WEATHER IMPACT

O [6/36 ANBS] O [11 AN] O [1-2 N] o [2-5 AN] O [1 A]

Set 27 Purpose: THE ENVIRN SET PROVIDES ENVIRONMENTAL INFORMATION.

O CHRON/……/……/……/……/……/……/……//

1 HOURS SCHEDULED OFF-TASK 2 WEATHER DOWN TIME 3 MAINTENANCE DOWN TIME 4 TOTAL TIME TO STREAM GEAR IN MINUTES 5 TOTAL TIME TO RECOVER GEAR IN MINUTES 6 TOTAL NUMBER OF TURNS 7 TOTAL TURN TIME (l-999 MIN) 8 TURN SYSTEM 9 TOTAL TRANSIT TIME TO AND FROM OPAREA IN MINUTES 10 EFFECTIVE TIME ON TASK IN THE LAP IN HOURS

O [1-3 N] O [1-3 N] O [1-3 N] O [1-3 N] O [1-3 N] O [1-3 N] O [1-3 N] O [3-20 ANBS] O [1-3 N] O [3-5 m]

Set 28 Purpose: THE CHRON SET PROVIDES A CHRONOLOGY FOR THE MCM TASKS.

O NAV/...../...../...../...../.....//

1 VERIFIED MONTH DATE-TIME 2 NAVIGATION SYSTEM CODE 3 POSITION

O [11 AN] O [1-2 N] O [6/36 ANBS]

Set 29 Purpose: THE NAV SET PROVIDES NAVIGATION INFORMATION.

C AMPN/_____//

1 FREE TEXT

M [1-U ANBS]

Set 30 Purpose: THE AMPN SET PROVIDES INFORMATION ON THE NAVIGATION SYSTEM USED TO DETERMINE THE POSITION.

O AKNLDG/_____/.....R...../...../...../...../.....//

1 ACKNOWLEDGEMENT REQUIREMENT INDICATOR 2 INSTRUCTIONS OR UNIT

M [2-3 A] O [1/50 ANBS]

Set 31 Purpose: THE AKNLDG SET PROVIDES OPERATOR ACKNOWLEDGEMENT AND NOT COMMUNICATIONS CENTER ACKNOWLEDGEMENT.

MCMREP MESSAGE EXAMPLE:

EXEIUSUN BIRD 93//
MSGID/MCMREP/CTF 425//
MXPN/MHC/BRECON/280T0-EE-12.5NM8/061T7-12KTS3/l61731Z9/315T9-120M3/GREEN//
MDETDAT/MSC/ALSSUND/573022.4N3-0010413.3W2/l20T3-4KTS4/261520Z6/3/lABCDEFGH//
MOPS/ASS/061200Z9SEP//
MTASK/125B2/BRONNINGTON/82/ON/l21345Z6/OFF/l21800Z21/
MINE/lABCDEFGWJE25/O569-87/27OT9-DD-l2.5NM8/3/2Ol34OZO/SUNK2Ol521Z1//
MSUM/.TEOl/l322l2ZlJUN//
MTYPE/42/lABCDEFGH//
PGRSS/42A2-B8/F/71/50/12l4WZ8JUN/35OM8/25OM7/O.9O/3OOM3/4OM4/O5OM5-S25-O2/MS25-O3/PS5O-O3//

NOOP/GIETZOORN/15063lZ6/151600Z3/150700Z30CT//
UWCOND/501000N6-O030300W6/190700Z7/B/LOW/3M3/O2OT2-1.2KTS3/20M2/1475MPS7/50M5//
CONMARK/MRN:OO142/524900NO-OOl1500E7/035T8-23M5/241214Z4//
MZONEKIARBOIU071200ZO/CLOSED//
AMPN/SHIPS ANCHOR IN FLUSHING ROADS//
MBUOY/DATUM./512002N0-0010010E2/PS102A/150T6-45YD9/NOFLAG//
MAP/DMAl3142/14/13/MAY84/WGS1984//
LOGSIT/90/85/99/99/99/53/221100Z6SEP//
ASORT/1/45/03.0/0.5/02.O/l5/30/l/5/NO/20//

ASUM/10/6/48/24/4//
DIVDAT/JEOl/A/l0/35/1.0/1.5//

ENVIRN/5120.200N0-00100.IOOE2/121300Z7JAN/20/lM/A//
CHRON/2/l/l/49/52/6/60/MK104/45/2.5//
NAV/221100Z6SEP/3/5120.200N0-00100.100E2//
AKNLDG/YES//

3. MCM Tasking (OPTASK MCM).

OPTASK MCM MESSAGE TEXT FORMAT

SEG OCC RPT SETID

C EXER/_____/...../////
1 EXERCISE NICKNAME 2 EXERCISE MESSAGE ADDITIONAL IDENTIFIER
M [1-56 ANBS] O [1-16 ANBS]

Set 1 Purpose: THE EXER SET PROVIDES THE DESIGNATED CODE NAME OR NICKNAME, IF THE MESSAGE SUPPORTS AN EXERCISE.

Note: THE EXER SET IS PROHIBITED IF THE OPER SET IS USED.

O
OPER/_____/...../
...../...../////
1 OPERATION CODEWORD 2 PLAN ORIGINATOR AND NUMBER 3 OPTION NICKNAME 4 SECONDARY OPTION NICKNAME
M [1-32 ANBS] O [1-23 ANS] O [1 -23 ANBS] 0 [1-23 ANBS]

Set 2 Purpose: THE OPER SET PROVIDES THE DESIGNATED CODE NAME OR NICKNAME, IF THE MESSAGE SUPPORTS AN OPERATION.

Note: THE OPER SET IS PROHIBITED IF THE EXER SET IS USED,

M MSGID/_____/_____/
...../...../...../...../////

1 MESSAGE TEXT FORMAT IDENTIFIER 2 ORIGINATOR 3 MESSAGE SERIAL NUMBER 4 MONTH NAME 5 QUALIFIER 6 SERIAL NUMBER OF QUALIFIER
M [1-20 ANBS] M [1 -30 ANBS] O [1-7 ANBS] 0 [3A] O [3A] O [1-3 N]

Set 3 Purpose: THE MSGID SET PROVIDES THE MESSAGE IDENTIFICATION AND ORIGINATOR.

Note: FIELD 1 OF THE MSGID SET MUST EQUAL “OPTASK MCM”.

O R REF/_____/_____/_____/
_____/...../...../...../
.....R...../////
1 SERIAL LETTER 2 TYPE OF REFERENCE 3 ORIGINATOR 4 DATE AND/OR TIME OF REFERENCE 5 SERIAL NUMBER OF REFERENCE 6 SPECIAL NOTATION 7 SIC CODE OR FILING NUMBER

M [1 A] M [1/20 ANBS] M [1-30 ANBS] M [6/13 AN] 0
[1-10 ANBS] O [5A] O [1/10 ANBS]

Set 4 Purpose: THE REF SET PROVIDES BOTH USMTF AND NON-USMTF REFERENCES.

C AMPN/_____//
1 FREE TEXT
M [1-U ANBS]

Set 5 Purpose: THE AMPN SET PROVIDES ADDITIONAL INFORMATION ON THE PRECEDING REF SET. ADDITIONALLY THE AMPN SET PROVIDES IDENTIFYING INFORMATION FOR A NON-USMTF REFERENCE.

Note: THE AMPN SET IS MANDATORY IF FIELD 2 OF THE REF SET IS A COMMUNICATION TYPE AND ONLY ONE REFERENCE IS USED.

C NARR/_____//
1 FREE TEXT
M [1-U ANBS]

Set 6 Purpose: THE NARR SET PROVIDES ADDITIONAL INFORMATION ON THE PRECEDING TWO OR MORE REF SETS. ADDITIONALLY, THE NARR SET PROVIDES IDENTIFYING INFORMATION FOR NON-USMTF REFERENCES.

Note: THE NARR SET IS MANDATORY IF THE REF SET IS REPEATED ONE OR MORE TIMES AND LFIELD 2 OF ONE OR MORE REF SETS CITES A COMMUNICATION TYPE.

O MTASK/_____/_____/
...../.....R...../.....R.....//
1 MCM TASK ORDER NUMBER 2 UNIT OR SHIP TASKED 3 Q-ROUTE NUMBER OR MCM AREA NAME 4 TIME MODIFIER 5 VERIFIED EFFECTIVE TIME
M [5-6 AN] M [1/30 ANBS] O [1/20 ANBS] 0
[2-3 A] O [8/11 AN]

Set 7 Purpose: THE MTASK SET PROVIDES INFORMATION ON THE MCM TASK.

O MNOP/_____/_____R_____/
_____R_____/.....R.....//
1 MINE OPERATIONS DIRECTIVE 2 ENEMY THREAT 3 TYPE OF MINE OPERATION 4 MCM OPERATION STAGE NUMBER
M [5-7 A] M [7-9 A] M [4-8 A] 0
[2 N]

Set 8 Purpose: THE MNOP SET PROVIDES INFORMATION ON THE MCM OPERATIONS.

O MPARA/_____/_____
/...../
...../.....//
1 NUMBER OF RUNS 2 PERCENTAGE CLEARANCE REQUIRED OR ACHIEVED 3 VERIFIED AGGREGATE ACTUATION WIDTH IN METERS OR YARDS 4 VERIFIED TRACK SPACING IN METERS OR YARDS 5 VERIFIED STANDARD DEVIATION IN METERS OR YARDS
M [2 N] M [2-4 NS]

O [5-6 AN] O [5-6 AN]
O [5-6 AN]

Set 9 Purpose: THE MPARA SET PROVIDES INFORMATION ON THE MCM TASK PARAMETERS.

O R
MDA/...../.....R...../.....R...../
1 MINE DANGER AREA NAME 2 MINE DANGER AREA LOCATION 3 MINE INDEX TYPE
O [6-20 ANBS] O [6/36 ANBS] O [2-9 AN]

Set 10 Purpose: THE MDA SET DESCRIBES THE MINE DANGER AREA.

O R MTYPE/_____/.....//

1 NUMBER OF MINES BY TYPE 2 MINE INDEX TYPE
M [1-3 N] O [2-9 AN]

Set 11 Purpose: THE MTYPE SET PROVIDES INFORMATION ON THE NUMBER AND TYPE OF MINES.

O R MREPT/_____/_____
/.....//
1 REPORT MODIFICATION ACTION 2 MINE WARFARE REPORT OR SIGNAL CODE 3 VERIFIED TIME
M [3-6 A] M [3/13 ABS]
O [8/11 AN]

Set 12 Purpose: THE MREPT SET PROVIDES INFORMATION ON CHANGES FOR MINE WARFARE REPORTING REQUIREMENTS.

O R CHANDAT/...../...../...../
...../...../...../
. . . . . /
...../...../
...../...../...../...../.....//
1 CHANNEL IDENTIFIER 2 START POSITION 3 END POSITION 4 VERIFIED CHANNEL DIRECTION 5 VERIFIED CHANNEL LENGTH IN NAUTICAL MILES 6 VERIFIED CHANNEL WIDTH IN METERS OR YARDS 7 VERIFIED TIDAL STREAM COURSE/ SPEED IN KNOTS 8 VERIFIED START DAY-TIME 9 VERIFIED END DAY-TIME 10 VERIFIED DANBUOY LINE OFFSET IN METERS OR YARDS 11 VERIFIED DANLINE DIRECTION
12 NUMBER OF DANBOUYS 13 VERIFIED DANBUOY SPACING IN METERS OR YARDS

O [2/8 ANS] O [6/36 ANBS] O [6/36 ANBS] O [5-7 ANS] O
[4-8 ANS] O [3-7 AN] O
[11-16 ANS] O [8 AN] O [8 AN] O
[5-9 ANS] O [5-7 ANS] O
[1-2 N] O [3-7 AN]

Set 13 Purpose: THE CHANDAT SET PROVIDES CHANNEL INFORMATION.

O TRINST/...../...../
...../

..../................R......................
/...............R...............//

1 PASSAGE DESIGNATOR 2 VERIFIED DAY-TIME OF TRANSIT START 3 VERIFIED RECOMMENDED TRANSIT SPEED 4 VERIFIED SHIP TRANSIT LONGITUDINAL INTERVAL 5 VERIFIED GROUP TRANSIT LONGITUDINAL INTERVAL 6 NAME OF LEAD SHIP IN GROUP 7 NUMBER OF SHIPS IN GROUP
O [4-6 A] O [8 AN] O [5-8 ANS]
O [3-7 AN]
O [4-6 AN] O [1-30 ANBS]
O [1-2 N]

Set 14 Purpose: THE TRINST SET PROVIDES MCM TRANSIT INFORMATION.

C AMPN/________________//
1 FREE TEXT
M [1-U ANBS]

Set 15 Purpose: THE AMPN SET PROVIDES INFORMATION PERTAINING TO THE PASSAGE DESIGNATOR.

Note: THE AMPN SET IS MANDATORY IF FIELD 1 OF THE TRINST SET EQUALS "INFORM" OR "STOP".

O VESC/______________________/......................................./.../
..../................................//
1 UNIT IDENTIFIER 2 NUMBER OF SHIPS 3 ARRIVAL COORDINATES 4 TIME OF ARRIVAL 5 LEAD THROUGH INSTRUCTIONS
M [1/30 ANBS] O [1-2 N] O [6/36 ANBS] O [8/11 AN] 0
[4-6 A]

Set 16 Purpose: THE VESC SET PROVIDES INFORMATION ON A VESSEL OR CONVOY'S ESTIMATED TIME OF ARRIVAL IN THE VICINITY OF THE MINED AREA AND LEAD THROUGH INSTRUCTIONS.

C AMPN/________________//

1 FREE TEXT
M [1-U ANBS]

Set 17 Purpose: THE AMPN SET PROVIDES INFORMATION PERTAINING TO THE LEAD THROUGH INSTRUCTIONS IN SET VESC.

Note: THE AMPN SET IS MANDATORY IF FIELD 5 OF THE VESC SET EQUALS "INFORM" OR "STOP".

O R SHIPDATA/................................/..................................../........................./..................................//
1 NATIONALITY 2 SURFACE SHIP TYPE 3 SHIP NAME 4 INTERNATIONAL RADIO CALL SIGN
O [2 A] O [2-4 A] O [1-30 ANBS] O [3-9 AN]

Set 18 Purpose: THE SHIPDATA SET PROVIDES INFORMATION ON A SPECIFIC SHIP.

O COMMS/______________________/__________________________/
______________R___________________________/..........................R........................../...........R............//

1 UNIT DESIGNATOR 2 SPECIFIC CALL SIGN 3 COMMUNICATIONS IDENTIFIER 4 COMMUNICATION PRIORITY 5 TRANSMISSION MODE
M [1/30 ANBS] M [1-38 ANBS] M [1/14 ANS] O

[1A] O [2-9 AB]

Set 19 Purpose: THE COMMS SET PROVIDES COMMUNICATIONS INFORMATION.

O BDCT/_____/_____/
.....R...../.....R...../
1 DAY-TIME SET WATCH 2 COMMUNICATIONS IDENTIFIER 3 DAY-TIME SHIFT WATCH 4 COMMUNICATIONS IDENTIFIER
M [7/8 AN] M [1/7 ANS] O [7/8 AN] O [1/7 ANS]

Set 20 Purpose: THE BDCT SET PROVIDES COMMUNICATIONS BROADCAST INFORMATION TO TASKED UNITS.

O EMCON/_____R_____/_____R_____/_____R_____//
1 EMISSION CONTROL PLAN IDENTIFIER 2 START TIME 3 STOP TIME
M [1/8 AN] M [7/8 AN] M [7/8 AN]

Set 21 Purpose: THE EMCON SET IDENTIFIES SPECIAL EMISSION CONTROL PROCEDURES OR CONDITIONS FOR THE MCM TASKING.

O EMCONFM/_____R_____/_____R //
1 EMCON PLAN FORMAT IDENTIFIER 2 EQUIPMENT OR TACTICAL UNIT TYPE
M [1/3 A] M [1/30 ANBS]

Set 22 Purpose: THE EMCONFM SET PROVIDES INFORMATION ON THE EMISSION CONTROL (EMCON) PLAN FORMAT.

O EMCONPL/_____/_____R_____/
_____R_____//
1 EMISSION CONTROL PLAN DESIGNATION 2 FORMAT INDEX LETTER 3 RADIATION STATUS INDICATOR
M [4-14 AB] M [1-2 A] M [3-5 AN]

Set 23 Purpose: THE EMCONPL SET PROVIDES INFORMATION ON THE EMISSION CONTROL (EMCON) PLAN INDICATORS.

O CODING/_____/_____R_____/
_____R_____/_____R_____//

1 PHONETIC ALPHABETIC IDENTIFIER 2 TYPE OF CODING 3 EFFECTIVE PUBLICATION 4 VERIFIED TIME OF CHANGE
M [4-8 A] M [9-14 AB] M [8-10 AN] M [6 AN]

Set 24 Purpose: THE CODING SET PROVIDES INFORMATION ON THE TYPE OF CODING TO BE USED.

O AREA/_____R_____//

1 AREA DESIGNATION OR COORDINATES
M [1/36 ANBS]

Set 25 Purpose: THE AREA SET DESCRIBES THE GEOGRAPHIC OPERATING AREA FOR THE MCM TASKING.

O CIRC/_____/_____R_____//
1 CENTER OF CIRCLE 2 CIRCLE RADIUS
M [1/36 ANBS] M [3-8 ANS]

Set 26 Purpose: THE CIRC SET DESCRIBES THE CIRCULAR OPERATING AREA FOR THE MCM TASKING.

O R MAP/_____/……/
……R……/……R……/……R……//
1 MAP OR CHART SERIES DESIGNATOR 2 MAP OR CHART SUFFIX NUMBER 3 MAP OR CHART SHEET NUMBER 4 MAP OR CHART EDITION NUMBER 5 GEODETIC DATUM
M [1-12 ANS] O [2 N] O [1-14 ANS] O [1-6 ANS] O [4-25 ANBS]

Set 27 Purpose: THE MAP SET PROVIDES THE MAP REFERENCES FOR THE MCM TASKING.

O DIVERT/……R……/……R……//
1 DIVERSION LOCATION 2 VERIFIED COURSE WITH TENTHS OF A DEGREE
O [6/36 ANBS] O [5-7 ANS]

Set 28 Purpose: THE DIVERT SET PROVIDES DIVERSION INSTRUCTIONS.

O R ANCHOR/_____/……/
……/……//
1 UNIT OR SHIP NAME 2 VERIFIED START DAY-TIME 3 VERIFIED END DAY-TIME 4 ANCHOR LOCATION
M [1/30 ANBS] O [8 AN] O [8 AN] O [6/36 ANBS]

Set 29 Purpose: THE ANCHOR SET PROVIDES ANCHOR INSTRUCTIONS TO TASKED UNITS.

O CVYORG/_____/_____/……/……/
……R……//
1 CALL SIGN 2 SHIP NAME 3 ALTERNATE CALL SIGN 4 ALTERNATE SHIP NAME 5 SPECIFIC RADIO FREQUENCY
M [1/28 ANBS] M [1/30 ANBS] O [1/28 ANBS] O [1/30 ANBS] O [3-14 ANS]

Set 30 Purpose: THE CVYORG SET PROVIDES INFORMATION ON THE CONVOY ORGANIZATIONS.

O R DUTY/_____/_____R_____//
1 UNIT DESIGNATOR 2 TACTICAL DUTIES
M [1/38 ANBS] M [1/11 AN]

Set 31 Purpose: THE DUTY SET DESIGNATES A PARTICULAR UNIT AND ITS ASSIGNED TACTICAL DUTIES.

O GENTEXT/_____/_____ //
1 GENTEXT TEXT INDICATOR M [1-61 ANBS]
2 FREE TEXT M [1-U ANBS]

Set 32 Purpose: THE GENTEXT/ACTION ON COMPLETION SET PROVIDES INSTRUCTIONS AND DETAILS OF ACTION UPON COMPLETION OF DUTY.

Note: FIELD 1 OF THE GENTEXT SET MUST EQUAL "ACTION ON COMPLETION".

O AKNLDG/_____/.....R...../
1 ACKNOWLEDGEMENT REQUIREMENT INDICATOR M [2-3 A]
2 INSTRUCTIONS OR UNIT O [1/50 ANBS]

Set 33 Purpose: THE AKNLDG SET PROVIDES OPERATOR ACKNOWLEDGEMENT AND NOT COMMUNICATIONS CENTER ACKNOWLEDGEMENT.

OPTASK MCM MESSAGE EXAMPLE:

EXER/SUN BIRD 93//
MSGID/OPTASK MCNUCTF 425//
MTASK/125B2/BRONNINGTON/82/ON/l21345Z6/OFF/l2180022//
MNOP/BRAVO/UNKNOWN/FOXTROT/21/UNKNOWN/GOLF/22//
MPARA/06/95.5/l50M6/100M1/050M5//
MDA/SILVERPIT/514230N5-O023530E3/lABC//
MTYPE/42/lABCD//
MREPT/ADD/MLAYREP/l41300Z9AUG//
CHANDAT/ZZ/531800N7-0041300E8/532600N6-0042400EO/035T8/7.5NM2/150M6
/040.2T6-10KTS1/13141020/131720Z4/85M3-N/090T9/18/900M9//
TRINST/LEAD/230535Z8/3KTS3/l000M1/2NM2/VEERE/3/HEIST/3//
VESC/ROTHMANS/l2/514230N5-0023530E3/160730Z7/INFORM//

AMPN/PROCEED INDEPENDENTLY IN ACCORDANCE WITH PREVIOUS ORDERS//
SHIPDATA/CA/AM/CANBERRA/CMTW//
COMMS/UNIT: REEVES/DODGEFALLS/23HZ/P/CW/CH10/S/VHF//
BDCT/171200Zl/BCS: A2MW171800Z7/BCS: S4CZl8OOOlZO/l23//
EMCON/ALFA/011201Z5/011300Z5/BRAVO/211300Z7/24060022//
EMCONFM/H/HYDROFOIL/52/RBOC//
EMCONPL/TANGO/A/l5E/A/40P/M/97EB//
CODING/BRAVO/AUTHENTICATION/AGBD999z/l20124//
AREA/523017N8-0024815W0/523219N2-0025012WO/523423N9-O024209W7//
MAP/DMA13142/14/13/MAY84/WGS1984//

DIVERT/402100.5N2-0502000.4Wl/350T8//
ANCHOR/TRUMP/250100Z8/25103021/512020N0-0111001E4//
CVYORG/BOSS/FALCONCREST/FOX/MCKINNLEY/l56.7MHZ//
DUTY/MIDDLEBURG/7T//
GENTEXT/ACTION ON COMPLETION/PROCEED TO KOEGE FOR EMBARKATION OF CARGO ZERO ONE EIGHT (O18)//

4. Mining Report (MLAYREP)

MLAYREP MESSAGE TEXT FORMAT:

SEG OCC RPT SETID

C EXER/_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _/...../// 1 EXERCISE NICKNAME 2 EXERCISE MESSAGE ADDITIONAL IDENTIFIER M [1-56 ANBS] O [1-16 ANBS]

Set 1 Purpose: THE EXER SET PROVIDES THE DESIGNATED CODE NAME OR NICKNAME, IF THE MESSAGE SUPPORTS AN EXERCISE.

O OPER/_____/...../...../..... 1 OPERATION CODEWORD 2 PLAN ORIGINATOR AND NUMBER 3 OPTION NICKNAME 4 SECONDARY OPTION NICKNAME M [1-32 ANBS] O [1-23 ANS] O [1-23 ANBS] O [1-23 ANBS]

Set 2 Purpose: THE OPER SET PROVIDES THE DESIGNATED CODE NAME OR NICKNAME, IF THE MESSAGE SUPPORTS AN OPERATION.

M MSGID/_____/_____/..... ...../...../...../// 1 MESSAGE TEXT FORMAT IDENTIFIER 2 ORIGINATOR 3 MESSAGE SERIAL NUMBER 4 MONTH NAME 5 QUALIFIER 6 SERIAL NUMBER OF QUALIFIER M [1-20 ANBS] M [1-30 ANBS] O [1-7 ANBS] 0 [3A] O [3 A] O [1-3 N]

Set 3 Purpose: THE MSGID SET PROVIDES THE MESSAGE IDENTIFICATION AND ORIGINATOR.

O R REF/_____/_____/_____/ _____/...../...../ .....R...../// 1 SERIAL LETTER 2 TYPE OF REFERENCE 3 ORIGINATOR 4 DATE AND/OR TIME OF REFERENCE 5 SERIAL NUMBER OF REFERENCE 6 SPECIAL NOTATION 7 SIC CODE OR FILING NUMBER M [1 A] M [1/20 ANBS] M [1-30 ANBS] M [6/13 AN] 0 [1-10 ANBS] O [5A] O [1/10 ANBS]

Set 4 Purpose: THE REF SET PROVIDES BOTH USMTF AND NON-USMTF REFERENCES.

C AMPN/_____// 1 FREE TEXT M [1-U ANBS]

Set 5 Purpose: THE AMPN SET PROVIDES ADDITIONAL INFORMATION ON THE PRECEDING REF SET. ADDITIONALLY, THE AMPN SET PROVIDES IDENTIFYING INFORMATION FOR A NON-USMTF REFERENCE.

C NARR/_____//
1 FREE TEXT
M [1-U ANBS]

Set 6 Purpose: THE NARR SET PROVIDES ADDITIONAL INFORMATION ON THE PRECEDING TWO OR MORE REF SETS. ADDITIONALLY, THE NARR SET PROVIDES IDENTIFYING INFORMATION FOR NON-USMTF REFERENCES.

O MTASK/_____/_____/
...../...../.....R...../.....R...../.....//
1 MCM TASK ORDER NUMBER 2 UNIT OR SHIP TASKED 3 Q-ROUTE NUMBER OR MCM AREA NAME 4 TIME MODIFIER 5 VERIFIED EFFECTIVE TIME
M [5-6 AN] M [1/30 ANBS) O [1/20 ANBS] O [2-3 A] O [8/11 AN]

Set 7 Purpose: THE MTASK SET PROVIDES INFORMATION ON THE MINING TASK.

O R MLAID/_____/_____/_____/
.....R...../.....//
1 TASK NUMBER 2 NUMBER OF MINES LAID 3 VERIFIED MONTH DATE-TIME 4 MINELAY DEVIATION
M [1-2 N] M [1-3 N] M [11 AN] O [4-18 ANS]

Set 8 Purpose: THE MLAID SET PROVIDES INFORMATION ON THE MINES LAID.

O R MCASEPOS/...../
...../
...../...../...../.....R...../.....//
1 MINE SEEDING INDICATOR 2 VERIFIED DELIVERY PLACEMENT ERROR IN NAUTICAL MILES 3 INTENDED DELIVERY POSITION 4 ACTUAL DELIVERY POSITION 5 DROP QUALITY

O [2 AN] O [4-8 ANS] O [6/36 ANBS] O [6/36 ANBS] O [1-4 N]

Set 9 Purpose: THE MCASEPOS SET REPORTS INTENDED AND ACTUAL POSITION OF INDIVIDUAL MINES.

O R MLINE/_____/_____/.....R...../.....//
1 MINE LINE SERIAL NUMBER 2 FIRST MINE POSITION 3 SUBSEQUENT MINE POSITION
M [1-2 N] M [6/36 ANBS] O [6/36 ANBS]

Set 10 Purpose: THE MLINE SET REPORTS THE POSITION INFORMATION ON MINE LINES.

O MFSTAT/_____/...../
...../...../...../.....R...../.....//

1 PURPOSE OF MINEFIELD 2 MINEFIELD LIFE IN DAYS 3 PERCENTAGE OF MINEFIELD COMPLETED 4 THREAT IN PERCENT 5 MINEFIELD TARGET CATEGORY
M [8-9 A] O [1-3 N] O [1-3 N] O [1-3 N] O [3 A]

Set 11 Purpose: THE MFSTAT SET PROVIDES INFORMATION ON THE MINEFIELD STATUS.

O AREA/_____R_____//
1 AREA DESIGNATION OR COORDINATES
M [1/36 ANBS]

Set 12 Purpose: THE AREA SET DESCRIBES THE GEOGRAPHIC OPERATING AREA FOR THE MINING MISSION.

O MAP/_____/...../
.....R...../.....R...../.....R.....//
1 MAP OR CHART SERIES DESIGNATOR 2 MAP OR CHART SUFFIX NUMBER 3 MAP OR CHART SHEET NUMBER 4 MAP OR CHART EDITION NUMBER 5 GEODETIC DATUM
M [1-12 ANS] O [2 N] O [1-14 ANS]
O [1-6 ANS] O [4-25 ANBS]

Set 13 Purpose: THE MAP SET PROVIDES THE MAP REFERENCES FOR THE MINE LAYING REPORT.

O R MLAVAIL/...../.....R.....//
1 NUMBER AND TYPE OF MINELAYING ASSETS 2 TYPE AND NUMBER OF MINES IN STOCK
O [3/6 AN] O [3/20 ANS]

Set 14 Purpose: THE MLAVAIL SET PROVIDES INFORMATION ON MINES IN STOCK AND MINELAYING FORCES AVAILABLE FOR MINELAYING TASKS.

O AKNLDG/_____/.....R...../
1 ACKNOWLEDGEMENT REQUIREMENT INDICATOR 2 INSTRUCTIONS OR UNIT
M [2-3 A] O [1/50 ANBS]

Set 15 Purpose: THE AKNLDG SET PROVIDES OPERATOR ACKNOWLEDGEMENT AND NOT COMMUNICATIONS CENTER ACKNOWLEDGEMENT.

MLAYREP MESSAGE EXAMPLE:

EXEIUSUNBIRD 93//
MSGID/MLAYREP/CTF 425//
MTASK/125B2/BRONNINGTON/82/ON/l21345Z6/OFF/l2180022//
MCASEPOS/IP/lNMl/21111lN7-0582618W0/210201N6-0582618W0/34//
MLINE/2/211510NO-0152300Wl/211520N1-0122310W9//
MFSTAT/TACTICAL/20/80/60/MEW/
AREA/523017N8-0024815W0/523219N2-0034810W6/523423N9-O025209W8//
MAP/DMAl3142/14/13/MAY84/WGS 1984//
MLAVAIL/1SS/MOORED-12//

5. Mining Tasking Report (OPTASK)

OPTASK MINING MESSAGE TEXT FORMAT

SEG OCC RPT SETID

C
EXER/________________________/...//
1 EXERCISE NICKNAME 2 EXERCISE MESSAGE ADDITIONAL IDENTIFIER
M [1-56 ANBS] O [1-16 ANBS]

Set 1 Purpose: THE EXER SET PROVIDES THE DESIGNATED CODE NAME OR NICKNAME, IF THE MESSAGE SUPPORTS AN EXERCISE.

Note: THE EXER SET IS PROHIBITED IF THE OPER SET IS USED,

O
OPER/_________________________/.../.../
....//
1 OPERATION CODEWORD 2 PLAN ORIGINATOR AND NUMBER 3 OPTION NICKNAME 4 SECONDARY OPTION NICKNAME
M [1-32 ANBS] O [1-23 ANS] O [1-23 ANBS] O [1-23 ANBS]

Set 2 Purpose: THE OPER SET PROVIDES THE DESIGNATED CODE NAME OR NICKNAME, IF THE MESSAGE SUPPORTS AN OPERATION.

Note: THE OPER SET IS PROHIBITED IF THE EXER SET IS USED,

M MSGID/______________________________________/__________________/../
............................./.........................../................................//

1 MESSAGE TEXT FORMAT IDENTIFIER 2 ORIGINATOR 3 MESSAGE SERIAL NUMBER 4 MONTH NAME 5 QUALIFIER 6 SERIAL NUMBER OF QUALIFIER
M [1-20 ANBS] M [1-30 ANBS] O [1-7 ANBS] O [3 A] O [3 A] O [1-3 N]

Set 3 Purpose: THE MSGID SET PROVIDES THE MESSAGE IDENTIFICATION AND ORIGINATOR.

Note: FIELD 1 OF THE MSGID SET MUST EQUAL “OPTASK MINING".

O R REF/____________________/_______________________/_________________/
_____________________________________/../......................../
...............R................//
1 SERIAL LETTER 2 TYPE OF REFERENCE 3 ORIGINATOR 4 DATE AND/OR TIME OF REFERENCE 5 SERIAL NUMBER OF REFERENCE 6 SPECIAL NOTATION 7 SIC CODE OR FILING NUMBER
M [1 A] M [1/20 ANBS] M [1-30 ANBS] M [6/13 AN] O [1-10 ANBS] O [5 A] O [1/10 ANBS]

Set 4 Purpose: THE REF SET PROVIDES BOTH USMTF AND NON-USMTF REFERENCES.

C AMPN/_________________//
1 FREE TEXT
M [1-U ANBS]

Set 5 Purpose: THE AMPN SET PROVIDES ADDITIONAL INFORMATION ON THE PRECEDING REF SET. ADDITIONALLY, THE AMPN SET PROVIDES IDENTIFYING INFORMATION FOR A NON-USMTF REFERENCE.

Note: THE AMPN SET IS MANDATORY IF FIELD 2 OF THE REF SET IS A COMMUNICATION TYPE AND ONLY ONE REFERENCE IS USED.

C NARR/_______________//
1 FREE TEXT
M [1-U ANBS]

Set 6 Purpose: THE NARR SET PROVIDES ADDITIONAL INFORMATION ON THE PRECEDING TWO OR MORE REF SETS. ADDITIONALLY, THE NARR SET PROVIDES IDENTIFYING INFORMATION FOR NON-USMTF REFERENCES.

Note: THE NARR SET IS MANDATORY IF THE REF SET IS REPEATED ONE OR MORE TIMES AND FIELD 2 OF ONE OR MORE REF SETS CITES A COMMUNICATION TYPE.

O R MREPT/_______________/_______________/
....//
1 REPORT MODIFICATION ACTION 2 MINE WARFARE REPORT OR SIGNAL CODE 3 VERIFIED TIME
M [3-6 A] M [3/13 ABS]
O [8/11 AN]

Set 7 Purpose: THE MREPT SET PROVIDES INFORMATION ON CHANGES FOR MINE WARFARE REPORTING REQUIREMENTS.

O MLORD/_______________//
1 MINE LAYING ORDER NUMBER
M [3 N]

Set 8 Purpose: THE MLORD SET PROVIDES INFORMATION ON THE MINE LAYING ORDER.

O R MIREQNR/_______________//
1 MINE REQUISITION NUMBER
M [3 N]

Set 9 Purpose: THE MIREQNR SET PROVIDES MINE REQUISITION INFORMATION.

O MINEOPS/../.../.../
..../../
..../.............................//

1 PURPOSE OF MINEFIELD 2 MINING OPERATION 3 MINEFIELD OBJECTIVE 4 MINEFIELD TARGET CATEGORY 5 MINEFIELD CONDITION AND VERIFIED TIME
6 DELIVERY METHOD AND VEHICLE 7 MINE TYPE
O [8-9 A] O [5-6 A] O [5-10 A] O [3 A]
O [21-22 AN]
O [7/10 AS] O [1/15 ANS]

Set 10 Purpose: THE MINEOPS SET PROVIDES INFORMATION ON THE MINING OPERATION.

O R MFLD/_______________/_______________/_______________/

_____R_____/_____R_____/
_____R_____/_____R_____/_____R_____/
_____R_____//

1 MINEFIELD IDENTIFIER 2 MINE TYPE 3 NUMBER OF MINES TO BE LAID 4 MINEFIELD POSITION 5 VERIFIED MINE LINE ORIENTATION AND SPACING 6 VERIFIED DEPTH IN METERS OR FEET 7 ARMING DELAY 8 COUNT OF SHIPS 9 LAYING REFERENCE NUMBER (LRN)

M [1/20 ANBS] M [1/15 ANS] M [1-3 N]
M [6/36 ANBS] M [10-12 ANS] M [3-6 AN]
M [4/15 AN] M [1/5 NS] M [2-15 ANS]

Set 11 Purpose: THE MFLD SET PROVIDES INFORMATION ON THE PLANNED MINEFIELD.

O POMOE/_____/_____/_____/
_____/_____/_____/
...../...../
. . . . . /
...../.....//

1 OBJECTIVE OF MINEFIELD 2 NAME OF SHIP CLASS 3 VERIFIED SPEED IN KNOTS 4 NAME OF SHIP CLASS 5 VERIFIED SPEED IN KNOTS 6 LEVEL OF EXPECTED COUNTERMEASURES 7 MMOE SIMPLE INITIAL THREAT PROBABILITY 8 AVERAGE NUMBER OF CASUALTIES 9 MMOE SUSTAINED THREAT PROBABILITY 10 PLANNED SUSTAINED THREAT OF MINEFIELD IN DAYS 11 EXPECTED NUMBER OF TRANSISTORS

M [2-4 A] M [1-30 ANBS] M [5-8 ANS] M [1-30 ANBS] M [5-8 ANS] M [4-8 A] O [3 NS] O [4-6 AN] O [3 NS] O [1-3 N] O [1-4 N]

Set 12 Purpose: THE POMOE SET REPORTS PLANNING INFORMATION FOR MINEFIELDS.

O PERIOD/_____/_____/...../...../

1 START TIME 2 STOP TIME 3 STOP TIME MODIFIER
M [7/11 AN] M [3/11 AN] C [7/11 AN]

Set 13 Purpose: THE PERIOD SET PROVIDES INFORMATION ON THE EFFECTIVE TIME PERIOD OF MINELAYING OPERATIONS.

O R COMMS/_____/_____/_____R_____/
.....R...../.....R...../...../

1 UNIT DESIGNATOR 2 SPECIFIC CALL SIGN 3 COMMUNICATIONS IDENTIFIER 4 COMMUNICATION PRIORITY 5 TRANSMISSION MODE

M [1/30 ANBS] M [1-38 ANBS] M [1/14 ANS] O [1 A] O [2-9 AB]

Set 14 Purpose: THE COMMS SET PROVIDES COMMUNICATIONS INFORMATION.

O BDCT/_____/_____/.....R...../
.....R...../...../

1 DAY-TIME SET WATCH 2 COMMUNICATIONS IDENTIFIER 3 DAY-TIME SHIFT WATCH 4 COMMUNICATIONS IDENTIFIER

M [7/8 AN] M [1/7 ANS] O [7/8 AN] O [1/7 ANS]

Set 15 Purpose: THE BDCT SET PROVIDES COMMUNICATIONS BROADCAST INFORMATION TO TASKED UNITS.

O EMCON/_____R_____/_____R_____/_____R_____//
1 EMISSION CONTROL PLAN IDENTIFIER 2 START TIME 3 STOP TIME
M [1/8 AN] M [7/8 AN] M [7/8 AN]

Set 16 Purpose: THE EMCON SET IDENTIFIES SPECIAL EMISSION CONTROL PROCEDURES OR CONDITIONS FOR THE MINING TASKING.

O EMCONFM/_____R_____/_____R_____//
1 EMCON PLAN FORMAT IDENTIFIER 2 EQUIPMENT OR TACTICAL UNIT TYPE
M [1/3 A] M [1/30 ANBS]

Set 17 Purpose: THE EMCONFM SET PROVIDES INFORMATION ON THE EMISSION CONTROL (EMCON) PLAN FORMAT.

O EMCONPL/_____/_____R_____/_____R_____//
1 EMISSION CONTROL PLAN DESIGNATION 2 FORMAT INDEX LETTER 3 RADIATION STATUS INDICATOR
M [4-14 AB] M [1-2 A] M [3-5 AN]

Set 18 Purpose: THE EMCONPL SET PROVIDES INFORMATION ON THE EMISSION CONTROL (EMCON) PLAN INDICATORS.

O AREA/_____R_____//
1 AREA DESIGNATION OR COORDINATES
M [1/36 ANBS]

Set 19 Purpose: THE AREA SET DESCRIBES THE GEOGRAPHIC OPERATING AREA FOR THE MINING TASKING.

O CIRC/_____/_____R_____//
1 CENTER OF CIRCLE 2 CIRCLE RADIUS
M [1/36 ANBS] M [3-8 ANS]

Set 20 Purpose: THE CIRC SET DESCRIBES THE CIRCULAR OPERATING AREA FOR THE MINING TASKING.

O MAP/_____/……/……R……/……R……/……R……//
1 MAP OR CHART SERIES DESIGNATOR 2 MAP OR CHART SUFFIX NUMBER 3 MAP OR CHART SHEET NUMBER 4 MAP OR CHART EDITION NUMBER 5 GEODETIC DATUM
M [1-12 ANS] O [2 N] O [1-14 ANS] O [1-6 ANS] O [4-25 ANBS]

Set 21 Purpose: THE MAP SET PROVIDES THE MAP REFERENCES FOR THE MINING TASKING.

O R COTI/____________________/________________//
1 START TIME OF MINE EMBARKATION 2 EMBARKATION HARBOR
M [4/11 AN] M [1-20 ANBS]

Set 22 Purpose: THE COTI SET PROVIDES INFORMATION FOR THE MINE EMBARKATION.

O MICA/__________R__________//
1 MINE CARGO DESIGNATION NUMBER
M [11-17 AS]

Set 23 Purpose: THE MICA SET PROVIDES INFORMATION ON MINE CARGO.

O COVER/____R____//
1 UNIT
M [1/30 ANB

Set 24 Purpose: THE COVER SET PROVIDES THE NAME OR DESIGNATOR OF THE FORCE PROVIDING COVER FOR THE OPERATION.

O FYFCE/____________/__________R__________/_______R_______//
1 UNIT DESIGNATION 2 NUMBER OF COOPERATING FORCES 3 COOPERATING FORCE
M [1-30 ANBS] M [1-2 N] M [1/30 ANBS]

Set 25 Purpose: THE FYFCE SET IDENTIFIES THE FRIENDLY FORCES OPERATING IN THE MINING AREA.

O FYPOS/____________/__________________/_______/.../
............................./..//
1 FRIENDLY UNIT 2 FRIENDLY FORCE LOCATION 3 TIME 4 COURSE AND SPEED 5 NATIONALITY 6 DISCRETE IDENTIFIER CODE
M [1/30 ANBS] M [1/36 ANBS] M [7/8 AN] O [7/10 ANS] O [2 A] O [4 N]

Set 26 Purpose: THE FYPOS SET PROVIDES THE POSITION OF FRIENDLY FORCES IN THE MINING AREA.

O TACOM/____________________/..//
1 TACTICAL COMMAND AUTHORITY 2 VERIFIED MONTH DATE-TIME OF CHANGE
M [1-20 ANBS] O [11 AN]

Set 27 Purpose: THE TACOM SET PROVIDES THE TACTICAL COMMAND AUTHORITY INFORMATION.

O R SAIL/______________/___________/........................//
1 TIME OF ARRIVAL 2 POSITION 3 TIME OF DEPARTURE
M [8/11 AN] M [1/36 ANBS] O [8/11 AN]

Set 28 Purpose: THE SAIL SET PROVIDES THE SAILING INFORMATION.

O PIM/_____/_____/
_____R_____/_____R_____//
1 FORCE POSITION 2 VERIFIED DAY-TIME OF POSITION 3 VERIFIED COURSE AND SPEED OF FORCE 4 DURATION IN HOURS
M [6/36 ANBS] M [8 AN] M [1 1/16 ANS] M [2/1 1 ANS]

Set 29 Purpose: THE PIM SET PROVIDES THE POSITION AND INTENDED MOVEMENT (PIM) INFORMATION.

O R DUTY/_____/_____R_____//
1 UNIT DESIGNATOR 2 TACTICAL DUTIES
M [1/38 ANBS] M [1/11 AN]

Set 30 Purpose: THE DUTY SET DESIGNATES A PARTICULAR UNIT AND ITS ASSIGNED TACTICAL DUTIES.

O GENTEXT/_____/_____//
1 GENTEXT TEXT INDICATOR 2 FREE TEXT
M [1-61 ANBS] M [1-U ANBS]

Set 31 Purpose: THE GENTEXT/ACTION ON COMPLETION SET PROVIDES INSTRUCTIONS AND DETAILS OF ACTION UPON COMPLETION OF DUTY.

Note: FIELD 1 OF THE GENTEXT SET MUST EQUAL "ACTION ON COMPLETION".

O AKNLDG/_____/.....R...../
1 ACKNOWLEDGEMENT REQUIREMENT INDICATOR 2 INSTRUCTIONS OR UNIT
M [2-3 A] O [1/50 ANBS]

Set *32* Purpose: THE AKNLDG SET PROVIDES OPERATOR ACKNOWLEDGEMENT AND NOT COMMUNICATIONS CENTER ACKNOWLEDGEMENT.

OPTASK MINING MESSAGE EXAMPLE:

EXER/SUN BIRD 93//
MSGID/OPTASK MINING/CTF 425//
MREPT/ADD/MLAYREP/141300Z9AUG//
MLORD/001//
MHU3QNR/001//
MINEOPS/TACTICAL/OVERT/BLOCKADE/MER/0PERATIONAL222000Z6SEP/AIR-FNU
/MARKMOD55-2//
MFLD/IDCODE:US123499Al/GROUND/250/623115N8-0071824E2/050T5-200M2/50M5
/10DAY20HR30MIN/4/42BMW001-250//
POMOE/PC/ROMEO SSN/5KTS5/TANGO SSK/5KTS5/LIGHT/.5O/5OFlO/.4303l/12//
PERIOD/121900Z3MAY/151900Z6MAY//
COMMS/UNIT:REEVES/DODGEFALLS/23HZ/CW/CH10/S/VHF//
BDCT/171200Zl/BCS: A2MX171800Z7/BCS:S4CZl8OOOlZO/l23//

EMCON/ALFA/011201Z5/011300Z5/BRAVO/211300Z7/240600Z2//
EMCONFM/H/HYDROFOL/52/RBOC//
EMCONPL/TANGO/A/15E/A/40PM97EB//
AREA/523017N8-0024815W0/523219N2-0025012W0/523423N9-0025209W8//
MAP/DMAl3142/14/13/MAY84/WGS1984//
COTI/121230Z9MAY/KOEGE//
MICA/ONE-SEVEN-TWO//
COVER/AVENGER/UCTU71.1.2//
FYFCE/RESERVEMINEFOR/l/BRECON//
FYPOS/CTF313/42121ONO-OO71412W5/221530Z3/050T25KTS/SZ/4621//
TACOM/CTG420.5/221600ZlDEC//
SAIL/170930ZO/PLACE:ESJBERG/190800Z8//
PIM/552243N1-0024312W2/261330Z5/180T9-7KTS7/l2HR3//

DUTY/MIDDLEBURG/3V//
GENTEXT/ACTION ON COMPLETION/PROCEED TO KOEGE FOR EMBARKATION OF
CARGO ZERO ONE EIGHT (018)//
AKNLDG/YES//

6. Unexploded Ordnance. The UXO spot report is a detailed, swift, two-way reporting system that makes clear where the UXO hazard areas are, what their priorities are, and which units are affected by them, The report is used to request help in handling a UXO hazard that is beyond a unit's ability to handle and that affects the unit's mission, This report helps the commander set priorities based on the battlefield situation.

a. The UXO spot report is the first echelon report that is sent when a UXO is encountered. Information about this report is also found in GTA 9-12-1 and in the supplemental information section of the signal operating instructions. The information must be sent by the fastest means available.

Line 1. Date-Time Group: DTG item discovered.
Line 2. Reporting Activity [unit identification code and location (grid of UXO)]
Line 3. Contact method: Radio frequency, call sign, point of contact, and telephone number,
Line 4. Type of Ordnance: Dropped, projected, placed, or thrown. If available, supply the subgroup. Give the number of items, if more than one,
Line 5. NBC Contamination: Be as specific as possible.
Line 6. Resources Threatened: Report any equipment, facilities, or other assets that are threatened.
Line 7. Impact on Mission: Provide a short description of your current tactical situation and how the presence of the UXO affects your status.
Line 8. Protective Measures: Describe any measures you have taken to protect personnel and equipment.
Line 9. Recommended Priority: Recommend a priority for response by EOD technicians or engineers.

GLOSSARY

PART I-ABBREVIATIONS AND ACRONYMS

A2C2	Army airspace command and control
AADC	area air defense commander
AAGS	Army air-ground system
AAV	amphibious assault vehicle
AAW	antiair warfare
ABCCC	airborne battlefield command and control center
ABMOC	air battle management operations center
ACA	airspace control authority; airspace coordination area
ACE	aviation combat element (USMC); analysis and control element (USA)
ACM	airspace control measures
ACO	airspace control order
ACP	air control point
ACQ	acquisition
ACR	armored cavalry regiment
ACT	analysis and control team
AD	air defense
ADA	air defense artillery
ADADO	assistant division air defense officer
ADIZ	air defense identification zone
ADMIN/LOG	administrative and logistics
ADP	automated data processing
AFATDS	advanced field artillery tactical data system
AFC	automatic frequency control
AFCC	Air Force component commander
AI	air interdiction
A/C	aircraft
ALO	air liaison officer
ALOC	air lines of communications
AM	amplitude modulation
AMCI	Army-Marine Corps integration
AMMO	ammunition
ANGLICO	air/naval gunfire liaison company
AO	area of operations; aerial observer; air officer (USMC)
AOA	amphibious objective area
AOC	air operations center
AOR	area of responsibility
APC	armored personnel carrier
APDS	armored piercing discarding sabot
APOE	aerial port of embarkation
ARFOR	Army forces
ARG	amphibious ready group
ASAS	All Source Analysis Aystem
ASB	aviation support battalion
ASC (A)	assault support coordinator (airborne)
ASL	authorized stockage list
ASLT	air support liaison team
ASOC	air support operations center

ASP	ammunition supply point
ATACMS	Army Tactical Missile System
ATC	air traffic control
ATCCS	Army Tactical Command and Control System
ATF	amphibious task force
ATHS	airborne target handoff system
ATO	air tasking order
ATP	ammunition transfer point
ATS	air traffic services
AUTODIN	automatic digital network
AVIM	aviation intermediate maintenance
AVLB	armored vehicle launched bridge
AVUM	aviation unit maintenance
AWACS	airborne warning and control system
BCE	battlefield coordination element
BCS	battery computer system
BDE	brigade
BFV	Bradley fighting vehicle
BICC	battlefield information coordination center
BLT	battalion landing team
BN	battalion
BP	battle position
BSA	brigade support area
BSFV	Bradley stinger fighting vehicle
btry	battery
C2	command and control
C2W	command and control warfare
C3	command, control, and communications
C3I	command, control, communications, and intelligence
C4	command, control, communications, and computer
C4I	command, control, communications, computer, and intelligence
C4I2	command, control, communications, computers, intelligence and interoperability
CA	civil affairs
CACDA	Combined Arms Center, Department of the Army
CAEMS	computer-aided embarkation management system
cal	caliber
CALM	computer-aided load manifesting
CAS	close air support
CATF	commander of amphibious task force
CB	counterbattery
CCIR	command critical intelligence requirements
CCIS	common channel interswitch signaling
CCR	closed circuit refuel
CCT	combat control team (Air Force)
CDR	commander
CE	command element
CEB	combat engineer battalion
CENTCOM	Central Command

CEV	combat engineer vehicle
CEWI	combat electronic warfare intelligence
CF	command fire
CFM	cubic feet per minute
CHS	combat health support
CI	counterintelligence
CIC	combat information center
CINC	commander in chief; commander of a combatant command
CJCS	Chairman of the Joint Chiefs of Staff
CJTF	commander of joint task force
CLF	commander of landing force
CMCC	corps movement control center
CMD	command
CMMC	corps materiel management center
CMO	civil-military operations
CNR	combat net radio
CO	company
COA	course of action
COC	combat operations center
COCOM	combatant command (command authority)
COLT	combat observation and lasing team
COMINT	communications intelligence
comm	communications
COMSEC	communications security
CONPLAN	operations plan in concept format
CONUS	Continental United States
COSCOM	corps support command
CP	command post
CRC	control and reporting center
CRF	crash-fire-rescue
CS	combat support
CSA	corps storage area
CSAR	combat search and rescue
CSB	corps support battalion
CSG	corps support group
CSP	contingency support package
CSR	controlled supply rate
CSS	combat service support
CSSCS	combat service support control system
CSSD	combat service support detachment
CSSE	combat service support element
CSSOC	combat service support operations center
cu	cubit
CWAR	continuous wave acquisition radar
DACS(A)	direct air support center (airborne)
DAO	division ammunition office
DAS	deep air support
DASC	direct air support center
DCS	Defense Communications System
decon	decontamination

demo	demolition
DEPMEDS	deployable medical system
DFSCOORD	deputy fire support coordinator
DIBITS	digital in-band interswitch trunk signaling
DISCOM	division support command
DISE	deployable intelligence support element
distro	distribution
div	division
DLA	Defense Logistics Agency
DLED	dedicated loop encryption device
DMMC	division materiel management center
DNVT	digital nonsecure voice terminal
DRB	division ready brigade
DS	direct support
DSCS	Defense Satellite Communications System
DSN	Defense Switched Network
DSSCS	Defense Special Security Communication System
DSVT	digital subscriber voice terminal
DTAMS	digital terrain analysis and mapping system
DTG	date time group
DZ	drop zone
E-mail	electronic mail
EA	engagement area; ea
EAC	echelons above corps
EBS	engineer support battalion
ECM	electronic countermeasures
e.g.	for example
engr	engineer
enl	enlisted
EPLRS	enhanced position locating reporting system
EPW	enemy prisoner of war
EPWB	EPW and civilian internee (CI) battalion (USA PSYOP)
EPWC	EPW/CI company
ESB	engineer support battalion
EUCE	end user computing equipment
EUCOM	European Command
EW	electronic warfare
EW/C	early warning/control
FA	field artillery
FAA	forward assembly area
FAAD	forward area air defense
FAADC3I	forward area air defense command, control, communications and intelligence
FAADS	forward area air defense system
FAASV	field artillery ammunition support vehicle
FAAWC	force antiair warfare commander
FAC	forward air controller
FAC(A)	forward air controller (airborne)

FACP	forward air control party
FAE	fuel air explosive
FARP	forward arming and refueling point
FAX	facsimile
FCT	firepower control team
FD	fire direction
FDC	fire direction center
FEBA	forward edge of the battle area
FEZ	fighter engagement zone
FFAR	folding fin aerial rocket
FFC	force fires coordinator
FFCC	force fires coordination center
FISP	fly in support package
FIST	fire support team
FIST-V	fire support team vehicle
FLI	force level information
FLIR	forward looking infared
FLOT	forward line of own troops
FLTSATCOM	fleet satellite communications
FM	field manual; frequency modulation
FMCC	force movement control center
FMF	Fleet Marine Force
FMFRP	fleet Marine force reference publication
FO	forward observer
FS	fire support
FSB	forward support battalion
FSC	fire support coordinator (USMC)
FSCC	fire support coordination center
FSCL	fire support coordination line
FSCM	fire support coordinating measures
FSCOORD	fire support coordinator (Army)
FSE	fire support element
FSO	fire support officer
FSS	fire support section
FSSG	force service support group
ft	foot
FW	fighter wing
F/W	fixed wing
FWD	forward
G-2	Army or Marine Corps component intelligence staff officer (Army division or higher staff, Marine Corps brigade or higher staff)
G-3	Army or Marine Corps component operations staff officer (Army division or higher staff, Marine Corps brigade or higher staff)
G-4	Army or Marine Corps component logistics staff officer (Army division or higher staff, Marine Corps brigade or higher staff)
G-5	Army or Marine Corps component civil affairs staff officer (Army division or higher staff, Marine Corps brigade or higher staff)
G-6	Army or Marine Corps component signal staff officer (Army division or higher staff, Marine Corps brigade or higher staff)
G/VLLD	ground/vehicular laser locator designator

gal	gallon
GBS	ground based sensor
GCE	ground combat element
GCS	ground control stations
GENSER	general service
GLO	ground liaison officer
GMF	greatly modulated frequency
GPS	global positioning system
GS	general support
GSM	ground station module
GSR	general support-reinforcing
H&S	headquarters and service
HA	holding area
HARM	high-speed antiradiation missile
HEI-T	high explosive incendiary with tracer
HEMAT	heavy expanded mobility ammunition trailer
HEMT	heavy expanded mobility tactical truck
HERS	helicopter expedient refueling system
HF	high frequency
HHB	headquarters and headquarters battery
HHC	headquarters and headquarters company
HHD	headquarters and headquarters detachment
HHQ	higher headquarters
HIDACZ	high density aircraft control zone
HIMAD	high to medium altitude air defense
HIMEZ	high-altitude missile engagement zone
HIPAR	high power illuminator radar
HLZ	helicopter landing zone
HMH	Marine heavy helicopter squadron
HMLA	Marine light/attack helicopter squadron
HMM	Marine medium helicopter squadron
HMMWV	high-mobility multipurpose wheeled vehicle
HN	host nation
HPT	high payoff target
HQ	headquarters
HR	hour
HST	helicopter support team
HUMINT	human intelligence
HWY	highway
IAS	intelligence analysis system
IAW	in accordance with
ICP	intertheater COMSEC package
ID	identification
i.e.	that is
IEW	intelligence and electronic warfare
IFF	identification friend or foe
IFSAS	interim fire support automation system
IHFR	improved high frequency radio
inf	infantry

INS	inertial navigation system
intel	intelligence
IPB	intelligence preparation of the battlespace
IR	infared
ISB	intermediate staging base
IT	interrogator-translator team
ITV	improved tube-launched optically-tracked wire-guided vehicle
J-2	Intelligence Directorate of a joint staff
JAOC	joint air operations center
JCEOI	joint communications-electronic operating instructions
JCSE	joint communication support element
JDISS	Joint Deployable Intelligence Support System
JFACC	joint force air component commander
JFC	joint force commander
JFLCC	joint force land component commander
JIC	joint intelligence center
JLOTS	joint logistics over-the-shore
JMC	joint movement center
JOA	joint operations area
JOC	joint operations center
JOPES	joint operations planning and execution system
JPOTF	joint psychological operations task force
JRC	joint reception center
JSEAD	joint suppression of enemy air defenses
JSOA	joint special operations area
JSOI	joint signal operating instructions
JSOTF	joint special operations task force
J-STARS	Joint Surveillance Target Attack Radar System
JTAR	joint tactical air strike request
JTF	joint task force
JTIDS	Joint Tactical Information Distribution System
JTSA	joint theater storage area
JTTP	joint tactics, techniques and procedures
JWICS	Joint Worldwide Intelligence Communications System
kbps	kilobits per second
KHz	kilohertz
km	kilometer
LAAD	low altitude air defense
LAAM	light antiaircraft missile
LAN	local area network
LANTIRN	low-altitude navigation and targeting infrared for night
LAR	light armored reconnaissance
LAV	light armored vehicle
lb	pound
LCC	land component commander
LEN	large extension node
LF	landing force
LFADS	Landing Force Asset Distribution System

LMT	lightweight medium tactical
LNO	liaison officer
LOC	lines of communications
LOMEZ	low-altitude missile engagement zone
LOS	line of sight
LOTS	logistics-over-the-shore
LRSU	long range surveillance units
LST	laser spot tracker
LTACFIRE	Light Tactical Fire Direction System
LVTP(AAV)	landing vehicle tracked, personnel (assault amphibious vehicle)
LVS	logistic vehicle system
LZ	landing zone
m	meter
MACCS	Marine Air Command and Control System
MACG	Marine air control group
MACS	Marine air control squadron
MAFC	MAGTF all source fusion center
MAG	Marine Air Group
MAGTF	Marine air-ground task force
MAIN CP	main command post
maint	maintenance
MALS	Marine air logistics squadron
MALSP	Marine Corps Aviation Logistics Support Program
MANPADS	Man-portable Air Defense System
MARDIV	Marine division
MARFOR	Marine forces
MASS	Marine air support squadron
MATCD	Marine air traffic control detachment
MATCS	Marine air traffic control squadron
MAW	Marine air wing
max	maximum
MCC	movements control center
MCMREP	mine countermeasure report
MCRP	Marine Corps reference publication
MCS	maneuver control system
MDCI	multidiscipline counterintelligence
mech	mechanized
MEF	Marine expeditionary force
MEF (FWD)	Marine expeditionary force (forward)
MET	meteorological
METT-T	mission, enemy, terrain and weather, troops and support available, time available
MEU	Marine expeditionary unit
MFWPU	medium freshwater purification unit
MG	machine gun
mgt	management
MHE	material handling equipment
MHz	megahertz
MI	military intelligence
MICLIC	mine clearing line charge

MINEOPS	minelaying operations
mist	miscellaneous
MLRS	Multiple Launch Rocket System
	millimeter
MOOTW	military operations other than war
MOUT	military operations on urbanized terrain
MP	military police
MPF	maritime propositioning force
MPPWCOM	Military Police Prisoner of War Command
MPS	maritime positioning ships
MPSRON	maritime prepositioning ship squadron
MRC	major regional conflict
MRE	meal ready-to-eat
MSB	main support battalion
MSC	military sealift command
MSE	mobile subscriber equipment
MSRT	mobile subscriber radio terminal
MSSG	Marine expeditionary unit service support group
MST	maintenance support team
MTACS	Marine tactical air command squadron
MWSG	Marine wing group
MWSS	Marine wing support squadron
N/A	not applicable
NAI	not all inclusive
NBC	nuclear, biological, and chemical
NCA	National Command Authority
NCF	naval construction force
NCO	noncommissioned officer
NCS	net control station
NEO	noncombatant evacuation operation
NFA	no fire area
NGF	naval gunfire
NGLO	naval gunfire liaison officer
NGO	naval gunfire officer
NICP	national inventory control point
NM	nautical mile
NMCB	naval mobile construction battalion
NSE	Navy support element
NSFS	Naval surface fire support
NTS	Naval Telecommunications System
NVG	night vision goggle
O&I	operations and intelligence
OAAW	offensive antiair warfare
OAS	offensive air support
OCAC	operational control and analysis center
off	officer
OIC	officer in charge
OPCON	operational control
OPLAN	operations plan

OPORD	operations order
ops	operations
OPSEC	operations security
P	package
PA	public affairs
PACOM	Pacific Command
PAR	pulse acquisition radar
PAX	passengers
PD	point detonating
PERMA	planning, embarkation, rehearsal, movement and assault
PIR	priority intelligence requirements
PLL	prescribed load list
PLS	palletized loading system
PMCS	preventive maintenance checks and services
POL	petroleum, oils, and lubricants
POTF	psychological operations task force
PSYOP	psychological operations
qty	quantity
R	reinforcing
R&S	reconnaissance and surveillance
RAAM	remote antiarmor mine
RAP	rear-area protection
RAU	remote access unit
RC	reserve component
rec veh	recovery vehicle
recce	reconnaissance (USAF)
recon	reconnaissance
regt	regiment
RFA	restricted fire area
RFI	requests for intelligence
RFL	restricted fire line
RMC	remote multiplexer combiner
ROE	rules of engagement
ROWUP	Reverse Osmosis Water Purification System
ROZ	restricted operating zone
RPV	remotely piloted vehicle
RRP	rearm/refuel point
RSR	required supply rate
RVT	remote video terminal
RW	reconnaissance wing
RX	reparable exchange
S1	battalion or brigade personnel or manpower staff officer (Army; Marine Corps battalion or regiment)
S2	battalion or brigade intelligence staff officer (Army; Marine Corps battalion or regiment)
S3	battalion or brigade operations staff officer (Army; Marine Corps battalion or regiment)
S4	battalion or brigade logistics staff officer (Army; Marine Corps

	battalion or regiment)
SAAFR	standard Army aviation flight route
SAAMS	special airlift assigned missions
SAAWC	sector antiair warfare coordinator
SACC	supporting arms coordination center
SALT	supporting arms liaison team
SAM	surface-to-air missile
SARC	surveillance and reconnaissance center
SAS	sensor acquisition section
SATCOM	satellite communications
SC	single-channel
SCATMINWARN	scatterable-minefield warning message
SCI	secret compartmented information
SCR	single-channel radio
SEAD	suppression of enemy air defenses
SEE	small equipment excavator
SEMA	special electronic mission aircraft
SEN	small extension node
SEWCC	signal intelligence electronic warfare coordination center
SFCP	shore fire control party
SHF	super high frequency
SHORAD	short-range air defense
SHORADEZ	short-range air defense engagement zone
SHTU	simplified handheld terminal unit
SIGINT	signals intelligence
SINCGARS	Single-channel Ground and Airborne Radio System
SIXCON	six container
SMFT	semitrailer mounted fabric tank
SOF	special operations forces
SOI	signal operating instruction
SOP	standing operating procedures
SOUTHCOM	Southern Command
SP	self-propelled/special purpose
SPIRIT	Special Purpose Integrated Remote Intelligence Terminal
SPMAGTF	special purpose marine air-ground task force
SPOD	seaport of debarkation
Spt	support
squad	squadron
SR	short-range
SRIG	surveillance, reconnaissance, intelligence group
SSO	special security office
STON	short ton
STU-III	secure telephone unit III
SVC	service
TAC	tactical
TAC(A)	tactical air coordinator (airborne)
TACAN	tactical air navigation
TACC	tactical air command center (USMC); tactical air control center (USN)
TAC CP	tactical command post
TACFIRE	Tactical Fire Direction System

TACON	tactical control
TACP	tactical air control party
TACS	theater air control system
TACSAT	tactical satellite
TAD	tactical air direction
TADC	tactical air direction center
TADIL	tactical air data link
TAGS	theater air-ground system
TALO	theater airlift liaison officer
TAMCA	Theater Army Movement Control Agency
TAMMC	theater army materiel management center
TAO	tactical air officer
TAOC	tactical air operations center (USMC)
TAR	tactical air request
TARP	target acquisition reconnaissance platoon
TAVB	aviation logistics support ship
TBM	theater ballistic missile
TBMD	theater ballistic missile defense
TBP	to be published
TC-AIMS	Transportation Coordinators' Automated Information for Movements System
TCF	tactical combat force
TEK	trunk encryption key
TEP	terminal emulation processor; task execution plan
TM	team
TMD	theater missile defense
TOC	tactical operations center
TOT	time on target
TOW	tube-launched optically-tracked wire-guided
TPT	tactical petroleum terminal
TRAM	container handler, rough terrain
trans	transport
TRAP	tactical recovery of aircraft and personnel
TRI-TAC	tri-service tactical communications
trk	truck
TROJAN	AN/FS Q-144V
TRSS	tactical remote sensor system suite
TSB	tactical support battalion
TSC	theater signal command (Army)
TSK	transmission security key
TTP	tactics, techniques, and procedures
UAV	unmanned aerial vehicle
UHF	ultrahigh frequency
UJTL	universal joint task list
ULCS	unit level circuit switches
u s	United States
USA	United States Army
USACOM	United States Atlantic Command
USMC	United States Marine Corps
USMTF	US Message Text Format

USN	United States Navy
UXO	unexploded ordnance
V/STOL	vertical/short takeoff and landing
veh	vehicle
VFR	visual flight rules
VHF	very high frequency
VINSON	encrypted ultra high frequency communications system
VMA	Marine attack squadron
VMAQ	Marine tactical electronic warfare squadron
VMFA (AW)	Marine fighter attack (all weather) squadron
VMGR	Marine aerial refueler transport squadron
vs	versus
VT	veribal time
WAN	wide area network
WCS	weapons control status
WEZ	weapons engagement zone
WOC	wing operations center
WP	white phosphorus
WPNS	weapons
xctry	cross country
yd	yard

PART II—TERMS AND DEFINITIONS

airborne operation. An operation involving the air movement into an objective area of combat forces and their logistic support for execution of a tactical or a strategic mission. The means employed may be any combination of airborne units, air transportable units, and types of transport aircraft, depending on the mission and the overall situation. (Joint Pub 1-02)

amphibious operation. An attack launched from the sea by naval and landing forces, embarked in ships or craft involving a landing on a hostile or potentially hostile shore. As an entity, the amphibious operation includes the following phases:

a. Planning—The period extending form issuance of the initiating directive to embarkation.

b. Embarkation—The period during which the forces, with their equipment and supplies, are embarked in the assigned shipping.

c. Rehearsal—The period during which the prospective operation is rehearsed for the purpose of—

(1) Testing adequacy of plans, the timing of detailed operations, and the combat readiness of participating force

(2) Ensuring that all echelons are familiar with plans

(3) Testing communications.

d. Movement—The period during which various components of the amphibious task force move from points of embarkation to the objective area.

e. Assault—The period between the arrival of the major assault forces of the amphibious tasks force in the objective area and the accomplishment of the amphibious task force mission. (Joint Pub 1-02)

augmentation. Augmentation is a command relationship. Units that are designated to augment another force are therefore not available to the losing command for the period of augmentation.

combined arms team. The application of two or more arms or branches of one military Service together in an operation.

commander, amphibious task force. The US Navy officer designated in the initiating directive as commander of the amphibious task force. Also called CATF. (Joint Pub 1-02)

common servicing. That function performed by one Military Service in support of another Military Service for which reimbursement is not required from the Service receiving support. (Joint Pub 1-02)

connectivity. The exchange of information by electronic means.

cross servicing. That function performed by one Military Service in support of another Military Service for which reimbursement is required for the Service receiving support. (Joint Pub 1-02)

decisive point. An enemy location, activity or unit that is vulnerable to attack by friendly forces and whose destruction, disruption, or capture has an adverse effect on the enemy's center of gravity.

force multiplier. A capability that, when added to and employed by a combat force, significantly increases the combat potential of that force and thus enhances the probability of successful mission accomplishment. (Joint Pub 1-02)

force protection. Security program designed to protect soldiers, civilian employees, family members, facilities, and equipment, in all locations and situations, accomplished through planned and integrated application of combating terrorism, physical security, operations security, personal protective services, and supported by intelligence, counterintelligence, and other security programs. (Joint Pub 1-02)

forcible entry. The seizing and holding of a military lodgment in the face of armed opposition.

intelligence preparation of the battlespace. An analytical methodology employed to reduce uncertainties concerning the enemy, environment, and terrain for all types of operations. Intelligence preparation of the battlespace builds an extensive data base for each potential area in which a unit may be required to operate. The data base is then analyzed in detail to determine the impact of the enemy, environment, and terrain on operations and presents it in graphic form. Intelligence preparation of the battlespace is a continuing process. Also called IPB. (Joint Pub 1-02)

joint operations area. That portion of an area of conflict in which a joint force commander conducts military operations pursuant to an assigned mission and the administration incident to such military operations. Also called JOA. (Joint Pub 1-02)

joint servicing. That function performed by a jointly staffed and financed activity in support of two or more Military Services. (Joint Pub 1-02)

joint targeting coordination board. A group formed by the joint force commander to accomplish broad targeting oversight functions that may include but are not limited to coordinating targeting information, providing targeting guidance and priorities, and preparing and/or refining joint target lists. The board is normally comprised of representatives form the joint force staff, all components, and if required, component subordinate units. Also called JTCB. (Joint Pub 1-02)

over-the-horizon amphibious operation. An operational initiative launched form beyond visual and radar range of the shoreline. (Joint Pub 1-02)

seize. To employ combat forces to physically occupy and control a designated area.

service component command. A command consisting of the Service component commander and all those individuals, units, detachments, organizations and installations under the command that have been assigned to the unified command. (Joint Pub 1-02)

supporting arms. Air, sea, and land weapons of all types employed to support ground units.

supporting forces. Forces stationed in, or to be deployed to, and area of operations to provide support for the execution of an operation order. Combatant command {command authority) of supporting forces is not passed to the supported commander. (Joint Pub 1-02)

synchronization. 1. The arrangement of military actions in time, space, and purpose to produce maximum relative combat power at a decisive place and time. 2. In the intelligence context, application of intelligence sources and methods in concert with the operational plan. (Joint Pub 1-02)

target. 1. A geographical area, complex, or installation planned for capture or destruction by military forces. 2. In intelligence usage, a country, area, installation, agency, or person against which intelligence operations are directed. 3. An area designated and numbered for future firing. 4. In gunfire support usage, an impact burst which hits the target. (Joint Pub 1-02)

target analysis. An examination of potential targets to determine military importance, priority of attack, and weapons required to obtain a desired level of damage or casualties. (Joint Pub 1-02)

targeting. 1. The process of selecting targets and matching the appropriate response to them, taking account of operational requirements and capabilities. 2. The analysis of enemy situations relative to the commander's mission, objectives, and capabilities at the commander's disposal, to identify and nominate specific vulnerabilities that, if exploited, will accomplish the commander's purpose through delaying, disrupting, disabling, or destroying enemy forces or resources critical to the enemy. (Joint Pub 1-02)

task organization. A temporary grouping of forces designed to accomplish a particular mission. Task organization involves the distribution of available assets to subordinate headquarters by attachment or by placing assets in direct support or under the operational control of the subordinate.

vertical envelopment. A tactical maneuver in which troops, either air-dropped or air-landed, attack the rear and flanks of a force, in effect cutting off or encircling the force. (Joint Pub 1-02)

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