

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, anti-air/surface/subsurface defense and naval surface fire support, counter-air, 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.*”

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

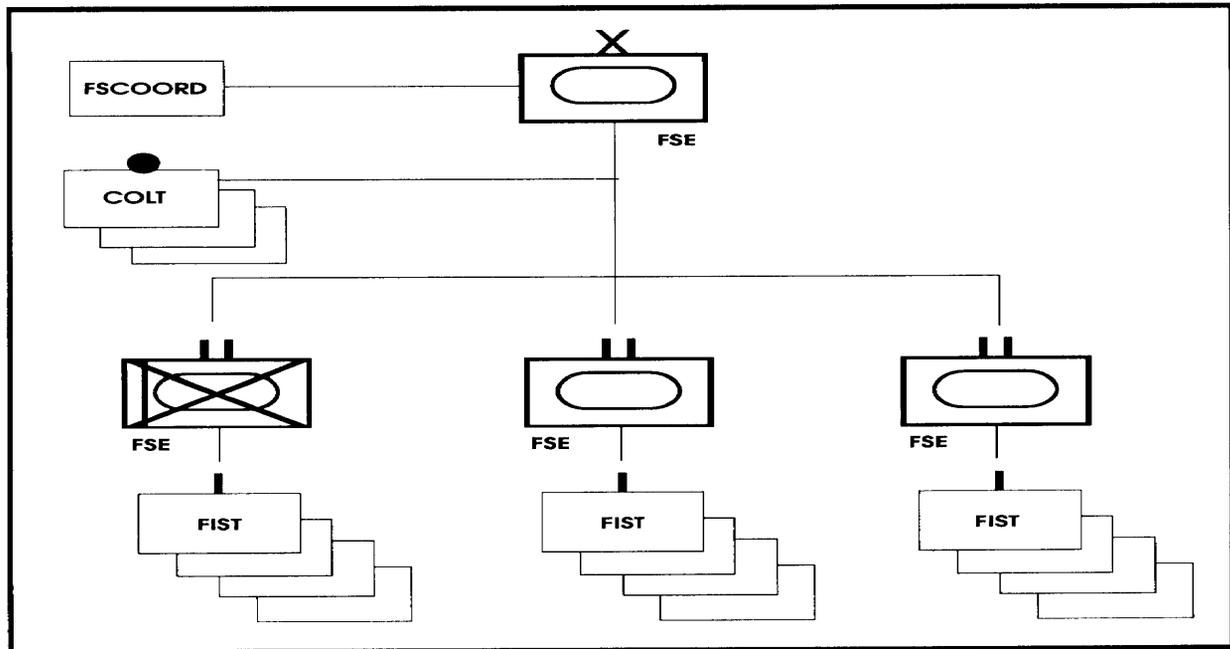


Figure V-1. DRB Fire Support Coordination Organizations

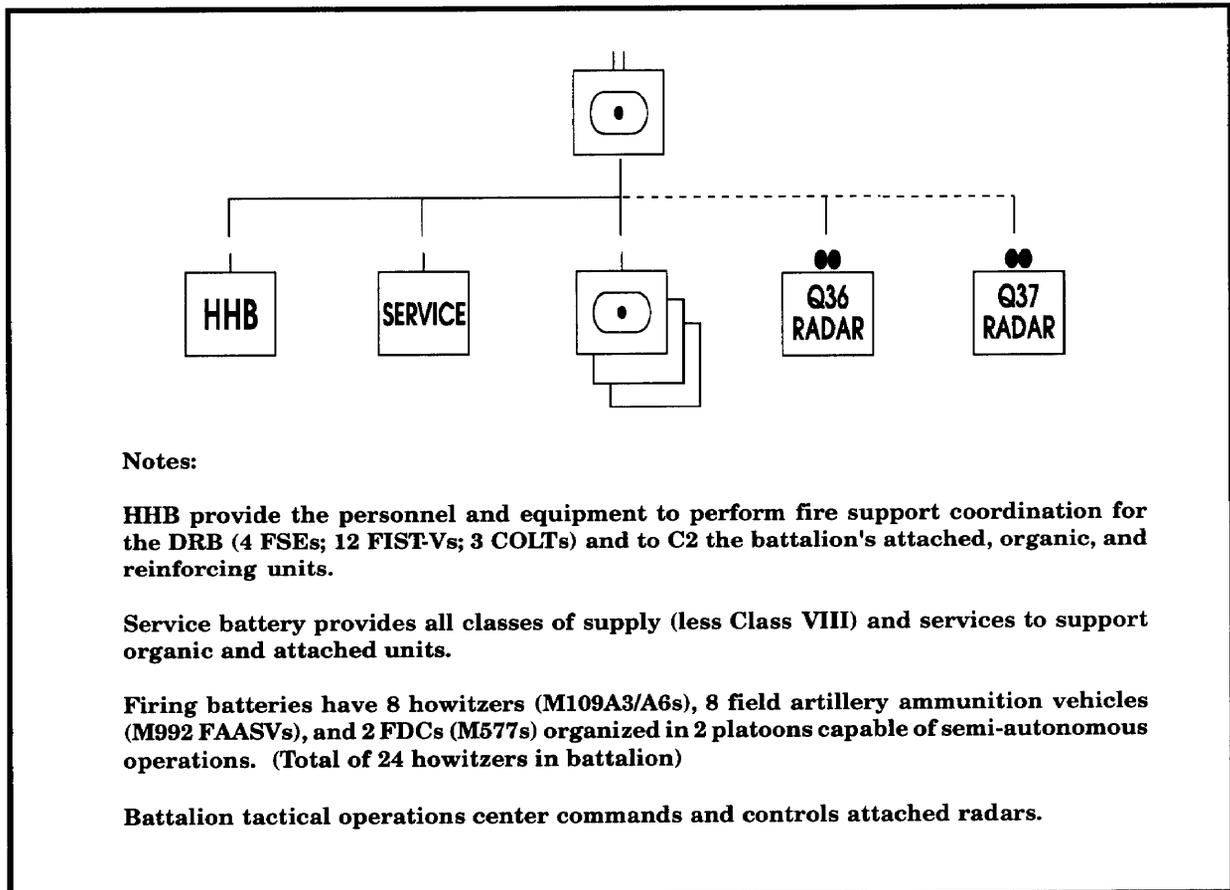


Figure V-2. DRB Field Artillery Organizational Structure

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.

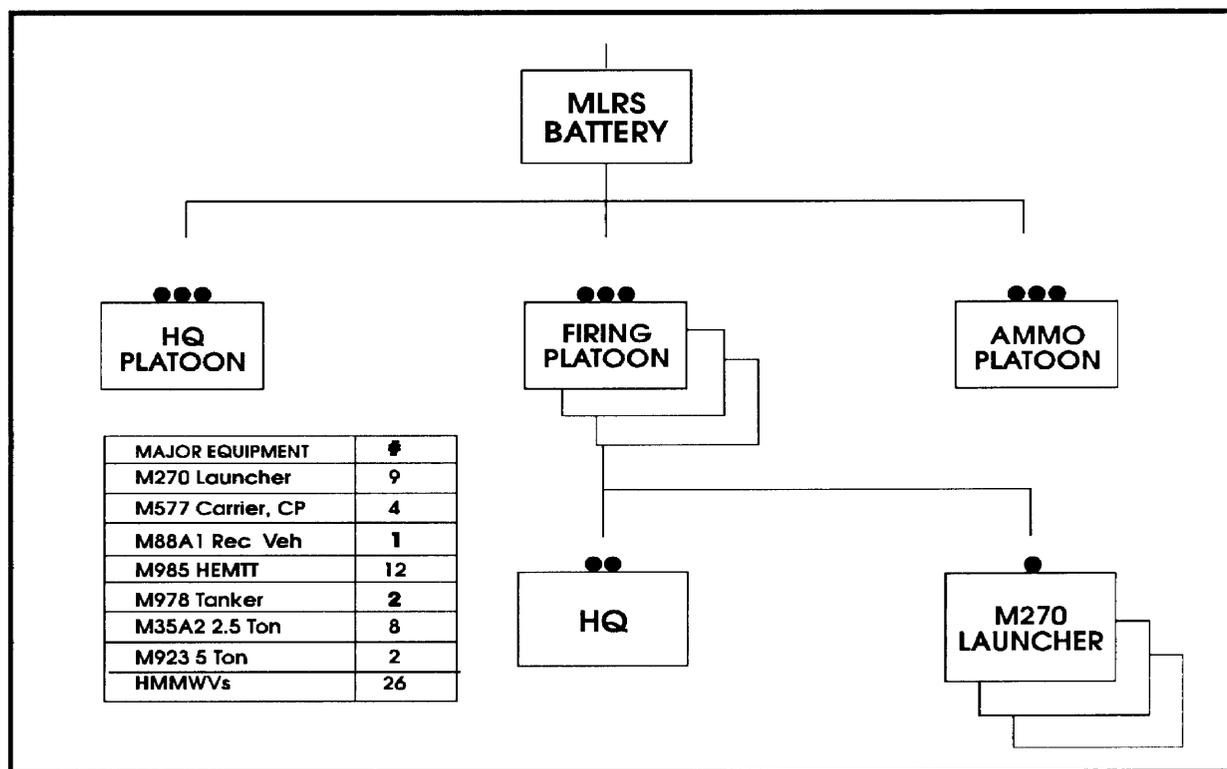


Figure V-3. MLRS Battery

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.

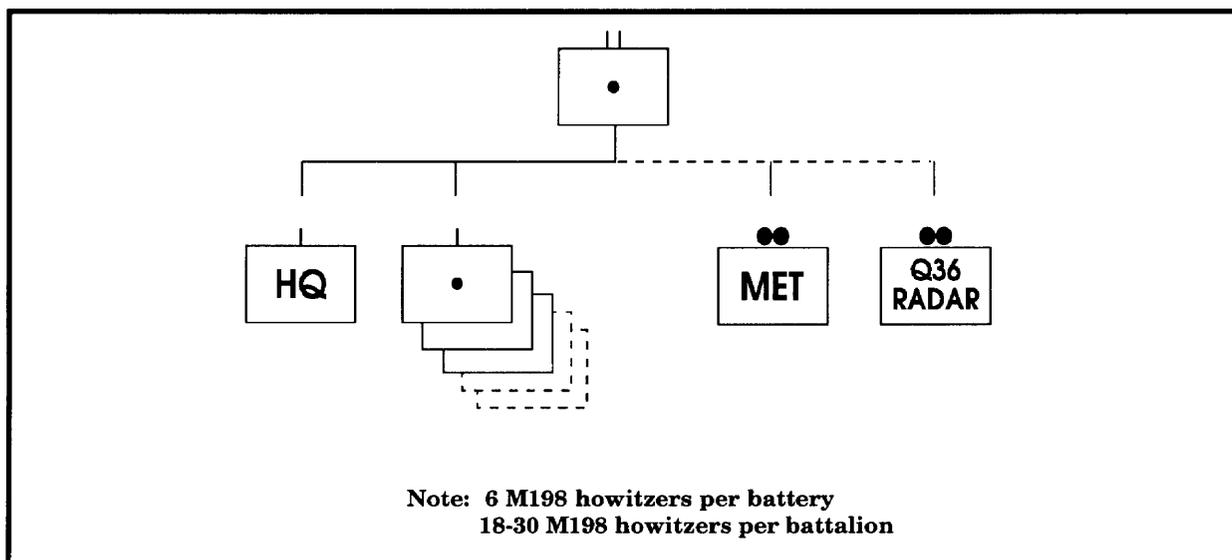


Figure V-4. Notional MEF (FWD) Artillery Battalion

(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.

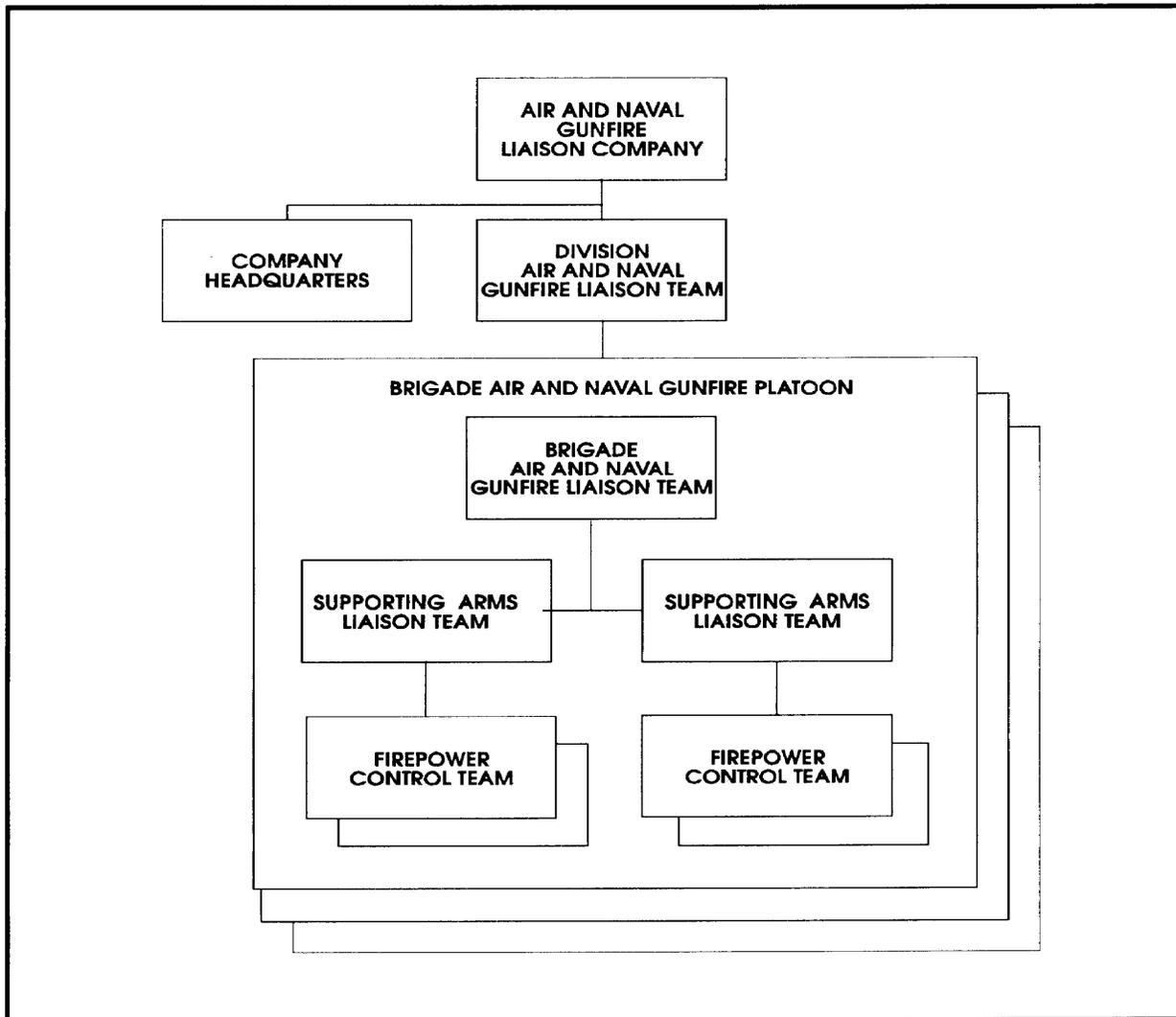


Figure V-5. ANGLICO Organization

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.

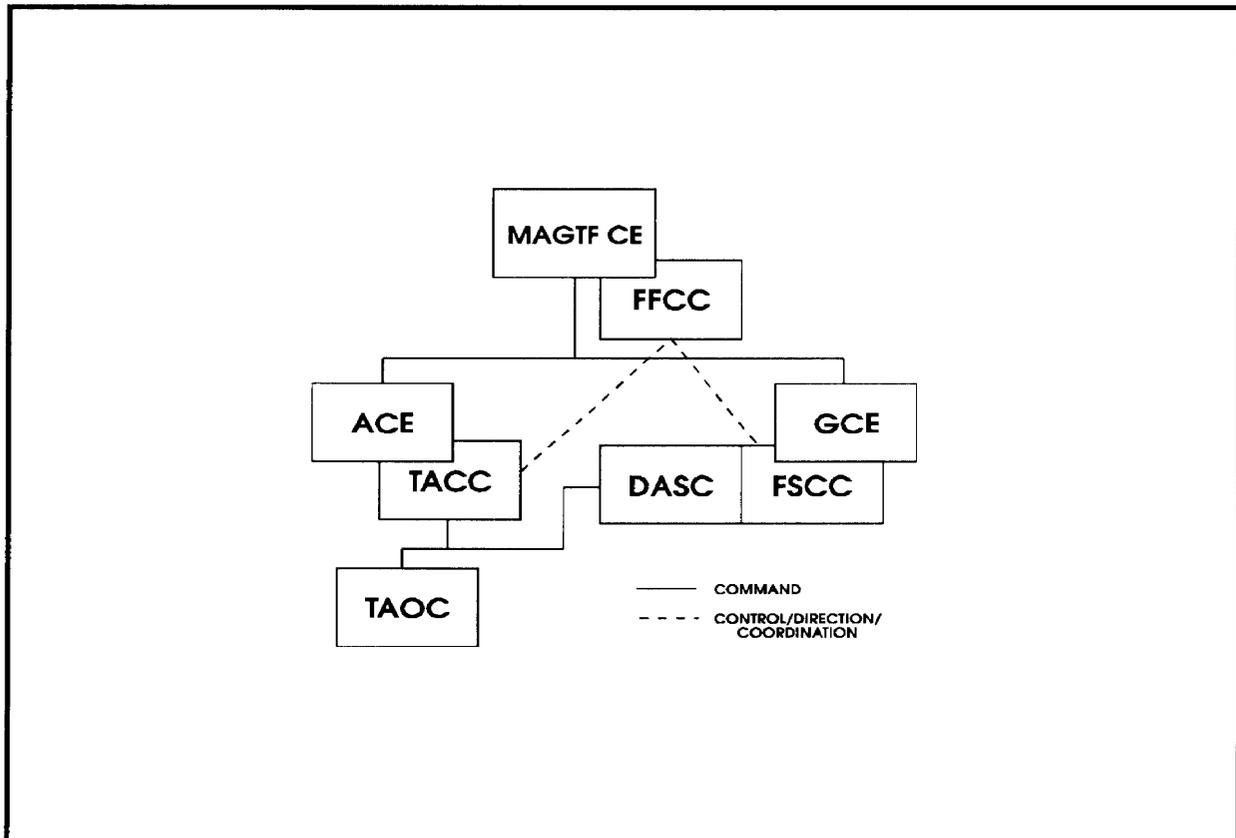


Figure V-6. MACCS/FFCC/FSCC Relationships

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

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

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/movement 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 NSF 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

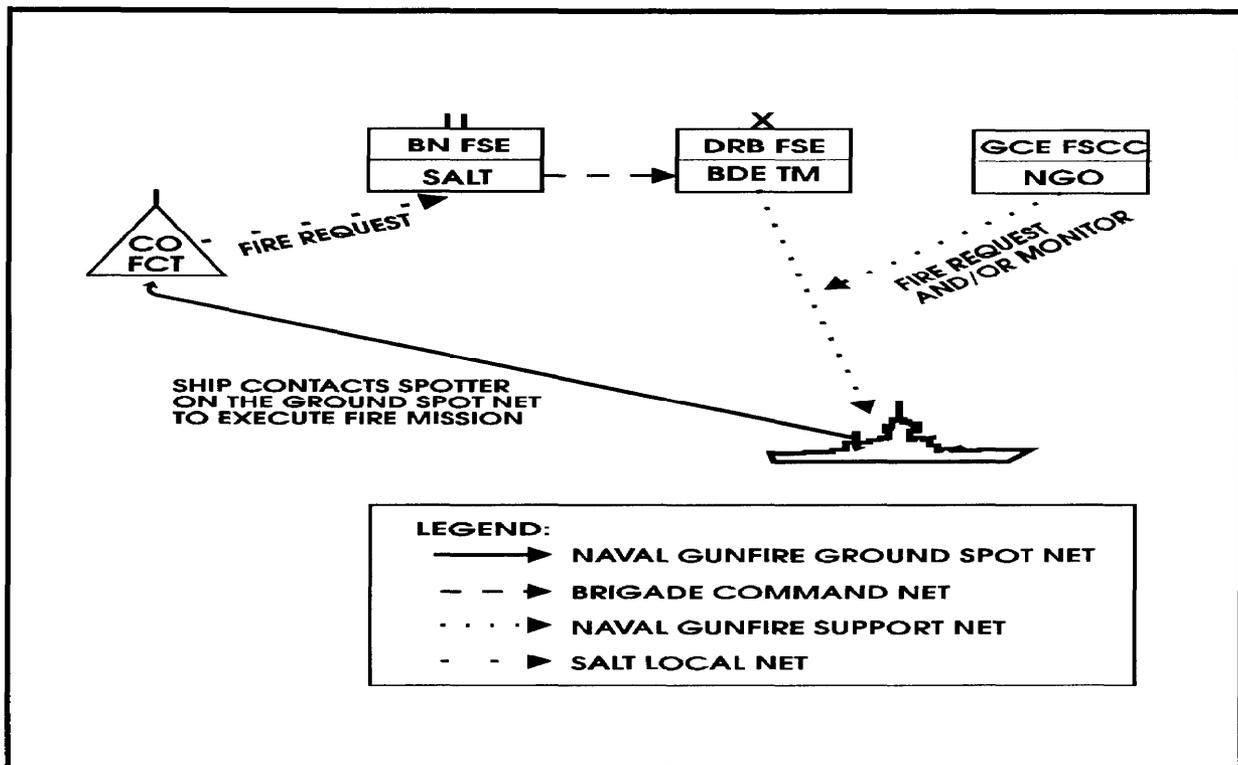


Figure V-7. DRB General Support Naval Gunfire Requests

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 Reinforced Unit 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				