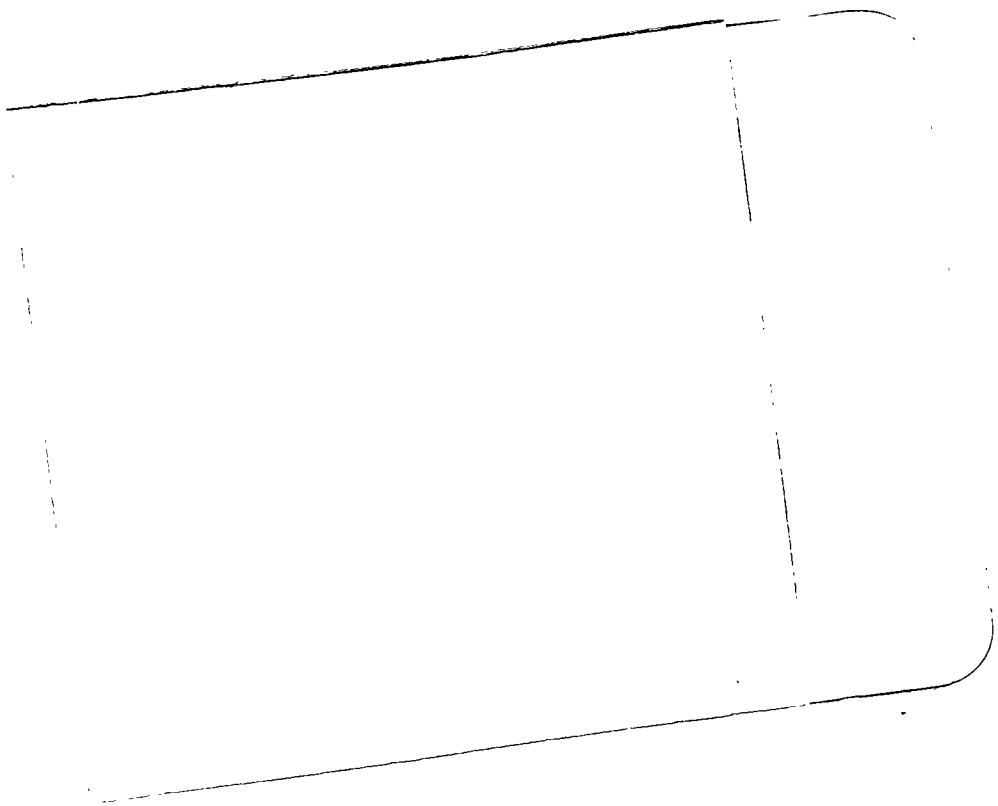
Hqt S/S by 23 April 1996

FM 6-60

Tactics, Techniques, and Procedures for the

MULTIPLE LAUNCH ROCKET SYSTEM (MLRS) OPERATIONS

HEADQUARTERS, DEPARTMENT OF THE ARMY



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HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 30 September 1993

Tactics, Techniques, and Procedures for the
MULTIPLE LAUNCH ROCKET SYSTEM (MLRS) OPERATIONS

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FM 6-60, 16 September 1992, is changed as follows:

1. New or changed material is indicated by a star (★).
2. Remove old pages and insert new pages as indicated below.

REMOVE PAGES	INSERT PAGES
iii through vi	iii through vi
1-1 and 1-2	1-1 and 1-2
2-1 and 2-2	2-1 and 2-2
3-1 through 3-4	3-1 through 3-4
4-1 through 4-10	4-1 through 4-10
5-1 and 5-2	5-1 and 5-2
6-1 through 6-12	6-1 through 6-13
7-1 through 7-6	7-1 through 7-6
8-1 and 8-2	8-1 and 8-2
9-3 and 9-4	9-3 and 9-4
10-9 and 10-10	10-9 and 10-10
Glossary-5 and -6	Glossary-5 and -6
Index-1 through -3	Index-1 through -3

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Field Manual
Number 6-60

Headquarters
Department of the Army
Washington, DC, 16 September 1992

Tactics, Techniques, and Procedures for the MULTIPLE LAUNCH ROCKET SYSTEM (MLRS) OPERATIONS

Table of Contents

*This publication supersedes TC 6-60, 29 September 1988.

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Preface

This publication is designed primarily for the multiple launch rocket system (MLRS) battalion, battery, and platoon. It also is a guide for corps artillery, field artillery brigade, heavy division artillery and their staffs, and fire support coordinators and their supported commanders and staffs. This publication sets forth the doctrine pertaining to the organization, equipment, command and control, operations, and tactics, techniques, and procedures for the MLRS battalion, battery, and platoon. It establishes the responsibilities and general duties of key personnel by focusing on essentials of how the MLRS unit fights. It keys the MLRS battalion, battery, and platoon leaders to those areas that must be trained to win the fight. The specifics of how we train to fight are outlined in soldier's manuals and Army training and evaluation program (ARTEP) mission training plans (AMTPs).

This publication is compatible with AirLand Battle doctrine as outlined in FM 100-5. It does not stand alone. It should be used with equipment technical manuals and soldier's manuals and trainer's guides. It is designed to be used with the FM 6-20 series , FM 71-3, FM 71-100, and FM 100-15.

This publication is based on objective Tables of Organization and Equipment (TOE) 06466L000, 06467L000, and 06398L000 under the Army of Excellence (AOE). The TOEs detail manpower and equipment authorizations for United States (US) Army units. However, all Army units are organized under modification tables of organization and equipment (MTOEs). To determine manpower and equipment authorizations for a specific unit, refer to the authorization document (MTOE) for that unit.

This publication implements the following international agreements (North Atlantic Treaty Organization [NATO] standardization agreements [STANAGs] and quadripartite standardization agreements [QSTAGs]:

- QSTAG 217, Edition 2, *Tactical Tasks and Responsibilities for Control of Artillery.*
- STANAG 2934, Edition 1, *Artillery Procedures.*

The proponent of this publication is HQ TRADOC. Send comments and recommendations on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to Commandant, US Army Field Artillery School, ATTN: ATSF-DM, Fort Sill, Oklahoma 73503-5600.

Unless this publication states otherwise, masculine nouns and pronouns do not refer exclusively to men.

CHAPTER 1

SYSTEM DESCRIPTION

The multiple launch rocket system is a highly mobile, rapid-fire, surface-to-surface, free-flight rocket and guided missile system. It is designed to complement cannon artillery; to attack the enemy deep; and to strike at counterfire, air defense, and high-payoff targets. It can supplement other fire support systems by engaging a dense array of mechanized targets during surge periods. The MLRS battalion is a corps asset and can be attached to a field artillery (FA) brigade or to division(s) within the corps. The MLRS battery is organic to armored and mechanized infantry divisions. Light infantry divisions may receive MLRS support from corps assets.

Section I

INTRODUCTION

★ MLRS EMPLOYMENT CONCEPT

The capabilities of MLRS make it one of the most versatile FA weapon systems available for both joint and combined arms operations. Its range, mobility, and lethality allow it to execute the full spectrum of fire support— providing close support to maneuver units, protecting the force with counterfire, and attacking operational targets for the division, corps, or joint task force commander.

Regardless of the tactical mission, MLRS units are positioned and fight well forward and use their shoot-and-scoot capability to improve survivability. When providing close support in the offense, MLRS units move with the maneuver forces they support, stop to fire as required, and then move rapidly to rejoin the formation. In the defense, these systems support maneuver units by moving laterally along the forward line of own troops (FLOT). This allows MLRS units to take maximum advantage of their range to protect manuver units from the destructive effects of the enemy's indirect fire systems. The mobility of the MLRS, coupled with its massive firepower, also makes it an ideal system to augment other artillery fires supporting cavalry units engaged in operations such as screening, covering force, and movement to contact.

The 30-kilometer (km) range of the MLRS rocket and the 100+ km range of the Army tactical missile system (ATACMS) provide the division, corps, and joint commanders with a deep strike option. To support deep operations, MLRS units are positioned close to the FLOT to engage the enemy at maxium ranges and to continue to attack him throughout the depth of the battlefield. Forward positioning is critical to accomplishing these deep missions. The MLRS units assigned the mission of firing ATACMS in support of a joint force comander's deep operation will often operate in a maneuver brigade area of operations. Intermixed with maneuver and cannon units, these MLRS units wi11 find themselves continually coordinating for positions within the maneuver brigade sector.

The MLRS plays a critical role in contingency operations because it provides a massive infusion of combat power in small, rapidly-deployable force packages. The extreme lethality of the MLRS family of munitions (MFOM), coupled with the air deployability of the system on a variety of aircraft, makes MLRS units the logical choice to provide fire support for initial entry forces when lethality for early deployers is a concern. This lethality, when linked with the system's extended range capability, provides devastating firepower to protect initial entry forces until cannon and other fire support systems are deployed.

Component

The system consists of the components described below.

M270 Launcher. Each launcher has the on-board capability to receive a fire mission, determine its location, compute firing data, orient on the target, and fire as many as 12 rockets or 2 missiles before reloading.

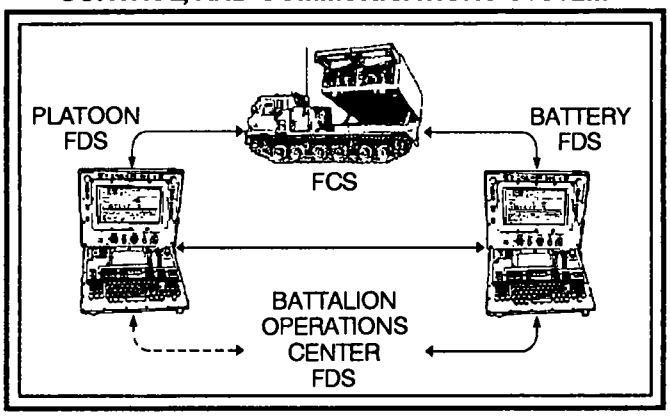
Launch Pod/Containers and Missile Launch Pod Assemblies. Each launch pod/container (LP/C) holds six rockets, and each missile launch pod assembly (M/LPA) holds one missile. Up to 12 rockets can be fired in less than 60 seconds and can be aimed at single or multiple

aimpoints. One or both missiles can be fired in less than 10 seconds and can be aimed at one or two separate aimpoints. Rockets or missiles can be fired individually, or a designated number can be fired at specified intervals. The rockets and missiles are factory loaded in launch pods.

Ammunition Resupply Vehicles and Trailers. The ammunition resupply capability for MLRS is provided by the heavy expanded-mobility tactical truck (HEMTT) M985 and the heavy expanded-mobility ammunition trailer (HEMAT) M989/M989A1. Each one can carry four launch pods for a total of 48 rockets or 8 missiles in a HEMTT and HEMAT load. (The HEMAT M989 is limited to two launch pods during peacetime operations. The HEMAT M989A1 does not have this limitation.)

Command, Control, and Communications System. The MLRS has an automated command, control, and communications (C3) system to provide command and control of subordinate launchers and to facilitate communication on the battlefield. Major components of the C3 system are the fire control system (FCS), located in the launcher, and the fire direction systems (FDSs), located at platoon headquarters and at the battery and battalion operations centers.

MAJOR COMPONENTS OF THE MLRS COMMAND, CONTROL, AND COMMUNICATIONS SYSTEM

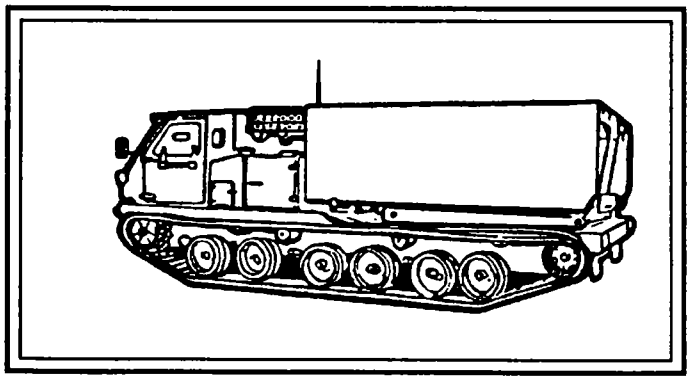


Section II
LAUNCHER AND SUBSYSTEMS

M270 Launcher

The M270 launcher is a highly mobile, lightly armored, tracked carrier vehicle with a launcher-loader module (LLM) mounted on the vehicle bed. The launcher has a three-man crew (section chief, gunner, and driver). Personal equipment is stored in the crew equipment storage containers located in the carrier under the LLM cage. References are listed in the references at the back of this publication.

M270 LAUNCHER



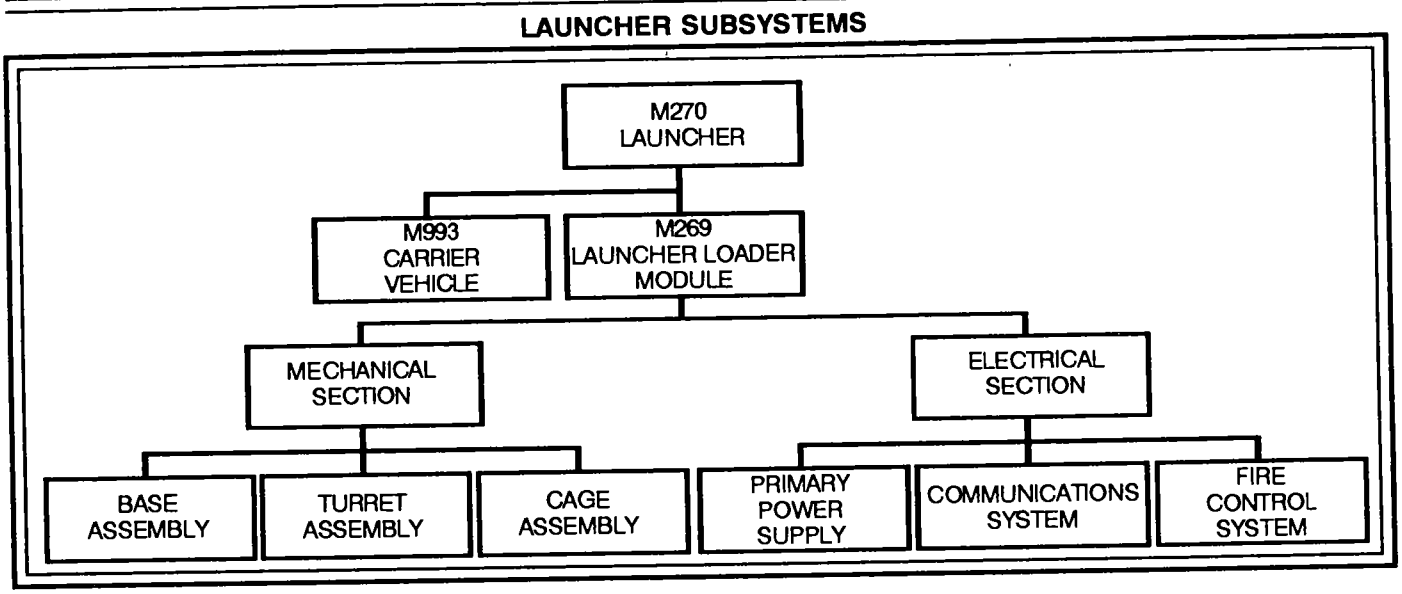
M993 Carrier Vehicle

The carrier vehicle is an elongated version of the Bradley fighting vehicle with 80 percent common components. It is 6.3 meters (m) (22 feet [ft] 11 inches [in]) long, 2.6 meters (8 ft 6 in) high, and 2.97 meters (9 ft 9 in) wide. When heaviest (loaded with M26 rocket LP/Cs), the launcher weighs approximately 24,700 kg (54,600 pounds). It can climb 60-percent slopes, ford 1.1 meters (40 in) of water, and climb 1-meter vertical walls. The launcher has a cruising range of 483 km (300 miles) and can be transported by C-141B and larger cargo aircraft. (See Appendix A.)

The vehicle cab is constructed of aluminum armor plate, providing ballistic protection to the crew. It is fitted with an M13A1 gas particulate filter unit. This unit protects the crew from chemical and biological agents and radioactive particles when each crew member connects his individual protective mask to the filter.

M269 LLM

The LLM is best described as consisting of two sections—a mechanical section and an electrical section.



LLM Mechanical Section

The mechanical section consists of base, turret, and cage assemblies. The base assembly provides for the physical mounting of the LLM to the carrier and rotates the LLM. The turret assembly elevates and depresses the LLM. The cage assembly performs two important functions. First, the structure of the cage assembly aligns, holds, and protects the launch pods. Second, two boom and hoist assemblies mounted in the cage assembly give the launcher crew a built-in loading and unloading capability.

LLM Electrical Section

The electrical section consists of three subsystems: the primary power supply, the communications system, and the FCS.

Primary Power Supply. The primary power supply is the source of power for all launcher equipment. It uses six standard military lead acid batteries to provide 24 volts of power to the launcher components. It also controls the distribution of power through the use of switching relays.

Communications System. The launcher communications system includes a secure FM radio set and one communications mode selector control (CMSC) device. The CMSC detects an incoming signal, determines whether it is digital or voice traffic, and automatically routes it to the secure FM radio in the proper mode for decryption. Each crew member has a combat vehicle crewman (CVC) helmet that is connected to an AN/VIC-1 intercom system.

Fire Control System. The FCS functions with the other launcher components to provide overall control of the LLM. It monitors, coordinates, and controls all electronic devices used during a launch cycle. The FCS consists of the fire control panel (FCP), improved electronics unit (IEU), fire control unit (FCU), boom controller (BC), short/no-voltage tester (SNVT), improved stabilization reference package/position determining system (ISRP/PDS), payload interface module (PIM), program load unit (PLU), and communications processor (CMP). Improvements to the electronics unit (EU) and stabilization reference package/position determining system (SRP/PDS) and the addition of the PIM and PLU (version 6 upgrade) enable the M270 launcher to fire the entire MLRS family of munitions (MFOM).

Fire Control Panel. The FCP, located in the front center of the carrier cab in front of the gunner's seat, has a data entry keyboard for manual entry operations and for message menu selection. The panel also gives alphanumeric displays in simple language. Next to the data keys are built-in test indicator lamps. These allow rapid detection and isolation of faults in the FCS.

Improved Electronics Unit. The IEU is referred to as simply the electronics unit (EU) from here on. The EU contains the computer program and data processing electronics to receive, compute, and distribute fire mission parameters.

Fire Control Unit. The FCU provides the link between the EU and the other launcher systems.

Boom Controller. The boom controller permits remote control of the loading and off-loading functions and positioning of the LLM for maintenance.

Short/No-Voltage Tester. The SNVT is a built-in test device used during loading operations. It is used to test the FCS umbilical cables. The test ensures that the cables are safe to connect to the loaded launch pods.

Stabilization Reference Package/Position Determining System. The ISRP/PDS is referred to as simply the SRP/PDS from here on. The SRP/PDS is composed of an electrically driven north-seeking gyrocompass and a position determining system. The SRP/PDS provides heading, elevation, launcher slope, and position location data to the FCS. The PDS uses two encoders in the vehicle final drives to determine position location data. Once updated at a survey control point (SCP), the SRP/PDS continuously computes location and provides these data to the FCS. If the launcher is stopped and the SRP/PDS is turned off, the last data recorded are retained. These data will be used to begin computation when the SRP/PDS is aligned and stabilized. Initial alignment of the system takes about 8 minutes. However, allowing the SRP to stabilize 3 to 4 minutes longer after SRP READY is displayed will increase the time before realignment from 17 minutes to 60 minutes for rocket munitions and from 7 to 28 minutes for the Army tactical missile system (ATACMS). If the launcher is moved with the SRP/PDS turned off or not stabilized, the position location capability is lost. The system must then be updated at an SCP before the launcher can respond to any fire mission requests. Errors in the system are minimized in two ways:

- Errors that are a function of time and total distance are corrected through the use of updates which must be performed after every 6 to 8 kilometers of travel. This requires the launcher to pull up to an SCP and enter the location data into the SRP/PDS through the FCS.
- Periodic calibration by the crew (at least every 30 days or after track or suspension maintenance) corrects for errors caused by changes in track tension or by wear of sprockets and track components. The procedure requires the use of two SCPs.

Payload Interface Module. The PIM provides communications power and interface between the loaded launch pods and the EU. Initial input of the EU munitions programs requires use of the PLU and the PIM.

Program Load Unit. The PLU is a program load group (PLG) PLG-39A with MBS-1000 removable cassettes. The PLG-39A can load and read a cassette, retrieve or delete specific files on a cassette, and uniquely identify and label a cassette. Each cassette holds from 128 to 512 kilobytes of memory (one or more munition programs), depending on its configuration. After configuration, the

EU itself can hold 1,024 kilobytes. The PLU is used to access specific munition programs on the cassettes. The hand-carried PLU issued to the firing platoons is used to program or change the current programming of the launcher EU. The EU holds all current weapons files and operational data for the launch and ballistic computation programs in its "bubble" (permanent, nonvolatile) memory. However, only those munition programs which have been moved into the EU random access memory (RAM) can be used by the launcher FCS to compute launch and other fire mission data. The launcher automatically identifies munition type from bubble to RAM, if it is available. If the proper software is not loaded, the crew can then use the PLU to load required munition data into the EU. The PLU requires at least 15 minutes to transfer an entire cassette of data. During very cold weather, more than 40 minutes may be required to transfer a cassette of data.

Communications Processor. The CMP controls the flow of the digital coded audio tone messages sent and received by the launcher communications-FCS interface. It is designed to ensure the FCS does not acknowledge nor allow itself to be disrupted by digital messages not addressed to that launcher. It also rejects any weak or garbled signals.

FCS Functions

The launcher FCS provides the link between the crew, external digital message sources, and the launcher components. It performs the following significant functions:

- Monitors and integrates all on-board sensor data.
- In conjunction with the launcher communications system, provides digital interface between the launcher crew and the command and control elements.
- Monitors the built-in test capability.
- Enables the crew to control launcher components.
- Uses programmed data and current mission input data to compute firing data for all fire missions.
- Lays the LLM and sets fuzes or programs warheads as required.
- Controls LLM operations.

The FCS receives data input in the following ways:

- Current mission data are input automatically through digital coded audio tone radio messages or manually through the FCP keyboard.
- The EU munitions programs are input from a tape through a program load unit.

The digital radio capability of the FCS, including the automatic input of current mission data, is the most common and preferred method of input. Through the radios, the FCS can communicate digitally with the platoon, battery, or battalion FDS. Secure digital communications between the tactical fire direction system (TACFIRE) or the lightweight TACFIRE (LTACFIRE) and a launcher FCS must be routed through an FDS because message formats are not compatible. The FCS allows the crew to send and receive fixed-format messages and to receive free-text messages.

The primary means of communication is frequency modulated (FM) digital secure; however, FM voice secure communication is available as a backup. In case of digital traffic failure or when operating with nondigital or target acquisition means, the crew can manually enter all data through the FCP keyboard.

The FCS automatically monitors, integrates, and computes data from the launcher electronic components. It continuously monitors the SRP/PDS data and computes launcher heading (travel direction), location, and altitude. It monitors the internal temperature of the launch pods and applies it in the computation of launch data.

The FCS determines the firing data when the target information is received. When the crew enters the appropriate mission command, the FCS lays the LLM on the required launch azimuth and elevation, sets the rocket fuze times, and/or programs the warheads. The FCS fires the rockets or missiles on command from the FCP.

The FCS continuously checks its components. It also checks the components of the LLM. These checks are made throughout the mission cycle. If a malfunction is detected, the crew members are notified by an error warning message displayed on the FCP.

The FCS can operate in five different language formats: United States, British, German, French, and Italian.

Note. The launcher is unable to fire the mission if a malfunction occurs in a launcher FCS; that is, in the FCP, EU, FCU, or SRP/PDS. Since no backup means exist to fire the launcher manually, the fire mission must be transferred to an operational launcher for completion.

Section III

MLRS FAMILY OF MUNITIONS

Launch Pod

Description

Each M270 holds either two LP/Cs or two M/LPAs (not a mix of the two) in the LLM. Each launch pod contains either six rocket tubes or one missile housing in a containerized shipping, storage, and launch frame. Rockets and missiles are factory assembled and tested; however, rockets are stored in fiberglass containers, and missiles are stored in an aluminum enclosure with fiberglass camouflage panels on the exterior. Both rockets and missiles are then mounted on the frame. Both the rocket tubes and the missile housing are connected by cable to common electrical connectors. Not only are handling, transport, and loading fixtures similar, the LP/C and M/LPA are also visually similar.

The launch pod is 4.04 meters (13 ft 3 in) long and 1.05 meters (3 ft 5 in) wide. The height of the pod is 0.84 meter (2 ft 8 in) with skids and 0.72 meter (2 ft 4 in) without skids. When loaded with rockets (tactical or practice), each LP/C weighs 2,270 kilograms (5,005 pounds); and an inert M27 training LP/C weighs 1,360 kilograms (2,998 pounds). A loaded M/LPA weighs 2,095 kilograms (4,609 pounds), and an inert training M/LPA weighs the same as the M27 training LP/C.

Four aluminum bulkheads provide rigidity to the frame and support for the fiberglass housing(s). Tie-down and lifting D-rings are located on the top of the frame at the four corners. A lifting rod is installed for lifting the container by the launcher boom and hoist assemblies.

Stacking pins at the top four corners of the frame permit stacking of the launch pods. They can be stacked two high during transport and four high during storage. They can be handled by forklift, since they have two inner bulkheads that serve as support members. Each launch pod is marked for center of gravity and proper lift areas.

The detachable skids mounted to the bottom four corners of the frame must be removed from the pod before it is loaded into the LLM. A quick-release pull pin allows easy removal of the skids. The M/LPA also has a lifting rod cover which must be removed before being loaded into the LLM.

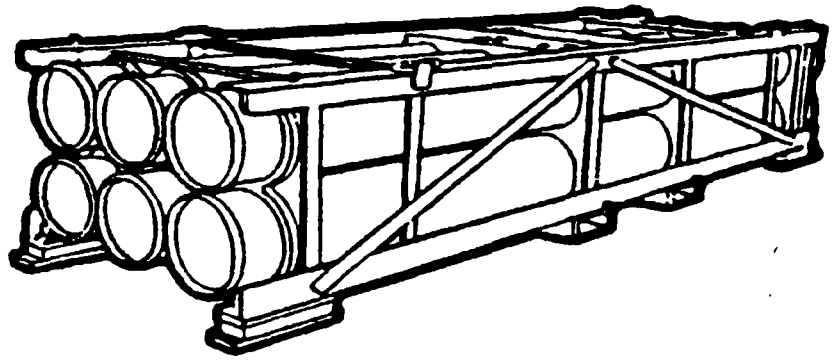
LP/C Configurations

M26 Rocket LP/C. This LP/C contains six tactical rockets, each armed with a warhead containing M77 DPICM submunitions.

M27 Training LP/C. This LP/C is an inert replica of the M26 and M28. It has six rocket tubes; three are ballasted, two are empty, and one (number 4) contains an electronic simulation device (fault insertion panel). This device gives the crewmen simulated readouts on the FCP of the launcher. The instructor or supervisor can interject simulated faults through the electronic device to the FCP. These faults include misfire, hangfire, and dud rocket fuze.

M28 Rocket LP/C. This LP/C contains six practice rockets, each armed with a warhead containing spotting charges.

LAUNCH POD



M/LPA Configurations

M39 Missile M/LPA. The M/LPA contains one ATACMS missile armed with a warhead containing M74 antipersonnel and antimateriel (APAM) submunitions.

M/LPA Trainer. The M/LPA trainer contains an electronic simulation device similar to that for the LP/C. It simulates either missiles or rockets and possible faults, to include multiple faults.

Rocket Assembly

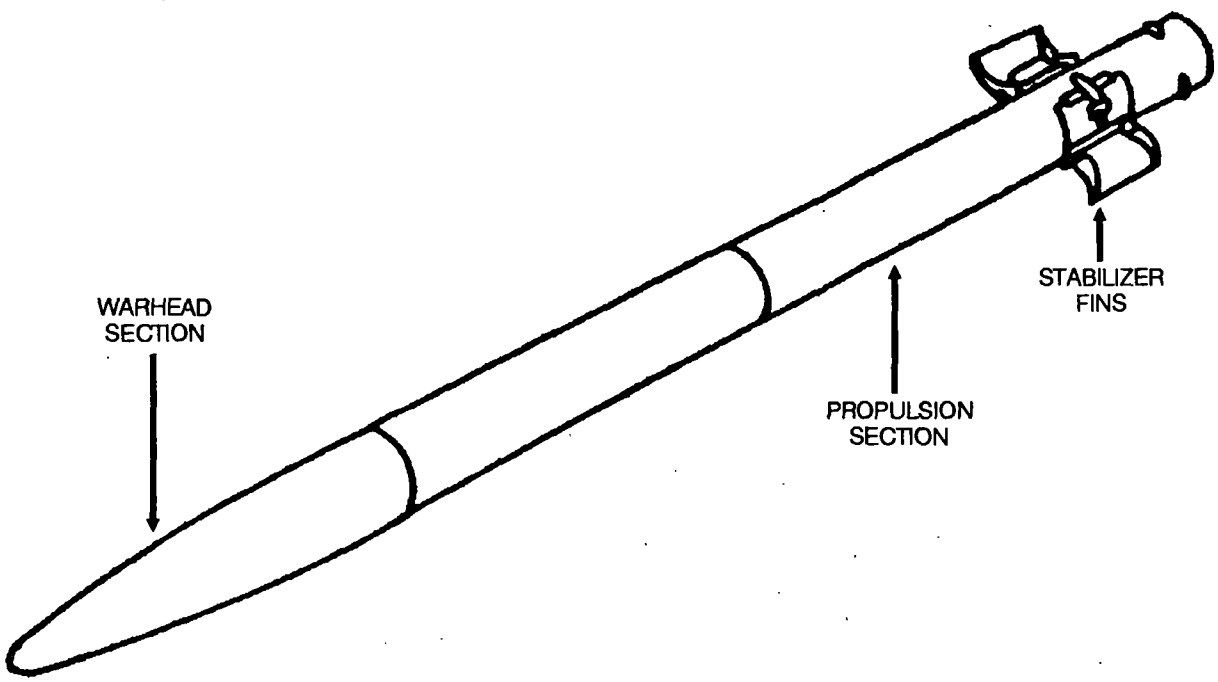
The MLRS rockets are tube-launched, spin-stabilized, free-flight projectiles. The rockets are assembled, checked, and packaged in a dual-purpose launch-storage tube at the factory. This design provides for tactical loading and firing of the rocket without troop assembly or detailed checkout. Major components of the rocket assembly include four stabilizer fins, a propulsion section, and a warhead section.

The MLRS rocket follows a ballistic, free-flight (unguided) trajectory to the target. The four stabilizer fins at the aft end of the rocket provide in-flight stability by maintaining a constant counterclockwise spin. The initial spin is imparted to the rocket through spin rails mounted on the inner wall of the launch tube.

Each rocket is packaged with the four fins folded and secured by wire rope retaining straps. As the rocket moves forward upon firing, lanyard devices trigger a delayed strap-cutting charge. After the rocket leaves the launch tube, the charge cuts the straps. This allows the fins to unfold and lock. The M28 rocket LP/C has an additional fin release device to ensure deployment.

Propulsion for the rocket is provided by a solid propellant rocket motor. An umbilical cable, passing through the aft end of the launch tube, links the FCS to an igniter in the rocket nozzle. The motor is ignited by an electrical command from the FCS.

ROCKET ASSEMBLY



Missile Assembly

The ATACMS missiles are tube-launched, fin-stabilized, ballistically launched, inertially guided missiles. The missile can be fired from any properly configured launcher and will be deployed with MLRS units with a deep attack mission. Like the rockets, they are assembled, checked, and packaged in a dual-purpose launch/storage tube at the factory. The missile has four sections–the guidance, warhead, propulsion, and control sections.

The missile follows a semiballistic, guided trajectory to the target. The guidance section consists of an inertial guidance unit (IGU) and associated equipment for determining flight path, adjusting and setting the four control fins, and initiating warhead event.

The control fins at the aft end of the missile are folded during storage. When the missile leaves the M/LPA, the spring-loaded fins snap into position and lock. They receive maneuver instructions from the IGU during flight.

The missile is propelled by a solid propellant motor of the same type as the rocket motors. Motor burn time, missile range, and related data are classified.

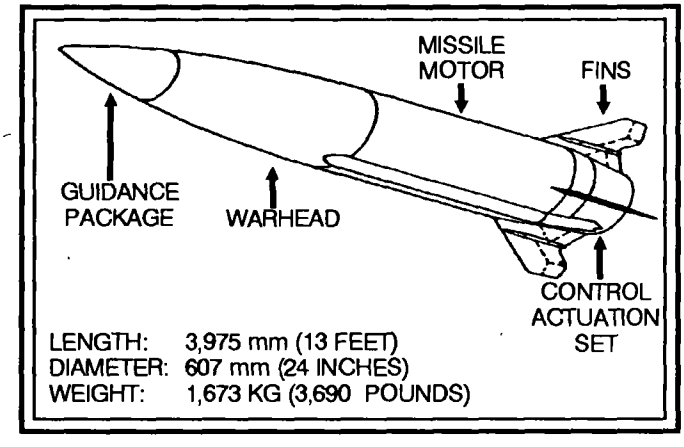
Rocket Warheads

Currently, MLRS has only two rocket types—the M26 with standard M77 DPICM and the M28 practice rocket. The MLRS can also deliver the German AT2 scatterable mine warhead, each of which dispenses 28 antitank mines.

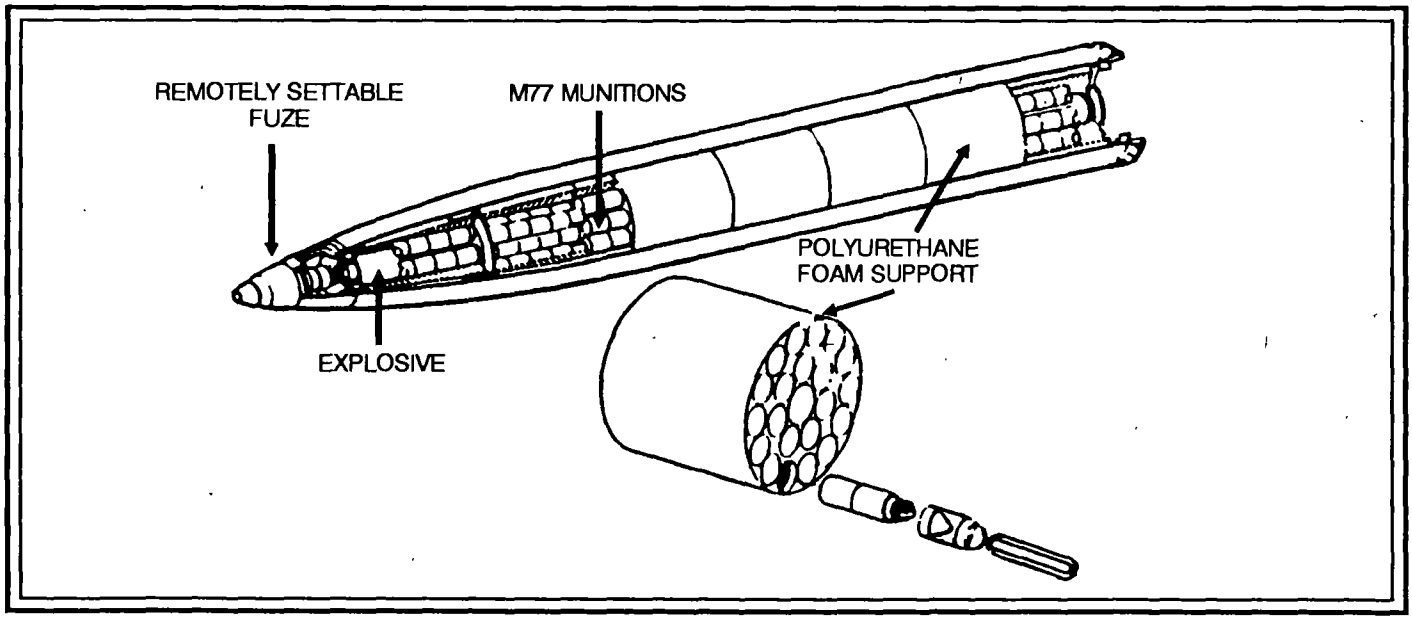
M26 Rocket Warhead

Warhead Description. This warhead is the basic, multipurpose warhead of the MLRS. It is used against personnel and soft and lightly armored targets with low or high target location errors (TLEs). Each rocket dispenses a cargo of 644 M77 DPICM submunitions over the target area.

ATACMS MISSILE ASSEMBLY



MLRS M77 DPICM WARHEAD SECTION



Warhead Function. Warhead event is initiated by an electronic time fuze (M445) that is set remotely by the FCS immediately before ignition of the rocket motor. The fuze triggers an electronic squib that ignites a center burster charge. This causes the warhead to rupture, the polyurethane filler to shatter, and the submunitions to be spread over the target area.

Submunition Description. The armed M77 submunitions detonate on impact with effects against both personnel and lightly armored materiel. The antimateriel capability is provided through a shaped charge with a built-in standoff. The M77 shaped charge can penetrate 2 1/2 to 4 inches of armor. When it explodes, its steel case fragments, producing an antipersonnel radius of 4 meters.

M28 Rocket Warhead

The M28 rockets are available for live firing at Army training installations. The practice rocket has a ballasted warhead with the same flight characteristics as the tactical rocket. It has a spotting charge consisting of lengths of steel pipe and three smoke canisters rather than submunitions.

Missile Warheads

The ATACMS missile design allows it to carry a variety of submunitions, to include "smart" munitions and lethal mechanisms to provide a wide range of future capabilities. Currently, the Army has only one ATACMS missile type, the M39 missile with the APAM M74 warhead.

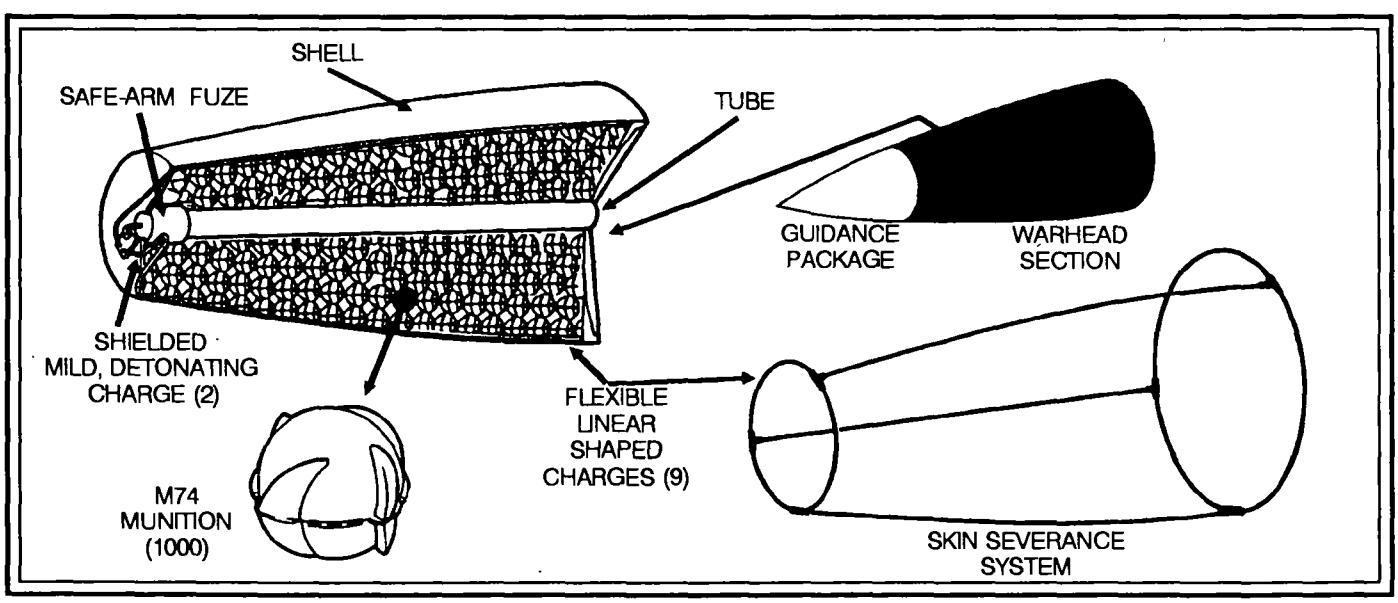
M39 Missile Warhead

Warhead Description. This warhead is used against personnel and soft targets with a low TLE. Each missile dispenses a cargo of about 1,000 APAM M74 grenades over the target area.

Warhead Function. Warhead event is initiated by an electronic time fuze (M219A2) that is set in the same manner as the M445 electronic time fuze of the MLRS DPICM rocket. The fuze detonates shaped charges mounted to the skin and bulkheads. This in turn severs the skin. By means of centrifugal force and airstream currents, the M74 grenades are distributed over the target area. Arming of the M74 grenades is accomplished by the spin action which is induced on the individual grenade.

Submunition Description. The M74 grenade is filled with composition B explosive filler and is covered by a steel shell. Upon detonation, each grenade breaks up into a large number of high-velocity steel fragments that are effective against targets such as truck tires, missile rounds, and radar antennas. The M74 grenade also contains incendiary material and has an antipersonnel radius of 15 meters.

ATACMS APAM M74 WARHEAD SECTION



Section IV

ASSOCIATED EQUIPMENT

Ammunition Resupply Vehicle and Trailer

Ammunition for the MLRS is resupplied by using the HEMTT and the HEMAT. The two-man HEMTT-HEMAT crews can be trained with expended, weighted launch pods.

The M985 HEMTT is a 10-ton, 8-wheel or 8-wheel-drive truck with a 5,400-pound lift capacity materiel-handling crane. An FM radio with a secure device provides FM secure voice command and control capability. The rear-mounted crane can traverse 360° to the left or right. Both the HEMTT and the HEMAT can be loaded and unloaded with the crane. The HEMAT does not have to be unhooked from the HEMTT. The truck carries four launch pods with a maximum on- or off-road gross vehicle weight of 59,000 pounds. Its operating range is 300 miles, and it can climb a 30-percent slope. The HEMTT has a 445-horsepower diesel engine with an automatic transmission. It can be transported by C-130 and C-141B aircraft in an unloaded configuration and by C-5A/C-5B aircraft in a loaded tactical configuration. (See Appendix A.)

The M989 HEMAT can carry two launch pods in peacetime operations. The gross weight of a trailer loaded with two M26 LP/Cs is about 17,000 pounds. The trailer can be towed by a launcher in an emergency. The M989A1 HEMAT can carry four launch pods and has a fully loaded gross weight of 31,000 pounds.

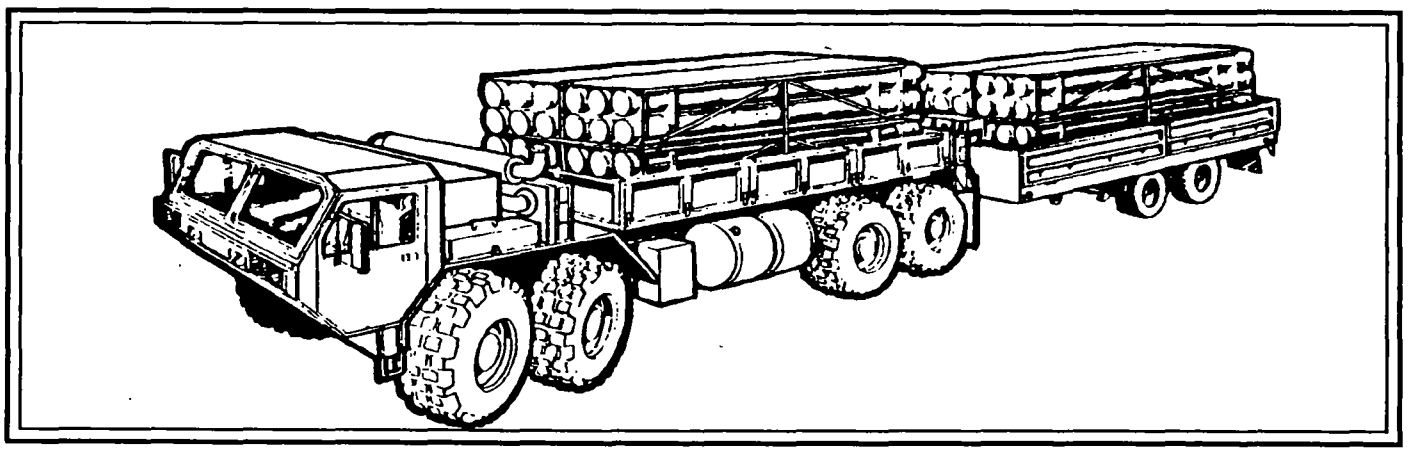
Command, Control, and Communications System

Tactical command and control and technical fire direction of MLRS units is provided through a C3 system. This system is designed to be integrated with several Army and Air Force command, control, communications, and intelligence (C3I) systems to optimize fire support system employment and effectiveness. The MLRS C3 system also can be used to conduct and execute command and control without external C3 input during independent operations. This independent C3 capability exists at battalion, battery, and platoon levels. The major components of the MLRS C3 system can communicate digitally with the following systems:

- The TACFIRE and LTACFIRE.
- The cannon battery computer system (BCS).
- The digital message device (DMD).
- The all-source analysis system (ASAS).
- The advanced field artillery tactical data system (AFATDS).
- The airborne target handover system (ATHS).

The MLRS C3 system also can communicate digitally through the ground station module (GSM) and the commander's tactical terminal (CTT) to Air Force and Army sensor systems such as the joint surveillance target attack radar system (JSTARS) and the Guardrail signals intelligence (SIGINT) system.

RESUPPLY VEHICLE AND TRAILER



Fire Direction System

The FDS provides tactical fire direction and digital command and control capability to the MLRS platoon, battery, and battalion. Initialization defines the FDS capabilities unless it is changed.

Components

The FDS consists of a battery computer unit (BCU), a printer, radio communications equipment, a power distribution unit (PDU), and communications security devices.

Peripheral Equipment

Peripheral equipment is added to the BCU as separate components to complete the FDS. These components are discussed below.

Power Distribution Unit. The PDU supplies power to all of the FDS components. It has two nickel-cadmium batteries that provide enough power to save the memory in the BCU if the primary power fails.

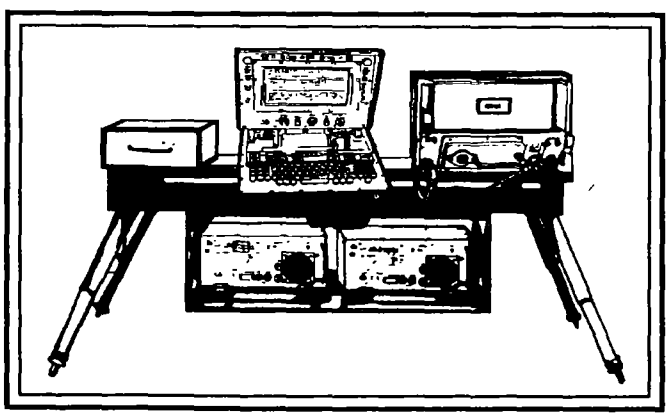
AN/UGC-74A Printer. The printer can provide a printed (hard) copy of all messages transmitted and received by the FDS.

Secure FM Radios. The FDS can communicate on two digital channels (internal and/or external fire direction nets) at the same time.

KG-31 Crypto Device. Each FDS is equipped with a KG-31 to provide secure digital communications with other KG-31-equipped devices such as TACFIRE.

Tape Transport Unit. Each FDS is equipped with a tape transport unit (TTU) to load the system software into the BCU.

FIRE DIRECTION SYSTEM



Communications Mode Selector Control. The CMSC distinguishes between received digital and voice traffic and sends these data to the KY-57 for decryption.

KY-57 Crypto Device. This device provides secure voice communications and secure digital communications with other FDS and FCSs.

Commander's Tactical Terminal and Ground Station Module

The MLRS battalions providing fires in support of the deep battle will be equipped with the CTT and/or the GSM. Both devices will give the MLRS battalion communications and fire support interface with Army and Air Force airborne sensor systems. The sensors will provide pinpoint near-real-time acquisition and tracking of deep, moving, high-payoff targets for scheduled or immediate unscheduled attack.

Commander's Tactical Terminal

The CTT provides full duplex data (can receive and transmit at the same time) and half duplex (can receive and transmit but not at the same time) voice communications between ground processing facilities (GPFs) and airborne sensor and data collection systems (such as the Guardrail SIGINT system). The system consists of an operator terminal, a processor, a receiver-transmitter, an adaptive array processor, an antenna, and a mast.

Ground Station Module

The GSM is an integral part of the JSTARS sensor and data collection system. It functions as the MLRS battalion tactical operations center (TOC) direct interface with the airborne sensor. The GSMs can receive unprocessed data from JSTARS, from the OV-1D Mohawk side-looking airborne radar (SLAR), and the Guardrail SIGINT system. The GSM is a ground-mobile, air-transportable, and self-contained C3I node. It is mounted on a 5-ton truck or on a high-mobility multipurpose wheeled vehicle (HMMWV) for light operations; it has its own generators, radios, and operators. Using United States message text formats (USMTFs) compatible message standards, the GSM can interface with the following Army tactical command and control systems (ATCCSs):

- Maneuver control system (MCS).
- ASAS.
- The TACFIRE and LTACFIRE.
- AFATDS.
- Forward area air defense command and control (FAADC2).

The GSM communicates over landline, FM digital radio links, and/or mobile subscriber equipment (MSE). It receives, displays, and/or stores all sensor input simultaneously. The GSM also interfaces with the French Orchidee radar system and the British Ostor Islander.

Survey Equipment

The survey section of the MLRS battery is equipped with one position and azimuth determining system (PADS). This equipment gives the MLRS battery a highly mobile survey capability.

Characteristics of the PADS are that it is—

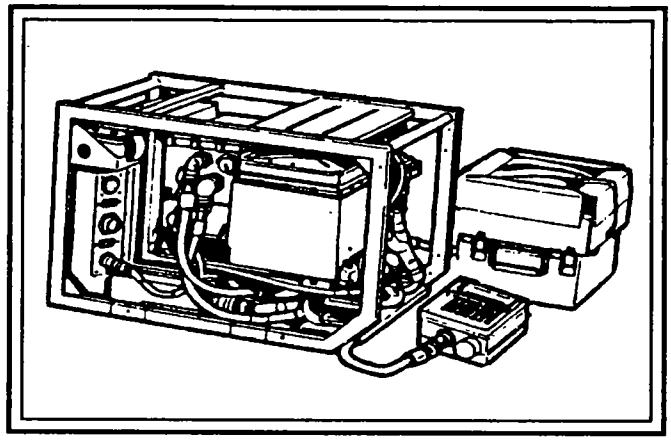
- A self-contained surveying system that rapidly determines accurate location, azimuth, and altitude.
- Operated by two people.

Results of using the PADS are that—

- Rapid survey is provided to facilitate dispersion of platoons.
- Occupation of unsurveyed positions is minimized.

If PADS is inoperable, the battery has several alternate means by which to establish survey control. The reference for the PADS is TM 5-6675-308-12.

POSITION AND AZIMUTH DETERMINING SYSTEM



CHAPTER 2

ORGANIZATION

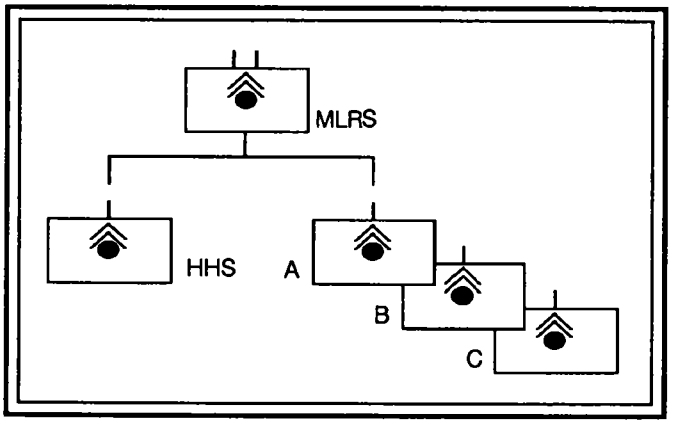
★ *The MLRS units are organized and equipped to provide FA rocket and missile fires in support of maneuver units and to reinforce the fires of other FA units. The MLRS battalion is usually attached to an FA brigade but may be attached to a division. An MLRS battery (btry) is organic to a heavy division artillery (div arty) to provide immediately responsive fires to the division commander.*

MLRS Battalion

The MLRS battalion is composed of a headquarters, headquarters and service battery (HHSB) and three firing batteries with nine launchers each.

The battalion can operate as a single unit, or it can detach batteries to perform separate tactical missions. When conducting separate battery operations, the MLRS battalion headquarters may assume control of one or more of its own batteries and of divisional MLRS batteries. In this role, the battalion headquarters may act as an MLRS controlling headquarters in coordination with the force artillery commander.

MLRS BATTALION



Headquarters, Headquarters and Service Battery

The HHSB is organized only in MLRS battalions. It is organized and equipped to coordinate administrative, logistical, maintenance, and communications support for the battalion headquarters and three firing batteries. The functional elements of the HHSB are discussed below.

Battalion Headquarters

The battalion headquarters consists of the battalion commander and his staff: the executive officer (XO), adjutant (S1), operations officer (S3), battalion maintenance officer (S4), battalion signal officer (BSO), chaplain, and command sergeant major (CSM). This headquarters controls and coordinates battalion activities. Equipment includes two 1 1/4-ton HMMWVs and two secure FM radios.

Battery Headquarters

The battery headquarters is supervised by the battery commander (BC) and the first sergeant (1SG). It includes the supply sergeant, an armorer, and a driver. It provides command and control and administrative, supply, and limited security support to the battery. The TOE equipment includes two HMMWVs, one 2 1/2-ton truck, and one secure FM radio.

Operations and Intelligence Section

The operations and intelligence (O&I) section is supervised by the S3. It is staffed with an operations officer; an intelligence sergeant; an operations sergeant; a chemical officer; a nuclear, biological, chemical (NBC) noncommissioned officer (NCO); a chief fire direction computer; four fire direction computer personnel; and a decontamination specialist. The O&I section makes up most of the battalion TOC and fire direction center (FDC). The O&I section has tactical control over and provides tactical fire direction to the batteries. It provides intelligence and security information, performs tactical operations, supervises NBC operations, and develops training plans for the battalion. Equipment includes two M577 command post (CP) carriers, one HMMWV, one high-frequency (HF) amplitude modulated (AM) radio, and four secure FM radios.

Survey Planning and Coordination Element

The survey planning and coordination element (SPCE) is supervised by the reconnaissance and survey officer (RSO). It includes a chief surveyor and a vehicle driver. The SPCE normally operates as a part of the battalion TOC, planning and coordinating the battalion survey efforts. The SPCE is not equipped with surveying equipment but is an administrative center only. Equipment includes one HMMWV with one secure FM radio.

Liaison Section

★ The liaison section is supervised by the liaison officer (LO). It includes a liaison sergeant and a liaison specialist. The section augments existing fire support elements when the MLRS unit supports a maneuver unit and provides liaison to a reinforced FA unit when the battalion is assigned a mission of reinforcing (R) or general support reinforcing (GSR). Equipment includes one HMMWV and one secure radio.

Signal Section

Battalion signal support is provided by the signal section, which is supervised by the BSO. The signal section is responsible for the maintenance and repair support of the battalion communications (comm) systems and establishes and maintains the FM retransmission station as required. Equipment includes two HMMWVs, one of which is equipped with a secure FM retransmission radio.

Personnel and Administration Center

The battalion personnel and administration center (PAC) is supervised by the battalion S1. It includes a PAC supervisor, a clerk-typist, two personnel administrative specialists, a personnel services NCO (PSNCO), and a chaplain assistant. It provides administrative and legal support and helps the battalion commander provide for the welfare of the battalion personnel. Equipment includes a HMMWV, a 2 1/2-ton truck, and a facsimile (fax) machine.

Battalion Supply Section

The battalion supply section is supervised by the S4/battalion maintenance officer. It includes a warrant officer property accountability technician, three supply sergeants, petroleum tanker operators, and a supply specialist. The section coordinates the overall supply activities of the battalion and conducts supply operations in support of the HHSB. It works closely with the O&I section in monitoring the resupply of ammunition and fuel. Equipment includes a 2 1/2-ton truck, a HMMWV, a HEMTT fuel tanker, and one secure FM radio.

Medical Treatment Team

Battalion medical support is provided by the medical treatment team. The ambulance team and a combat medical section support the medical treatment team. Battalion medical activities are supervised by the primary care physician. Support personnel include a physician assistant, an emergency treatment NCO, two medical specialists, two ambulance drivers, and three combat medics. The medical teams provide sick call, limited medical services, and emergency medical treatment for patients who must be evacuated. Equipment includes two 2 1/2-ton trucks, one HMMWV ambulance, and two secure FM radios.

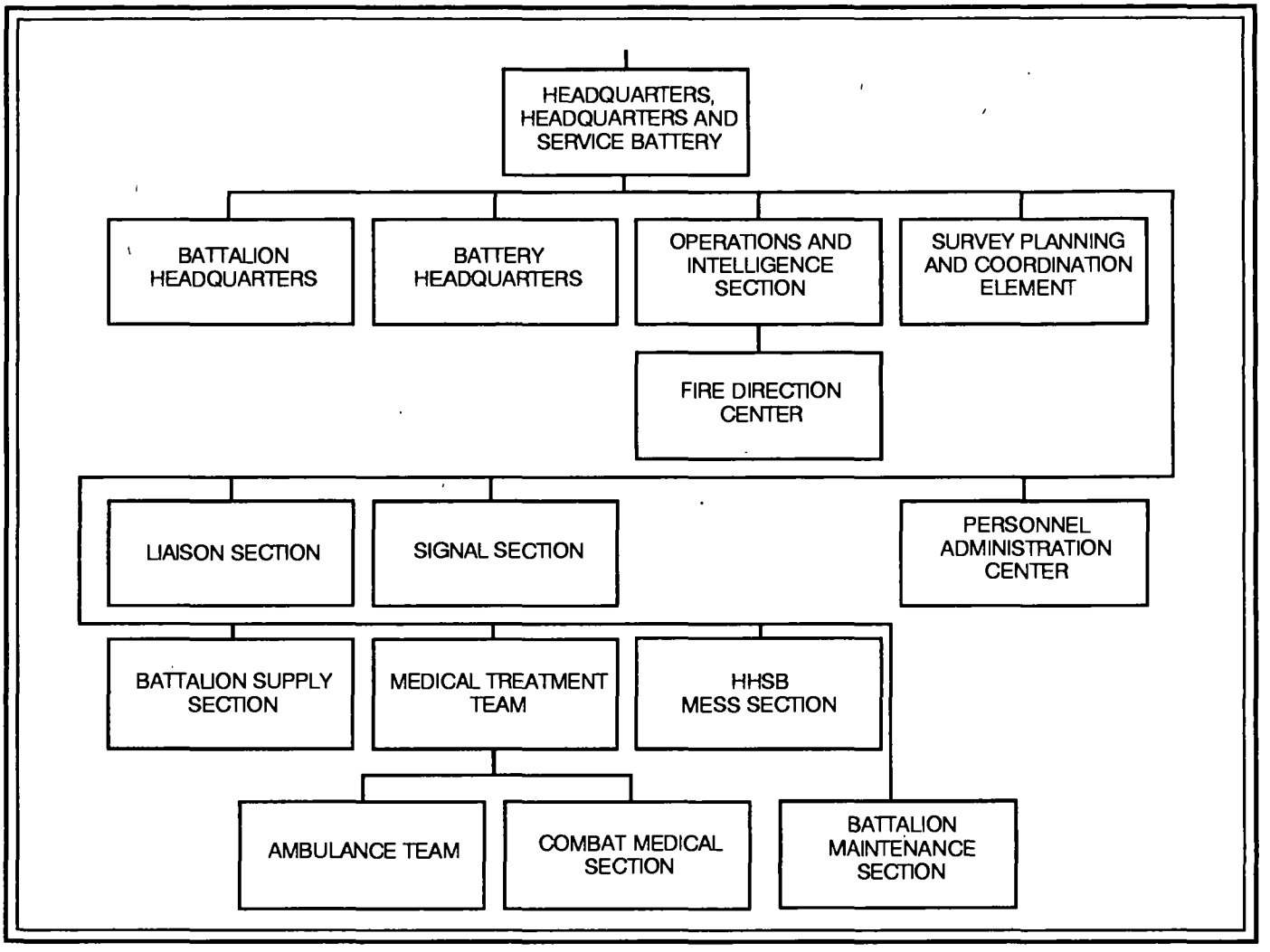
HHSB Mess Section

The HHSB mess section is supervised by a food service sergeant. It includes three cooks, one 2 1/2-ton truck, and a field kitchen trailer. The mess section provides mess support to the HHSB.

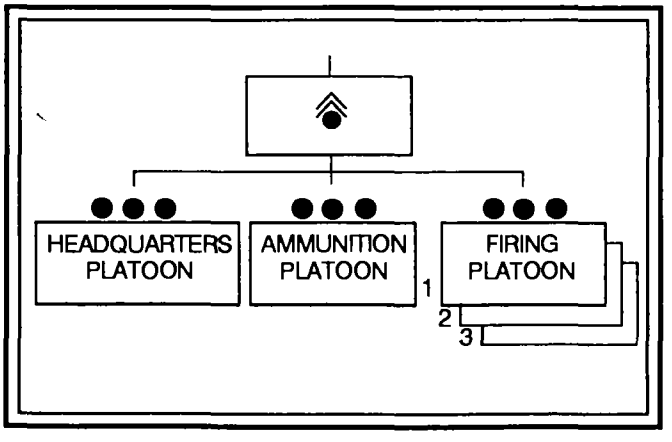
Battalion Maintenance Section

The battalion maintenance section is supervised by the S4/battalion maintenance officer and is staffed with a warrant officer maintenance technician and 15 HHSB maintenance personnel. It provides automotive maintenance and recovery support to the HHSB and technical advice and expertise to the battalion and battery commanders on matters concerning maintenance operations. It coordinates maintenance and maintenance supply with the intermediate DS unit and maintenance support teams within the battalion. The section is organized and equipped to field on-site unit maintenance teams for equipment repair. The section keeps its own prescribed load list (PLL). It can draw, transport, and issue or install all organizational repair parts for the HHSB. Equipment includes one HMMWV, two 2 1/2-ton trucks, one HEMTT wrecker, one tracked recovery vehicle, and three secure FM radios.

HEADQUARTERS, HEADQUARTERS AND SERVICE BATTERY



MLRS FIRING BATTERY



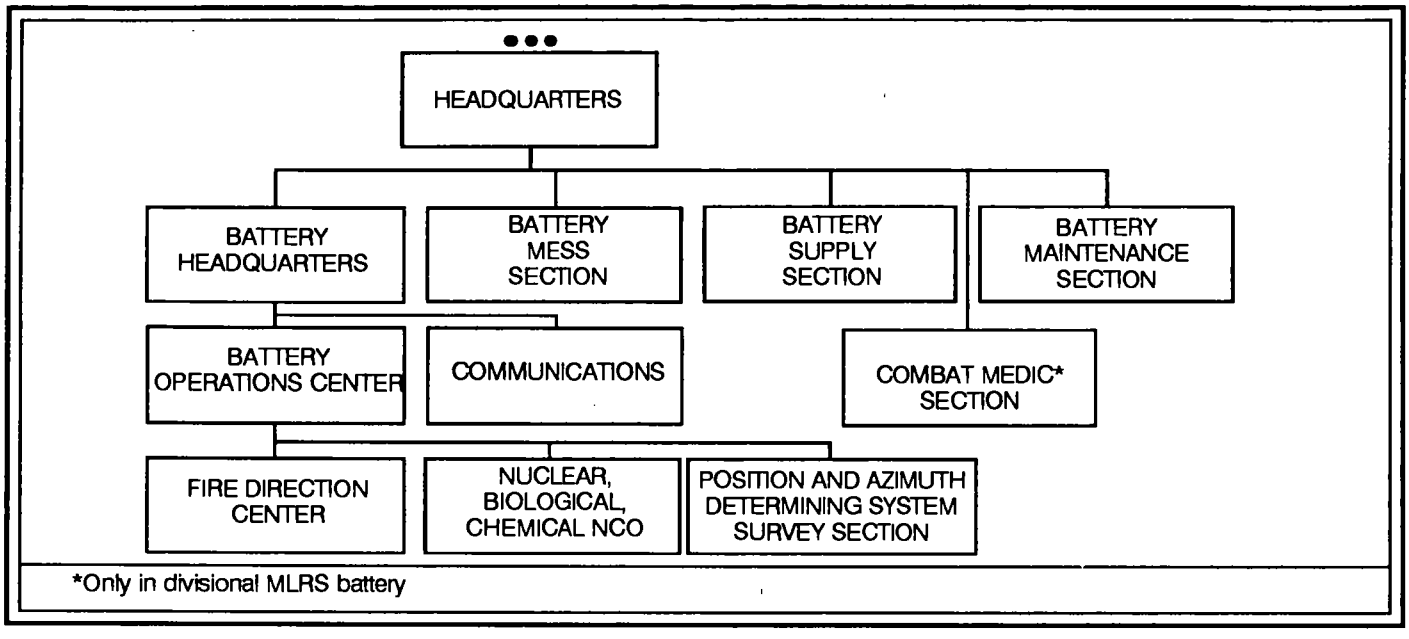
MLRS Firing Batteries

The MLRS firing batteries are organized similarly, whether assigned to a div arty or to an MLRS battalion. These firing batteries are structured for independent operations much like cannon battalions. The MLRS firing battery consists of a headquarters platoon, an ammunition (ammo) platoon, and three firing platoons.

Headquarters Platoon

The headquarters platoon consists of the battery headquarters, mess, supply, maintenance, FDC, and the PADS survey section. The divisional MLRS battery also has a combat medic.

MLRS FIRING BATTERY HEADQUARTERS PLATOON



Battery Headquarters. The battery headquarters (HQ) consists of the BC, 1SG, an NBC NCO, a signal NCO, and a signal specialist. A divisional MLRS battery also has a unit clerk. The signal NCO and specialist provide limited communications-electronics (C-E) installation, troubleshooting, and repair support to the battery. The battery headquarters command element (commander and 1SG) and the BOC provide the necessary C3 and coordination of internal and external administrative and logistical support for the battery.

Battery Operations Center. The FDC is an integral part of the battery operations center (BOC). It provides fire direction and comm control. The remaining elements coordinate and supervise battery NBC activities, survey support, and basic medical support for battery personnel; and they help control and coordinate other battery operations as required.

Battery Mess Section. The battery mess section is equipped with the mobile field kitchen trailer. It can draw, prepare, serve, and deliver rations (using the supply section 1 1/4-ton HMMWV vehicles) to the battery headquarters, the firing platoons, and the ammunition platoon.

Battery Supply Section. The battery supply section is organized and equipped to draw and issue supplies of all classes except I, V, VIII, and IX. It can also transport and deliver these supplies to the three firing platoons.

Battery Maintenance Section. The battery maintenance section performs organizational automotive maintenance on all battery equipment except radio and electronic equipment. The section is organized and equipped to field on-site unit maintenance teams for equipment repair. The section keeps its own PLL. It can draw, transport, and issue or install all organizational repair parts for the battery. The section is equipped with both wheeled and tracked recovery vehicles.

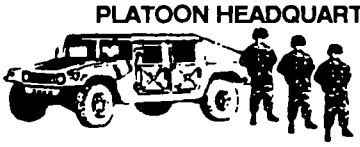
Combat Medic. The three combat medics of the divisional MLRS battery supports the entire battery. In the MLRS battalion, the HHSB medics usually are deployed with the firing batteries to provide medical support.

Ammunition Platoon

The ammunition platoon provides Class V (rocket, missile, and small-arms ammunition) support for the MLRS battery. The platoon has a 1 1/4-ton HMMWV and 18 resupply vehicles and trailers (RSV/Ts). All vehicles are equipped with secure FM radios. The platoon is comprised of a platoon headquarters and three ammo sections. These sections can resupply ammunition from corps ammunition storage points or ammunition transfer points (ATPs) to the three firing platoons and battery stocks.

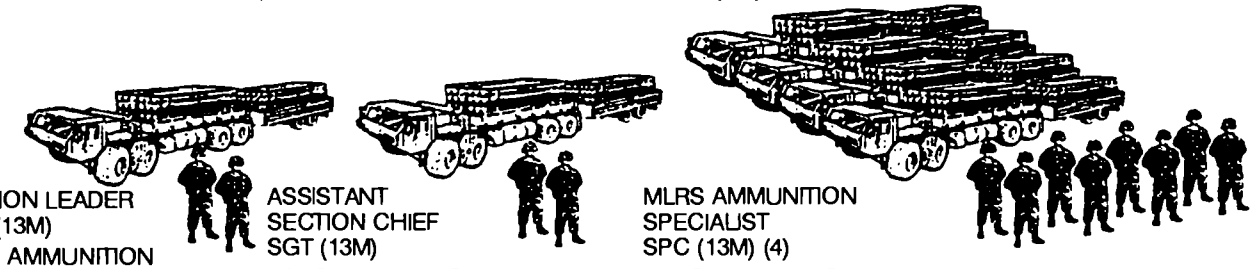
AMMUNITION PLATOON

PLATOON HEADQUARTERS



PLATOON LEADER
1LT (13B)
PLATOON SERGEANT
SFC (13M)
VEHICLE DRIVER
PFC (13M)

AMMUNITION SECTION (X 3)



SECTION LEADER
SSG (13M)
MLRS AMMUNITION
SPECIALIST
PFC (13M)

ASSISTANT
SECTION CHIEF
SGT (13M)
MLRS AMMUNITION
SPECIALIST
SPC (13M)

MLRS AMMUNITION
SPECIALIST
SPC (13M) (4)
MLRS AMMUNITION
SPECIALIST
PFC (13M) (4)

LEGEND: **1LT** = first lieutenant; **PFC** = private first class; **SFC** = sergeant first class; **SGT** = sergeant; **SPC** = specialist; **SSG** = staff sergeant

Firing Platoons

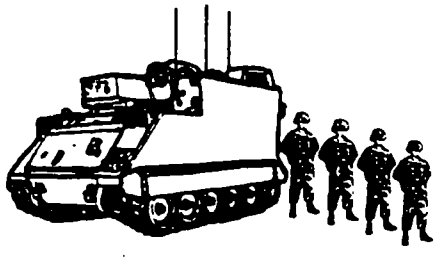
The MLRS battery has three firing platoons. Each platoon (plt) has a platoon headquarters and three firing sections. The platoon HQ is equipped with one M577 CP carrier, four secure FM radios, an FDS, and two 1 1/4-ton HMMWVs with secure FM radios. Each firing section has one launcher with one secure FM radio set.

FIRING PLATOON

PLATOON HEADQUARTERS

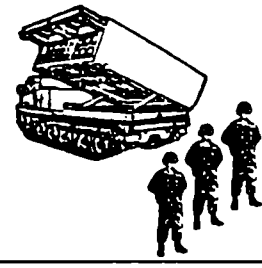
PLATOON LEADER
1LT (13B)
LIGHT VEHICLE
DRIVER
PFC (13M)

RECONNAISSANCE
SERGEANT
SGT (13M)



PLATOON SERGEANT
SFC (13M)
BATTERY DISPLAY
OPERATOR
SGT (13P)
FIRE DIRECTION
SPECIALIST
SFC (13P)
FIRE DIRECTION
SPECIALIST
PFC (13P)

FIRING SECTION (X 3)



FIRING SECTION CHIEF
SSG (13M)
GUNNER
SGT (13M)
SELF-PROPELLED
LAUNCHER LOADER
DRIVER
PFC (13M)

CHAPTER 3

DUTIES OF KEY PERSONNEL

Although the duties of key personnel in the MLRS unit closely parallel those in other artillery units, they are unique in some ways. Generally, MLRS battalion and battery personnel are responsible for tasks performed by higher grades in cannon units. The discussions in this chapter cover the major duties of personnel in MLRS units. They are not intended to be all-inclusive but rather to highlight major functions unique to the system.

Section I

MLRS BATTALION

Battalion Commander

The battalion commander, aided by the battery commanders and staff, controls all the tactical, training, logistical, and administrative activities of the battalion. He directs employment of the battalion in accordance with assigned missions and the guidance from force FA headquarters. He works closely with the commanders of supported and supporting units to ensure that the battalion can accomplish its mission. He establishes policies to promote discipline and morale within the battalion.

Executive Officer

The XO directs, supervises, and ensures coordination of the staff sections. He oversees all logistical functions within the battalion, acts on behalf of the commander to direct the logistical support of the battalion, and commands the battalion in the absence of the commander.

S1 Officer

The S1 coordinates and directs the activities of the battalion PAC to ensure that the commander's policies, guidance, and orders for personnel administration are implemented. The S1 is the main staff advisor to the commander in the areas of personnel management, morale, discipline, and equal opportunity. He maintains the unit strength through requisition of new personnel and outprocessing of departing soldiers.

S3 Officer

The S3 officer is responsible for operations, intelligence, planning, and training within the battalion. Through the O&I section, he provides tactical and fire direction control to the batteries. He directs the employment of the batteries to meet the needs of the supported units. He plans for the employment of the batteries and recommends the allocation of resources based on the current tactical situation and proposed future actions. He prepares and publishes command standing operating procedures (SOPs), operation plans (OPLANs), and operation orders (OPORDs). He is responsible for establishing and directing the battalion training plan.

Battalion Maintenance Officer (S4)

The battalion maintenance officer coordinates all logistical functions for the battalion (S4). He is responsible for the continuous flow of all classes of supply (except Class VIII, medical) to the battalion. He identifies the support requirements, provides them to the supporting unit, and coordinates with the supporting unit to ensure requirements are met. He recommends policies and procedures to increase unit logistic readiness posture. He provides guidance on the execution of logistics operations to the battery supply and maintenance sections.

Operations Officer

The operations officer directs the operations of the battalion FDC. He functions as the S2, directing the actions of the intelligence sergeant. He ensures that all fire direction and intelligence information is processed and dispersed to the batteries; that the commander's guidance on all fire direction and security matters is properly executed; and that fire direction and intelligence information is kept on maps and charts, including ammunition and weapons status.

Reconnaissance and Survey Officer

★ The RSO directs the operations of the SPCE and is the battalion's principal advisor on survey operations. He is mainly concerned with coordinating timely survey control for the firing batteries. He maintains current maps and trigonometric (trig) lists and keeps the battery PADS survey sections informed of available survey information. He may conduct reconnaissance, selection, and occupation of position (RSOP) for the headquarters. He may also perform S2 functions if the operations officer becomes fully engaged in FDC operations.

Field Artillery Liaison Officer

★ The LO directs the liaison section and represents the MLRS battalion commander with supported units. He advises the supported commander on battalion capabilities, limitations, and disposition. He recommends employment options and helps coordinate fires of the MLRS battalion with other fire support assets. He keeps the MLRS battalion commander informed on the current situation of the supported unit and on future requirements.

Chemical Officer

The chemical officer advises the commander and staff on NBC defense matters. He prepares the NBC portion of plans and orders and prepares NBC estimates and SOPs for defense against NBC attacks. He exercises staff supervision over NBC training throughout the battalion.

Battalion Signal Officer

The BSO is a special staff officer who has operational control of the signal and radio sections. He advises the commander on communications within the battalion. He advises the commander and staff on electronic counter-countermeasures (ECCM), signals security (SIGSEC), comm training, comm planning, and CP site selection. He prepares the signal annex of the unit OPORDs, OPLANs, and SOPs. He supervises the installation, operation, and maintenance of the battalion comm system and equipment. He coordinates with signal units for comm support. He safeguards the communications security (COMSEC) equipment, serves as the COMSEC custodian and/or COMSEC officer for the unit subaccount, and issues and accounts for COMSEC equipment. He guides and assists the battery radio repair personnel.

HHSB Commander

The HHSB commander is responsible for maintaining personnel and equipment readiness within the HHSB. He ensures provision of supply, maintenance, mess, and administrative support for HHSB elements. He must work closely with the staff officers, as most of the soldiers assigned to the battery work within the staff. He may conduct RSOP for the battalion HQ and act as the battalion CP area commander.

Battalion FA Vehicle Maintenance Technician

The battalion maintenance technician advises the commander and coordinates external maintenance support. With the S4/battalion maintenance officer, he provides technical advice and expertise to the battalion and battery commanders. He recommends maintenance procedures and policies to facilitate support. He coordinates for maintenance and repair parts support from DS maintenance units and supervises the battalion maintenance section in the absence of the S4/battalion maintenance officer.

Property Accountability Technician

The property accountability technician coordinates all supply activities in the battalion. He is responsible for maintaining property accountability and the battalion property book. He helps the battery supply sergeants request and receive supplies by coordinating with supporting supply activities. He works closely with the O&I section in monitoring the resupply of ammunition and fuel. He supervises the battalion supply section in the absence of the S4/battalion maintenance officer.

Primary Care Physician

The battalion primary care physician advises the commander on all health-related issues. He is responsible for immediate medical services for field casualties within the battalion and coordinates all medical support with higher headquarters in coordination with the S3 and S1. He supervises the operations of the battalion medical treatment team.

Chaplain

The battalion chaplain advises commanders on moral and ethical matters. He coordinates and conducts garrison and field services and soldier welfare ministries. He provides counseling as required for all soldiers and helps maintain the morale and spiritual well-being of all personnel.

Section II

MLRS FIRING BATTERY

Battery Commander

The firing battery commander is responsible for executing the tactical mission given the battery by the force FA headquarters. He is responsible for maintaining discipline and morale within the battery. He ensures supply, maintenance, mess, and administrative support is provided for the unit.

Reconnaissance, Selection, and Occupation of Position

★ The firing battery commander depends heavily on map reconnaissance (recon) for the selection of positions for the battery elements. He must be familiar with terrain analysis and must keep close contact with the controlling artillery or maneuver headquarters. Thorough map recon and terrain analysis are essential because of the extended frontages, the wide dispersion of battery elements, and the fast pace of the battle. The BC develops movement plans only after coordinating routes of march and positions with the controlling headquarters. He usually will not perform ground recon of firing platoon operational areas (OPAREAs), as this is done by the platoon leader.

Ammunition Resupply

The commander must closely monitor the ammo status of the battery by coordinating with the BOC, the firing platoon, and the ammo platoon leaders. This is best done by using the BOC to collect, maintain, and monitor the ammo status. The commander can then efficiently designate the amount of ammunition to be deployed to firing elements or retained under battery control. The distance and convoy time required for resupply from the ammunition supply point (ASP) or ATP make this a critical job.

Situation Updates

The commander, through the BOC, keeps the controlling headquarters informed of the battery situation at all times. Information in these periodic updates includes launcher firing status, ammo status, and other information that affects the mission.

Command and Control

Command and control (C2) of widely dispersed battery elements is increasingly difficult. This is because of the extended frontages and dispersion of battery elements, comm limitations, and the terrain. Detailed SOPs and advance planning minimize the difficulty and provide continuity of operations when direct communication is impaired. The commander should provide frequent situation updates to the BOC and all platoon leaders. He is aided by the BOC and the first sergeant in carrying out his C2 responsibilities.

Executive Officer

The firing battery has no XO. The commander should designate which of the lieutenants is second in command. The responsibilities of both the operations officer and the ammo platoon leader include some of the duties of the traditional FA battery XO. However, it is up to the commander to decide which, if either, of these individuals will act as the XO.

Operations Officer

★ The operations officer is, in effect, the S3 of the firing battery. He supervises the BOC, which is the C2 center of the battery. He keeps tactical situation maps and overlays; plans and coordinates tactical movements and positioning, with the commander's guidance; and processes intelligence information. He directs logistical efforts in coordination with the 1SG and ammo platoon leader or, if in use, with the battery logistics operations center (LOC). As the point of contact between the controlling artillery or maneuver headquarters and all battery elements, he informs the commander of all directives from higher headquarters, passes reports to higher headquarters when appropriate, and establishes and maintains communications with higher headquarters and all battery elements. He supervises the C2 of battery elements, according to the commander's guidance, and orchestrates the commander's guidance during all movements of the battery elements. He also supervises comm procedures and net discipline. His primary concern is with the tactical control of the battery.

The operations officer is also responsible for the smooth operation of the FDC. Although he is not a fire direction officer (FDO), he supervises the FDC chief's actions and is responsible for ensuring the timely transmittal of fire

missions and other data to the firing elements. He is concerned with selection of launcher sections to fire, sequence of firing point usage, fire support coordinating measures, terrain mask areas, status of the firing platoons, met data, and all other fire direction information.

The operations officer also plans, directs, and monitors survey operations. He ensures the battery PADS team has current survey information (trig lists, SCP lists, and so on) for the battery area of operations. He directs the priority of survey to the deployed firing platoons. He selects the general area for the emplacement of the SCPs in the platoon OPAREA in coordination with the firing platoon leader, platoon sergeant, and PADS team chief. His selection is based on terrain analysis, map recon, and existing survey information. He coordinates with higher headquarters for additional survey coordination and support, as necessary. He provides survey information on points established by the battery PADS team to higher headquarters, when requested. The operations officer is usually the battery training officer.

Ammunition Platoon Leader

The ammo platoon leader is usually the firing battery logistics officer with responsibility for coordinating all ammo resupply for the battery. His responsibilities include ammo resupply operations for the supporting ATP or ASP, positioning the ammo platoon elements within the battery ammunition holding area (AHA), and establishing communications. Also, he may perform the duties of battery motor officer. As such, he coordinates with the BOC for maintenance support and directs maintenance efforts. Through the BOC, he keeps the commander informed of the maintenance situation.

The ammo platoon leader must coordinate with the BOC to plan for ammo resupply of the firing platoons and convoys to the ATP or ASP. If the distance to resupply points is great, he may have to arrange for refueling, rations, approval of the route, and intelligence information for the convoy. He coordinates with the BOC to keep the commander informed of the battery ammo status and the status of the ammo platoon elements. If ammo resupply has been decentralized, the firing platoon leader will update the BOC; and if the battery is using a LOC, he may supervise its operation.

Firing Platoon Leader

The firing platoon leader is responsible for the tactical control of the firing platoon. He reconnoiters and selects platoon OPAREAs on the basis of guidance from the BOC and battery commander. He selects the location of the platoon HQ, entry control point, firing points, reload points (RL), and AHAs. These positions should enhance platoon survivability and communications between the platoon HQ and the deployed launchers The position for the platoon HQ must afford good communications with the BOC.

The firing platoon leader selects the location of the platoon SCPs. If the SCPs are not established by PADS, he establishes survey control by the use of alternate methods of survey.

The firing platoon leader designates platoon launchers for firing selected munitions. He also designates the operational status of the launchers and determines their employment sequence on the basis of guidance from the BOC commander and mission requirements. He then sends this information to the BOC, and the BOC selects the launchers to fire.

He establishes communication with the BOC and ensures that the BOC is informed of the status of the platoon. He supervises and assigns missions to the platoon recon sergeant.

The firing platoon leader and platoon sergeant coordinate the maintenance effort within the platoon. They ensure operator unit-level FCS and LLM maintenance is performed. They control any DS-level FCS and LLM mechanic maintenance support teams (MSTs) assigned to the platoon. They may request additional maintenance support when needed.

First Sergeant

The firing battery 1SG is the senior NCO in the battery. He provides leadership and guidance to the battery's enlisted personnel. He is the primary administrative and logistics coordinator for the battery. He is responsible for all internal and external administrative and logistical duties, with the exception of rocket ammunition. His principal duties in this area include the following:

- Coordinating with the controlling headquarters to determine the location and status of support activities. These activities include the supporting maintenance activity; nearest water and ration distribution point; nearest petroleum, oils and lubricants (POL) distribution point; supporting shower and laundry points; and supporting Class II and Class VII activities.
- Guiding and supervising internal battery support activities, such as battery supply, maintenance, and food service operations.
- Directly supervising the battery clerk, comm repairmen, and aidman.

- Coordinating with the BOC and LOC for overall battery administrative and logistics support of the firing platoons.
- Ensuring the above support is timely, adequate, and consolidated as much as possible.
- Developing and supervising the battery defense.

Chief Fire Direction Computer

The chief fire direction computer is the primary assistant to the operations officer. He directly supervises the FDC and FDS operations. He organizes the BOC for 24-hour operation, directs its setup, and controls the battery radio nets. In coordination with the operations officer, he monitors all radio transmissions and ensures that all pertinent information and fire missions are quickly relayed to the proper agencies. He maintains the fire direction information on the fire direction capabilities map, supervises upkeep of FDC operations records and reports, and keeps the operations officer informed.

Ammunition Platoon Sergeant

The ammo platoon sergeant is the primary assistant to the ammo platoon leader. He selects and reconnoiters routes to and from the ATP and ASP, directs and commands convoy movements of ammo vehicles, and coordinates with the division ammo officer for all Class V resupply. If a LOC is being used, he helps the ammo platoon leader supervise it. He keeps the ammunition document register and accountability files.

Firing Platoon Sergeant

The firing platoon sergeant supervises the platoon HQ, including operations with the platoon FDS. He ensures that all reports submitted to the BOC are accurate and timely; and, in the platoon OPAREA, he controls the ammo vehicles and monitors ammo resupply. He must be prepared to reconnoiter firing points, reload points, and AHAs. He maintains the status of launcher sections; plans and coordinates the defense of the platoon elements; and assists the platoon leader in command, control, and execution of the platoon mission.

Firing Section Chief

The firing section chief is responsible for all activities involving the launcher. This includes making final selection of the hide area and firing point, ensuring that the launcher is properly emplaced and prepared for action, checking the site to crest (mask), and reporting it to the firing platoon HQ. He observes and checks the functioning of equipment during firing and immediately reports errors, unusual incidents, or equipment malfunctions to platoon HQ. Reload operations for the launcher are also under his supervision.

Ammunition Section Chief

An ammo section usually is associated with each firing platoon. The section operates under the supervision of the ammo section chief. He coordinates ammo resupply (with the firing platoon HQ) for the associated firing platoon and commands the ammo section convoy operations. The composition of the ammo section depends on the situation and varies with the resupply option used.

Reconnaissance Sergeant

The recon sergeant in each firing platoon is the primary assistant to the firing platoon leader for reconnaissance. He reconnoiters primary and alternate routes to the platoon OPAREA, visually reconnoiters selected platoon OPAREAs, and recommends positioning of platoon elements. He not only helps the firing platoon leader establish survey control but also must be thoroughly familiar with alternate methods of establishing survey control.

PADS Team Chief

The PADS team chief advises the battery operations officer on the survey plan for battery operations. The chief is responsible for extending and establishing survey control forward to the firing platoons by use of the battery HMMWV-mounted PADS.

Battery Motor Sergeant

The battery motor sergeant coordinates and expedites repair of all vehicles and equipment. He manages all maintenance-related activities in coordination with the BOC, battery motor officer, and battery commander. He supervises all recovery operations and interfaces with the supporting DS battalion and the attached MST. He supervises maintenance personnel in performing scheduled services on all equipment and organizational-level maintenance on all equipment except the LLM.

CHAPTER 4

OPERATIONS

Successful MLRS operations start with a sound organization for combat and subsequent task organization that maximize MLRS capabilities. Key to this process is a complete understanding of employment considerations and a thorough analysis of the factors of METT-T (mission, enemy, terrain, troops, and time available).

General Employment Considerations

On the modern battlefield, corps and division commanders' areas of operations normally include all areas occupied by enemy forces who could jeopardize completion of the current corps or division mission. Often, MLRS can engage enemy forces to the full depth of those areas of operations. Therefore, fire support planners must consider many factors when planning to employ MLRS.

System Capabilities

The tremendous flexibility of the MLRS makes it an important fire support asset to maneuver commanders at all levels. This flexibility is vested in the MLRS C3 capabilities; the organizational structure; and the system range, firepower, and munitions.

The MLRS **C3 system** can interface with many types of other C3 and C3I systems. This allows for interface with target acquisition (TA) and sensor systems. These systems include the Firefinder radar and the JSTARS and Guardrail signals intelligence systems. The FDS at platoon, battery, and battalion levels can interface directly with the TACFIRE, the LTACFIRE, DMDs, other FDSs, the cannon BCS, the ASAS, the AFATDS, the ATHS, the GSM, and the CTT.

The **organizational structure** of MLRS units emphasizes autonomy. It allows assignment of tactical missions down to the firing battery and platoon levels. The MLRS firing batteries are equipped to operate independently from parent battalion control. The MLRS firing platoons may execute separate standard or nonstandard tactical missions for limited periods. Augmentation of platoon assets increases this semi-independent capability.

The MLRS **range, firepower, and munitions** give fire support planners flexibility in supporting the maneuver plan. Every M270 launcher will be modified or produced with the capability of firing the MFOM. However, the launcher FCS must be configured to fire the desired munition types. The tables below compare the firepower and volume on targets that MLRS munitions provide in terms of equivalent 155-mm and 203-mm artillery. The effects comparison is based on the 155-mm and 203-mm weapon systems joint munitions effectiveness manuals (JMEMs). Firepower comparison is for reference and comparison only. The number of rockets fired on a target will depend on target type, size, altitude, range, and effects desired.

Planning and Coordination

Employment of the MLRS requires thorough planning and coordination. Operation orders and fire support plans should include detailed tasks and instructions for MLRS units. These instructions must include types and amounts of each munition by unit and FCS configurations for specific launchers and units. Mission planning, processing, and launcher response times must be considered.

RANGE COMPARISON

SYSTEM	MINIMUM RANGE	MAXIMUM RANGE
MLRS M26 Rocket (DPICM)	10 km	32 km
MLRS M39 Missile (APAM)	25 km	100+ km
M109 A2/A3 (155-mm, SP) How	none	18.1 km (23.5 km with RAP)
M198 (155-mm, T) How	none	18.1 km (30 km with RAP)
M110 (203-mm, SP) How	none	23 km (30 km with RAP)
M119/M102 (105-mm, T) How	none	11.5 km (15.1 km with RAP)

LEGEND: DPICM = dual-purpose improved conventional munitions **How** = howitzer **RAP** = rocket-assisted projectile **T**= towed

☆ MUNITIONS COMPARISON

MLRS M26 ROCKET	155-MM HOWITZER	203-MM HOWITZER
644 Submunitions per Rocket (M77)	88 Submunitions per Round (M483A1)	180 Submunitions per Round
1 Rocket	7.32 Rounds	3.6 Rounds
1 Launcher Load (12 Rockets)	3.6 Battalion Volleys[1] (88 Rounds)	1.8 Battalion Volleys[1] (180 Rounds)
1 Battery (9 Launchers) (108 Rockets; 69,552 Submunitions)	33 Battalion Volleys[1] (792 Rounds) (69,696 Submunitions)	16 Battalion Volleys[1] (384 Rounds) (69,552 Submunitions)
M39 (ATACMS) MISSILE		
1,000 M74 Bomblets per Missile		
[1]24-gun Battalion.		

☆ EQUIVALENT VOLUME OF FIRES COMPARISON

SYSTEM	TARGET TYPE		
	Personnel	*Light Materiel*	*Self-Propelled Artillery*
MLRS M26 Rocket	12 Rockets	12 Rockets	12 Rockets
155-mm DPICM	10 Battalions (240 Rounds)	3 Battalions (72 Rounds)	3 Battalions (72 Rounds)
203-mm DPICM	5 Battalions (117 Rounds)	2 Battalions (35 Rounds)	2 Battalions (35 Rounds)

Mission and Enemy

The commander's scheme of maneuver and the enemy's capabilities and predicted courses of action identified by the intelligence preparation of the battlefield (IPB) are the next consideration in employing the MLRS.

Close Operations. In the close fight, the MLRS best supports the maneuver commander with rocket fires. Rocket range makes the MLRS ideal for augmenting cannon fires in counterfire, suppression of enemy air defenses (SEAD), interdiction, and deep fires. The MLRS M26 rocket has a large "footprint," compared to cannon fire coverage. That and its multiple aimpoint capability make the MLRS ideal for attacking large or inaccurately located targets well forward of the FLOT. The targets best suited for MLRS rocket engagement are personnel, light materiel, and self-propelled (SP) artillery. Because of the large footprint of the MLRS M26 rocket and the probability of dud munitions, fire support planners must use the same planning considerations as for 155-mm or Air Force delivered DPICM. Specifically, they must be careful not to assign missions or targets that are too close to friendly troops. Consideration must also be given to MLRS employment in areas friendly units will occupy or pass through.

Deep Operations. AirLand Battle doctrine requires the field artillery to provide deep fires and fires in support of other deep operations. The MLRS can best support the commander's deep operations plans with M39 (ATACMS) missile fires. With ranges exceeding 100 kilometers, the M39 (ATACMS) is ideal for attack of long-range, high-payoff targets (HPTs). The methodology for planning and executing deep operations is decide-detect-deliver (D3). This methodology requires that targets and their areas of engagement be planned during the decide phase. In deep operations, most fires are planned and scheduled as opposed to immediate, unscheduled fires on targets of opportunity. In the planning process of the decide phase, the following must be considered:

- Availability and location of properly-configured MLRS units and/or launchers.
- The M39 missile stockage levels and locations. Management and delivery of munitions depend heavily on fire planning decisions made early in the decide phase.

- Target acquisition and sensor system availability, C3 linkage to the MLRS firing unit, and target acquisition and sensor systems cuing to detect and/or track targets.

These assets (launchers, munitions, and TA and sensor systems) are limited. Therefore, fire support planners must carefully plan and coordinate the development of deep targets and their attack. The warhead description and capabilities of the M39 (ATACMS) missile are addressed in Chapter 1. The D3 methodology and the doctrine for planning and executing fire support in deep operations are addressed in FM 6-20-30 and FM 6-20-10.

Rear Operations. The objective of rear operations is to ensure freedom of maneuver and continuity of operations through sustainment. Use of MLRS fires in support of rear operations is limited because MLRS is an area fire weapon; it is not the FS weapon of choice for rear operations. MLRS fires may, however, be required in support of division or corps response operations and/or tactical combat force (TCF) operations. Once committed, the TCF normally is given priority of fires to support its operations.

★ Positioning

Proper positioning and employment of MLRS units increase their effectiveness. The MLRS units fight forward, positioned as close to the FLOT as possible, to maximize the system's ability to attack deep. Also, positioning launchers forward and intermixing them with other fire support systems and maneuver units in the maneuver brigade sector degrade the ability of the enemy to template MLRS operations and locations. Shoot-and-scoot tactics are used to reduce the enemy's ability to aquire and engage MLRS launchers with indirect fires. Fighting forward, however, does increase the risk to soldiers since MLRS units have a limited ability to defend themselves against ground attack. It also increases coordination requirements because the signature of MLRS when it fires increases the vulnerability of all elements in the immediate vicinity to enemy fires. The MLRS unit must continually coordinate with the manuver element that controls the area of operation. Digital communications are essential for effective MLRS operations. Communication requirements, particularly FM line of sight, are a key consideration when selecting position areas.

Fire Planning

Maneuver and force FA commanders must consider the items discussed below when planning for MLRS fire support.

Fire Missions. The MLRS, in support of close operations, uses two basic types of fire missions—planned (scheduled) and targets of opportunity (unscheduled). Use of MLRS fires typically requires long planning times. The MLRS is suited more for planned missions. Both scheduled and unscheduled missions are used in the offensive and defensive phases of the close battle. (For further discussion of fire planning, see Chapter 9.)

Configuration Time. Normally, all the weapon files required to carry out anticipated missions are loaded in the unit FCS before fire missions begin. Changing from one munition to another takes no additional time if the correct weapon files are loaded. Unusual circumstances may warrant loading additional files; however, this is not a normal occurrence.

Planning Time. The MLRS units require at least 30 minutes to execute any fire plan. (See Chapter 9 for more information.)

Launcher Response Time. The MLRS response time on any given mission may vary from 2 to 20 minutes. (See Chapter 9 for more information.)

Munition Load. The MLRS units may carry any of the MFOM. The unit mission dictates munition load and resupply necessities. Mission changes may require exchange of part or all of a unit's ammo stocks.

Munition Range. The minimum and maximum munition ranges must be considered in positioning elements and assigning missions.

> **Note.** More detailed discussions of MLRS battalion, battery, and platoon operations are in Chapters 5, 6, and 7.

Survivability

Movement. The shoot-and-scoot tactics combined with the wide dispersion of elements help MLRS elements avoid detection and minimize vulnerability. Survivability is enhanced by the rapid transmission rate of digital message traffic and by secure voice communications. Quick emplacement and displacement enhance survivability. However, they also require more planning and coordination because of competition for terrain. Firing platoon leaders and battery commanders must coordinate with maneuver unit commanders throughout all phases of an operation.

Mission. The M270 firing missiles may be less vulnerable to counterfire than are firing rockets. This is due to a shorter time from initial launch to movement from the firing point and randomly selected off-axis firings. The M270 firing missiles may, however, be a higher priority enemy target and are required to be on the firing point for a longer period of fire mission processing before launch.

Detection. The key to MLRS survival on the battlefield is the avoidance of detection. Enemy forces can detect MLRS units firing either rockets or missiles by the means discussed below.

Air-Ground Observation. Until it fires, an M270 launcher normally is difficult to detect by air-ground observation. During firing, the large signature of the launch provides easy location of the firing point by direct observation.

Counterbattery Radar. At lower firing elevations (less than 300 mils), MLRS rockets are difficult to detect by counterbattery radar. At firing elevations greater than 300 mils, the rockets can be more easily acquired because of their higher trajectory. The ATACMS off-axis launch, low radar cross section, and semiballistic guided flight program further reduce MLRS vulnerability to enemy radar acquisition.

Sound Ranging. The vulnerability of MLRS to detection by sound ranging is comparable to that of cannon artillery. Enemy sound ranging techniques are highly advanced and extremely accurate.

Flash Ranging. The MLRS is readily detected by flash ranging because of the large visual signature of the launcher firing. Enemy flash ranging techniques are highly advanced and extremely accurate.

Radio Direction Finding. Overuse of radio communications can make detection by enemy radio direction finding more likely. This is especially true because of the radio-intensive nature of MLRS operations. Terrain masking, short transmissions, and use of low radio power and directional antennas can improve survivability.

Task Organization

The maneuver commander establishes the command and control of MLRS units through his organization for combat. This is a two-step process as follows:

- Step 1—Establish a **command relationship** by placing the unit in a specific tactical organization.
- Step 2—Assign a **tactical mission.** (MLRS batteries and battalions, whether part of a div arty or an FA brigade, will always be assigned tactical missions. The MLRS batteries of an MLRS battalion may also be assigned tactical missions.)

Note. The FM 6-20 series gives a detailed description of these steps.

Tactical Mission Assignment

Considerations

★ The corps MLRS battalion and the divisional battery may be assigned any tactical mission consistent with the combined arms commander's fire support guidance. The MLRS units can readily accomplish R, GSR, and general support (GS) missions. Because the divisional MLRS battery does not have a liaison section, it must fulfill liaison requirements with internal assets. The battery commander may choose to collocate his CP with that of the supported unit. Before assigning a direct support (DS) mission to any MLRS unit, the following factors should be carefully considered:

- Given its large footprint and greater range, MLRS DPICM is best used against area targets and to complement cannon fires.
- Danger close for MLRS M26 rockets is 2 km at maximum range.
- The MLRS has extensive ammo resupply considerations.
- The MLRS lacks the munitions normally required for a DS mission (for example, illumination and smoke).
- The MLRS comm nets are insufficient for the DS mission.
- The use of MLRS in the decentralized DS mode denies the force FA commander the use of an important asset needed to influence the battle.

Tactical Missions

★ **Direct support.** While not normally assigned to MLRS units, some tactical situations may require an MLRS unit to assume a DS mission. The liaison team can be used to augment or establish the fire support element (FSE) at the supported maneuver unit. To accomplish the DS mission, the MLRS unit will be required to operate in the following nets:

- Fire support (FS) very high frequency ([VHF]-FM) voice net.
- One or more digital fire direction (FD) (VHF-FM) nets.
- Force FA operations/fire (ops/F) (VHF-FM) (digital) and command (cmd) (VHF-FM) (voice) nets.

These communication requirements exceed the capabilities of the unit. The MLRS battery or battalion

will have to be augmented with additional communications equipment and personnel from corps or division assets. When possible, MLRS units should reinforce the habitually associated DS cannon unit rather than assuming the DS mission on its own.

Reinforcing. If assigned an R mission, the MLRS unit should operate on the reinforced artillery battalion ops/F (VHF-FM) (digital) and cmd (VHF-FM) (voice) nets. Communication with the force FA headquarters should be maintained with the HF AM radio and/or mobile subscriber equipment. (To use MSE, a node must be nearby.) The MLRS battalion has a liaison section to help in implementing and executing an R mission. There is no organic liaison capability at the firing battery. The BC can do this to some extent. A major consideration in giving an MLRS unit an R mission is the ammo expenditure rate. In an R role, expenditure of MLRS ammo may exceed the unit resupply capability. Another consideration is ensuring the reinforced unit understands MLRS capabilities and limitations.

General Support Reinforcing. The GSR mission requires the MLRS unit to furnish fires for the force as a whole as its first priority and to reinforce the fires of another FA unit as the second priority. A GSR unit remains under the tactical control of the force FA headquarters and responds on a first-priority basis to the needs of that headquarters. The GSR mission gives the force commander flexibility to meet the needs of various tactical situations. In the R or GSR mission, two inherent responsibilities must be addressed—liaison and communications.

Liaison. The MLRS battalions are authorized and assigned a liaison section under the L-series TOE. Battery-level liaison requirements can be met by the ammo platoon leader or other personnel. However, the presence of the battery officers and senior NCOs is critical to sustained operations. Therefore, the loss of personnel to a liaison mission would degrade overall battery capabilities.

Communications. When conducting a GSR mission, the battalion or firing battery should maintain FM communications with the force FA headquarters on both the force FA cmd and ops/F nets. Digital traffic from the reinforced unit can be sent to the MLRS battalion or battery on either internal or external nets, addressed directly to the MLRS TOC or BOC. Another solution is to use the battalion MSE or improved high-frequency radio (IHFR) capability to maintain communication with the reinforced unit. The liaison officer uses his HMMWV radio, operating on the controlling FA or battalion cmd (voice) net to coordinate with the MLRS battalion TOC.

General Support. An MLRS unit assigned a GS mission provides FA support for the force as a whole. This is the most centralized mission for the force commander. It provides fires that are immediately responsive to his needs. Planned fires and fires against HPTs are best provided by those MLRS units with a GS mission. Assigning a GS MLRS unit a priority of fires allows the commander to influence specific areas of the battlefield. The priority of fires option can fulfill many of the R and GSR needs.

Nonstandard Mission. The MLRS unit is well-suited for a variety of nonstandard missions. If the commander's intent cannot be satisfied with one of the standard FA tactical missions, a nonstandard tactical mission may be assigned. These missions amplify, limit, or change one or more of the inherent responsibilities or spell out contingencies not covered by those responsibilities. A nonstandard mission may be assigned if there is not enough artillery to cover all the contingencies or if an FA battalion, FA battery, or MLRS platoon is required to meet the responsibilities of more than one tactical mission. (Additional information appears later in this chapter.)

Inherent Responsibilities

Field artillery battalions normally meet their FA support requirements through one of the four basic standard tactical missions. Assignment of a tactical mission implies that an FA commander will meet each of the seven inherent responsibilities of his mission, as applicable. The table below depicts the seven inherent responsibilities as well as the automated responsibility of commander's criteria as they relate to the four basic standard tactical missions.

The following paragraph and table implement STANAG 2934 and QSTAG 217.

Operations With Allied Units

Several of the NATO and American, British, Canadian, Australian (ABCA) alliance members as well as other countries are deploying or planning to deploy MLRS with their armies. Currently, Germany, France, Italy, The Netherlands (Holland), Turkey, the United Kingdom, Japan, and Bahrain have MLRS. American MLRS units may find themselves operating with allied MLRS or other FA units. Therefore, they must be familiar with allied standard artillery tactical missions and inherent responsibilities. QSTAG 217 and STANAG 2934 define ABCA and NATO tactical tasks and responsibilities for control of artillery.

SEVEN INHERENT AND AUTOMATED RESPONSIBILITIES OF FIELD ARTILLERY STANDARD TACTICAL MISSIONS

AN FA 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 FA HQ.	1. Reinforced FA. 2. Own observers.[1] 3. Force FA HQ.	1. Force FA HQ. 2. Reinforced unit. 3. Own observers.[1]	1. Force FA HQ. 2. Own observers.[1]
Has as its zone of fire—	Zone of action of supported unit.	Zone of fire of reinforced FA.	Zone of action of supported unit to include zone of fire of reinforced FA unit.	Zone of action of supported unit.
Furnishes FIST or FSE[2]—	Provides temporary replacements for casualty losses as required.	No requirement.	No requirement.	No requirement.
Furnishes liaison officer—	No requirement.	To reinforced FA unit HQ.[3]	To reinforced FA unit HQ.[3]	No requirement.
Establishes communication with—	Company fire support officers (FSOs) and supported maneuver unit HQ.	Reinforced FA unit HQ.	Reinforced FA unit HQ.	No requirement.
Is positioned by—	DS FA unit commander or as ordered by force FA HQ.	Reinforced FA unit or as ordered by force FA HQ.	Force FA HQ or reinforced FA unit if approved by force FA HQ.	Force FA HQ.
Has its fires planned by—	Develops own fire plans.	Reinforced FA unit HQ.	Force FA HQ.	Force FA HQ.
Has its commander's criteria established by—	Establishes own commander's criteria.	Reinforced FA unit HQ.	Force FA HQ.	Force FA HQ.

[1]Includes all TA means not deployed with supported unit (radar, aerial observers, survey parties, and so on).
[2]A fire support element (FSE) for each maneuver brigade, battalion, or cavalry squadron and one fire support team (FIST) with each company or ground cavalry troop are trained and deployed by the FA unit authorized these assets by TOE. After deployment, FISTs and FSEs stay with the supported maneuver unit throughout the conflict.
[3]The MLRS battalion only.

ARTILLERY WITH A TACTICAL TASK OF	ANSWERS CALLS FOR FIRE IN PRIORITY FROM	ESTABLISHES LIAISON WITH	ESTABLISHES COMMUNICATION WITH	FURNISHES FORWARD OBSERVERS TO[1]	WEAPONS MOVED AND DEPLOYED BY (POSITIONED BY)	HAS AS ITS ZONE OF FIRE	HAS ITS FIRES PLANNED BY	NATIONS TO WHICH TERMINOLOGY APPLIES
Direct support	1. Directly supported formation or unit. 2. Own observers. 3. Force field artillery.[2]	Directly supported formation or unit (battalion, regiment, or brigade).	Directly supported maneuver formation or unit.	Each maneuver company of the directly supported formation or unit.	Direct support artillery unit commander or as ordered by force field artillery HQ.[2]	Zone of action of the directly supported formation or unit.	Develops own fire plans in coordination with directly supported formation or unit.	BE, CA, DA, FR, GE, IT, NL, PO, TU, UK, US
	1. Directly supported formation or unit. 2. Any other formation or unit as authorized by the controlling HQ.	Directly supported formation or unit.	Directly supported formation or unit.	Directly supported formation or unit.	Next higher artillery HQ.	Zone of action of the directly supported formation or unit or as ordered by higher artillery HQ.	Artillery formation or unit in direct support in conjunction with directly supported formation or unit.	AS
In support	1. Supported formation or unit. 2. Any other formation or unit as authorized by the controlling HQ.	No inherent requirement.	No inherent requirement.	No inherent requirement.	Next higher artillery HQ.	Zone of action of the supported formation or unit or as ordered by higher artillery HQ.	Next higher artillery HQ.	AS
At priority call	1. Formation or unit to which placed at priority call. 2. Any other supported formation or unit. 3. Any other formation or unit as authorized by the controlling HQ.	No inherent requirement.	No inherent requirement.	No inherent requirement.	Next higher artillery HQ.	Zone of action of the formation or unit to which placed at priority call or as ordered by higher artillery HQ.	Formation or unit to which placed at priority call.	AS
General support	1. Force field artillery HQ[2] and target acquisition artillery. 2. Own observers.	No inherent requirement.	No inherent requirement.	No inherent requirement.	Force field artillery HQ.[2]	Zone of action of the supported formation or unit or zone prescribed.	Force field artillery HQ.[2]	BE, CA, DA, FR, GE, IT, NL, NO, PO, TU, UK, US
General support reinforcing	1. Force field artillery HQ.[2] 2. Reinforced artillery unit. 3. Own observers.	Reinforced artillery unit.	Reinforced artillery unit.	Reinforced artillery unit if approved by force field artillery HQ.[2,3]	Force field artillery HQ[2] or reinforced artillery unit if approved by force field artillery HQ.[2]	Zone of action of the supported formation or unit to include zone of fire of the reinforced artillery unit.	Force field artillery HQ[2] or as otherwise specified.	BE, CA, DA, FR, IT, NL, PO, TU, UK, US
Reinforcing	1. Reinforced artillery unit. 2. Own observers. 3. Force field artillery HQ.[2]	Reinforced artillery unit.	Reinforced field artillery HQ.	Reinforced field artillery unit.[2]	Reinforced artillery unit or as ordered by force field artillery HQ.[2]	Zone of fire of reinforced artillery unit or zone prescribed.	Reinforced artillery unit.	BE, CA, DA, FR, IT, GE, NL, NO, PO, TU, UK, US
Reinforcing by fire (mutual support)	1. Supported formation or unit and own observers. 2. Force field artillery HQ.[2]	Supported formation or unit and reinforcing artillery unit.	Supported formation or unit and reinforcing artillery unit.	No inherent requirement.	Unit commanding officer or as ordered by force artillery HQ.[2]	Zone of supported formation or unit or zone prescribed by force artillery HQ.[2]	Own FDC and reinforced artillery unit.	FR

[1]The US will not furnish forward observers but will furnish fire support teams (on request).
[2]Force artillery headquarters or higher artillery headquarters.
[3]Applies also to the provision of liaison officers.

LEGEND:

AS = Australia
BE = Belgium
CA = Canada
DA = Denmark
FR = France
GE = Germany
IT = Italy
NL = Netherlands
NO = Norway
PO = Portugal
TU = Turkey
UK = United Kingdom
US = United States

Offensive Operations

An MLRS unit must be prepared to support the five basic types of offensive operations:

- Movement to contact.
- Hasty attack.
- Deliberate attack.
- Exploitation.
- Pursuit.

A detailed discussion of these operations and the responsibilities of the fire support coordinator (FSCOORD) for each of them is in FMs 6-20-30, 6-20-40, and 6-20-50.

Movement to Contact

Units make movement to contact to gain or regain contact with the enemy. Once contact is made, the commander can further develop the situation.

★ The MLRS can provide support during both movement and follow-on operations once contact is made. With its long range and tactical mobility, MLRS is ideally suited to augment other artillery fires in supporting covering forces and flank guard formations.

The MLRS must be integrated into the march columns to ensure responsive supporting fires during the initial action. By planning for delivery of immediate mass MLRS fires, the commander can help the supported unit as it seizes and retains the initiative.

Hasty Attack

Movements to contact end when contact is made, with a series of meeting engagements and/or hasty attacks. These operations require extremely responsive fires to compensate for the relatively small amount of maneuver power initially echeloned forward.

The MLRS can best be used in support of hasty attacks by delivering deep fires against reserve or reinforcing formations, counterfires, and fires reinforcing the DS artillery of attacking brigades.

Although time normally will not be available for detailed formal MLRS fire planning, MLRS units may be able to provide SEAD support to close air support (CAS) and Army aviation operations.

Deliberate Attack

A deliberate attack is planned in detail. It is undertaken after time-consuming reconnaissance, acquisition, and development of targets and a thorough analysis of all factors affecting the situation. The MLRS units may still be able to provide SEAD support to CAS and Army aviation operations. Also, MLRS can provide effective mass fires against enemy counterattack forces.

Exploitation and Pursuit

Exploitation and pursuit operations follow successful attacks. They involve rapid movement forward to secure deep objectives and maintain contact with retreating enemy units. The 32+ kilometer range of MLRS rockets, the 100+ kilometer range of missiles (ATACMS), and system mobility enable MLRS to effectively support exploitation and pursuit operations.

Exploitation and pursuit operations are characterized by rapid movement and continuous hasty attacks. Maneuver units usually are unable to coordinate extensively or directly for fire support. Without this coordination, MLRS use in these operations must adhere to positive clearance of fires procedures.

Use of MLRS in these operations requires terrain positions close to the line of departure or FLOT. From these positions, MLRS can support operations well beyond the forward edge of the battle area (FEBA).

★ Once these operations begin, to be effective, MLRS units must travel well forward with maneuver units. This forward positioning allows MLRS units to stop, fire, and then use their tactical mobility to resume their place in the movement factor.

Ammunition is a prime consideration in selecting MLRS units to support exploitation and pursuit operations. Intelligence operations will determine what types of targets will be encountered and, therefore, what munitions will be needed. The ability to resupply these munitions is an important factor. Resupply capability must be evaluated; the additional distance between rapidly advancing MLRS units and their resupply points in the division and corps areas must be considered. Ammunition will have to be "pushed" forward to maintain resupply requirements.

The long range and accuracy of the ATACMS can be especially effective in supporting a long-range exploitation and pursuit operation. The ATACMS can be used to disrupt attempts to slow or stop friendly maneuver forces or to interdict and neutralize enemy counteroffensives. The ATACMS targets might include enemy forces that are mining high-speed avenues, setting up ambush points and battle positions, trying to demolish bridges, and setting up other obstacles to friendly advance. The ATACMS also can attack reserve forces that are maneuvering to counterattack. The force FA commander and maneuver commander must coordinate extensively with the MLRS units of the supporting corps artillery for such missions.

Defensive Operations

In defensive operations, the corps and division commanders normally have more centralized control of MLRS assets to ensure that they are immediately responsive to the force commander. However, MLRS units may be attached to or under the operational control (OPCON) of armored cavalry regiments (ACRs) or other covering force units. The duration of the attachment or OPCON and other instructions and restrictions should be delineated in the OPORD.

The MLRS units can support defensive operations with fires by providing the following:

- Counterfire and SEAD fires.
- Fires on enemy C3 assets and maneuver assembly areas to disrupt command, control, and attack preparations.
- Engagement of enemy forces as far forward as possible. Attack of targets with MLRS DPICM will strip enemy forces of light armor and infantry support and will cause mobility and firepower kills to heavy armor.
- Long-range missile fires on second-echelon forces and other HPTs.

A Firefinder-MLRS direct link is most effective during defensive operations. This link allows rapid detection and destruction of enemy artillery and mortars as they fire in support of their maneuver's advance.

Defensive operations require different positioning considerations. The positioning of MLRS in the security area, to range more deeply, must be carefully considered and planned. Considerations include the following:

- Increased security risks to MLRS units.
- Communications requirements.
- Availability of survey control in the security area.
- Limited logistical support as a result of positioning far forward.
- Availability of suitable firing positions and routes.

In MLRS unit positioning, munition minimum range must be considered. The units could be positioned at different, staggered distances from the FEBA or FLOT, which would overcome minimum range limitations.

The MLRS units should not be positioned on major avenues of approach. This is to prevent enemy breakthroughs from jeopardizing the unit or forcing it to displace prematurely. It would also preclude displacing several MLRS platoons or batteries at the same time and losing that fire support.

Nonstandard Employment Techniques

The flexibility of MLRS unit organization, delivery of fires, and ammo types makes it a versatile system usable in ways that are nonstandard to cannon artillery.

Nonstandard Missions

Nonstandard MLRS missions include those discussed below.

An MLRS firing battery answers calls for fire from a combat aviation brigade. The FDS can communicate digitally with an aerial observer in an OH-58D through the helicopter's ATHS. It also can communicate digitally with an observer using a DMD or other hand-held digital device in an OH-58A or OH-58C helicopter. The battery FDC also can receive voice calls for fire from aerial observers. All of these configurations allow the MLRS firing battery to engage the variety of targets the aviation brigade can acquire.

A battery from an MLRS battalion is attached to an FA brigade or div arty for positioning and movement but remains GS to the corps.

A battery from an MLRS battalion is attached to an FA brigade which is DS to an ACR or separate maneuver brigade but remains GS to the regiment or brigade.

An MLRS battalion is attached to an FA brigade which is reinforcing a Marine Corps or coalition army force artillery headquarters. However, the MLRS battalion is positioned by and has its fires planned by the reinforcing FA brigade headquarters, not the force FA headquarters.

A nondivisional MLRS battery is GSR to a DS cannon battalion but is positioned by and has its fires planned by the reinforcing FA unit headquarters.

Delivery of Fires

Flexibility in delivery of fires includes the following:

- Methods of fire control (such as time on target [TOT]).
- The moving target location prediction capability of the FDS.
- The multiple target aimpoint and mission capability of the launcher.

An example of fire delivery flexibility is the concentration of an MLRS battalion rocket TOT to neutralize a large, moving enemy mechanized force. An MLRS battalion TOT can saturate a 5-square-kilometer area with 208,656 M77 DPICM submunitions in less than 1 minute. This is the equivalent firepower of seventy 24-gun 155-mm

howitzer battalions or a TOT from 1,680 155-mm howitzers. Using the FDS to interface with allied systems, a single German MARS (MLRS) battery of eight launchers can fire 2,688 AT2 antiarmor mines to stop or slow the enemy in the engagement area and thereby achieve better DPICM effects. (See Chapter 9 for delivery of fires information.)

Munitions

★ The variety of munitions, the firepower, and the organizational flexibility of the MLRS lend the system to munition-based roles. This nonstandard technique consists of matching munitions to units on the basis of mission needs. This technique simplifies unit C2 and may simplify ammo resupply operations when MLRS units are designated to fire either ATACMS or DPICM rather than a mix. For example, specific MLRS batteries or platoons may be designated to fire ATACMS missiles.

Target Acquisition and Sensor System Interface

The MLRS C3 system interfaces directly with all digital comm systems. Therefore, it is easily linked to any TA or sensor systems equipped with digital communications. This linkage allows faster response for attack of detected targets. Three of the most likely sources of target information are the Firefinder radar, the OH-58D helicopter, and the JSTARS or Guardrail SIGINT systems.

Firefinder Radar

The MLRS FDS at all levels can interface directly with the Firefinder DMD emulator in a digital, nonsecure mode. This link gives the force FA commander an extremely fast, responsive, and effective counterfire capability. Through zone management and the use of common sensor boundaries, MLRS-Firefinder operations can orient on the maneuver commander's battlefield priorities while still providing counterfires to the force as a whole. Specific commander's guidance is essential for providing targeting zone and report criteria for the radar section and engagement and effects criteria for the MLRS unit. (See FM 6-121 for more detailed information.)

Firefinder Targeting

Messages. The Firefinder DMD emulator can transmit six and receive nine message types. The MLRS FDS can receive only the FM;RFAF, FM;FOCMD, and SYS;PTM messages.

Zones. Up to nine zones can be entered in the Firefinder radars. All zones may be one of four types discussed below or any combination of the four types. These zones prioritize target detections and determine in which format the detection will be reported.

A **critical friendly zone** (CFZ) is an area, usually a friendly unit or location, that the maneuver commander designates as critical. It is used to protect an asset whose loss would seriously jeopardize the mission. When the computer predicts that an enemy round will impact in a CFZ, the location of the weapon that fired the round will be reported by the computer in precedence ahead of all other detections. Any location of a weapon firing into a CFZ will result in an immediate call for fire (FM;RFAF message) unless it is manually overridden by the radar operator. The FM;RFAF message is received by TACFIRE as a Priority 1 message. Thus, a CFZ provides for the most responsive submission of targets to the fire support system.

A **call-for-fire zone** (CFFZ) designates a search area forward of the FLOT that the maneuver commander wants suppressed, neutralized, or destroyed. An area designated as a CFFZ would likely be on a suspected regimental artillery group (RAG) or division artillery group (DAG) position. Its designation would be closely tied to information developed during the IPB process. A CFFZ provides the second most responsive priority of requests for fire generated by the radar. A target identified in a CFFZ will generate an FM;RFAF Priority 2 message. However, the commander may upgrade this to a Priority 1 message for certain CFFZs.

The **artillery target intelligence zone** (ATIZ) is an area in enemy territory that the maneuver commander wishes to monitor closely. Any weapons acquired in this zone will be reported to the TACFIRE computer ahead of all target detections except CFZ and CFFZ. However, the detections will result only in a target report (ATI;CDR).

A **censor zone** (CZ) is an area from which the commander wishes to ignore all target detections. The CZs must be used very judiciously, since the computer does not report to the operator a round originating from a CZ. A CZ may be used to ignore a friendly artillery position that, because of its aspect angle to the radar, could be detected as enemy artillery. This situation could occur when the FLOT is uneven or when friendly units are in enemy territory.

Attack Criteria. Firefinder generates only a target grid location and a mortar, type unknown (MORT UNK) or an artillery, type unknown (ARTY UNK) target description. Since Firefinder cannot discriminate between target size or specific type, the commander must establish specific attack criteria (for example, six M26 (DPICM) rockets for all mortar targets).

Firefinder Restrictions. Direct Firefinder-MLRS interface places several restrictions on Firefinder and MLRS usage as follows:

- The Firefinder's inability to discriminate beyond mortars and artillery prevents full use of the commander's engagement criteria.
- Firefinder digital nonsecure communication is highly susceptible to enemy electronic warfare (EW).
- The direct link of Firefinder and MLRS displaces TACFIRE from the reporting loop. This prevents complete target analysis for artillery intelligence evaluation and counterfire assignment.
- Firefinder can generate more targets than one MLRS battery can handle with its nine launchers. Even a moderate, but constant, stream of Firefinder targets will place an enormous strain on the MLRS resupply system.
- Firefinder can generate more target information than the MLRS battalion TOC can process. To be responsive and to engage legitimate targets, the TOC must be augmented with targeting personnel. Battalion should be given authority to engage targets positively identified.

Optimum Use. Direct Firefinder interface is best used when—

- Enough MLRS assets are available to handle the high volume of counterfire targets generated and/or enough ammo is available to support the fire mission load.
- Enough additional MLRS and other FA assets are available to engage all targets generated by other sources.
- Enemy EW capability is low.
- The force FA commander determines that only MLRS is necessary in the engagement of counterfire targets.
- Counterfire is determined to be the most critical requirement.

OH-58D Helicopter

The FDS at platoon, battery, or battalion can communicate digitally with an aerial observer in an OH-58D through the helicopter's ATHS. Because of the large number of targets the OH-58D can acquire, the best configuration is the OH-58D communicating digitally with the battery FDS. This allows the battery to choose the optimum number of launchers to engage targets.

The MLRS battery can then engage a variety of target types. This link gives the force FA commander near-real-time target description and location and provides an extremely fast, responsive, and effective offensive or defensive (for example, covering force operations) capability.

Ground Station Module or Commander's Tactical Terminal

The MLRS battalions can be equipped with either a GSM or a CTT. These devices interface with Army and Air Force C3I systems to provide near-real-time target description and location. They enable the MLRS battalion to engage deep and moving targets detected by these systems.

The GSM is a highly mobile, self-supporting data receiving and processing center. The system is mounted on a 5-ton truck, has a companion support 5-ton truck, and has its own operators, generators, radios, and assigned frequencies. The GSM is collocated with the MLRS battalion TOC to provide direct interface to airborne radar systems such as JSTARS. The GSM at the MLRS battalion gives the corps and division commanders immediately responsive attack capability against deep targets located by airborne radar systems.

The CTT is a stand-alone field terminal located at the MLRS battalion TOC. It provides immediately responsive attack capability against targets located by airborne emitter-detection systems.

Extensive commander's guidance is necessary for the battalion to effectively engage HPTs. Targeting information received at the GSM and CTT is unfiltered raw data. It has not been processed by targeting or intelligence analysts for deception and target importance.

Both systems provide targeting data for fire direction processing by FDS or TACFIRE. Long-range attacks and/or moving targets may require a final warhead and/or firing data update from the GSM and/or CTT to the launcher(s) on the firing point.

CHAPTER 5

MLRS BATTALION OPERATIONS

★ *This chapter addresses options for MLRS employment and organization of the battalion staff for tactical operations. Instructions covering features of combat operations which lend themselves to definite or standardized procedures without loss of effectiveness should be covered by tactical SOP (TSOP). (For a guide and checklist for preparing an MLRS battalion TSOP, see Appendix B.)*

Employment Guidelines

There are several options for employing the battalion across the corps front. In all options, one of the first considerations is terrain needed to position elements of the battalion. For example, the battalion requires at least 13 position areas (as much terrain as three DS cannon battalions) to support operations: nine platoon OPAREAs of 3 by 3 kilometers each, three battery HQ positions, and a battalion HHSB location. Battalion split headquarters operations would add another four locations (three battery trains and one battalion trains).

Battalion HQ and HHSB organization during tactical operations will vary according to the factors of METT-T. Normally, a battalion CP and a battalion trains are formed. The organization, functions, and procedures of these elements should be standardized and included in the unit TSOP.

Note. The logistical and administrative elements of the HHSB and any headquarters elements not located with the battalion CP are centralized in one location—the battalion trains. The CP in the battalion trains is the administrative and logistical operations center (ALOC).

Options For Employment

Discussed below are the corps commander's options for employing the battalion and the advantages and disadvantages of each.

Option 1

The corps commander retains direct control of the MLRS battalion through the corps artillery headquarters TOC. Normally, this option is used only in controlling MLRS units configured for delivering ATACMS fires. The corps artillery TOC does the following:

- Coordinates movement, positioning, and delivery of fires of the MLRS unit(s) to support the corps operations.
- Monitors ammunition status.
- Coordinates combat support (CS) and combat service support (CSS) for the MLRS unit(s).

The **advantages** of Option 1 are as follows:

- Intelligence-generated targets can be sent directly from the sensor platform to the CTT or GSM at the MLRS battalion for immediate attack. Targets also can be sent by the corps to the MLRS battalion.
- The corps commander can directly influence the battle as an active participant rather than as an allocator of combat power. He applies long-range missile fires at decisive points to help shape the close fight.

The **disadvantages** of Option 1 are as follows:

- Communications may be constrained by the distances over which the MLRS battalion and corps artillery TOC have to communicate.
- Terrain management for launchers is time-consuming. The coordination for OPAREAs and firing points requires clearance through the corps FSE, division FSE, brigade FSEs and, in some cases, battalion FSEs.
- Requests for additional fires from within the corps must be routed through the div arty and corps and then sent to the battalion for execution.

Option 2

The corps commander attaches the MLRS battalion to an FA brigade. If the corps commander keeps the FA brigade under his control with a GS or GSR mission, the corps FSE will send requests for fire through the FA

brigade HQ to the MLRS battalion. The battalion may continue to receive target data directly from sensors through the CTT and GSM. If the corps commander allocates or prioritizes the brigade fires to a division (reinforcing a div arty), the division FSE will send requests for fire through the div arty and then through the FA brigade HQ to the MLRS battalion.

The **advantages** of Option 2 are as follows:

- Communications relayed through the FA brigade HQ facilitate C2 of MLRS unit and launcher operations.
- The MLRS can still effectively respond to targets requested by corps.
- The corps commander can still establish priorities of fires. This will increase the combat power within a subordinate unit area.
- The FA brigade is more capable of assisting and supporting the attached MLRS battalion than a corps artillery TOC or div arty.

The **disadvantages** of Option 2 are as follows:

- When brigade fires are not allocated to a division, the processing time for division requests for fire is increased. (A quick fire link might be established from div arty to the FA brigade to preclude this problem.)
- Coordination with maneuver units for position areas may be difficult and time-consuming.

Option 3

★ The corps commander allocates some or all of the MLRS units directly to the divisions, thus increasing their combat power. This decentralized employment of the MLRS battalion may be most appropriate to fast-paced offensive operations. The MLRS battalion, or its batteries, may be attached to a committed division. This division normally would further attach the MLRS unit to the div arty. This places all the artillery in the division area under a single FA commander. A firing battery from a corps MLRS battalion can be assigned a tactical mission to support the division. The div arty must provide information on the following:

- Required supply rates for ammunition.
- Target attack criteria.
- The SEAD criteria.
- Interdiction requirements.
- Supportability of future operations.

★ If the corps commander attaches an MLRS battalion to a division, the battalion, operating with the div arty, may assume control (OPCON) of the divisional MLRS battery. Priority of fires, with specific target criteria, can be established and shifted quickly within the division in accordance with the plan for support.

The **advantages** of Option 3 are as follows:

- Communications distances between the MLRS unit and the force FA CP are reduced.
- Additional MLRS units give the division more immediately available combat power.

The **disadvantages** of Option 3 are as follows:

- It may be time-consuming to change the task organization and get the pure battalion back under the corps artillery or FA brigade control when required.
- Fire planning and MLRS attack of targets identified at corps and echelons above corps are degraded because there are no immediately available MLRS fires at that level.
- With all MLRS assets attached to the divisions, no MLRS units could be assigned the mission of GS to the corps for ATACMS fires.

Note. The versatility of MLRS allows combinations of these options. Firing batteries can be detached and assigned separate tactical missions within the corps or allocated to subordinate units.

Battalion Headquarters

The MLRS is an extremely versatile and flexible system. Therefore, the MLRS battalion commander must consider several options when organizing the staff for tactical operations. In addition to the factors of METT-T, he must consider survivability, dispersion, support requirements, past experience, and SOPs. He can devise almost any option to accomplish the unit mission. Several options are addressed below.

Option 1—Dual CPs

The battalion HHSB is divided into a battalion CP and a battalion trains. At the battalion CP, the O&I section acts as the TOC and provides C2 for the battalion elements and the primary comm link to the controlling force FA headquarters. The TOC also monitors and, if necessary, coordinates for logistical support through the ALOC for the forward elements of the battalion.

At the battalion trains, the ALOC coordinates and controls support operations. The battalion XO supervises the ALOC. The HHSB HQ, trains, and ALOC are located in one area. See Chapter 10 for logistical support information.

This type of organization emphasizes reduced signature of the battalion HQ and increased responsiveness of the battalion CSS system. The POL resupply, maintenance, medical treatment, ammo resupply, and other support operations are handled by the ALOC and/or trains personnel. Signal personnel may stay with the TOC.

Option 2—Consolidated CP

The entire HHSB, both TOC and ALOC with trains, is located in one position area. This option derives the greatest measure of local defense from organic elements and simplifies TOC and ALOC procedures and operations. However, if battalion ammo resupply operations are centralized at battalion level, the size and operational signature of the combined TOC, ALOC, and trains may facilitate the enemy locating, targeting, and attacking the CP.

Option 3—Mixed CPs

The HHSB is split into a battalion CP and a battalion trains as with Option 1. The commander moves some of the trains support elements to the battalion CP location and places them under the control of the O&I section. He leaves the rest under the control of the ALOC to operate from the trains area. The primary objective is to move critical support as far forward as possible within operational and/or situational constraints and to provide greater security for the battalion CP.

Personnel and Administration Section

The adjutant, as discussed in Chapter 3, is responsible for personnel management in the battalion in coordination with the battery commanders, first sergeants, and battalion CSM. The S1 or PAC section handles the following functional areas in the ALOC:

- Personnel strength accounting.
- Personnel assignment and requisition.
- Legal assistance to the commander.
- Financial services.
- Records management.
- Casualty reporting.
- Publications.
- All personnel actions (evaluation reports, promotions, awards, decorations, and so on).
- Coordination of morale support and religious activities with the chaplain.
- Mail.

Operations and Intelligence Section

Within the TOC there are two distinct operations—fire direction and operations and intelligence. (See Chapter 9 for more information on fire direction.) Although the functions differ, they must work together to ensure effective delivery of fires. The S3 supervises the TOC.

Operations responsibilities are as follows:

- Issue plans and orders.
- Establish liaison as required.
- Plan and coordinate all unit movements.
- Coordinate positioning with controlling FA headquarters or maneuver FSE.
- Record all significant events on DA Form 1594 (Duty Log).
- Maintain operational overlays.
- Maintain situation map.
- Monitor and project ammo status and/or requirements.
- Establish communications on appropriate nets. (See Chapter 8.)
- Exercise staff supervision of unit NBC operations.
- Ensure operations security (OPSEC).

Intelligence responsibilities include the following:

- Enemy situation awareness.
- Terrain analysis.

- Intelligence information processing and coordination.
- Weather updates.
- Map control.
- Physical security.

Functional Command Post

The battalion TOC and ALOC must be organized to conduct sustained 24-hour operations. The purpose of the functional CP is to standardize the functions and equipment within the command post organization of units.

Current functional diagrams for the MLRS battalion CP are in Appendix C. These diagrams use personnel and equipment authorizations in the current objective L-series TOE and are designed to—

- Improve effectiveness in executing C2 functions.
- Improve C2 interoperability.
- Improve application of limited CP resources.

The MLRS battalions should use these diagrams as a source for developing tactical SOPs and for determining specific materiel and personnel requirements and training programs for CP sections and individuals.

CHAPTER 6

MLRS FIRING BATTERY OPERATIONS

The MLRS firing battery is the basic unit of employment of the MLRS. This chapter addresses battery employment and operations. Platoon-level operations, which differ from battery-level operations, are addressed in Chapter 7. Instructions covering features of combat operations which lend themselves to definite or standardized procedures without loss of effectiveness should be covered by TSOP. (For a guide and checklist for preparing an MLRS battery TSOP, see Appendix B.)

Section I

EMPLOYMENT

Battery Headquarters

The battery HQ provides command, control, and logistical support to the battery. The command element and the BOC provide the command and control; the rest of the headquarters has the assets to enable the battery to function independent of any battalion control. The elements and sections organic to the battery HQ perform almost all service support functions normally associated with the battalion.

Battery Operations Center

Like a battalion TOC, the MLRS BOC is the C2 center of the battery. The BOC directs all battery operations in coordination with the battery commander. It directly controls FDC, survey, and NBC operations. It monitors ammo and launcher status and directs and coordinates battery internal and external logistics and support operations.

The BOC operates in the FDC M577A2 tent extension. The battery and battalion command (voice) nets can be remoted to field tables in the extension. The BOC uses the SB-22 switchboard to connect it with the essential HQ elements, such as the ammo platoon CP, observation posts (OPs), listening posts (LPs), maintenance, supply, and the commander's tent. The BOC personnel maintain situation maps and overlays. They maintain SCP, ammunition, maintenance, and similar status charts and post other operational information in the tent extension.

The battery operations officer supervises the BOC. The BC can establish a BOC staff whose shifts may include the operations officer, the ammo platoon leader and sergeant, the chief fire direction computer, the NBC NCO, and the supply sergeant.

The BOC passes movement orders and other information for the subordinate platoons directly to platoon HQ. There they are processed and dispersed to firing sections as required.

Fire Direction Center

The MLRS firing battery FDC operates as a subelement of the BOC. With the FDS, it can receive fire missions, fire direction information, and related digital traffic directly from TACFIRE or from variable format message entry devices (VFMEDs) at any level (corps artillery, div arty, FA brigade, and battalion). It can receive data from an MLRS battalion, battery, or platoon FDS; from a cannon battery BCS (limited); from a Firefinder radar; or from other designated target acquisition or sensor systems. The battery FDC may determine the number of rockets and/or missiles to fire and chooses the launcher to fire. To process fire missions, it must have the map mod, launcher location, launcher firing points, ammunition, and assigned firing positions. The FDC uses this information to select and control all firings of the battery launchers. The FDC maintains a DA Form 1594 and a DA Form 7232-R (MLRS FDC Fire Mission Log). (See example in Chapter 7.)

Support

Mess, supply, comm, and maintenance sections may be collocated with the BOC at the battery HQ. When collocated, wire communications should be established from these sections to the BOC. The BOC is the focal point for support requests, planning, and coordination.

Split Headquarters Operations

Considerations

The MLRS battery HQ usually deploys in one location, the battery CP, with the BOC handling both C3 and logistics coordination. However, the commander may choose to split his headquarters operations between a BOC at the battery CP and a LOC at the battery trains, the same as MLRS and cannon battalions may split operations between an ALOC and a TOC. The situations below may require split operations.

Terrain. An elevated location is needed by the BOC for communications. The logistics elements (ammo platoon, maintenance, and supply) require a good road net and firm ground. If these two needs cannot be met at the same location, the commander may choose to separate the elements; for example, he may place the BOC on a hill and the trains in a nearby town (preferably in a valley).

Enemy. Because of enemy counterfire or air attack capability, the commander may choose to split operations. This precludes total neutralization of the headquarters platoon, if detected. The BOC's large comm output or logistics area traffic patterns may jeopardize the entire headquarters. Split headquarters operations reduce the chances of complete detection.

Logistics Operations Center Establishment

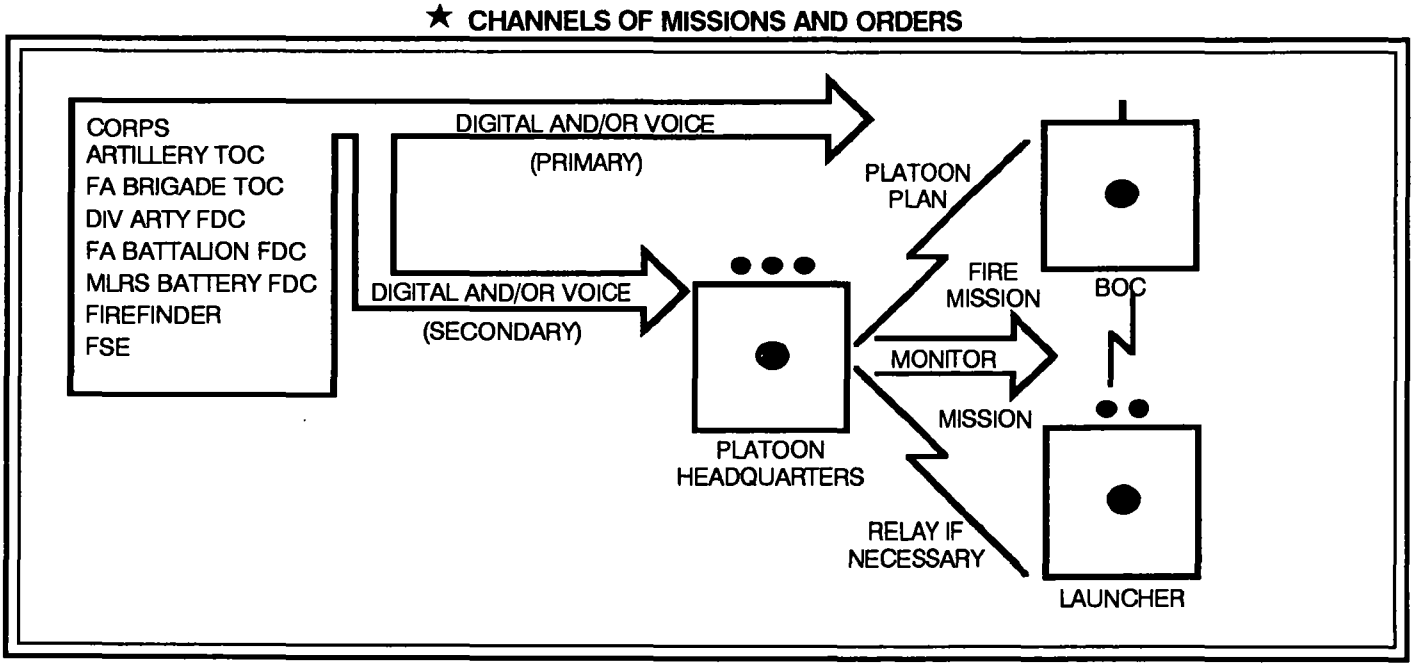
Split headquarters operations can be accomplished by the firing battery establishing a battery trains with a LOC as a logistics command post. The LOC activities are directed by the BOC. The LOC is directly supervised by the ammo platoon leader and/or first sergeant. The commander decides which assets to deploy with the LOC and which to leave with the BOC. His decision is based on the options discussed below.

Ammunition. The commander can deploy all ammo assets to the platoons. This reduces the size, signature, and C2 problems of the battery CP and trains; but it adds to those of the platoons. Ammo vehicles could either go directly to the ATP and/or ASP from the platoons for ammunition resupply or stop first at the LOC or MLRS battalion ALOC.

Support Elements. The commander can deploy all support elements to the battery trains. This leaves only the commander and operations officer (with their drivers and HMMWVs) and the FDC with the BOC. This option virtually eliminates vehicular signature and trafficability needs from the battery CP. However, it reduces battery CP personnel and battery CP defensibility.

Wire Communications. When the LOC is located near the BOC (800 to 1,000 meters), wire line communications can be used between the two operations centers. This reduces C3 problems and the comm signature caused by separation. The BOC remains the main comm terminal and forwards all logistics information and support requests to the LOC. The LOC is not required to maintain a 24-hour radio net station to support the battery. This also allows the centers to serve as OPs or LPs for each other and to deploy reaction forces when attacked.

★ CHANNELS OF MISSIONS AND ORDERS



Radio Communications. Distance increases C3 and defense problems and requires the LOC to monitor the battery command or other designated frequency. The radio in the ammo platoon's or first sergeant's HMMWV can be used to monitor the net; however, this restricts the use of the vehicle. Increased distance may be necessitated by terrain or by enemy counterfire capability.

Coordination

The LOC must coordinate with the BOC on all decisions and efforts to prevent conflicting and incorrect direction of support activities. The BOC, with its better access to tactical situation information, is the command element.

Detachment of the MLRS Firing Platoon

The MLRS firing platoon with a platoon FDS can provide fire support in a detached mode without a parent MLRS battery or battalion. Logistical support of the detached platoon is the most significant problem in this type of operation. For a short time, a cannon battalion could provide limited support while the platoon's assigned ammo section provides short-haul Class V resupply. The platoon could be assigned a nonstandard GSR or R role to support an attack or to counter an enemy thrust. Detailed support must be planned and specific resources allocated to support the platoon before this type of mission is executed.

Section II

RECONNAISSANCE, SELECTION, AND OCCUPATION OF POSITION

Planning

Frequent moves are common to MLRS operations. Survival on the modern battlefield necessitates such tactics. Because MLRS operations are dispersed, firing platoons conduct their own RSOP and the BC and first sergeant conduct the recon and selection for only the battery HQ positions.

The BC must anticipate movement and plan in advance for displacement. He must keep the controlling headquarters advised of all factors that will impact on the movement of a platoon, the headquarters, or the battery as a whole.

Because of the size of platoon OPAREAs (3 x 3 km), also referred to as goose eggs, the BC must try to quickly acquire information of possible alternate or supplementary positions for his elements. He must, therefore, have enough lead time to plan and conduct his reconnaissance and selection. The MLRS chain of command must continuously reconnoiter the next OPAREAs.

Method

Fortunately, MLRS units are well-adapted to the technique of moving frequently and can move with minimal notice. The keys to successful RSOP are discipline, teamwork, and rehearsal. Battery and platoon RSOPs are executed in a three-step process.

The **first step** is that, on receiving the approximate next position from higher headquarters, a recon party reconnoiters it. At the battery level (battery HQ positions), this party usually consists of the BC or first sergeant and a driver. At the platoon level, this party is usually the recon sergeant with the platoon leader or platoon sergeant. Ammo personnel sometimes are included at both levels. They offer advice on the placement of their vehicles and give more defensive firepower to the recon party. The recon party traverses the designated position and determines how best to use it. The actual locations are reported after the occupation.

The **second step** is the assembly, movement, and occupation of the advance party. The advance party prepares the selected position for occupation by the main body; conducts a security sweep, if required, and an NBC sweep of the area; and, if necessary, establishes a jump BOC and/or provides continued support fires with an advance firing element.

The **third step** is the assembly, movement, and occupation of the main body. The main body usually begins this step only after the advance party, with its jump BOC or firing section, has emplaced and is ready to take over the mission. This step can actually be a series of movements by small infiltration groups or echelons.

Preparation

Preparation must include briefing the advance party and chain of command on the following:

- Mission.
- Tentative next locations.
- Proposed routes.
- Adjacent units.
- Possibly the designation of a platoon operations center (POC) as jump BOC if the BOC displaces and can no longer communicate.
- Enemy situation (threat to movement and occupation).

In planning the RSOP, an analysis of the factors of METT-T is essential.

Mission

★Providing responsive fire support is the overall mission. A key consideration for the MLRS battery commander is determining the movement technique (battery, platoon, or echelon) that best supports the fire support needs of the maneuver force. The MLRS, with its on-board PDS and on-board technical computer, is never out of action. It provides continuous fire support because of its ability to stop, know its location, and shoot from anywhere. At the platoon level, continuous fire support can be provided by moving a launcher forward with the advance party. The advance launcher becomes operational in the new OPAREA before the main body leaves the old one. This enables the battery and platoon to continue to provide maximum possible fire support. Speed in occupation is essential to providing fast, effective fire support.

Enemy

All members of the battery must fully understand the enemy situation and related factors. An imminent enemy offensive requires increased MLRS fire support, which is degraded during moves. Enemy rear area incursions jeopardize moving elements; enemy target acquisition and counterfire capabilities may change the distance or frequency of displacement.

Terrain

Terrain dictates time and distance requirements, primary and alternate routes, positioning possibilities within the assigned goose egg, and many other factors.

Troops

Commanders and platoon leaders must consider the availability of troops and their state of morale, rest, and training.

Time Available

The maximum time possible must be allotted to MLRS commanders and leaders for the RSOP. However, the time available for RSOP changes constantly; and planning must include variations and contingencies.

Reconnaissance

At least four recons are required to move the entire battery into a new position (one for battery HQ and three for the firing platoons). The three types of recon are map, air, and ground.

Map Reconnaissance

The map recon is preliminary to the ground or air recon. Potential positions and routes to them are selected. This method is very fast; it allows unsuitable routes to be eliminated. Also, likely ambush sites, rendezvous points, checkpoints, and other pertinent locations can be identified on the map. The major disadvantages of the map recon are as follows:

- Actual terrain conditions cannot be determined. Terrain features change with time, especially vegetation and the presence of man-made features. The map publication date should be checked.
- Surface conditions of the route and the position cannot be determined accurately.
- Other units may be in the position.
- Enemy forces may be in the area.

Air Reconnaissance

An air recon is made in conjunction with map and ground recons, whenever possible. If time and resources are available, information gained from an air recon is very useful. Air recons are faster than ground recons. However, they may give an inaccurate picture of the surface conditions and may reveal the route and the new position to the enemy.

Ground Reconnaissance

This is the best type of recon because the routes and position can be physically examined. However, this is the slowest type of recon.

Selection of Position

Battery Headquarters

The battery commander or first sergeant must consider many factors in the selection of the battery HQ area.

Mission. Mission is the most important consideration. The position should provide for ease of both C3 and logistical support of the firing platoons.

Tactical Situation. The tactical situation largely dictates the following:

- Location of the position area.
- Whether the headquarters is split into a battery CP and battery trains.
- The technique of positioning the vehicles.
- The use of terrain in defense of the unit.

Communications. The position must allow optimum communications between the battery HQ, controlling FA HQ, platoon HQ, and launchers. Often the battery HQ location must be well forward and on elevated terrain. Terrain communications masking must be used to enhance survivability.

Defensibility. The position should permit both active and passive defense so that it—

- Can be entered without enemy observation.
- Offers good cover and concealment.
- Has more than one entrance and exit.
- Takes advantage of existing terrain features.

Trafficability. The soil must be firm enough to support the vehicles of the unit. If an urban location (town or village) is used, the street widths, turn radii, and overhead objects must allow adequate clearances for the heavy and large (55-foot-long HEMTT-HEMAT) battery vehicles.

Weather. Weather conditions and the effect of weather on the terrain must be considered.

Road Network Availability. The headquarters area should be on or near the main supply route (MSR) used by battery resupply and support vehicles going to and from the platoons, ATPs, ASPs, and supply distribution points.

Other Factors. Additional factors to be considered are as follows:

- Zone of supported force.
- Location of ATPs and ASPs.
- Location of maneuver units.
- Weather and trafficability in the supported zone.

Firing Platoon

Platoon OPAREAs are selected by the same criteria. However, the following must also be considered:

- Existing survey control.
- Planning ranges for munition loads (for example, 10 to 32 km for M26 rockets).
- Fire unit status, available launchers, and ammo types.
- Terrain masks (both immediate and down-range masks).

Battery Headquarters Survivability Occupation and Positioning

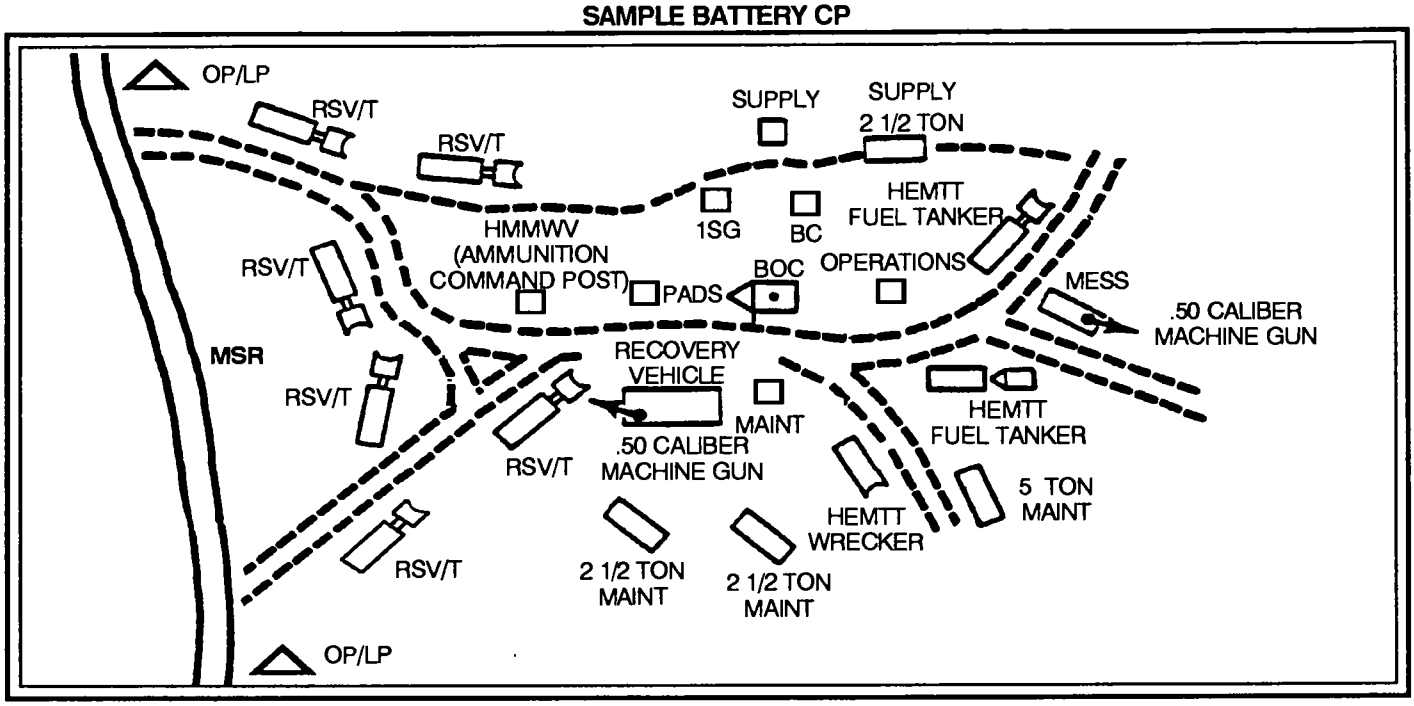
The primary method of survivability for an MLRS firing battery is the avoidance of detection. Battery headquarters, firing platoons, and ammunition platoons should use natural and man-made camouflage, noise and light discipline, and terrain to keep from being detected from the ground or air.

The firing battery headquarters position should be set up to take advantage of all means of cover and concealment, natural and man-made. The .50 caliber machine gun, M60 machine guns, antitank weapons, and M203 grenade launchers should be positioned to fire at likely enemy avenues of approach. The LPs and OPs should be in place to provide sufficient early warning to the battery so that it can displace when the threat is too great.

The BOC must stay attuned to the current tactical situation and ensure that information is disseminated to all battery elements. Especially important is information pertaining to enemy locations and disposition, friendly units in or near platoon OPAREAs, the NBC threat, and locations of friendly and enemy minefields.

Depending on the ammo resupply techniques used or the support available, the battery HQ can have as many as 50 to 70 personnel and 20 or more vehicles to emplace. The area required can be up to 500 meters in radius. These requirements highlight the need for a well-trained but relatively light advance party.

SAMPLE BATTERY CP



The positions to be occupied must incorporate the selection factors already listed, with emphasis on communications and concealment. Built-up areas such as towns and villages, in many cases, provide better hide areas than rural locations.

When selecting positions, battery leaders must consider each element of the battery HQ. See the following illustration and discussions.

Battery Operations Center

The BC or first sergeant should locate the BOC on elevated terrain for communications. It should be in the center of the headquarters position for maximum protection against ground attack and for ease of headquarters internal wire communications.

Mess

This section should be located on firm, accessible ground; should have good drainage; and should be upwind from the field latrine. The mess section TOE .50 caliber machine gun, mounted on the M35A2 truck, should be positioned to cover critical areas of the headquarters position, such as an avenue of approach. The machine gun can be dismounted and emplaced on a tripod.

Maintenance and Direct Support Attachments

This section should be placed to cover a portion of the defensive perimeter and to allow maintenance vehicles to move in and out easily in support of the platoons. The maintenance (maint) section has a .50 caliber machine gun mounted on the recovery vehicle and an M60 machine gun. Both should be sited and used for position defense or emplaced (dismount the .50 caliber) at an LP and/or OP. The section also should be located on firm, accessible ground that gives dispersion of the section vehicles and vehicles being repaired and recovered. Maintenance recovery vehicles usually move last in the march order.

Supply

This section requires firm terrain as well. The supply vehicles (not including the POL tankers) are placed to cover a portion of the headquarters position. The supply and POL vehicles are placed for easy access to and from the position. The supply section has an M60 machine gun which can be emplaced as part of the position defense or on an LP or OP.

Ammunition Holding Area

The AHA should be adjacent or closest to the MSR. It should be large enough to hold 6 to 12 of the battery HEMTT-HEMATs. It should be easily located, in darkness or daylight, by the ammo platoon personnel. Placed closest to the MSR, the AHA controls the main access route into the area.

Other Headquarters Elements

The rest of the headquarters platoon usually locates near the BOC. The NBC NCO works in the BOC, while the commander's vehicle and tent usually are located within 50 meters of the BOC. The PADS survey section should be located within easy access of the BOC.

Section III

BATTERY MOVEMENT

Displacement Options

The MLRS battery displacement options resemble those of other FA units; however, the BOC directs and controls the displacement of subordinate platoons. The BC usually is directed to displace by battery, echelon, or platoon. Some considerations in selecting an option for displacement are as follows:

★ • Maneuver unit scheme of movement.

- Continuous fire support.
- Overall tactical situation.
- Immediate and future requirements of the supported unit.
- Characteristics of the terrain to be traversed.
- Distance of march.
- Enemy capabilities.
- Command and control capabilities.

Displacement by Platoon

This is the most common and preferred method of MLRS displacement. One firing platoon at a time is displaced, either as a complete platoon, by echelons within the platoon, or by individual vehicle infiltration.

Displacement by Battery Echelon

In this method, one or two of the major elements of the battery are moved in two or more groups, such as two firing platoons. Then elements of the battery HQ or ammo platoon and the rest of the battery are moved.

Displacement by Battery

This method, displacement of the entire battery at once, is the least preferred. It is seldom used by an MLRS battery. However, distance, mission, route priorities, or the overall tactical situation may dictate a battery-level move. The MLRS battalion, if controlling two or more batteries, may use this method.

Jump Battery Operations Center

Each BOC tries to maintain C3 and fire direction processing while moving; often, this is not possible. Batteries can send a BOC slice forward with the headquarters advance party to act as jump BOC. Since the battalion FDS cannot control launchers, automated fire direction is lost when the battery FDS cannot communicate. Therefore, each battery should designate a platoon to assume fire direction control of the battery as the headquarters displaces or if the FDS becomes non-mission-capable. The platoon FDS then enters the digital net with the div arty TACFIRE, MLRS battalion FDS, or corps TACFIRE. Once this link occurs, the platoon assumes the role of battery FDC. If the entire C2 mission is passed to a platoon (for example, if the BOC were destroyed), the BC and/or battery operations officer moves to the designated POC to best influence the action and to ensure the continuity of operations. The battery commander's FM secure radio helps in the establishment of voice net links. In this case, the BC may choose to relocate personnel to the designated POC. There they help with the increased workload.

Tactical Marches

A tactical march is the movement of a unit or elements of a unit under actual or simulated combat conditions. There are several methods for moving the battery or platoon in a tactical configuration. Each method has specific advantages and disadvantages. The BC decides which method or combination is best.

Open Column

The open column is used for daylight movements when there is an adequate road network that is not

overcrowded, when enemy detection is not likely, when time is an important factor, or when the travel distance is great. Vehicle interval in an open column is generally 100 meters.

The **advantages** of the open column are as follows:

- Speed (the fastest method of march).
- Reduced driver fatigue.
- Improved vision on dusty roads.
- Ease in passing individual vehicles.
- Ease in dispersing vehicles as a passive defense measure against an air attack.
- Less chance of the entire unit being ambushed.
- Less vulnerability to indirect fire.

The **disadvantages** of the open column are as follows:

- Greater column length requires more road space.
- Other traffic often becomes interspersed in the column.
- Communication within the column is complicated.

Close Column

In close column movement, the vehicle interval is less than 100 meters. At night, each driver observes the cat's-eyes of the blackout markers on the vehicle in front of him and maintains an interval of 20 to 50 meters. If the driver sees two marker lights, the interval is too large; if he sees eight marker lights, the interval is too small. Four visible marker lights indicate he is maintaining the proper interval. During daylight, close column is used to maintain maximum command and control during periods of limited visibility or when moving through built-up or congested areas.

The **advantages** of the close column are as follows:

- Simplicity of command and control.
- Reduced column length.
- Concentration of defensive firepower.

The **disadvantages** of the close column are as follows:

- The column is vulnerable to enemy observation and attack.
- The strength and nature of the column are quickly apparent to enemy observers.
- Convoy speed is reduced.
- Driver fatigue is increased.

Infiltration

When the battery moves by infiltration, vehicles are dispatched individually or in small groups without reference to a march table. Though this technique is time-consuming and the vehicles are difficult to control, it is used when the enemy has good target acquisition means and quick reaction capabilities.

The **advantages** of infiltration are as follows:

- Vehicles are less vulnerable to hostile observation.
- Opportunities for covert operations are increased.
- Defense against air and artillery attack is provided.
- The enemy is deceived as to the size of the unit.

The **disadvantages** of infiltration are as follows:

- It is time-consuming.
- It is difficult to command and control.
- Vulnerability of small elements is increased.

Terrain March

The terrain march is an off-road movement to reduce vulnerability and to avoid traffic. A unit using this type of movement should travel close to tree lines, along gullies, and close to hill masses. When enemy observation or interdiction by artillery fire or air attack is likely, a terrain march should be conducted. A unit may move safely on a road for some distance and change to a terrain march at a point where enemy observation becomes likely or vehicle congestion makes an inviting target.

The terrain march should be considered when traveling to alternate positions; but first, the following factors should be considered:

- Displacement time may be increased.
- Ground recon is required.
- Soil conditions may complicate this type of movement.
- Wheel or track marks to the new position may be left.
- Extensive coordination is required to avoid traveling through other unit areas.

The MLRS unit employing the terrain march may move in open column, in close column, or by infiltration.

Conduct of the Movement

Preparation for the move should include the following actions:

- Conduct preventive maintenance checks and services (PMCS) of equipment.
- Recover wire.
- Replace section equipment in the proper storage areas.
- Remove overhead cover and camouflage.
- Load all service elements, such as mess and maintenance.

The **organization** of the column varies according to the tactical situation, the threat, and the position to be occupied. The following considerations apply:

- Vehicles should be arranged in an order that facilitates speed, occupation of the new position, and defense during movement and occupation.
- Preparations should be made for personnel in convoy to return fire, if attacked.
- Key personnel and equipment should be dispersed throughout the column. This enhances command and control during attack and precludes losing a large number of critical soldiers and equipment to enemy action.

The following **control measures** help in the movement:

- The start point (SP) is a geographical feature, identifiable on the ground and on a map. It is the initial control point where the first vehicle of a unit convoy crosses at a specified start time.
- A checkpoint is a geographical feature, identifiable on the ground and on a map. It is used in reporting progress along the route of march and also as a target in planning fires in defense of the convoy.
- The release point (RP) is a geographical feature, identifiable on the ground and on a map. It is the final control point where the last vehicle of a unit convoy crosses at a reported time.
- A rally point is a geographical feature, identifiable on the ground and on a map. It is used as a point of assembly and recovery from dispersion due to enemy attack. The designated rally point(s) should be located near or on the alternate route of march to the new position.
- A route-marking detail marks the route by posting signs and/or personnel at critical locations to guide the convoy. Details concerning traffic control and route marking are in FM 19-25 and FM 55-30.
- Predetermined signals, such as colored flags and flashlights, should be established by SOP to aid in convoy control.

March Discipline

Officers and NCOs ride where they can best control and supervise the march of their units. The senior person in each vehicle is responsible for ensuring that all orders concerning the march are carried out.

The column must keep moving. The unit SOP should indicate who stops to pick up mission-essential personnel and equipment if a vehicle breaks down. Usually, the driver stays with the vehicle and the maintenance section stops to help. If the disabled vehicle cannot be repaired in a reasonable time or be recovered by the unit, the position and condition of the vehicle are reported to higher headquarters for recovery. To be available for the rest of the unit, the maintenance section must be prepared to proceed along the route of march independently and as soon as possible. The maintenance section and all other sections must have maps and must be thoroughly briefed concerning the route of march.

Each vehicle commander must watch for signs, markers, signals, and other traffic.

March discipline is attained through training and internal control within the marching unit. The specific objective of march discipline is to ensure cooperation and effective teamwork by march personnel as follows:

- Respond immediately and effectively to all signals.
- Relay all signals promptly.
- Obey traffic regulations and the instructions of traffic control personnel.
- Use cover, concealment, camouflage, dispersion, radio listening silence, blackout precautions, and other protective measures against air, ground, and NBC attack.
- Maintain correct speeds, positioning, and intervals between vehicles within the column.
- Recognize route-marking signals and signs.
- Use correct procedures for handling disabled vehicles.

During extended vehicle marches from rear areas to the main battle area (MBA), sites that provide cover and/or concealment should be selected for the halts needed to service equipment or to rest personnel. Security must be maintained at these locations.

March Column Contingencies

Immediate Action Procedures

An MLRS firing battery or platoon is a high-priority target for the enemy. The MLRS units are most vulnerable to attack while moving; therefore, they must establish an SOP for defensive actions if attacked on the march. In establishing this SOP, the BC or platoon leader must consider the following:

- Enemy situation (kinds of attack to be expected).
- Organic resources available to counter each kind of attack.
- Nonorganic support available to counter attacks (fire support from FA units and so on).
- Amount of time available for training the unit in particular defensive actions (such as infantry squad tactics in response to a blocked ambush).
- Type of comm system to be employed with defensive actions (flags, radio, arm-and-hand signals, and so on).
- Means of protecting the battery or platoon.
- Methods to neutralize the attack.

March Column Under Artillery Attack

The defensive action in response to artillery fire is to move out of the danger area, report the situation to higher headquarters, and request immediate counterfire. If a unit expects hostile artillery fire during the march, it can reduce its vulnerability by using one of the following methods of movement:

- Open column or infiltration.
- Movement during darkness or other periods of reduced visibility.
- Terrain march.

March Column Under Air Attack

Under an air attack, the unit should immediately engage the aircraft with all air defense weapons available in the column. At the same time, it should disperse off both sides of the road and halt. High-performance aircraft can be effectively engaged with low-volume, independent, small-arms fire. As the aircraft approach, all personnel in the column should fire their weapons in the air to form a wall of bullets through which the aircraft must fly.

Roadblocks

When halted by a roadblock, the unit must apply, on both sides of the roadblock, the maximum amount of firepower available. If nonorganic support is available, such as close air support or covering artillery or armor, the convoy commander or controlling authority should request it immediately. If the roadblock cannot be neutralized, the unit must disengage under cover of supporting fires. Upon disengaging, the unit should meet at a designated rally point and then resume its march by using an alternate route. An attempt to crash through a roadblock with vehicles before the roadblock is checked for mines can result in unnecessary loss of equipment and personnel. Also, the road may become completely blocked by disabled vehicles.

Ambush

There are two types of ambush—blocked and unblocked. Both must be countered in the same manner: Get out of the kill zone, and neutralize the ambushing force with firepower.

If the route is blocked, maximum available fire should be placed immediately on the attacking forces. Personnel in the kill zone should dismount, attack as infantry, and evacuate the kill zone as soon as possible. Convoy personnel not in the kill zone also must react immediately and outflank the ambushing forces.

In an unblocked ambush, the convoy should increase its speed and move through the ambush area while placing the maximum amount of small-arms fire on the attackers.

The area may have been identified during the map inspection as a likely ambush site, and on-call fires may have been planned. If so, the convoy commander or controlling authority executes on-call fires. Otherwise, he immediately sends a fire request to the FDC of the controlling FA headquarters.

The ambush or any other enemy action may be of such magnitude that the column is broken up. Then individual elements should go on their own to the new position or designated rally points.

Section IV

SURVEY AND METEOROLOGICAL SUPPORT

Survey Support

Each MLRS firing battery has a survey section, equipped with one PADS. It provides survey control for the primary, alternate, and future positions of the supported unit.

The accuracy of the data produced by PADS is directly related to the accuracy of its starting data. Whenever possible, starting data for the battery PADS should be at least of fourth-order accuracy. These data can be obtained from the SPCE at higher headquarters, from trig lists, or from other artillery units operating in the same area as the MLRS unit. When surveyed starting data are not available, PADS can use information from overprinted maps; from graphic resection; or, in the absence of these, from assumed starting data.
Survey control is provided to the platoons by the battery PADS team, using 10-minute zero velocity correction. The points the battery survey team establishes should be considered SCPs. Ideally, the SCPs are located on readily identifiable and accessible terrain, such as road junctions, every 6 to 8 kilometers throughout primary, future, and alternate OPAREAs. The launcher personnel must be able to locate each point and stop the launcher at the SCPs without excessive maneuvering. Within platoon OPAREAs, SCPs for launcher update are established at the entrance to the OPAREA and at the reload points. The POC personnel give SCP coordinates and altitude to each launcher section and the PADS survey section. Then they leave these data on a tag at a marker to identify the SCP.

The PADS section, located in the battery HQ area, coordinates survey with the advance party. The section ensures platoon SCPs are in place before the battery displaces. It is controlled by the BOC and directed to link up with the platoon leader requiring survey support. The locations of all SCPs are maintained on the BOC situation map or charts for future use. Upon completion of his survey mission, the PADS chief reports directly to the BOC for further instructions.

If there is no survey control, the platoon leader must establish alternate methods of survey. He uses one of the following options:

- Use adjacent unit SCPs or their survey assets to extend survey control into the OPAREA.
- Use SCPs outside the OPAREA. Depending on the number of SCPs and their distance from the firing points, this method may severely limit platoon operations, since launchers must be updated after 6 to 8 kilometers of travel.
- Use the launcher SRP/PDS to establish SCPs in the OPAREA by transferring survey from other SCPs and known points. This method may create some accuracy loss (accuracy depends on the distance traveled by the launcher); however, it is as accurate as hasty survey techniques up to an 8-kilometer transfer distance, and it is faster.
- Use hasty survey (graphic resection) to establish SCPs. The steps for establishing survey control through graphic resection are described in Appendix D. If hasty survey is used to establish an SCP, each launcher position determining system (PDS) should be updated after every 4 to 6 kilometers of travel.
- Use map spotting. Well-trained map readers using Graphic Training Aid (GTA) 5-2-12 often can establish an SCP to the same accuracy as by using hasty survey techniques. Map spotting should be used only as a last resort. Launchers using map-spotted SCPs should update their PDSs after every 4 to 6 kilometers of travel.

Meteorological Support

The MLRS is sensitive to met conditions and uses met message data as part of the fire direction computation. The on-board FCS of the launcher uses all lines of the current computer met message to compute rocket firing data.

Met messages usually are received in a digital secure mode from the controlling headquarters TACFIRE. They are routed through the battalion or battery FDS and sent to the FCS. The battery FDS sends met messages to all launchers and platoon FDSs simultaneously.

The platoon FDS can store the message and retransmit it to a launcher if necessary. Both the platoon FDS and the launcher FCS can be manually loaded with met data through keyboard entry if required.

The FDS interfaces directly with the met data system (MDS) or met measuring set (MMS). Current met information can be obtained by communicating directly with the MDS on the met section net. The MDS is deployed down to FA brigade; while the MMS is used by light infantry, airborne, and air assault division artilleries.

Section V

FIRE MISSION PROCESSING

Fire Direction Responsibilities

The FDS usually performs the fire direction tasks automatically. If the FDS in the FDC is inoperable, then either a platoon FDS processes the mission; or the BOC and/or FDC personnel manually perform these tasks. Responsibilities include the following:

- Target analysis and selection of type and number of rockets and/or missiles to fire.
- Down-range mask checks.
- Fire support coordinating measure and air corridor checks.
- Selection of platoon and launcher to respond.
- Transmission of fire orders.
- Recording the missions.

For MLRS rocket missions, the MLRS battalion or battery FDC determines the number of aimpoints and the number of rockets to fire at each aimpoint to achieve the required effects. Effects guidance is provided by the controlling FA headquarters on the basis of the maneuver commander's requirements.

Similarly, missile (ATACMS) missions can be processed by the MLRS battalion or battery FDC. The FDS can process targets to determine target aimpoints and the number of missiles necessary to achieve the required effects as specified in the commander's guidance. However, because of the deep, high-payoff nature of many ATACMS targets, effects processing may be done at levels above the MLRS unit. In this case, the unit receives the fire mission through the digital fire direction radio net or through the battalion CTT or GSM for manual input. The fire mission includes aimpoints, number and type of munitions (warheads) to fire, and any other targeting guidance.

Selection of the launcher to fire is based on information given to the BOC and/or FDC by the firing platoons. This information includes launcher and ammo status and the firing platoon leader's plan for use of his launcher sections in responding to fire missions. The platoon leader designates firing points and the preferred sequence of use for each of his firing sections. The battery FDC enters the platoon leader's data into the FDS and uses those data as the primary criteria for launcher selection.

The battery FDC is responsible for identifying potential down-range mask problems and ACA and other fire support coordinating measure (FSCM) violations. Down-range masks, ACAs, and other fire support coordinating measures are plotted on the fire direction capabilities map in the FDC and entered into the FDS. The battery FDS checks automatically for down-range mask, ACA, and other FSCM violations. The results of these checks may require the FDC to select a different platoon or launcher to fire or to defer the mission. The MLRS battalion FDS also automatically checks down-range mask when selecting a firing battery to fire. Down-range masks, FSCMs, and ACAs are plotted on an overlay of the fire direction capabilities map. Any FSCM and ACA violations should be reported to higher HQ.

The battery FDC sends the call for fire directly to the launcher selected to fire the mission. Usually, it is transmitted over the battery fire direction net (FM digital) from the FDS to the launcher FCS. The appropriate platoon HQ monitors the fire order with its FDS. The platoon FDS can be used to relay digital messages between the FDC and the launcher. If digital traffic is not possible, the mission can be sent to the launcher over the battery command net (FM voice) for the crew to input through the fire control panel.

Firing Data Computation

The FDS does all fire mission functions except compute the actual firing data. This function is controlled by the launcher FCS. When the FDS is operational, FDC personnel, at a minimum, record and print the mission and plot the target on the fire direction capabilities map. The fire mission log may be used to record the mission if the FDS printer is not operational. The data recorded on the fire mission log include the following:

- Target number.
- Target grid.
- Unit assigned—launcher, platoon, or battery.
- Time of receipt.

- Number of rounds—volleys or percent of effects.
- Ammo type.
- Method of control and/or TOT time.
- Time to send to launcher.
- Mission status.
- Time mission fired report received.
- Number of rounds fired.
- Remarks.

CHAPTER 7

MLRS FIRING PLATOON OPERATIONS

The operational unit of the MLRS battery is the MLRS firing platoon. It conducts semiautonomous operations under the control of the battery, occupies an independent area of operations, and conducts its own RSOP. The MLRS firing platoon can be considered analogous to a cannon firing battery for fire support, positioning, and logistics considerations. (For discussion of the FA cannon battery, see FM 6-50.) The MLRS firing section (one launcher) is analogous to the cannon battery or platoon in that each is considered a unit of fire. Tactically, the platoon leader must do all of those tasks usually associated with the cannon battery commander. The leaders of the firing platoon must be innovative and creative in their approach to operations. The uniquely independent operations of an MLRS firing platoon place great responsibility on personnel to meet their missions. Instructions covering features of combat operations which lend themselves to definite or standardized procedures without loss of effectiveness should be covered by TSOP. Preparation of MLRS platoon TSOPs is normally guided by a battery TSOP. (For a guide and checklist for preparing an MLRS battery TSOP, see Appendix B.)

Platoon Headquarters

Platoon Operations Center

The POC is located in an M577A2 with an FDS. The POC is manned by MLRS fire direction personnel and is supervised by the platoon leader or the platoon sergeant. The recon sergeant also may work in the POC when he is in the platoon HQ position. The platoon leader or platoon sergeant should locate the POC on elevated terrain for communications and should center it in the platoon HQ position for maximum protection against ground attack and ease of platoon internal wire communications.

Command and Control

The platoon leader and platoon sergeant are responsible for the command and control of platoon operations and for advising the BC and/or BOC on their launcher and ammo status. The BC and/or BOC direct the platoon leader and sergeant concerning the specific number of operational launchers that are postured for specific munitions and ready to fire status. Because of the limited number of personnel available, the platoon leader and platoon sergeant usually work shifts; thus, they keep the POC operational 24 hours a day. They are responsible for coordinating ammo resupply with the BOC. The POC personnel monitor all traffic between the BOC and the launchers by using the platoon FDS. Loss of the platoon FDC would severely hinder platoon command and control. The BOC personnel maintain a DA Form 1594 and a DA Form 7232-R. (A reproducible copy of DA Form 7232-R is at the back of this book.) An example of an MLRS FDC Fire Mission Log is shown below.

Support

The POC is the hub of platoon support activities. The attached MST stays with the platoon HQ and is deployed in accordance with (IAW) unit SOP. Launchers, in an inoperational (INOP) status move to the platoon HQ area to reduce the command, control, and resupply burden.

MLRS FDC FIRE MISSION LOG

MLRS FDC FIRE MISSION LOG

For use of this form, see FM 6-60. The proponent agency is TRADOC.

DATE: 30 MAR 92 — UNIT: 2/A/4/27/FA

TARGET NUMBER (a)	TARGET EASTING (b)	TARGET NORTHING (c)	UNIT ASSIGNED (d)	TIME OF RECEIPT (e)	NUMBER OF ROUNDS TO FIRE (f)	AMMO TYPE TO FIRE (g)	METHOD OF CONTROL TOT TIME (h)	TIME MSN SENT (i)	MISSION STATUS (j)	TIME MFR RECEIVED (k)	NUMBER OF ROUNDS FIRED (l)	REMARKS (m)
XA 0011	6812	1624	1-1-A	2330	12	JED	AMC	2331	READY	2332	12	EOM
XA 0013	6747	1581	1-3-A 2-3-A	2335	15	JED	2350	2334	READY	2335	15	EOM 1-3-A & 2-3-A
XA 0016	6688	1589	2-1-A	2336	5% / 8	JED	WR	2336	READY	2336	8	EOM
XA 0018	6751	1499	1-2-A	2340	6	JED	WR	2340	CANCOM	2341	0	EOM Ammo Prob-FP A6
XA 0018	6751	1499	3-2-A	2341	6	JED	WR	2342	READY	2342	6	EOM Reassigned from 1-2-A
						31	MAR	92				
XA 0001	6915	1833	2-1-A	0015	2	JEE	0030	0016	READY	0016	2	EOM

Operational Area

★An MLRS platoon area should be large enough to be trimmed to a 3- by 3-kilometer (goose egg) OPAREA by the platoon leader's map and ground recon. Smaller areas severely restrict the platoon leader's employment options, the length of time the platoon can stay there, and the survivability of the platoon. The entire OPAREA may not be used intensively. However, after use by MLRS launchers, the firing point (FP) areas may be subjected to intense enemy counterfire; therefore, they are considered highly dangerous. Except for cases of tactical neccessity, launchers should use a firing point only once. The signature of the M270—noise, smoke, and fire—make it easily identifiable from a great distance, especially in open terrain. Quality terrain is desired by all units, and parts of the MLRS platoon OPAREA can be used by other units. However, units are discouraged from occupying positions within 500 meters of any FP. This often requires MLRS units to conduct face-to-face coordination with units on the ground. There are six types of positions within the OPAREA; each type may have several locations. These positions are discussed below.

Firing Point

Each platoon OPAREA should have at least nine FPs, three for each launcher. Each launcher section chief is responsible for selecting his firing points. The platoon leader should select desired firing areas from which firing points are selected. The following are considerations in selecting a firing point:

- It should be on a level point within 150 meters of the given FP grid from which a launcher can fire. (The launchers cannot fire from slopes greater than 89 mils.)
- There should be no immediate mask in the probable direction of fire.
- Hide areas (HAs) should be located within 20 to 100 meters of the FP.
- The FP may be located on a road. (For rocket missions, the road should be perpendicular to the general azimuth of fire; and for missile missions, the road should parallel the general azimuth of fire. The road should lead directly to the RL or the next FP. This reduces ground signature, response time, and time required to "scoot.")
- Communications must be established with the BOC and the POC.

Hide Area

The hide area is selected by the launcher section chief. It is an area in which to hide the launcher while awaiting a fire mission. It should be a covered and concealed position close to the designated FP (not more than 100 meters away). A launcher in the HA must be able to communicate with the POC and should be able to communicate with the BOC. The HA should be on a road leading to the FP to reduce ground signature and to speed response time.

Reload Point

The reload point is where the launchers upload launch pods and the HEMTT-HEMATs off-load. This is the most vulnerable point for each element. Each platoon OPAREA should have at least two RLs. They should be collocated with SCPs to reduce travel time and the distance of the launchers. The RL selection is based on the following:

- Cover and concealment for a HEMTT-HEMAT and launcher in the position at the same time.
- Maneuver room for the 100-foot turning radius of the 55-foot-long HEMTT-HEMAT.
- Firm ground or pavement for supporting vehicles and launch pods.
- Covered and concealed route from AHA to RL.
- Trafficability.

Survey Control Point

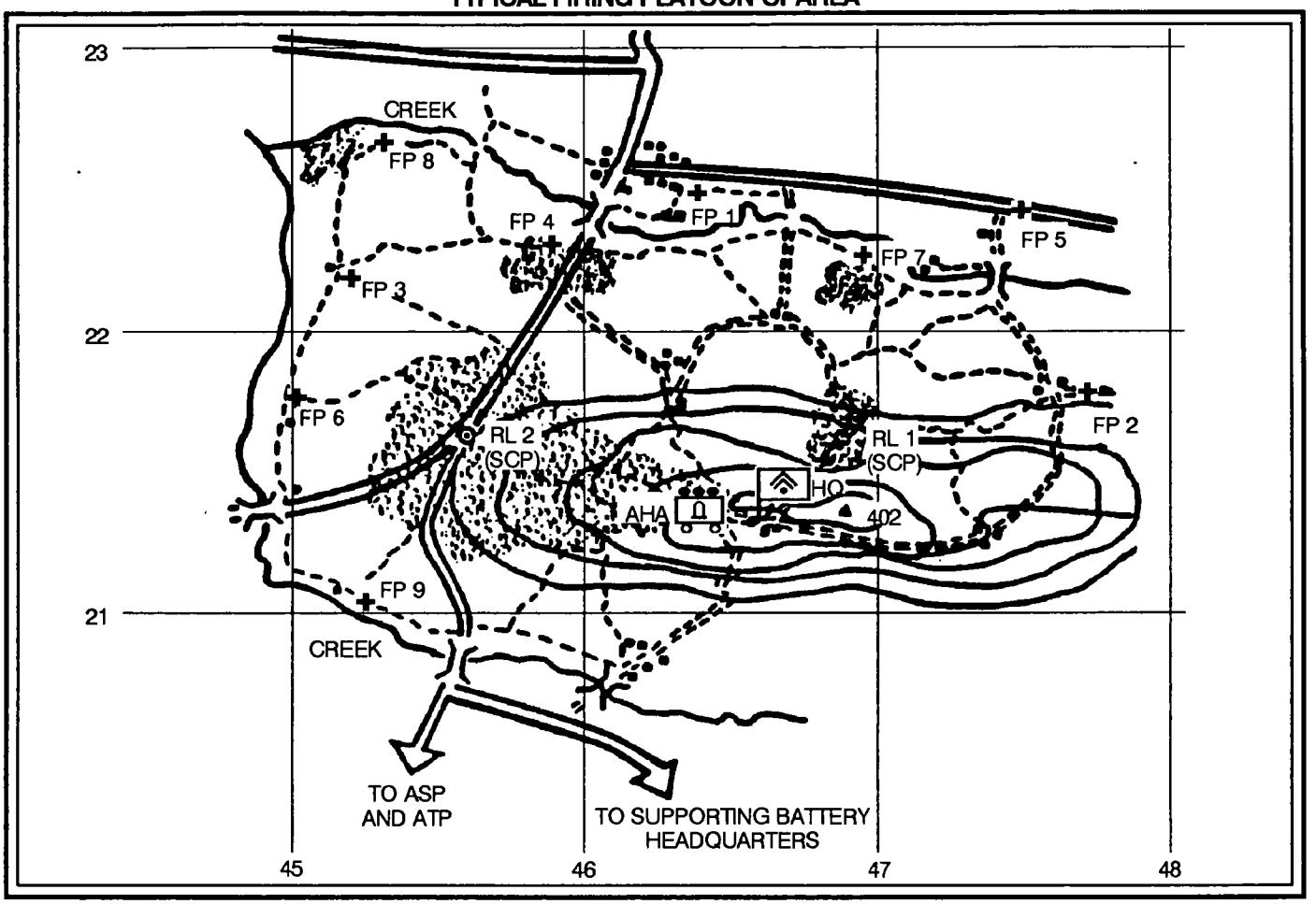
The SCP is where the launchers update or begin calibration of the SRP/PDS. At least two SCPs should be established in the OPAREA. These should be collocated with the RLs, as mentioned above. The same considerations, except in the area of Class V resupply, apply for SCPs as for RLs.

Platoon Headquarters

Platoon HQ is where the M577A2 CP track, the platoon leader's HMMWV, the recon sergeant's HMMWV, and, if attached, the 27M DS MST vehicles are positioned. Normally, inoperational launchers (being serviced, crew resting, and so on) are also positioned here. Each platoon OPAREA should have a primary platoon HQ location and an alternate location, if possible. The platoon HQ location is based on the following:

- Optimum communications with the BOC and launchers.
- Cover and concealment.
- Comm mask between the position and the enemy.
- Defensibility with the AHA.
- Trafficability.

★ TYPICAL FIRING PLATOON OPAREA



Ammunition Holding Area

The AHA is where the attached ammo section positions its vehicles (four to six HEMTT-HEMATs). It can be collocated with the platoon HQ if the ground threat is greater than the air attack or counterfire threat. Otherwise, the AHA should be 100 to 300 meters from the platoon HQ and astride the main entrance route into the platoon HQ for entry control. The AHA selection considerations are as follows:

- Cover and concealment.
- Trafficability.
- Maneuver room for the 55-foot-long HEMTT-HEMATs.
- Proximity to the MSR.
- Defensibility with platoon headquarters.

Reconnaissance, Selection, and Occupation of Position

Procedures

The platoon leader receives the general proposed location, in the form of a goose egg, from his BC by either digital, voice, or messenger communications. Leaders in the platoon should follow the RSOP procedures in Chapter 6. A sample platoon RSOP procedure is outlined below.

Recon Party. Reconnaissance is the responsibility of the platoon leader and the primary duty of the recon sergeant. The recon party also may include the platoon sergeant in the platoon leader's absence and/or the ammo section chief (or his representative) to advise on AHA positioning.

Moving the Platoon. One of the advantages of MLRS is that the system requires very little, if any, position preparation. The MLRS firing platoon uses no advance

party. The position preparation that does occur is either completed during the reconnaissance or does not impact on operations and is completed after occupation. When the commander has directed that the platoon maintain a firing capability during the displacement, the unit moves by platoon echelon. This means that the platoon leader moves a launcher, an ammunition HEMTT/HEMAT, the battery PADS vehicle, and a fire direction specialist forward before the main body. If the platoon moves by echelon, the first echelon normally completes the tasks below; otherwise, the recon party completes them or they are done after occupation.

- Coordinates and emplaces SCPs.
- Conducts a mounted security check of the platoon headquarters and AHA positions.
- Establishes communications with the BOC and assumes command and control when the main body with platoon headquarters moves.
- Lays wire line from platoon headquarters location to the AHA and/or entry control point.
- Occupies a firing point with one launcher and notifies the BOC of platoon OPAREA data and single firing point information. When the launcher is operational in a new OPAREA, the BOC normally directs the platoon main body to displace.

Considerations

The arrangement of the platoon OPAREA depends on METT-T. Primary considerations in the recon and selection are based on the following:

- Communications with the BOC.
- Open areas for firing points.
- Dispersion requirements of platoon locations; for example, FPs, HAs, RLs, SCPs, platoon HQ, and AHAs.
- Maximum cover and concealment for the platoon HQ, HAs, RLs, SCPs, and AHAs.
- Trafficability within the OPAREA and location of the MSR.

Trafficability

Trafficability is absolutely critical to MLRS operations. The recon party must develop a sound traffic plan. Considerations are discussed below.

Limitations of the HEMTT-HEMAT. The HEMTT-HEMAT—

- Bogs and slides easily on soft, muddy, snowy, sandy, or icy surfaces.
- Requires a 100-foot radius for turning. Routes requiring sharp turns or positions requiring turnarounds must be carefully checked.
- Is top-heavy when fully loaded.

Limitations of the Launcher. The launcher leaves a readily identifiable signature on the ground when it pivot-steers or turns sharply. Routes that would require such maneuvers should not be used.

Roads, Clearances, and Grades. All positions should be placed on or near roads, if possible. Special consideration should be given the following:

- Road widths (urban areas) and grades (steep slopes for winter and wet weather usage).
- Tunnel heights and widths.
- Bridge capacities.
- Overhead electrical wires (train, telephone, power, and so on).

Serviceability of Roads. Hard, all-weather roads must be used, if possible, to prevent bogging down vehicles and leaving ground signatures.

Routing. The traffic pattern should route all HEMTT-HEMAT runs to RLs that are away from FPs (where counterfire is heaviest). Launchers should operate in separate road network areas where they will not risk collision in poor visibility, at high speed. The HEMTT-HEMATs should be routed away from these areas for the same reason. Main enemy avenues of approach and major friendly MSRs should be avoided, as both bring unwanted traffic and attention to the OPAREA.

Displacement Route. A recognizable displacement route from the OPAREA for all elements should be established.

Dispersion

Part of the survivability of MLRS is based on dispersion within the OPAREA. Minimum preferred distances between elements are defined below.

The **firing point**, the likeliest point for receiving counterfire, should be at least 500 meters from any other FP (800 meters is preferable) and 800 meters from any other position or element within the OPAREA except hide areas.

The **reload point** should be at least 800 meters from FPs and at least 500 meters from any other element or location.

Survey control points are usually collocated with RLs. If not, the same dispersion rules should be followed as for RLs.

The **platoon HQ** and **ammunition holding area** are located within the above restrictions. They can be collocated or separated by up to 300 meters, depending on the situation and METT-T.

Security

★ Because of the limited number of personnel, lack of crew-served weapons, and large size of the platoon area, defense against a ground attack is limited. The platoon is a high-priority target for enemy ground maneuver and special operations forces. Since the platoon is normally positioned as close as possible to the FLOT in the manuever brigade sector, security must be a high priority to avoid exposing the launchers and nearby maneuver units to enemy ground or indirect fire attack. The keys to survivability are the avoidance of detection and passive defense. The platoon sergeant is in charge of the platoon area security and does the following:

- Coordinates with DS cannon and maneuver units within the OPAREA for direct fire support.
- Uses mines and trip flares if available. (This requires extensive coordination.)
- Gives a rendezvous grid to each launcher for use in case of hasty or emergency displacement.
- Places the M60 machine gun on the most likely avenue of approach to the platoon HQ (usually with LP and/or OP at the entry control point in the AHA).
- Has launcher chiefs dismount one man in the HA to provide local security, except during a fire mission.

Launcher Survey Control

Calibration

The crew calibrates the launcher SRP/PDS every 30 days or whenever the launcher track system or SRP/PDS is replaced or repaired. The launcher requires two SCPs, 4 to 6 kilometers apart, located to at least fourth-order accuracy. One point is used to initialize the SRP/PDS for location. The launcher is driven to the second SCP at about 40 kilometers per hour, and the first set of calibration corrections is determined. The launcher is then driven back to the starting SCP, where a second set of calibration data is computed. If both sets of calibration data are within tolerance (0.4 percent of distance travelled), the system is functional and the second set of data is used.

Update

To update the SRP/PDS position, the crew drives up to an SCP and enters the data from the point into the FCS. An updated SRP/PDS holds its firing accuracy up to 8 kilometers before requiring another update.

Survey Control Points

Although cover and concealment are factors in SCP selection, utility should be the primary consideration. The SCP must be readily accessible so the driver can stop the launcher with the rear edge of the left drive sprocket aligned next to the SCP marker. The area and SCP marker must be such that the driver can position the launcher without ground guidance or excessive maneuvering. The SCPs should be collocated with a reload point, if possible. This allows easy return of the launcher to operational status.

Alternate Survey

If PADS support is not available, survey control can be obtained from trig lists, from adjacent unit survey, by transferring survey with the launcher SRP/PDS, and by other means. (See Chapter 6 for more information on alternate means for establishing survey control.) Graphic resection and map-spot data are not considered adequate for launcher initialization or calibration except in an emergency situation.

Launcher Response Posture

Definitions

On the basis of METT-T, the force FA commander's guidance, and ammo resupply and launcher maintenance status, the commander determines how his unit launchers will be postured. A launcher response posture is its readiness to respond to fire missions. Through several generations of software for the FCS and FDS, the terms *hot, cool,* and *cold* have come to indicate launcher response posture.

Hot. Hot status indicates the launcher is fully capable of firing. Usually, the status is based on the launcher's electrical and mechanical systems, not on its location or ammunition load. A launcher may be hot and, therefore, mechanically capable of firing. However, it may not be on or near an FP; or perhaps it may not have any, or enough, or the right type of ammunition aboard.

Cool. Cool status indicates a launcher is capable of firing but only after a warm-up period.

Cool status indicates the launcher SRP/PDS has been turned off but that all other systems are on and fully functional. To reduce long-term wear on the components, the crew enters the FCS auxiliary menu, selects SPLL COOL, and turns the SRP/PDS off. About 8 minutes are required to align the SRP/PDS and return it to operational capacity when it is turned on again.

The FDS is notified of SPLL COOL status when the crew sends a LCHR LST launcher status message, indicating that the launcher is INOP—SPLL COOL. The FDS will not select an INOP launcher to fire.

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

Technical Posturing

Fire Control System Posturing. The launcher crew makes one or more entries into the FCS to notify the BOC of the launcher status and location. These LCHR LST messages are entered as launcher OPER or INOP. Additional explanatory entries and the launcher's current location and altitude are entered.

OPER. Upon entering OPER into the LCHR LST message, the crew must choose a numeric code to further identify the launcher status. For OPER messages, these are location codes. When LCHR LST is sent, the FDS displays the launcher status (OPER or INOP), current ammo load, and code location (FP and so on). Code messages may be assigned by unit SOP; however, only the code number will appear on the FDS. For example, OPER 06 might indicate that the launcher is fire-mission-capable but is displacing with the platoon to a new OPAREA.

INOP. The crew usually sends an INOP LCHR LST message to the BOC when the launcher is NMC. Instead of indicating locations, like OPER codes do, INOP codes indicate reasons for the launcher being INOP. The codes may be assigned messages under unit SOP. The messages are displayed on the FDS when LCHR LST is transmitted. For example, INOP 07 might mean that the launcher is INOP if the crew is conducting PMCS or refueling.

LCHR LST. After entering the OPER or INOP codes, the crew must verify and enter the launcher's grid coordinates and altitude for transmission to the FDS. LCHR LST is transmitted after the location fields are edited. The LCHR LST messages can also be used to send additional information. If a fire mission is stored in the FCS, the crew edits and transmits the fire mission target number. If no fire mission is stored, the target number is sent blank. The number and type(s) of rockets on board also can be sent. This updates the FDS on the launcher ammo load. If the LLM has been laid for a fire mission, the crew can transmit azimuth of fire, quadrant elevation (QE), and fuze time. If the LLM is not laid, these data are all zeros.

Fire Direction System Posturing. The FDS shows launchers as either OP, PART, MOBL, COOL, or INOP. The MOBL, COOL, or INOP launchers are not considered by the FDS when selecting a launcher to fire. The FDS continuously displays each launcher status as well as the code location and/or reason for the status. This provides easy reference for the BOC personnel in determining the battery's overall and individual launcher status and location. The FDS also can transmit a command message to a launcher, directing the crew to bring the launcher to a hot (OP) status. This message automatically turns on the SRP/PDS to begin the process.

Tactical Posturing

The BC directs the platoons to have a specific number of launchers in hot (OPER) status. The number is based on guidance from the controlling FA headquarters, METT-T, total launchers available, ammunition available, crew available, and fatigue. The platoon gives the BOC information on crew and launcher status and decides which launchers to posture as directed. The platoons usually rotate their launchers through hot status, changing individual launchers and maintaining the total number of required hot launchers.

The commander can further modify these postures by using the OPER and INOP entries. For instance, he wants the FDS to select launchers to fire only if they are fully loaded and positioned in HAs. Therefore, he directs all crews to send INOP LCHR LST messages under all other circumstances. These INOP LCHR LST messages could be misunderstood to indicate NMC launchers. Therefore, they might be submitted as INOP—SPLL COOL, indicating that they are only temporarily INOP because of their location or ammo status. Launchers sending INOP—SPLL COOL LCHR LST messages, like those sending other INOP LCHR LST messages, will not be selected by the FDS for fire missions.

Fire Mission Cycle

The BOC processes fire missions for the MLRS firing battery. Mission assignments given the BOC by each firing platoon HQ are based on the following information:

- Platoon OPAREA.
- Grid locations of FPs and RLs.
- Requested and actual SCP locations.
- Requested FP and RL employment sequence.
- Number and type of rockets or missiles currently on board each launcher and on HEMTT-HEMATs in the platoon OPAREA.
- Launcher status and locations.

These data are input into the battery FDS. It selects the platoon and launcher to respond, the number and type of munitions to fire, and the method of fire. The fire mission is then passed directly to the launcher. Using the platoon FDS, the POC monitors the fire missions. If the launcher cannot communicate digitally with the BOC, the platoon FDS can be used to relay fire missions. At a minimum, the POC records the mission by using DA Form 7232-R and plots the target on the firing capabilities map.

While in its HA, the launcher FCS does a consistency check of the fire mission data to ensure that the launcher can fire, that it has the correct munitions loaded, and that the target is in range. If it can fire, a WILCO message is generated to be sent to the FDS.

The section chief should have previously inspected the FP for any immediate mask. If one is apparent, he should measure the mask with the Abney Level or an M2 compass to determine if it should be entered in the FCS. The mask should be entered if it measures 100 mils or greater. If the high QE option is selected in the FCS, the FCS will not perform missions with mask data that have a range to mask of over 2,000 meters. If the high QE option is not in use, the FCS accepts a range-to-mask distance of over 2,000 meters. If the launcher cannot fire over the mask, it must be repositioned or the section chief must send a cannot comply (CANTCO) message to the FDS.

If site to mask is not a problem, the launcher then moves to within 150 meters of the designated FP and orients on the selected parking heading. The crew lays the LLM, arms the system, fires the mission(s), stows the LLM, and moves as ordered in the first part of the fire mission message. The launcher crew records the mission by using DA Form 7233-R (MLRS Launcher Fire Mission Log) as shown in the example below. (A reproducible copy of DA Form 7233-R is at the back of this book.)

> **Note.** The lay-arm-fire process is different for timed-when-ready (TWR), at-my-command (AMC), time-on-target, timed TOT (TTT), and time-to-fire (TTF) missions.

Ammunition Resupply

At the firing platoon, ammo resupply is coordinated by the platoon sergeant. Four to six HEMTT-HEMATs may be attached to each firing platoon. When a HEMTT-HEMAT is emptied, the truck is dispatched to either the battery AHA (headquarters), the battalion trains, the ATP, or the ASP. No ammo vehicle should leave the platoon area without permission and coordination with the platoon HQ. There are several options for resupply within the platoon OPAREA.

Unoccupied Reload Point

The POC monitors the mission flow, determining how many rockets and/or missiles are used and what RLs need replenishment. The POC notifies the ammo section chief in the AHA when one of the RLs needs more launch pods. A HEMTT-HEMAT is dispatched from the AHA, moves to the RL, and off-loads a specified number of launch pods at the RL. The HEMTT-HEMAT then returns to the platoon AHA, ASP, or ATP in accordance with (IAW) the unit ammunition resupply plan.

MLRS LAUNCHER FIRE MISSION LOG

MLRS LAUNCHER FIRE MISSION LOG
For use of this form, see FM 6-60. The proponent agency is TRADOC.

DATE	SECTION CHIEF	UNIT/SECTION
16 MAR 92	SSG JONES	2/3/C/6-37FA

TARGET NUMBER (a)	TARGET COORDINATES (b)	FIRING POINT (c)	METHOD OF CONTROL (d)	AMMUNITION TYPE (DODIC) (e)	AMMUNITION NUMBER OF ROUNDS ASSIGNED (f)	AMMUNITION NUMBER OF ROUNDS FIRED (g)	TIME OF FIRST FIRE (h)	REMARKS (i)
AB 0001	5365 7046	4092 6352	FWR	H104	06	06	09:13:26	
AB 0003	5401 6835	4075 5842	TOT	H104	06	06	11:23:27	Reloaded two rds PL81.
AC 0010	5225 6521	4110 6000	FWR	PL81	02	01	13:40:20	Weapons malf. M/LPA(2)Offloaded RL1.
AC 0011	5225 6396	3995 5765	TWR	PL81	02	02	16:50:17	Reloaded 12 rds H104.
AB 0010	5325 5842	4110 5845	ON CALL	H104	06	05	19:13:02	Dud fuze LP/C1.
			17 MAR 92					
AD 0001	5210 6925	3895 6170	FWR	H104	07	00	N/A	LDS malfunction.

Observed Reload Point

A HEMTT-HEMAT is deployed in a covered and concealed location where it can observe and secure the RLs. As the launchers use the launch pods, the HEMTT-HEMAT moves to the RL and replenishes them. The hot HEMTT-HEMAT returns to the platoon AHA when empty, and a replacement HEMTT-HEMAT is sent forward.

Occupied Reload Point

A HEMTT-HEMAT is placed at each RL and off-loads launch pods as the launchers need them. Launchers up-load off the ground or directly off the HEMTT-HEMAT until all launch pods have been off-loaded. The HEMTT-HEMAT then returns to the AHA to be replaced. Reloading directly off the HEMTT and/or HEMAT is not recommended, because it requires intensive launcher crew training. This method requires precise launcher positioning (resulting in slow, time-consuming maneuvers) and precise operation of the LLM. Damage to the cable and hoist mechanism of the LLM may result from imprecise handling.

No Reload Point

The fastest, but most vulnerable, method is when HEMTT-HEMATs with launch pods are sent directly to the FP of the launcher. They down-load the launch pods there and return to the AHA. To fire all missions during surge and peak ammo expenditure conditions, this method may be required.

Note. The ATACMS munitions are resupplied by use of the same options. However, because of the special nature and limited supply of such munitions, they must be secured. Some missions will necessitate unusual conditions and methods of resupply, such as delivery of M/LPAs to the platoon or launcher by the CH-47D from the corps ASP.

CHAPTER 8

MLRS COMMUNICATIONS

The ability of MLRS units to provide fires depends on a responsive, dependable comm system. The MLRS units must be prepared to rely on voice and/or digital radio communications, usually over long distances, with many diverse and highly mobile units. They will accomplish radio communications by using the new SINCGARS FM radios and the new IHFRs.

Responsibilities

The successful execution of a mission requires an understanding of the fundamental responsibilities so that all elements work toward establishing and maintaining the critical comm links.

Commander. The commander is responsible for the adequacy and proper use of the comm system within his command. He is also responsible for its efficient operation in the system of the next higher command. The authority to establish, maintain, control, and coordinate the various comm systems within a command may be exercised by a subordinate in the name of the commander. The responsibilities of the commander, however, cannot be delegated.

Echelons of Command. The senior unit is responsible for the establishment of communications with its subordinate units, whether organic or attached. This responsibility is mainly one of planning and directing the establishment of the linking comm systems, since assets belonging to either the senior headquarters or the subordinate unit may be used (senior to subordinate).

Tactical Missions. Comm responsibilities are inherent to tactical artillery missions. Normally, tactical artillery missions are assigned only to a field artillery battalion. Each of the four standard tactical missions have seven inherent responsibilities. One is the establishment of communications.

★ *Direct Support.* An artillery unit with the mission of direct support has the responsibility of establishing communications with the supported maneuver unit headquarters (supporting to supported).

Reinforcing. An MLRS unit with the mission of reinforcing must establish communications with the reinforced artillery unit headquarters (reinforcing to reinforced).

General Support. An MLRS unit with the mission of general support does not have an inherent responsibility for establishing external communications with any other unit. However, the senior MLRS unit must establish communications with its subordinate MLRS units (senior to subordinate).

General Support Reinforcing. An MLRS unit with the mission of general support reinforcing must establish communications with its subordinate MLRS units and with the reinforced artillery unit headquarters (senior to subordinate and reinforcing to reinforced).

Battle Area. Lateral commands must maintain communications with each other to ensure coordination of the combat effort. The command on the left establishes communications with the command to its right, as facing the FEBA or FLOT (left to right).

Joint Maintenance. Regardless of who is responsible for establishing a comm system, all units being served by the system help restore it if it is disrupted.

Net Discipline. This responsibility must be self-policing and required of all elements. For example, voice traffic can be carried over the FM digital fire net, but it should be avoided if at all possible to prevent disruption of digital transmission. The net control station (NCS) is responsible for enforcing net discipline.

User Responsibilities. The comm equipment in an MLRS unit is becoming general purpose user (GPU). This means that the user of the equipment must install, operate, and maintain his organic terminal devices according to the standards and procedures established by the technical manual (TM).

MLRS Battalion Communications

★ **Type of Unit.** The base TOE for a corps 3 x 9 MLRS battalion are used to develop the communications network described below.

External Communications. The battalion operates on three external FM and two AM radio nets to communicate by voice and digitally with higher headquarters.

Force FA Cmd Net (VHF-FM)(V). This secure net is the primary voice (V) command and control link between higher headquarters and the MLRS battalion.

Force FA Ops/F Net (VHF-FM)(D). This secure net provides the digital link between the battalion FDS and the controlling headquarters TACFIRE.

Force Admin/Log Net (VHF-FM)(V). The battalion ALOC operates in this secure net on an "as required" basis.

Corps Arty Cmd and Ops/F Nets AM/SSB)(V-FAX). These nets provide the battalion link to the corps headquarters. One radio is on the corps cmd net, and the other radio is on the corps ops/F.

> **Note.** Radio set AN/GRC-193 will replace RATT AN/GRC-142. Radio set AN/GRC-213 will replace radio set AN/GRC-106.

Internal Communications. The MLRS battalion communicates with the subordinate batteries mainly by secure FM voice and secure digital means. Wire is used only within the battalion headquarters, headquarters and service (HHS) elements because of the position of the batteries and the limited quantity of wire.

Battalion Cmd Net (VHF-FM)(V). This secure net is the main voice cmd and control net used by the commander, his staff, subordinate commanders, and BOCs and as an alternate FD net. The NCS is the battalion O&I section.

Battalion Fire Direction Net (VHF-FM)(D). This secure net is used exclusively for digital (D) communications between BOCs. No voice traffic should be used on this net. The NCS is the battalion FDC.

Battalion HF Cmd/Ops Net (HF-AM)(V or D). This net facilitates secure long-range communications between the battalion FDC and the BOCs. This net uses an HF AM radio for voice or digital communications with the batteries.

Battalion Admin/Log Net (VHF-FM)(V). This secure net is used to reduce the amount of traffic on the cmd net. The NCS is the ALOC.

MLRS BATTALION COMMUNICATIONS NETWORK MATRIX

MLRS BATTALION (CORPS/FA BRIGADE)	INTERNAL						EXTERNAL					
SUBSCRIBER	Bn Cmd (VHF-FM)(V)	Bn FD (VHF-FM)(D)	Bn Cmd/Ops (HF-AM/SSB)(V-FAX)	Bn Admin/Log (VHF-FM)(V)	Btry Cmd (VHF-FM)(V)	Btry FD (VHF-FM)(D)	*Btry Admin/Log (VHF-FM)(V)	Force FA Cmd (VHF-FM)(V)	Force FA Ops/F (VHF-FM)(D)	Force Admin/Log (VHF-FM)(V)	Corps Arty Cmd (HF-AM/SSB)(V-FAX)	Corps Arty Ops/F (HF-AM/SSB)(V-FAX)
Bn Cdr	X							X				
Bn XO	X			X								
Bn S3	X							X				
Bn O&I Sec	N							X			X	X
Bn FDC		N	N						X			
Bn Supply (ALOC)				N						A		
Bn Maintenance				X								
Bn Wrecker				X								
Bn Recovery				X								
Treatment Team				X								
Ambulance Team				X								
Liaison Section	X							A				
SPCE	X				X			X				
Btry Cdrs	X				X							
BOCs	X	X	X	A	N	N						
Btry 1SGs				A			N					
Btry Ammo Plt HQ					X		A					
Btry Maintenance							X					
Btry Wrecker							X					
Btry Recovery							X					
PADS Surv Sec					X							
Plt Ldrs					X		A					
Plt Recon SGTs					X		A					
POCs					X	X	A					
SPLLs						X	A					
HEMTTs/HEMATs							X					

*Denotes optional net. Net subscribers are on the btry cmd net when not on this net.

LEGEND: **A** = As required subscriber **N** = Net control station **X** = Subscriber

MLRS Battery Communications

Type of Unit. The model for the MLRS battery is the nine launcher battery with MLRS FDS. Units with MTOEs that differ significantly will have to adjust their communications accordingly.

External Communications. As the main unit of MLRS employment, the firing battery is designed to operate as part of an MLRS battalion or independently, under the force FA headquarters. The battery operates on two external FM radio nets and one AM radio net to communicate by voice and digitally with higher headquarters. In a standard GS or GSR mission, the battery would operate on the force FA headquarters cmd and FD nets, receiving traffic from higher headquarters and/or the reinforced unit on these nets. If the battery has a standard R mission, the BOC should enter the reinforced unit cmd net and the FD net. If the battery is given a nonstandard R mission, the FDC should enter the FD net of the reinforced unit and establish FM voice communications specified in the fire support plan.

Controlling FA Headquarters (for example, div arty or MLRS bn) Cmd Net (VHF-FM)(V). This secure net is the main command and control link between higher headquarters and the MLRS battery.

Controlling FA Headquarters FD Net (VHF-FM) (D). This secure net provides the digital fire direction link between higher headquarters and the MLRS battery.

Controlling FA Headquarters Admin/Log Net (VHF-FM)(V). This secure net is optional and is used to reduce the amount of traffic on the battalion net. It keeps administrative and logistical traffic from interfering with command and control transmission.

Controlling FA Headquarters Cmd/Ops Net (HF-AM/SSB) (V or D). The battery can communicate by voice or digitally via an AM HF radio. This ability facilitates longer range communications with the controlling FA headquarters.

Internal Communications. The MLRS battery has two internal FM radio nets. Although the battery has no capability to lay external wire, internal wire lines can link elements within a position. However, communications usually are achieved through voice or digital FM radio, rather than wire. The BOC is the NCS of both the battery cmd and battery FD nets.

Battery Cmd Net (VHF-FM)(V). This secure net gives the battery commander his main voice command and control link to his platoons. Each firing section monitors this net during normal operations. The firing sections use it for voice-transmitted fire missions if digital communications with the FDS are lost. Net discipline is essential.

Face-to-face couriers may be used when possible. Short, mission-essential radio transmissions enhance survivability. The NCS is the BOC.

Battery FD Net (VHF-FM)(D). This secure net is used only for fire mission processing and other digital communications between the battery BOCs, POC, and launchers. The NCS is the battery FDC.

Battery Admin/Log Net (VHF-FM)(V). This secure net is optional and is used to reduce the amount of traffic on the battery cmd net. It keeps administrative and logistical traffic, such as ammunition, recovery, and maintenance support, from interfering with command and control transmissions. All HEMTTs/HEMATs, maintenance, supply, and recovery vehicles might operate on this net. The NCS is the battery 1SG or ammunition platoon leader.

Platoon Communications

Communications at platoon level are limited to FM (voice and digital) radio. Each platoon headquarters has two secure FM radios in the M577 CP carrier. One is used for operating on the battery cmd net. The other is used in conjunction with the platoon FDS for operation on the battery FD net.

Each launcher has a secure FM radio. The launcher crew monitors the battery cmd net and operates on the battery FD net through the FDS. The crew can communicate with the platoon headquarters and the BOC.

MLRS BATTERY COMMUNICATIONS NETWORK MATRIX

MLRS BATTERY / SUBSCRIBER	INTERNAL			EXTERNAL			
	Btry Cmd (VHF-FM)(V)	Btry FD (VHF-FM)(D)	*Btry Admin/Log (VHF-FM)(V)	Force Artillery HQ Cmd (VHF-FM)(V)	Force Artillery HQ CF (MSE)(V-FAX)	Force Artillery HQ Ops/F (VHF-FM)(D)	Force Artillery HQ Admin/Log (VHF-FM)(V)
Btry Cdr	X			X			
BOC	N	N		X	X	X	A
Btry 1SG	X		N				A
Btry Ammo Plt HQ	X		X				
Btry Wrecker	X		X				
Btry Recovery	X		X				
Btry Maintenance	X		X				
PADS Surv Sec	X						
Plt Ldrs	X		A				
Plt Recon SGTs	X		A				
POCs	X	X	X				
Launchers	X	X	A				
HEMTTs/HEMATs	X		X				

*Denotes optional net. Net subscribers are on the btry cmd net when not on this net.

The platoon leader and the recon sergeant each has a secure FM radio mounted in their HMMWVs. It operates on the battery cmd net.

Each platoon has limited internal wire comm capability for use with OPs and LPs or an attached ammo section.

When the platoon must function as a jump TOC or a BOC, the platoon FDS can provide limited command and control functions for the battery. The platoon HQ can operate on two FM radio nets—digital secure and/or voice secure. Usually, the platoon operates on the battery FD and cmd nets with the two secure FM radios in the platoon HQ track. If operating as a jump TOC or BOC for the battery, the platoon HQ can operate on three nets: two digital nets (one internal and one external) and a voice net or two voice nets and one digital net. This is done by connecting the platoon FDS to both of the platoon HQ M577A2 radios and reconnecting the CMSC to the battery internal FD net while the KG-31 is on the external FD net. The higher HQ cmd net (FM voice secure) can be monitored through the secure FM radios in one of the platoon HMMWVs. (This mode severely restricts the platoon in RSOP and other requirements by restricting one of the two HMMWVs.)

Mobile Subscriber Equipment

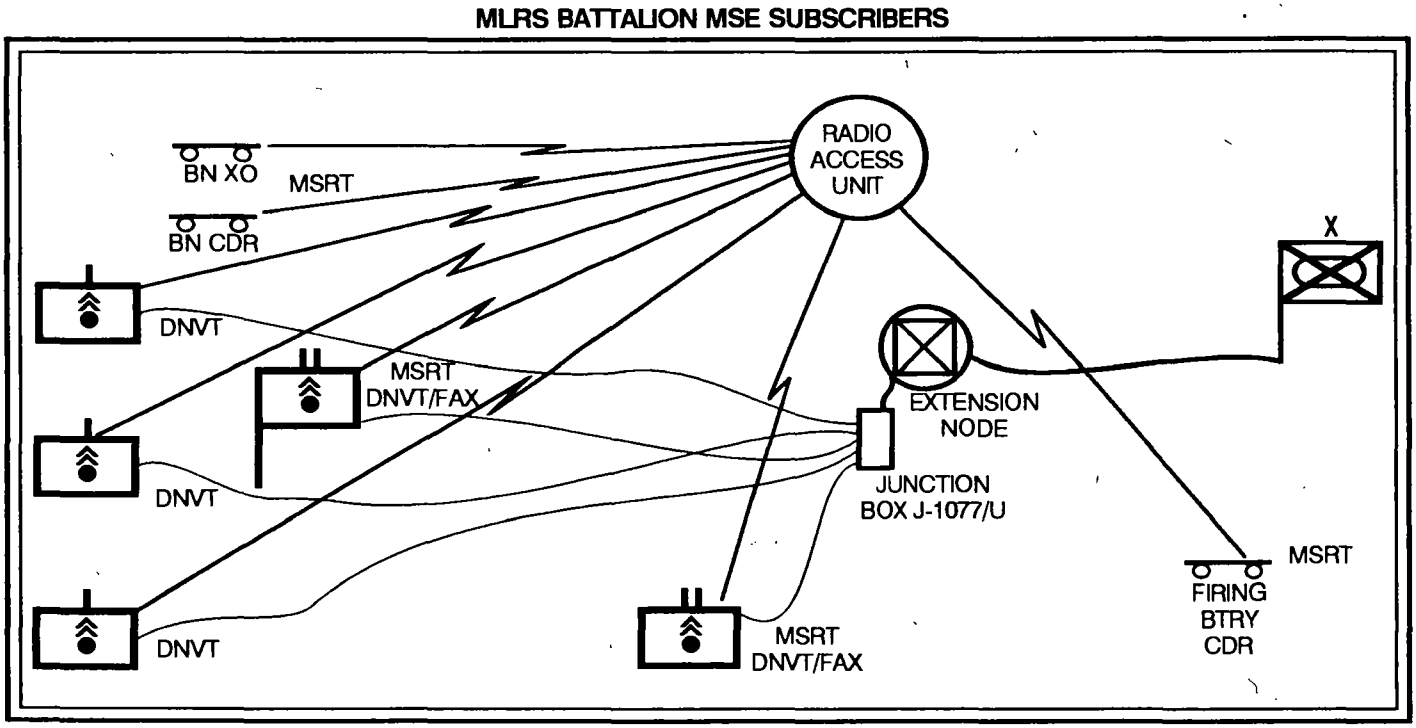
The division and corps signal units will establish the MSE system by positioning signal nodes throughout the division and corps area of operations. Extension nodes will be placed near maneuver brigade and div arty CPs and throughout the rear areas. The MLRS battalions access the MSE system either by wiring into the extension nodes or by using cellular-type radiotelephones through the signal nodes.

The MSE system provides secured voice, digital, and fax communications to the user, whether static or mobile. It will replace the existing area common-user multichannel comm system and many of the RATT nets. It is an area comm system extended by mobile telephone. The MSE can be used for data (digital) transmissions; however, its main purposes are for voice telephone and fax communications.

When in place, the MSE network works similar to a civilian telephone system. Subscribers are assigned individual telephone numbers, which can be dialed directly. Text and graphics can be transmitted in hard copy via the fax capability of the system. The MLRS battalion uses three key pieces of equipment when it operates in the MSE system. These are discussed below.

- *Digital Nonsecure Voice Telephone (DNVT) TA-1035/U.* The DNVT is the conventional telephone of the MSE system. It must be wired into the J-1077/U junction box, which is located at the area signal node. The user is responsible for laying wire to the junction box. The MLRS battalion will have DNVTs in the CP, trains, and at the firing batteries. The DNVTs cannot operate with the older wire telephones, such as the TA-312.

MLRS BATTALION MSE SUBSCRIBERS



- *Mobile Subscriber Radiotelephone Terminal (MSRT) AN/VRC-97.* The MSRT is the mobile cellular telephone of the MSE network. It links into the MSE system through one of the remote access units (RAUs) positioned throughout the area of operations by the signal unit. The RAU picks up the signal from the MSRT and switches it into the nearest signal node. The MLRS battalion has seven MSRTs. They are mounted in the vehicles of the battalion commander, XO, S3/O&I section, battalion supply, and each firing battery commander. The battalion also has two stand-alone installation kits (SAIKs), which allow the S3 and battalion supply MSRTs to be dismounted for use in the CP and trains.
- *Lightweight Digital Facsimile (LDF) AN/UXC-7.* The LDF, when connected to the MSE system through the DNVT or MSRT, allows the battalion to send and receive text and graphics in hard copy. It can also be connected to the FM radios.

The MSE will eliminate the radio teletypewriter (RATT) service that was previously provided by the signal battalion assets. Those RATT nets that are internal to the artillery also will disappear; however, they will be replaced by the IHFR (AN/GRC-193), or the traffic will be passed over the AN/UXC-7 LDF.

Single Channel Ground and Airborne Radio System

Over the next several years, MLRS units will exchange their old FM radios for the new single channel ground and airborne radio system (SINCGARS) family of radios. (See the table below.)

SINCGARS CONVERSIONS

NOMENCLATURE	REPLACES	COMPONENTS (BASIC ISSUE ITEMS)				POWER OUTPUT
		Receiver-Transmitter	*Vehicle Adapter*	*Dismount Kit*[1]	*Power Amplifier*	
Manpack AN/PRC-119A	AN/PRC-25/77	1		1		LO, M, HI
Vehicular Short-range AN/VRC-87A	AN/VRC-53/64	1	1			LO, M, HI
Vehicular Short-range AN/VRC-88A	AN/GRC-125/160	1	1	1		LO, M, HI
Vehicular Long-range/Vehicular Short-range AN/VRC-89A	AN/VRC-12/47	2	1		1	LO, M, HI, PA
Vehicular Long-range AN/VRC-90A	AN/VRC-43/46	1	1		1	LO, M, HI, PA
Vehicular Long-range/Vehicular Short-range Dismount AN/VRC-91A	AN/GRC-160 PLUS AN/VRC-46	2	1	1	1	LO, M, HI, PA
Dual Vehicular Long-range AN/VRC-92	AN/VRC-45/49	2	1		2[2]	LO, M, HI, PA

[1]Dismount kit includes manpack antenna, battery case interconnecting box, and handset.
[2]Requires a power amplifier mount for second power amplifier.

LEGEND:
Planning ranges: **HI** = high (8 km) **LO** = low (0.3 km) **M** = medium (4 km) **PA** = power amplifier (35 km)

Although the type and number of radio nets in which these radios are used will not change, users will be able to transmit in more nets without having to physically change the frequency on the radio. The SINCGARS radio is more complicated to operate than the old VRC-12 series and requires more sustainment training for the operators to maintain proficiency.

Antennas

General. Poor communications or lack of communications can be caused by long distances between transmitter and receiver, unfavorable terrain, and other conditions. This problem can often be overcome by the use of the right antenna. When the tactical situation allows, the battalion FDC, the battery BOCs, and the POCs should use an extended-range antenna, the OE-254/GRC, or the OE-303/GRC to obtain the maximum planning range of their radios.

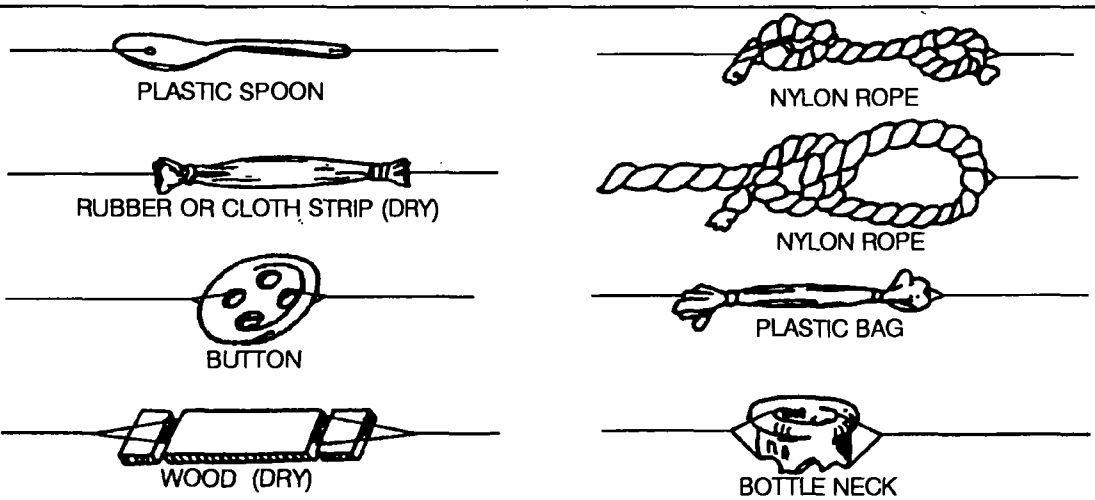
Site Selection. To obtain the maximum efficiency of an antenna, the following factors must be considered:

- An antenna site should not be located in or near obstacles such as tunnels, overpasses, or steel bridges. They can block or reflect signals.
- Trees with heavy foliage and dense underbrush should be avoided as they can absorb signals.
- Antennas should not be set up near pole wire lines and high-tension power lines. They can introduce interference and absorb part of the radio signals. This also constitutes a safety hazard.

Field-Expedient Antennas. In many instances, planning distances of radios can be doubled and even tripled by the use of a field-expedient antenna. These antennas may reduce jamming, interference, and vulnerability to radio direction finding.

- *Materials.* Most field-expedient antennas can be constructed from material that is normally readily available as described below.
  - The best types of wire (conductors) for antennas are copper and aluminum. However, in an emergency, use any type available. Field wire WD-1/TT and WD-1A/TT will probably be the best available wire source in the field. The WD-1/TT is two separate insulated conductors twisted together. The WD-1A/TT is a pair of insulated conductors molded together.
  - Insulators are used to separate the antenna from the support (trees, poles, and so forth), since a direct connection would result in the grounding of the radio signal. It may be necessary to fabricate an insulator. The figure below shows items immediately available for use as insulators.
  - Resistors used to construct a bidirectional or unidirectional antenna should have a resistance of 500 to 600 ohms. You can obtain resistors through normal supply channels (national stock number [NSN] 5905-00-153-4853). A sufficient supply should be kept available for use when the need arises.

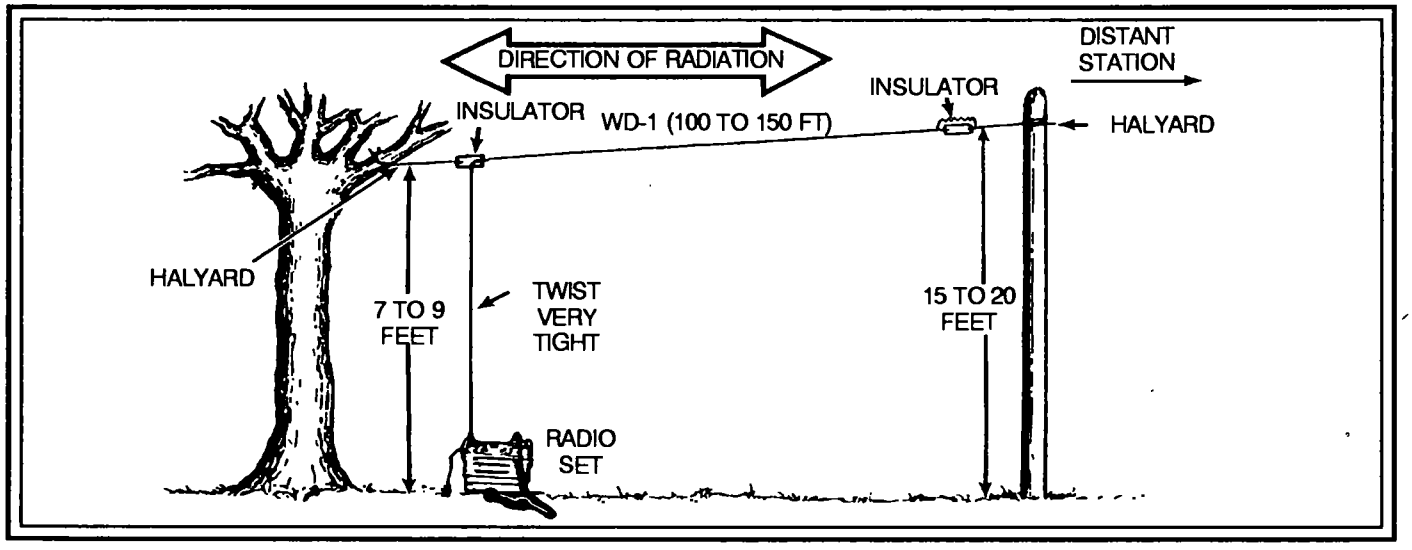
FIELD-EXPEDIENT INSULATORS



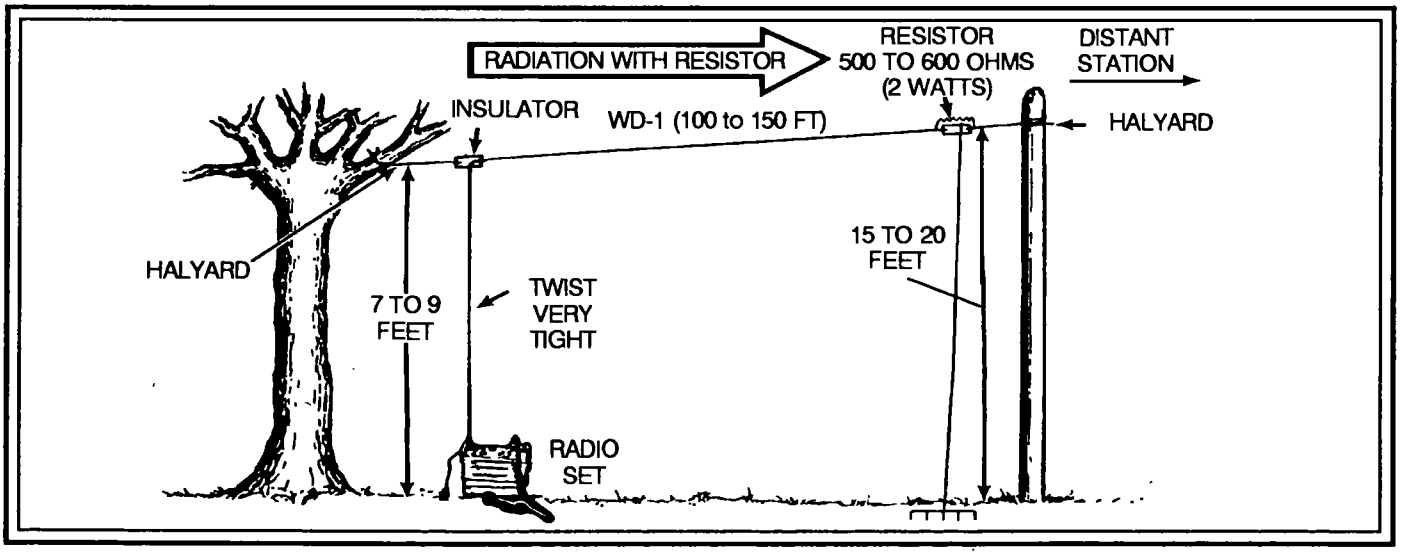
(BEST: PLASTIC, GLASS) (GOOD: WOOD) (FAIR: CLOTH, ROPE)

- *Horizontal Antennas.* When the tactical situation does not require mobility or when the OE-254 or OE-303 antenna is not available, greater range can be achieved by using horizontal antennas. These antennas normally are used to provide communications in either one or two directions. This capability helps avoid detection by enemy direction-finding stations. Horizontal antennas are described below.
  - *Bidirectional Long-Wire Antenna.* The length of a long-wire antenna is 100 to 150 feet. One end of the antenna (see the figure below) should be 15 to 20 feet high in the direction of the station with which you want to communicate. A tree or pole can be selected to support it. The other end is connected directly to the antenna receptacle. To do so, strip approximately 1 inch of insulation from the wire, loosen the antenna base enough to place the bare wire under it, then retighten the base.
  - *Unidirectional Long-Wire Antenna.* When a 500- to 600-ohm resistor is added to this antenna (see the figure below), the direction of transmission will be from the radio set end of the antenna toward the resistor end (unidirectional). This type of antenna is very useful for minimizing the effects of enemy jamming.

BIDIRECTIONAL LONG-WIRE ANTENNA (WITHOUT RESISTOR)

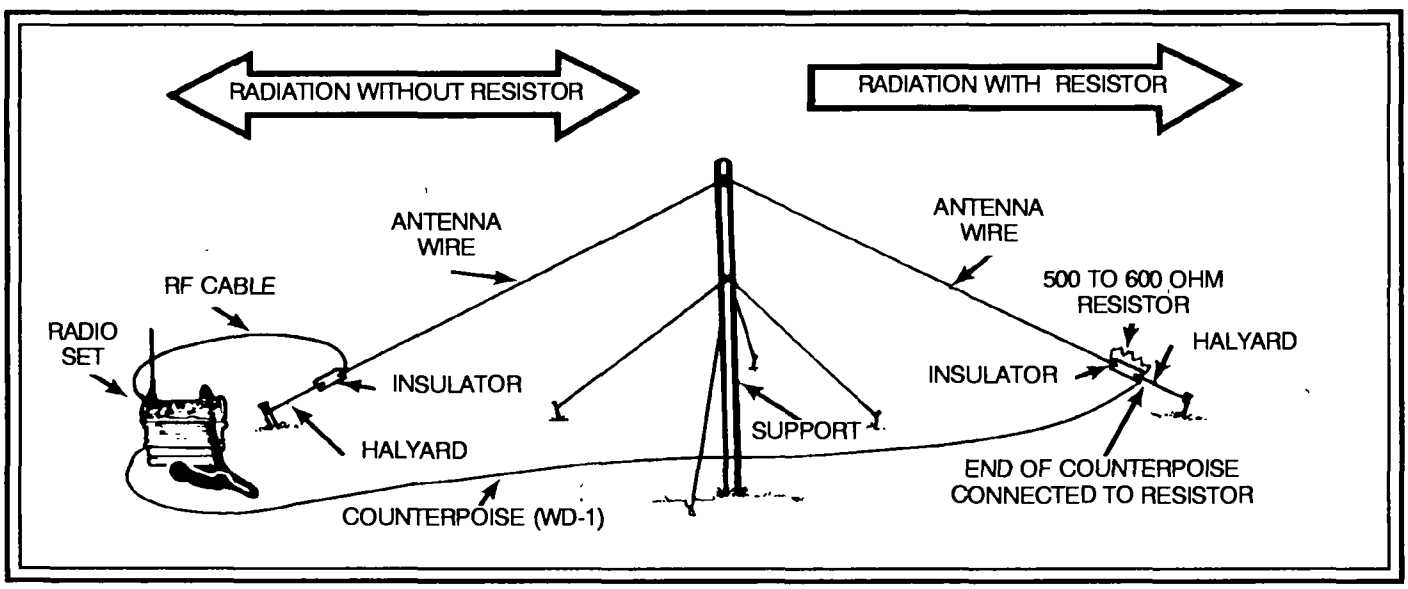


UNIDIRECTIONAL LONG-WIRE ANTENNA (WITH RESISTOR)



- *Vertical Half-Rhombic Antenna.* This type of antenna also is constructed from 100 to 150 feet of WD-1 field wire. (See the figure below.) The center of the wire should be 25 to 30 feet high. A tree limb, pole, or whatever is handy can be used to support it. The support should be centered with 50 to 75 feet of wire on each side. Again, by using a 500- to 600-ohm resistor, the antenna is unidirectional. Direction of transmission is from the radio set end of the antenna toward the resistor end. Without the resistor, the antenna is bidirectional. To increase the efficiency of the antenna, a counterpoise is used. To install the counterpoise, crimp one end of WD-1 field wire between the battery box cover and the radio. Then run the wire to the stake at the distant end of the antenna and connect it to the resistor. For maximum efficiency, the counterpoise must be run directly under the antenna.

VERTICAL HALF-RHOMBIC ANTENNA



CHAPTER 9

DELIVERY OF FIRES

Delivering MLRS fires and achieving the desired effects on target is a multistep, multichannel operation. It involves thorough and effective fire planning at all levels. The versatility of the MLRS, FDS, and TACFIRE allows smooth, rapid, and accurate fire planning, target processing, and target engagement. The unique characteristics of this fire delivery process must be understood for maximum effective use. (A sample firing safety checklist is provided in Appendix E.)

Section I

INTRODUCTION

Responsibilities

Battalion Level

The MLRS battalion is capable of only very limited fire planning for its organic or attached MLRS fire units. Selection of targets for the MLRS battalion is the responsibility of the controlling FA headquarters or FSE. Fire plans are sent to a battalion as target lists with specific implementing instructions; for example, H-hour and time to fire targets in a series. The battalion selects batteries to execute the fire missions and then transmits the targets or the complete plans to them. Targets that fall in the category of unscheduled fires are distributed on the basis of battery or platoon status; for example, range to target, number of missions in progress, launcher availability, and ammo type and status.

Battery Level

The MLRS battery is concerned solely with the delivery of fires. The battery engages targets in one of two modes—scheduled or unscheduled fires. These modes determine the way the FDS processes missions. Scheduled fires include all fire plans transmitted from higher headquarters and timed missions in conjunction with fires from other units. Unscheduled fires are targets of opportunity and include all other targets. The battery may engage targets as either scheduled or unscheduled fires, depending on direction from the controlling element. In delivering unscheduled fires, the battery may use any of the methods of control allowed by the launcher FCS: FWR (fire when ready), AMC, TOT, TTF (time for projectile to leave launcher), TTT, and TWR. The TTT and TWR methods are similar in that each one has a timed window of 59 minutes 59 seconds. The difference in the two is that TTT considers the flight time of the munition and TWR does not. The TOT, TTF, TTT, and TWR methods are used in unscheduled fires to control the firing of multiple launchers on a single target or on moving targets.

Platoon Level

The FDS enables the platoon to command and control all platoon assets and, if necessary, to assume control of battery functions.

Fire Direction System

The delivery of MLRS fires involves a combination of hardware, computer software, and human decision criteria. The FDS at the battalion, battery, or platoon level coordinates the delivery of MLRS fires. The FDS has the same hardware as the cannon BCS with the AN/UGC-74 printer added. The BCU is the heart of the FDS. It provides data management that increases the effectiveness and responsiveness of fires. The FDS gives the firepower manager comprehensive and rapid analysis of target data. It also gives information on availability of launchers and ammunition, safety, critical terrain, and friendly troops.

Battalion Fire Direction Center

The delivery of timely and accurate fires depends on the FDCs at the battalion and battery levels. With the FDS, the battalion FDC tactically controls the fires of the battalion. The battalion FDC is the NCS and the primary link with the force FA headquarters for all delivery of fires by the MLRS battalion. The battery FDC tactically controls fires by distributing fire missions to the launcher level.

FDC PERSONNEL

BATTALION FDC		
Position	***Rank***	***MOS***
Operations Officer	CPT	13B00
Chief Fire Direction Computer	SFC	13P40
Fire Direction Computer	SSG	13P30
Battery Display Operator (2)	SGT	13P20
Fire Direction Specialist	SPC	13P10
BATTERY FDC		
Position	***Rank***	***MOS***
Operations Officer	1LT	13B00
Fire Direction Computer	SSG	13P30
Battery Display Operator	SGT	13P20
Fire Direction Specialist (3)	SPC	13P10

The FDCs control all battalion artillery fires; they record all fire missions. The FDCs are responsible for maintaining firing unit locations, operational firing status, ammo expenditures by type, and so on. All printouts should be saved for future reference. Status charts to aid record keeping include the following:

- Equipment status chart.
- Ammunition status chart.
- Communications chart (signal operation instructions [SOI] information).

Manual procedures require the FDCs to keep additional records on the progress of fire missions, operational status of equipment, and ammo updates. Voice fire missions are sent only to the next lower level that has digital capability (for example, from battalion FDC to BOC).

FDS Setup

The FDS setup, a standard but critical process, consists of the actions required to prepare the FDS (hardware and software) for operation. Supplied with each FDS is a tape transport unit containing the MLRS program. Every FDS in the battalion, battery, and platoon receives the same program. Setup of the FDS BCU must be completed at all levels. This setup consists of the following:

- Turning on all FDS hardware. (See TM 11-7440-283-12-1-2-1.)
- Loading the BCU software.
- Entering setup data into the BCU.

BCU Software

The BCU software is a permanently recorded program on a tape in the TTU and is loaded into the BCU memory. The operator places the TTU into the program load unit and presses the LOAD PLU key on the BCU to load the BCU software. (Refer to TM 11-7440-283-12-1 for TTU installation and removal instructions.)

Setup Messages

After the software is loaded, the BCU is ready to receive setup data. These data are entered on five messages as discussed below.

The **SYS;SETUP** message is used to enter, update, or display system setup data. It is the first of the setup messages. This message includes entries for unit location, target numbers, whether to print all incoming and outgoing messages, and setting the internal clock. After the SYS;SETUP message is executed, the SYS;COMM message is displayed.

The **SYS;COMM** message is used to establish net information for the user's net, the user's echelon, the user's report to echelon, and the user's system status. The operator inputs comm parameters for up to six nets (for battalion and battery FDS) or two nets (for platoon FDS). After the SYS;COMM is executed, the SYS;SBT message is displayed.

The **SYS;SBT** message is used to enter subscriber data into the data base so the FDS can communicate with other subscribers. Subscriber data include channel designation, source address, unit identification (ID), device type, serial numbers, COMSEC information, and subscriber system status. Subscriber data are compiled from the SOI, unit SOP, OPLANs, and higher headquarters TACFIRE SOP. After the SYS;SBT is executed, the FM;FDSMOD message is displayed.

The **FM;FDSMOD** message is used to transmit, receive, and store system default data for fire mission messages. It also contains information for unit ID, terminal homing munitions processing, zone of operations, effects cutoff factor (ECOF) data, reload level for MLRS launchers (one or both pods empty), and the maximum number of rounds

to be fired at a target. This information may be transmitted from higher headquarters or manually input. It is recorded on the TTU, which stores the data after setup. When this message is executed during setup, the SYS;AUTO message is displayed.

The **SYS;AUTO** message is used to select certain messages for automatic processing. Once the setup data are completed, the FDS is ready to receive data base information.

> **Note.** Procedures for system setup and communications are discussed in TM 11-7440-283-12-1-2-1, Chapter 4. The full setup process is referred to as a cold start.

FDS Data Base

After setup is complete and communications have been established, the operator must build the data base. The data base is a collection of information including the general area of operations (map mod), met data, down-range masks, FSCMs, ACAs, ammunition, and fire unit locations. The information for the data base may be received by voice or in written form for manual entry or by digital traffic for automated processing.

Establishing and maintaining the data base are the most difficult and time-consuming tasks the FDS operator has. Without accurate and up-to-date data, the MLRS unit cannot perform its mission of providing timely and accurate fires in support of combat operations.

FDS DATA BASE STORAGE CAPABILITIES

DATA TYPE	NUMBER
Map Modification (MAP MOD)	1
Meteorology (met) files	(4)
• Computer Met (MET; CM)	2
• Target Area Met (MET; TA)	1
• Target Area Low Level (MET; TALL)	1
Fire Units	(36)
• Launchers	18
• Platoons	18
Firing Point	81
Survey Control Points	18
Ammunition Storage Sites	32
Battlefield Geometry (BGEOM)	(45)
• Airspace Coordination Area (ACA)	10
• Downrange Masks (DRMASK)	15
• FSCM	(20)
- Coordinated Fire Line (CFL)	20
- Fire Support Coordination Line (FSCL)	1
- Restictive Fire Area (RFA)	20
- Restictive Fire Line (RFL)	20
• Crossover Geometry (CROS)	20
• Target Geometry (TGTG)	20
• Zone of Responsibility (ZNE)	20
Rendezvous Points	9
Hide Areas	81
Postures	27
Datums	60

Section II

FIRE PLANNING

Commander's Criteria

The commander influences TACFIRE or LTACFIRE tactical fire control (TFC) solutions by establishing his commander's intent, which is used to develop the commander's criteria for engaging targets. These criteria guide the computer selection of units to fire, munitions, and volume of fire for each mission. The TACFIRE selects targets for MLRS engagement. It helps in the fire planning, collation of intelligence, and TFC for MLRS.

The commander's criteria should be entered into TACFIRE before the fight begins. When they have been entered, the computer will execute the criteria without a delay in fire mission processing. (See TC 6-40A for more information.)

Commander's criteria are established, are updated as the situation changes, and may be overridden manually whenever a situation warrants. As circumstances and SOP dictate, the battalion operations officer, battery

operations officer, and/or fire direction personnel can override the commander's modifications on a mission-to-mission basis. A specific request for fire overrides the commander's criteria. Extreme care must be used in modifying the execution of the commander's criteria, since their effect on the TACFIRE (or LTACFIRE) and FDS solutions influences the outcome of the battle.

The parameters involved in establishing the commander's criteria are discussed below.

★ If assigned a DS mission, the supported maneuver commander's intent is used to develop engagement criteria. When given an R mission, the MLRS unit will use the criteria of the reinforced unit. When assigned a GSR or GS mission, the MLRS unit will use the criteria of the force FA headquarters.

These examples of commander's modifications should be considered when determining how to implement the commander's guidance. Together, they will make up the commander's criteria for the TFC for MLRS.

Ignore Ammunition

The IGAMMO (ignore ammunition) modification directs the computer to select units to fire regardless of the ammunition on hand. This keeps a fire unit from being excluded solely on the basis of not having the required ammunition. When IGAMMO is in effect, the controlled supply rates are violated, since all ammo constraints are ignored. Fire planners use IGAMMO in the fire planning modifications when planning future fires to determine ammo requirements. Usually, IGAMMO is not used for current TFC operations.

Maximum Rockets

The commander can limit the number of volleys that a fire unit or weapon type may fire against a single target or target type. MAXRKTS (maximum rockets) is specified for each weapon type and applies to each fire unit with that weapon. The lower the MAXRKTS, the more fire units the computer must select to achieve the required volleys or desired effects on a target. If not specified for a particular weapon type, MAXRKTS defaults to six rockets.

Fire Unit Selection

The commander can assign an ordering number for each battalion and each fire unit within a battalion. He must be careful when ordering fire units, because the one ordered first will always be chosen before others. Therefore, it is recommended that all units be ordered equally. Fire units can then be selected on the basis of busy status, frequency of assignment, and the order entered into the AFU file.

Exclusions

A commander can exclude fire units, weapon types, shells, or fuzes from consideration during TFC. The MLRS FDS can exclude fire unit, warhead, rocket, and missile types.

Attack Methods

The attack methods table in the computer defaults to a desired effects value of 10 percent for M77 DPICM effects-type targets. Default value for ATACMS is 30 percent. An MLRS standard volleys factor (SVF) of six is the default for all volleys targets. The commander can override the attack criteria for each target type and can specify an SVF for an effects target. However, he cannot specify desired effects for a volleys target. For a volleys target, the SVF works with the volleys size factor (VSF) to generate the computer recommendation for the total number of volleys to fire on the target. The FDS or TACFIRE operator can override attack criteria by assigning the number of volleys to fire on the target on a mission-to-mission basis for either effects or volleys targets. Effects processing for MLRS targets is performed by battalion, battery, and platoon FDS—not by TACFIRE.

Munition Selection Matrix

The table below gives the fire planner a matrix for determining the best MLRS munition with which to defeat a target.

MUNITION SELECTION MATRIX

MUNITION	CHARACTERISTICS	TARGETS
M26 Rocket	M77 DPICM 644 Bomblets Per Rocket	Personnel Light Armor and Soft Vehicles
M39 Missile	M74 APAM 1,000 Bomblets Per Missile	Personnel and/or Materiel

Effects Cutoff Factor

The ECOF is a value that limits the ammo expenditures on effects targets. It specifies the minimum percentage of effects that the commander considers acceptable on any volley during volume-of-fire calculations for effects targets. The ECOF is always entered into the computer in tenths of 1 percent. For example, an entry of 20 specifies an ECOF of 2.0 percent. The computer default value for ECOF is 1 percent. The above information applies to both TACFIRE and the MLRS FDS; however, each computer processes ECOF in a different way. The MLRS ECOF processing procedures are discussed in the next two paragraphs.

The MLRS FDS begins effects processing with one round specified for the target. Then it adds one round at a time, comparing the effects of the second and subsequent rounds to the ECOF to ensure the ECOF has been achieved. The computer stops processing effects when an increase of one round fired on the target does not provide an increase in effects equal to or greater than the ECOF value. The comparison starts with the first round added, or the second round. It is, therefore, possible to receive a computer solution of one round to be fired on an effects target. This is enough for personnel in the open; but it certainly would be ineffective on an armored target. The ECOF may be changed as the situation changes. However, in general, for hard targets, the MLRS ECOF should not be greater than 0.5 percent; 0.2 percent is preferred. This gives the commander more flexibility in employing his MLRS fires. If ammo availability becomes a problem, the commander can decrease the ECOF, restrict the use of MLRS to certain target types, specify all MLRS targets be treated as volleys targets, or do any combination of the above.

The ECOF is part of the MLRS setup process. The initial MLRS ECOF is included in the OPORD. Subsequent changes to the ECOF can be sent to the MLRS unit by courier or by secure radio.

MLRS Size

If the TACFIRE AFU file contains MLRS fire units, the computer considers those units first to engage a target when the target radius exceeds the size entered in the MLRSIZ (MLRS size) modification.

Target Criteria

Another consideration for assigning targets to MLRS units is the possibility of TACFIRE or the FDS rejecting the target because of size or target type. It is very important that commanders and, in particular, FSE personnel and TACFIRE operators be thoroughly familiar with MLRS target criteria. Appendix F lists MLRS target types and subtypes. Particular attention also must be paid to the maximum size of targets that MLRS can engage. The maximum sizes of MLRS targets (for M26 rockets) are as follows:

- Rectangular targets—2,000 meters long by 1,000 meters wide.
- Square targets—1,000 meters on a side.
- Circular targets—500-meter radius.

During effects processing, the MLRS FDS can segment and establish multiple aimpoints within a square or rectangular target. If the long side of a rectangular target exceeds 1,000 meters, the FDS will automatically segment the target. The FDS can do this only if the target size does not exceed the limits stated above; otherwise, the FDS will reject the target. The target must be segmented at TACFIRE before it can be sent to the MLRS unit if it exceeds the established limits. Circular targets are engaged as point targets, resulting in decreased attack effectiveness. The TACFIRE defaults many targets to circular shapes. The O&I officer and FSE should analyze each MLRS target to determine the most effective means of engagement

Fire Plan Processing

Process

The MLRS fire plans originate from TACFIRE or LTACFIRE. The FDS can then store in the data base and execute up to four fire plans. The FDS current mission file can hold a maximum of 100 targets. Seventy-five of these can be associated with each of four fire plans. Handling procedures for fire plans differ at battalion- and battery- or platoon-level FDSs.

Battalion FDS. After the fire plan is entered in the data base, the S3 decides which platoon(s) will execute the fire plan. He instructs the FDC to transmit the fire plan to the battery(s). The operator displays the fire plan messages for transmission to the battery. If more than one battery is to receive the fire plan, the operator must display and transmit the fire plan to each battery, individually. When H-hour is received, it is transmitted to each battery executing the fire plan.

Battery FDS. After the fire plan has been received from battalion, it is stored in the data base until H-hour is received. When H-hour is received, the FDS operator enters it into the fire plan. The FDS then computes a TOT for each target. Thirty minutes before TOT, the FDS places the target into the input queue; it is processed as a normal TOT mission. A platoon FDS in use as the battery FDS operates in the same manner.

Limitations

The FDS requires the input of H-hour at least 30 minutes before the H-hour time. The FDS must have 30 minutes notice before execution of on-call schedules.

MLRS Fire Planning

Current TACFIRE and LTACFIRE software can perform effects processing for all MLRS munitions. For munitions other than M77 DPICM, TACFIRE (and FDS) must have the supporting weapons description files in the data base to calculate effects.

On-call schedules for MLRS support should be requested no less than 30 minutes before desired fire support. This rule is based on the reaction time required by the MLRS FDS and the average fire mission cycle of 20 to 30 minutes. Included are receiving the fire mission, reloading, and moving to the firing point or hide area.

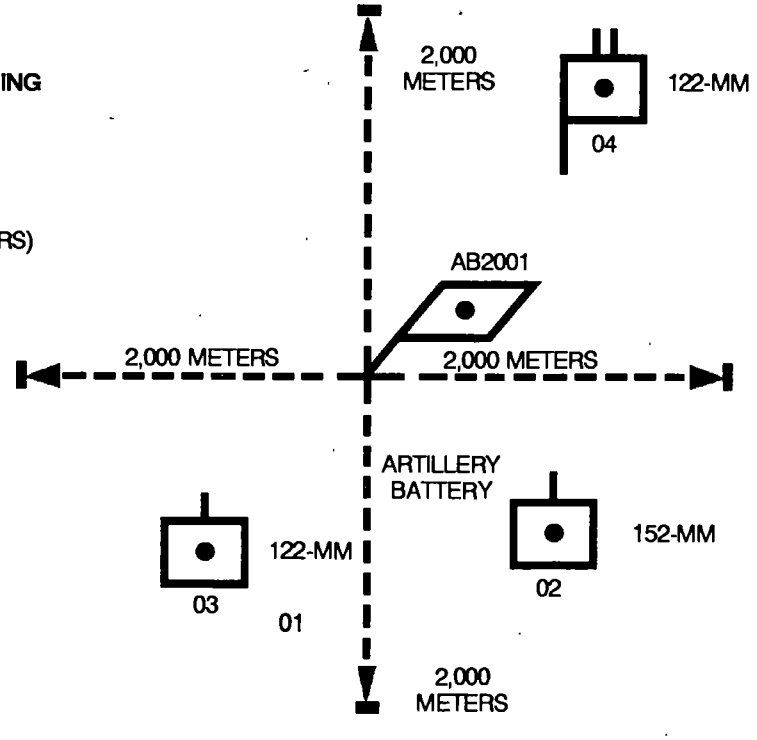
Depending on the time between missions in a single fire plan, launchers can fire, reload, and fire again. (From 20 to 45 minutes may be required for a launcher to reload and be ready for another mission.) Depending on the number of rockets required for each mission, launchers can fire one mission, move to another FP, and fire again. In the case of a rapid fire plan and large fire volumes, no single launcher should be given more than one target per fire plan, for a maximum of nine targets per battery. When the situation warrants, batteries can be given up to three targets per launcher. (This factor is based on the launcher capability to store three missions. Any number of targets over 27 would require processing by the FDS during the execution portion of the fire plan.) However, firing multiple missions from a single launcher during a rapid schedule may require launchers to remain on the same FP for an extended time. During this exposure, launchers become extremely vulnerable to counterfire. This procedure is not recommended for any cases except an extreme tactical emergency or nonexistent counterfire and enemy air threat. If targets are close enough together, they should be processed as multiple aimpoints of the same target. Although not recommended, launchers can fire up to three missions without having to stow the LLM.

MULTIPLE TARGETS ENGAGED AS MULTIPLE AIMPOINTS OF A SINGLE TARGET

TARGET GRID
4400 5000

AIMPOINT GRID	EASTING	NORTHING
01 OF 04	-0000	+0000
02 OF 04	+0100	-0100
03 OF 04	-0100	-0100
04 OF 04	+0150	+0150

(LOCATIONS MEASURED IN DECAMETERS)



The total rockets in the plan should not exceed 108 (9 launchers × 12 rockets each). The number of rockets per target depends on target size and type. An effective, efficient method of engaging multiple targets during a schedule is to use the launcher's capability to fire on multiple aimpoints during a single fire mission. Targets separated by less than 4,000 meters (±2,000 meters northing and easting) can be input as aimpoints of a single target. This process must be completed manually and input into the FDS for transmission to the launcher.

Schedules of fire must be coordinated with the BC so he can manage launcher posture and/or response time. The fire planner must have an accurate picture of launcher status. Because of maintenance, personnel, and other factors, a "rule of thumb" is to plan fires for no more than six 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 an FS asset (20 to 45 minutes) can be expected while the launchers move to reload points, reload, and return to firing points.

In anticipation of future operations, the FSE can transmit posture information, directing the munitions to be available within a specified time frame. This posture information can be stored in the data base at battalion, battery, and platoon.

Section III

TACTICAL FIRE CONTROL

TACFIRE Tactical Fire Control

The FA brigade, corps artillery, division artillery (BCD) TACFIRE computer performs tactical fire control when requests for additional fire are received from subordinate or adjacent FA units. TACFIRE tactical fire control is initiated when computer action is taken on recommendations for fire (generated by the artillery target intelligence [ATI] program) or automatically when requests for additional FA fires are received.

Only fire-for-effect (FFE) missions are processed by TACFIRE. The TFC programs do not compute technical fire control solutions or generate messages to observer (MTOs). They consider only cannon, rocket, and missile systems using HE and DPICM. (The FSE programs enable the division and corps FSEs to analyze targets for attack by naval and tactical air assets.) The TFC function checks FSCM, including chemical hazard areas. However, it does not check for fire unit (FU) mask, ACA, or RFA violations because no ballistic trajectory is computed. Also, TFC programs do not store observer files and known point files nor do they determine munitions or volumes of fire for MLRS units.

If the radius of a target is larger than 250 meters, the computer generates a warning. It recommends that the operator split the target into two or more smaller targets for more effective coverage. Otherwise, the computer processes the target as having a 250-meter radius. The TACFIRE considers MLRS fire units before cannon units if the target size is greater than the size specified in the commander's criteria for MLRS engagements. In other words, MLRS units are selected only if all artillery cannon units cannot, collectively, defeat the target.

Tactical fire control for MLRS is performed by TACFIRE, the battalion FDS (in a corps MLRS battalion), and the battery FDS (or platoon FDS when necessary). When TACFIRE receives a request for fire, it determines if the MLRS unit is to receive the fire mission. The determination is based on target size and type, commander's criteria, and availability of MLRS fire units and ammunition. If an MLRS unit is selected to engage the target, TACFIRE sends the mission to the battalion or battery FDS. Fire mission processing is similar at battalion and battery. See Chapter 1 for a comparison of battalion and battery or platoon FDS capabilities.

The LTACFIRE computer gives the light infantry, airborne, and air assault division artilleries automated capabilities similar to those provided by TACFIRE. The LTACFIRE, however, stores a total of only 250 targets and lacks the extensive targeting capabilities of TACFIRE. The LTACFIRE can be put into operation quickly and can operate while the div arty TOC is moving. The LTACFIRE computer communicates digitally secured by a TSEC/KY-57 COMSEC device.

FDS Tactical Fire Control

Battalion Processing

When a fire mission is received at the battalion, it is placed in the input queue to await operator review. The illumination of a fire mission lamp on the front panel of

the FDS alerts the operator that a fire mission has been received. The operator displays the message, and the senior person on shift reviews the mission to ensure the validity of the message. The operator then executes the message to start TFC processing. The FDS checks the range to the target from each current platoon center location. If the target is not within range, the computer stops processing and displays a message, addressed to TACFIRE, indicating the battalion cannot defeat the target; an error message notifies the operator that the target is out of range. If the target is within range, the computer continues processing. It performs a target analysis, checks for violations of ACAs and other FSCMs, and performs a down-range mask check. It does this by generating a ballistic trajectory from each platoon center location to determine the best fire unit to engage the target. The computer then displays a recommended solution addressed to the battery controlling the recommended fire unit (platoon). The senior person reviews the message. He has the option of accepting the computer solution or overriding it and specifying a fire unit to accomplish the mission. If the computer solution is accepted, the operator transmits the mission to the controlling battery. The computer solution should be used unless there is AFU information, not yet entered in the data base, that affects the mission.

Battery Processing

When the fire mission is received at the battery FDS from the MLRS battalion FDS or div arty TACFIRE, it is placed in the input queue. The operator is notified in the same manner as the operator at battalion. The message is displayed by the operator; it is reviewed by the senior person on shift. If he decides to assign a specific launcher to or exclude one from the mission, this information is entered. The operator then requests a down-range mask check and executes the message to start TFC processing. The computer first computes range from the next firing position for each launcher (not already assigned a mission) to the target to ensure the target is within range. If the target is not within range, the computer stops processing and rejects the mission. A message is displayed and addressed to battalion and/or div arty, indicating the battery cannot defeat the target.

Volleys-Type Target. If the target is designated as a volleys type, all rockets are aimed at the center of the target, regardless of its size or shape. If the number of rockets to be fired at the one aimpoint is entered in the volleys field of the message, that number of rockets is fired at target center. If there is no entry, a default value of six rockets is used.

Effects-Type Target. If the target is designated as an effects-type target, the following process occurs:

- The target type is checked to be sure it is a legal effects type. If it is not, the computer stops processing and an error message is displayed.
- The target dimensions are checked to verify that they are within the size limits for MLRS processing. If they are not, the computer stops processing, the mission is rejected, and an error message is displayed.
- The computer designates one, two, four, or six aimpoints for an effects target. The number of aimpoints for an effects-type target and the number of rockets to be fired at each aimpoint depend on the following:
  - Desired effects.
  - Dimensions of the target.
  - Range to target from the launcher.
  - Lethal area of submunition in relation to target type.
  - Disposition of enemy personnel in the target area.
  - Shape of the target—must be square or rectangular before the FDS can segment it.
- The computer rejects the fire mission request when—
  - Percentage of effects requested cannot be achieved.
  - Solution indicates that more than 36 rockets per aimpoint are required to achieve percentage of effects requested.
- The number of aimpoints, aimpoint easting and northing offset from target center, and number of rockets required for each aimpoint are stored, temporarily, for use by the fire unit selection routing.

Battery Status. During fire mission processing, the computer considers a fire unit busy when it has one active fire mission assigned. A ready fire unit is selected over a busy fire unit. The FDS operator can manually force a fire unit to be selected by entering the FU identification and an entry in the override field in the message. Under these instructions, the computer generates a CFF message for the unit(s) specified. This is done regardless of any violations, as long as the fire unit is in the data base, is operational, and has been assigned a firing position. A launcher can be executing a fire mission and have two additional fire missions stored in its computer.

Solution Acceptance. When the computer completes TFC processing, it displays a call for fire addressed to the selected launcher for review by the

senior person on shift. He makes the decision to accept or reject the computer solution. If the solution is rejected, the selected launcher is excluded and the mission is processed again. If the solution is accepted, current met data and the call for fire are transmitted to the launcher.

Check Fire Procedures

Check fire procedures are uniform throughout the system and are processed automatically by the FDS. If the check fire originates at the FDS, the procedure used depends on the type of check fire required.

Check Fire All

The operator presses the CHECK FIRE key, and the check fire messages are transmitted automatically.

Check Fire on a Specific Target

The operator composes and executes an FM;FOCMD message. The FDS automatically transmits a check fire message to the launcher(s) engaging the target. Also, the FDS automatically transmits a plaintext message to the next higher HQ, informing them of the check fire.

Check Fire Message

The TACFIRE or LTACFIRE can send a check fire message (FM;CHECK) to any FDS to initiate a check fire.

Cancel Check Fire Procedures

Cancel check fire procedures vary throughout the system and are not automatically processed. The procedure used depends on the type of cancel check fire required, but the source is immaterial.

Cancel Check Fire All

The operator must press the CANCEL CHECK FIRE key. This procedure applies when the command is received by either voice or digital means. The cancel check fire message is then transmitted automatically.

Cancel Check Fire on a Specific Target

The operator must compose and execute an FM;FOCMD message. The FDS automatically transmits a call for fire (CFF) message cancelling the check fire. Also, a plaintext message to his next higher HQ informing them that he is going to cancel the check fire is automatically transmitted.

CHAPTER 10

COMBAT SERVICE SUPPORT

Combat service support includes those functions and services required to man, arm, fuel, fix, and move forces in combat operations. The division support command (DISCOM) and corps support command (COSCOM) are organized to provide the full range of health services and personnel functions as well as the traditional logistics functions of supply, maintenance, field services, and transportation. This chapter covers all functional areas of CSS.

Section I

ORGANIZATION

Logistics

Commanders and leaders at all echelons are responsible for the CSS of organic and attached elements in their commands. Each leader anticipates his requirements, makes his needs known, and uses the available CSS elements.

Combat service support must be constantly pushed forward to the using units, giving them the means to meet their missions. At all echelons, CSS activities must be located close enough to the supported unit for expedient resupply by the support unit organic transportation assets.

The logistics plan, based on adequate and timely support of the tactical operation, must be complete, simple, and flexible. It must be prepared with foresight and coordinated with all appropriate staff officers. Combat service support and tactical planning are interwoven. Battalion-level units stock some combat-essential supplies such as rations and repair parts (called prescribed loads) and conventional ammunition (called basic loads). These stocks enable units to operate if the supply chain is temporarily broken.

Logistics Support Areas

In a maneuver brigade area, most CSS is provided to the brigade and supported forces by a forward support battalion (FSB). The FSB is located in the brigade support area (BSA). Normally, the brigade establishes a BSA in the brigade rear area. The FSB and brigade field trains operate from the BSA. The FSB commander is the connecting link who ties combat and combat support units to CSS elements in the brigade. He commands the FSB elements responsible for maintenance, supply, transportation, and medical support for the brigade. He is the point of contact for all DISCOM and COSCOM elements operating in the BSA. The BSA is the distribution point for all classes of supply for brigade units, to include the DS FA battalion.

Combat service support to the units under division control is provided by the main support battalion (MSB), located in the division support area (DSA). The DSA also contains the division trains and forward COSCOM elements operating in the division sector. The division establishes one DSA, which normally is located in the division rear area. The MSB commander controls all DISCOM and COSCOM elements operating in the DSA. The MSB provides support to the division as a whole, to include the divisional MLRS battery.

The COSCOM provides CSS mainly through two types of major subordinate elements: corps-wide service organizations and support battalions, groups, or brigades. The method of providing support is based on the size of the corps, the organization of the COSCOM, the number of units to be supported, and the tactical situation. The COSCOM augments support to the divisions and provides CSS to nondivisional units under the control of the corps, including the MLRS battalions.

The MLRS units, through their parent headquarters, should coordinate to draw logistics support from the closest support area available. The CSS of support areas varies; not all will be able to support an MLRS unit with all of the CSS functions and services required. For example, MLRS units often must obtain ammunition from an ATP or ASP established or augmented by corps.

The MLRS battalion must be flexible in obtaining support. Dispersion throughout the corps area may dictate nonstandard methods of support. For example, a battery conducting independent operations may be required to obtain its support from the closest divisional FSB. It may change supporting units during the operation on the basis of a change of missions. The battalion XO must ensure that this support is thoroughly coordinated with both the direct support unit (DSU) and the supported battery.

MLRS Unit Trains

The battalion trains is a grouping of personnel, equipment, and vehicles to provide logistics support to the batteries. The battalion trains normally operates under the control of the ALOC. The organization of the MLRS battalion trains varies with the mission and tactical situation as well as the other factors of METT-T. The battalion trains is typically a small organization with few assets. Unlike the traditional FA headquarters and headquarters battery (HHB) and service batteries, the MLRS battalion HHSB has few organic CS assets. The HHSB is organized and equipped only to provide combat support to itself, not to support the entire battalion. Most of the battalion CS assets are organic to the firing batteries, thereby facilitating their independent operations. Normally, the battalion locates near a logistics support area to facilitate coordination for logistics support. However, to facilitate resupply of the batteries, the trains may be centrally located on the battlefield. (See Chapter 5 for more information.)

An MLRS battery commander may choose to split a battery trains element from the BOC. Then it operates under the control of the LOC. (See Chapter 6 for more information.)

Section II

SUPPLY AND TRANSPORTATION OPERATIONS

Supply Operations

Supplies are those items required to equip, maintain, and operate the unit. Supply operations determine requirements and request, procure, store, and distribute items to fulfill those requirements.

Batteries stock some combat-essential supplies and repair parts called the prescribed load or, in the case of conventional ammunition, the basic load. The minimum stockage level is directed by a higher command. Prescribed loads enable a unit to start combat operations and sustain them until resupply can be effected. Normally, a prescribed load consists of supplies for a predetermined number of days. A basic load does not necessarily have to be transported by the unit all at one time. Some of the basic load may be prestocked in position.

When possible, supplies are delivered directly to the firing batteries. This is unit distribution. Batteries also may draw supplies from a distribution point. This is supply point distribution. Direct distribution from division and corps support units is another form of unit distribution. Intermediate locations or units are bypassed to save time and resources.

The divisional MLRS battery normally receives CSS directly from DISCOM assets in the DSA. The MLRS battalion under corps control receives CSS directly from the COSCOM. The div arty, FA brigade, and corps artillery headquarters, as appropriate, monitor those items of command interest and coordinate as required. The MLRS battalion supply section coordinates the overall supply activities of the battalion and helps the firing batteries in their supply activities.

The battalion may be required to tailor the staff to provide support to independent battery operations. The staff may operate from several locations to ensure battery requirements are met.

Logistics support units publish external SOPs that specify the policy and methods used to obtain the various types of support and classes of supply. All personnel who deal directly with the logistics units should be familiar with their supporting unit external SOPs.

Class I: Subsistence

Subsistence is provided through forward distribution points to combat units of the division. Corps supply and transport (S&T) battalions operate COSCOM distribution points in the communications zone (COMMZ). The supply and service (S&S) company of the MSB operates the distribution points at the DSA. The supply companies of the FSBs operate the distribution point at the BSA. Strength reports and any special requirements serve as the basis for computing Class I requirements.

Supplies are requisitioned through the proper logistics support unit at the support area. Unit distribution of Class I to the division is broken down into battalion lots in the DSA. Then supplies are picked up by the unit at the prescribed forward distribution point. Class VI supplies are issued with Class I supplies.

The MLRS battalions submit their requests directly to the supply unit operating the forward distribution point of the COSCOM or DSA, as appropriate. The MLRS battery submits requisitions for rations directly to the Class I distribution point.

Class II: Clothing and Organizational Equipment

This class applies to all supplies and equipment other than principal items and cryptographic equipment prescribed by TOE, common tables of allowances (CTAs), and PLLs. Class II supplies include clothing, individual equipment, tool sets, administrative supplies, tentage, and housekeeping supplies.

Class II supply requests are made through the supporting supply unit at the logistics support area. The unit draws its Class II resupply from the logistics support area supporting the unit.

Class III: Petroleum, Oils and Lubricants

Class III supplies include petroleum fuels, lubricants, hydraulic and insulating oils, and antifreeze. Requisitioning of Class III supplies begins with a forecast submitted by the unit to the appropriate support area. The external SOPs of the support unit dictate the frequency of the reports. The forecast may be based on FM 101-10-1/2, historical data reflecting consumption rates, or experience.

On the basis of the forecasts, fuel is supplied to the forward distribution points. Here the units draw Class III supplies from their supporting logistics unit on an as-required basis. In emergency situations, the corps has a limited capability to provide direct shipments of bulk Class III to the consuming divisional units or as far forward as practical. A combination of unit and supply point distribution is used.

Normally, MLRS battery POL resupply operations are managed by the first sergeant and conducted by the battery supply section. Battery POL tankers are sent to the nearest supporting forward distribution point, refueled, and returned to the battery area. Because of the operational distances an MLRS unit may have to cover, the MLRS unit commander may have to coordinate Class III resupply for MLRS batteries and/or platoons with other units. Battery refueling operations can be carried out in the following manner:

- The fuel truck is taken to the platoon OPAREAs. There, either the fuel truck is taken to individual vehicle positions or the vehicles move to the centrally located fuel truck.
- All vehicles refuel during movement from one battery or platoon position to another (filling station method).
- Combat refueling (the use of 5-gallon cans) is slower but is an alternative to the other methods.

Class IV: Items for Which Allowances Are Not Prescribed

This class of supplies includes barrier, construction, or fortification material and the lightweight camouflage support system. Some Class IV items are regulated through command channels. Requisitions for regulated Class IV items (normally, fortification and barrier material) are submitted through command channels. Items not regulated, such as small quantities of nails and common electrical, plumbing, and similar hardware, are requested or obtained from the supporting logistics unit.

The battery supply section picks up the Class IV items from the Class IV forward distribution point located in the support area. In some cases, corps or division may deliver requested critical items directly to the unit.

Note. Class V, ammunition, is addressed in Section IV.

Class VI: Personal Demand Items

Class VI supplies consist mainly of Army and Air Force Exchange Service items. Examples are toilet articles, tobacco, and confections. The Class VI system becomes operational when the exchange operation becomes nonoperational. The request for Class VI supplies is submitted with the request for Class I. Class VI supplies are picked up with Class I resupply.

Class VII: Major End Items

The issuing of major end items (launchers and HEMTTs) is closely controlled through command channels. The commander issues priorities for the replacement of losses. He considers item availability, unit mission, and the tactical situation.

Requests for major end items normally are processed in the form of battle damage reports. These reports are consolidated at command level and processed through command channels. Requests for controlled nonbattle loss items are submitted through command channels. Requests for issue are approved by the maneuver commander. Major end items of equipment may be delivered to the unit, or the unit may have to pick up the items from a designated support unit.

Class VIII: Medical Supplies

Medical supplies are obtained through medical channels. Items required by a battalion aid station are requisitioned by the primary care physician through the supporting medical unit. Nondivisional MLRS units under corps control are supported by the medical battalion located in the COMMZ. Class VIII supplies for the divisional MLRS battery are requisitioned from the MSB medical company.

Class IX: Repair Parts

Class IX is made up of those repairable components, kits, assemblies, and subassemblies (serviceable and unserviceable) that are required for maintenance support of all equipment (less medical-peculiar repair parts). Minor repairable components are included in Class IX repair parts. To recover and repair these items, they are treated as repairable exchange (RX) items. Class IX items required for support of SIGINT equipment are drawn from the supporting signal battalion.

Requisitioning Class IX items is unique, as it is done through the maintenance support structure. Units maintain a stockage of parts to meet immediate needs. At the unit level, this is called the PLL. Maintenance units keep a stockage of parts to meet the immediate needs of the units they support. This stockage is the authorized stockage list (ASL). Unit Class IX PLL replenishment is obtained from the maintenance support company. An unserviceable RX item is exchanged at the maintenance support activity for a serviceable like item.

Requests for Class IX repair parts are submitted to the Class IX section of the maintenance unit which supports the MLRS unit. The maintenance unit issues the part from the ASL, if it is on hand. Requests from supported units which cannot be filled by the maintenance company or activity are forwarded to the materiel management center (MMC). The MMC issues the part from the ASL of another maintenance unit; or, if the part is unavailable, the appropriate support command (DISCOM or COSCOM) orders it.

Class IX items that arrive in the corps (for MLRS battalions under corps control) or division (for divisional MLRS batteries) are received by the maintenance unit which supports the MLRS unit. The supported unit picks up the Class IX parts from the supported maintenance unit, or they may be delivered to the unit.

Class X: Nonstandard Items

Nonstandard supplies are items intended for support of nonmilitary programs. They include agriculture, food, clothing, and medical supplies and economic development items if resources of the area are inadequate. Class X supply is handled through civil affairs units. These units estimate requirements and supervise the distribution of supplies.

Other Supplies

Stocks of unclassified maps are maintained for the division by the S&S company of the MSB. For units under corps control, they are maintained by a designated S&S company or by an engineer map platoon. The S4 requests unclassified maps on the basis of requirements established by the S2.

The S&S company of the MSB purifies and distributes water. It normally establishes water points in the BSAs, DSAs, and COMMZ.

Transportation

Additional transportation may be required to supplement the battalion and battery resources. It may be used for such tasks as hauling additional Class III and Class V supplies, moving large amounts of barrier materials, evacuating damaged material, and making administrative moves. Requests are forwarded by the S4 or supply sergeant through logistics channels to the DISCOM or COSCOM movement control center. (Aerial transportation is discussed in Appendix A.)

Section III

MAINTENANCE OPERATIONS

Maintenance Program

A successful maintenance program depends on a concentrated effort by all personnel in the unit to maintain equipment in a serviceable condition. The operational requirements and sophisticated equipment of the MLRS unit require that most maintenance be done at the operational site. Therefore, maintenance support teams must include the skilled personnel, proper tools, test equipment, and necessary repair parts.

Levels of Maintenance

The Army maintenance system consists of four distinct levels, or categories, of maintenance as follows:

- Unit.
- Intermediate
  - Direct support.
  - General support.
- Depot.

Unit Maintenance

The cornerstone of unit maintenance is the operator and/or crew performing PMCS from the applicable TM -10 and -20 series. Unit maintenance is characterized by the isolation of faults by using built-in or automatic test equipment, by visual inspections, by minor adjustments, and by the exchange of faulty modules and components. Unit mechanics also perform recovery tasks. All MLRS crew members are able to perform unit maintenance formerly performed by the MLRS organizational maintenance mechanic (ASI S8).

Intermediate Direct Support Maintenance

Direct support maintenance is the backup support to unit-level maintenance. In other words, it is in direct support of the user.

Direct support mechanics diagnose and isolate equipment or module failure, adjust and align modules and components, and repair defective end items. They also operate an RX activity, perform light body repair, and provide backup recovery support to the battalions. In addition to working in the support areas, the DS maintenance company has tailored MSTs with each battalion. The divisional forward maintenance company gets additional support from the division MSB.

The MLRS batteries depend on their DS unit for assistance when equipment needs maintenance support beyond the organic capabilities of the battery and battalion. The heavy maintenance and missile support companies provide DS automotive maintenance support and MLRS-specific support for the divisional MLRS battery. Both companies are organic to the MSB. A corps maintenance battalion provides automotive maintenance support for the corps MLRS batteries. Corps batteries are supported with MSTs from the missile support platoon of a corps maintenance battalion.

Intermediate General Support Maintenance

General support maintenance is the backup maintenance support to DS units. It supports the theater supply system through repairing components and modules involving time-consuming tasks and by replacing internal pieces or parts. It is provided by corps maintenance units working in their own facilities and providing mobile MSTs to the BSA and DSA.

Depot Maintenance

Depot maintenance provides technical support and backup to DS and GS maintenance units. It consists of repair or overhaul of economically repairable components and end items. Such maintenance is intended to augment stocks of unserviceable equipment and to support lower levels of maintenance. Depot maintenance requires extensive shop equipment and personnel with greater technical skills than are required in organizational and intermediate maintenance activities. It can provide combat-ready materiel to the Army supply system.

Maintenance Support Teams

Repair of MLRS-specific components (LLM) is facilitated by the MOS 27M MST from the DS unit. Usually, this MST collocates with the MLRS battery. The MST foreman responds to requests for direct support by dispatching MLRS repairers to the platoon area to repair a nonoperational launcher on site. The MST representatives may collocate with the LOC to receive requests via FM, to troubleshoot before the MST is dispatched, and to prioritize the maintenance workload. The MLRS platoon leader assumes responsibility for the MST. He releases the MST to return to the battery LOC when DS assistance is no longer required. The MSTs also may be attached to the firing platoons for the duration of

training exercises or combat operations. This ensures rapid fault diagnosis and repair. Automotive maintenance support may be provided by forward contact teams, or the vehicles may be consolidated at the battery headquarters and evacuated to an MSB maintenance company. Both teams may be augmented as needed by members from corps GS units. To handle this extra maintenance load, the FSBs may be augmented with teams from the MSB and the corps maintenance battalion.

Battalion Maintenance Support

The battalion maintenance section consists of supervisory and HHS maintenance personnel. It provides advice and expertise on maintenance operations; it coordinates DS maintenance requirements. The battalion maintenance technician and motor sergeant give technical advice and expertise to the battalion and battery commanders. They coordinate maintenance and maintenance supply with the DS MSTs. If the MLRS battery is without a battalion HQ, the above maintenance support responsibilities fall on the BC and motor sergeant.

The battalion maintenance section provides unit-level maintenance and recovery support to HHSB elements. This support includes performing scheduled services and repairs. The battalion maintenance section also can provide recovery assistance to the firing batteries.

The battalion maintenance section is manned as shown in the table below.

Firing Battery Maintenance Operations

Each MLRS battery is designed to perform its own unit maintenance. Unit-level maintenance on the FCS is performed by the crew in the firing platoons. They must work closely with the maintenance section for repair parts support and to coordinate for DS MST assistance. All other unit maintenance repair is performed by the MLRS battery maintenance section.

The MLRS maintenance concept is based on the established conventional levels of maintenance (unit, DS, GS, and depot) with minimal use of specialized maintenance detachments or organizations.

The FCS incorporates built-in test equipment (BITE) to help the crew maintain system performance. This BITE continually monitors the FCS components and functions. If a failure occurs, the crew is notified by illumination of a status light or by a fault message on the FCP. If the fault is serious, any ongoing mission is automatically stopped. When a fault indication is received, the crew refers to corrective actions in the troubleshooting section of the technical manual. If the fault cannot be corrected by the prescribed actions and more testing is required, the mechanic does the following:

- Calls up his diagnostic menu.
- Selects the test indicated by the troubleshooting table.
- Performs checks indicated by the table or by the FCP prompts.

BATTALION MAINTENANCE SECTION PERSONNEL BASED ON TOE

POSITION	RANK	MOS	QUANTITY
Battalion Maintenance Technician	WO	915CO	1
Battalion Motor Sergeant	SFC	63B40	1
Recovery Vehicle Operator	SGT	63B20	1
Light Wheeled Vehicle Mechanic	SGT	63B20	1
BFVS Mechanic	SPC	63T10	1
PLL Clerk	SGT	76C20	1
Recovery Vehicle Operator	SPC	63S10	1
Heavy Wheeled Vehicle Mechanic	SPC	63S10	1
BFVS Vehicle Mechanic	PFC	63T10	1
TAMMS Clerk	PFC	76C10	1

LEGEND: **BFVS** = Bradley fighting vehicle system **TAMMS** = the Army Maintenance Management System

Usually, completion of these checks results in the requirement for component replacement, RX at unit level, or notification of DS MST personnel.

Unit maintenance repair other than FCS repair is performed by the MLRS battery maintenance section. Operator-detected faults which cannot be corrected by troubleshooting are reported to the platoon HQ. The HQ coordinates with the BOC or maintenance section for support.

Defective assemblies, modules, and parts not authorized for repair at unit level are evacuated to the appropriate DS facility for exchange or repair.

The structure of the MLRS battery maintenance section supports unit ability to conduct independent operations. However, the dispersion of MLRS platoons from battery headquarters can hinder repair operations. Task-organizing battery maintenance assets into platoon contact teams can alleviate this problem by providing immediately available repair capability. The figure below shows the contact team organization.

CONTACT TEAM

ORGANIZATIONAL	DIRECT SUPPORT
Personnel (One 63T10)	Personnel (Two 27M10)
Transportation (HMMWV)	Transportation (HMMWV)
Equipment (Sets, Kits, and Outfits [SKO], PLL)	Equipment (SKO, ASL)

Operating under the control of the platoon leader and/or sergeant, this team is immediately available to support the platoon. It can repair minor problems and perform complete fault diagnosis. Parts which are required but not on hand can then be pushed from battery HQ or an adjacent platoon, significantly decreasing repair time over that of consolidated operations.

Recovery

Recovery of MLRS equipment is a critical function of the unit maintenance program. The two-vehicle recovery capability of the battery and the possible wide dispersion of battery elements can require the use of self-recovery techniques within the platoons. Extra recovery support is provided by the battalion maintenance section for nondivisional units. Recovery beyond the unit organic capability must be obtained from the supporting maintenance unit.

Communications Maintenance

An austere signal section is authorized for repair of comm equipment. Troubleshooting by operators and evacuation to the support maintenance battalion signal repair company are the usual maintenance procedures.

Fire Direction System

The FDS does its own software fault detection and isolation for unit maintenance. Plug-in modules and printed circuit boards are replaced by the operator. Replacement boards are stocked in the PLL.

MLRS BATTERY MAINTENANCE SECTION

POSITION	RANK	MOS	QUANTITY
Motor Sergeant	SFC	63B40	1
Heavy Wheeled Vehicle Mechanic	SGT	63S20	1
Light Wheeled Vehicle Mechanic	SGT	63B20	1
BFVS Automotive Mechanic	SGT	63T20	1
Equipment Received/Parts Specialist	SGT	76C20	1
Light Wheeled Vehicle Mechanic	SPC	63B10	1
BFVS Automotive Mechanic	SPC	63T10	1
Power Generator Equipment Repairer	SPC	52D10	1
Recovery Vehicle Operator	SPC	63S10	1
Heavy Wheeled Vehicle Mechanic	SPC	63S10	1
BFVS Automotive Mechanic	PFC	63T10	1
Light Wheeled Vehicle Mechanic	PFC	63B10	1
TAMMS Clerk	PFC	76C10	1
BFVS Automotive Mechanic	PFC	63T10	1

Section IV

AMMUNITION (CLASS V) OPERATIONS

Ammunition Description

The MLRS units operate throughout division and corps (including covering force) sectors. They have unique ammunition requirements, resupply vehicles, and procedures. The MLRS family of munitions is described in Chapter 1. The following descriptions of ammo agencies and terms apply to all MLRS units.

Resupply

Corps Storage Area. The corps storage area (CSA) is located deep in the corps support zone (about 145 kilometers from the MLRS unit trains). It is the main source of ammunition for all FA units in the corps area. The GS ammo company operating the CSA resupplies ammunition, by using corps transportation assets, to the ASPs and the ATPs

Ammunition Supply Point. The ASPs are alternate sources of ammunition for units located in a division area. (The ATPs are the primary.) They are located at or near the division rear boundary (about 45 kilometers from the MLRS unit trains). The ASPs are operated by the COSCOM DS ammunition company. Stocks, including MLRS, are managed by the COSCOM MMC and are based on requirements determined by the division ammunition officer (DAO) and the division materiel management center (DMMC).

Ammunition Transfer Point. Artillery units located in a division area normally receive 100 percent of their ammunition requirements at an ATP. Normally, there are four ATPs in a division area.

Each forward support area battalion operates an ATP in its BSA. These ATPs service mainly the maneuver brigade and the 155-mm FA battalions operating in the brigade zone. The fourth ATP, operated by the DS ammo company, is located in the division rear. It is designed to provide the required lift and transload capability for the divisional MLRS unit, corps MLRS units, and all 203-mm artillery units supporting the division. The MLRS unit draws ammunition from the ATP designated by the DAO.

The MLRS units that have been postured for corps deep attack missions and are positioned in a division area normally will draw the ATACMS from the ATP in the division area. However, these items may require extraordinary asset management and distribution to ensure the right ammunition is available to the right weapons at the right time. Designated units may be located closer to an ASP than to the appropriate ATP. With proper planning and coordination, the DAO, working through the DMMC and COSCOM MMC, may arrange for that MLRS unit to draw its ATACMS from the ASP. Another option to expedite reaction time would be to provide ATACMS from the CSA or ASP to the ATP or unit trains by air.

> **Note.** Only under the most unusual or emergency circumstances will an MLRS unit use its organic assets to draw ammunition from the CSA.

The MLRS battery ammo platoon leaders and MLRS battalion S4s must coordinate with the DAO and the ATP to ensure MLRS needs are met at the nearest ATP. Normally, MLRS ammunition is left on the corps transportation vehicle trailers at the ATP. The MLRS unit personnel transload launch pods from the trailers by using organic material handling equipment. Therefore, the real estate at the ATP should be organized to facilitate rapid transload. Often, the MLRS transfer point is actually outside of and adjacent to the ATP.

Ammunition Holding Area. The AHAs are established at MLRS platoon and battery levels. The HEMTT-HEMATs of the ammo platoon are held in the AHA between resupply missions. The location of AHAs and the crewmen duties in these areas vary according to unit SOP. (See Chapter 7.)

Reload Point. The RLs are the locations in the platoon OPAREA where M270 launchers down-load expended launch pods, up-load new launch pods, and rendezvous for other resupply items. At least two RLs per OPAREA are recommended. These requirements may vary with METT-T. (See Chapter 7.)

General Definitions

Basic Load. The unit basic load (UBL) consists of quantities of conventional ammunition required to sustain the unit during combat until regular resupply can be conducted. The basic load must be available for the unit to carry into combat with its organic

transportation. However, a unit may not be able to transport its entire basic load in a single lift. Unit transportation assets are based on resupply rate, not the higher basic load. The major Army command (MACOM) establishes the stockage level for the UBL. The basic load includes MLRS launch pods, small-arms ammunition, explosives, mines, fuzes, detonators, pyrotechnics, and associated items. It does not include TOE items, such as explosive components of sets or kits.

Required Supply Rate. The required supply rate (RSR) is the estimate of the amount of ammunition needed to sustain operations, without restrictions, for a specific length of time. The RSR is a result of the unit forecast for ammunition, which is based on the tactical situation and mission. The MLRS battalion S3 or div arty S3 and divisional MLRS battery commander are responsible for determining ammo requirements and submitting forecasts to the next higher headquarters. The RSR is expressed in terms of rounds per unit, per individual, or per weapon per day. The unit RSR is reported as part of operations or logistics reports. These requirements are compared with assets expected to be available for the period to determine the controlled supply rate (CSR).

Controlled Supply Rate. The CSR is the amount of ammunition use that can be sustained with available assets. The CSR also is expressed as rounds per unit, per individual, or per weapon per day. The theater commander determines the CSR for each item of ammunition. In turn, the commander of each subordinate tactical unit determines a CSR for his units at the lower levels. The CSRs for individual items may vary from one command to the next. The corps commander uses the CSR to prioritize unit ability to expend ammunition, consistent with the mission requirements of the overall force. This ensures enough ammunition for all units on the basis of their missions. The CSR may be communicated to subordinate commands through the logistics support channels; or it may be published in the OPORD, a fragmentary order (FRAGO), or the fire support portion of the OPORD. The statement "The CSR is the RSR" is used if there are no restrictions. Except in emergency situations, units may not draw more than their CSRs without authority from their next higher headquarters.

Expenditure. This is the amount of ammunition used by a unit. During combat, ammunition is considered expended at the corps level when the ASP issues it to the user. Ammunition for the ATPs is considered expended when it leaves the CSA or ASP for the ATP.

★ Resupply Operations

Ammunition is normally drawn from a division or corps ATP or ASP. On the basis of the tactical situation, ammunition platoons organic to batteries can be task-organized in many ways to accomplish the mission of resupply.

Decentralized. This method is the least centralized and places all of the ammunition RSV/Ts under the control of the firing platoons. The firing platoon sergeant is then responsible for the flow of ammunition from the ATP or ASP directly to the platoon resupply points.

Centralized. Under centralized control of ammunition resupply operations, the battery commander retains control of all of his organic RSV/Ts and manages all ammunition resupply operations at battery level.

Consolidated. This method is employed when the battalion consolidates all RSV/Ts from the batteries into a battalion ammunition resupply platoon of 36 to 54 HEMTTs and HEMATs. The battalion manages all Class V resupply operations.

Efficient Class V resupply operations will normally require the unit to employ a combination of methods. When the appropriate management technique is decided upon, two of the most important considerations are the locations of the ammunition resupply points and the echelon of the lowest level of tactical fire direction.

The farther the ASP or ATP is from the unit, the greater the need to consolidate or centralize at least a portion of the available assets. If the battery or battalion is the lowest level at which tactical fire direction is to be accomplished, the battalion or battery must retain some control over ammunition resupply capability to facilitate rapid shift distribution.

Routing

Ammunition resupply routing must be carefully coordinated and controlled, since MLRS batteries may have to go to more than one location for ammunition. Movement on MSRs will require clearance by the appropriate MCC. The MLRS munitions may be picked up at an ATP, at an ASP, at the CSA, or at a combination of two or more locations. Coordination and synchronization are key to accurate and timely resupply. At the ATP, ASP, or CSA, MLRS personnel are required to transload their own MLRS ammunition.

Resupply by Air

Army aviation assets can be used to transport limited quantities of ammunition. However, transport of MLRS ammunition by air may not be practical given the limited haul capacity of aviation assets. (See Appendix A.)

Section V
SERVICES

Definition

Services are those sustainment support functions provided to an armed force that are not included in supply, maintenance, transportation, or personnel services. They consist of food service, bath and clothing exchange, laundry, bakery, graves registration, and textile renovation.

Services in the division, particularly in the forward areas, are limited. They are provided by the S&S company of the MSB with corps augmentation. Many of the sections and platoons that perform wartime services are not authorized during peacetime.

Graves Registration

Graves registration (GRREG) is a dual responsibility. The unit must recover, identify, and transport the dead to the GRREG point. From there, the S&S company personnel further evacuate to division and corps collection points. The GRREG consists of prompt identification of the remains, evacuation of remains out of the division area, prompt and accurate administrative recording and reporting, and emergency burial when required.

Because of the chance of massive fatalities in an NBC environment, the use of regular GRREG methods may be impossible. In this case, special GRREG task groups may be formed and mass burial may be required. Mass burial requires the approval of the theater GRREG officer. If there are no GRREG units in the area or if contact with higher headquarters is lost, the senior officer decides whether remains should be buried in a mass grave or evacuated to the rear.

Bath and Clothing Exchange

Bath and clothing exchange are provided by the S&S company of the MSB when augmented by corps for divisional units or by the S&S battalion of the corps for nondivisional units. This support is generally on an area basis but may be moved to the BSA when needed. Clothing exchange and bath teams also are used in radioactive decontamination of personnel.

Laundry and Renovation

Laundry and renovation support is provided to division and corps units as soon as the tactical situation permits. This support is provided by the S&S company of the MSB for divisional units and by the corps field service companies for nondivisional units.

Decontamination

Complete NBC decontamination is performed by the unit with help from the division or corps NBC company providing specialized equipment and expertise. Priorities for decontamination are established by higher headquarters. Therefore, decontamination support may not be immediately available. This support is coordinated through the FA brigade HQ for MLRS battalions in an FA brigade, through corps artillery HQ for MLRS battalions under corps control, and through the div arty HQ for the divisional MLRS battery.

Section VI

PERSONNEL SERVICE SUPPORT

Functions

Personnel service support is an important component of CSS. It involves many CSS functions that sustain the combat potential of the force and the morale and welfare of the soldier. They include the following:

- Personnel services.
- Finance support.
- Chaplain activities.
- Legal service support.
- Public affairs.

Initial personnel service support planning should focus on the combat-critical tasks of personal services (strength accounting, casualty reporting, and replacement operations) and health services. Once the planning for those critical functions is complete, attention is focused on the other functions of personnel service support. The order of importance of the sustainment functions is not fixed; rather, it varies according to the tactical situation.

In the MLRS battalion, the staff officer responsible for coordinating personnel service support is the S1. In the divisional MLRS battery, the 1SG and unit clerk are the focal points for personnel service support activities.

Strength Accounting

Strength accounting is the process by which combat readiness (personnel status) is measured. It keeps track of the troops on hand, identifies those that have been lost, and identifies those that are needed. The MLRS battalion S1 (1SG for divisional MLRS batteries) serves as a conduit between subordinate units and the higher headquarters.

Batteries submit a daily personnel summary report to the battalion S1 in the battalion trains. He then forwards a consolidated battalion report. The divisional MLRS battery submits its report to div arty. These reports, together with authorized vacancies, are the basis for requesting individual replacements. Accurate strength reports also give the commander and staff information to plan future operations. The unit SOP provides guidelines for the report.

Casualty Reporting

The main personnel accounting function on the battlefield is casualty reporting. The casualty reporting system, a by-name personnel accounting system, begins at unit level with the person who knows that a casualty has occurred. Casualty information must be reported with 100-percent accuracy as quickly as the situation permits.

During combat operations, the S1 (1SG for divisional MLRS batteries) must make sure that strength and casualty reports are timely and accurate. Casualty reports give the detailed information needed to requisition specific replacements. Casualty reporting occurs as soon as possible after the event and is started by the section chief or battery commander. A DA Form 1156 (Casualty Feeder Report) is carried by all small-unit leaders to report hostile-action casualties and non-hostile-action casualties. It provides initial information to the adjutant general (AG) for preparing the casualty report. This report is used by Department of the Army (DA) to notify next of kin. Also, it validates the soldier's line-of-duty status, which determines payment of benefits. Casualties are reported to the first sergeant, who collects the reports and forwards them to the PAC. Reports are forwarded through the FA brigade HQ for nondivisional MLRS units under corps control. Reports are forwarded through the div arty HQ for the divisional MLRS battery.

Replacement Operations

The battalion S1 is the MLRS battalion commander's main staff officer for individual personnel replacement operations. Personnel requirement reports and loss estimates determine the replacement requirement. The division or corps AG, on the basis of documented losses, replacement projections, and the division commander's priorities, prepares replacement distribution projections. The corps AG prepares a similar report to the corps artillery S1. Replacements are delivered to the S1 through the BSA or DSA for the divisional MLRS battery and through the COSCOM for the nondivisional corps MLRS battalion.

Replacement flow is monitored by the battalion S1. The HHB commander establishes a replacement receiving point (RRP) in the battalion field trains and notifies the FA brigade S1 of the RRP location. All replacements or returnees are brought to the RRP for initial processing. The division AG normally is responsible for delivering replacements to the RRP. Hospital returnees are handled as replacements by the division AG. Replacements are equipped with needed field gear before leaving the field trains.

Enemy Prisoners of War

Enemy prisoners of war (EPWs) are evacuated from the unit area as fast as possible. The battery or battalion is responsible for guarding EPWs, recovering weapons and equipment, removing documents with intelligence value, and reporting to the higher headquarters S2 and S4. The EPWs are evacuated to the brigade EPW collection point on returning resupply vehicles or are moved to the MSR and guarded. The location is reported to the S4, who coordinates transportation. The S2 reviews and reports, as necessary, any documents or information of immediate value. The S4 coordinates the evacuation of large amounts of equipment. Wounded EPWs are treated through regular medical channels but are separated from US and allied patients.

Section VII

Health Service Support

Mission

The basic health service mission is to preserve the fighting strength. Health service support involves the prevention of illness through field sanitation and personal hygiene. It also involves obtaining medical support that ranges from sick call (conducted by battery aidmen) to the processing of casualties. Carrying out this mission requires the implementation of a full array of services. Some services are as follows:

- Hospitalization.
- Evacuation.
- Dental support.
- Veterinary and preventive medicine activities.
- Medical supply and maintenance.
- Optical support.
- Laboratory support.
- Command and control.

Battery-Level Support

At the battery level, the aidman provides medical support to the unit. He is at the lowest level on the medical support chain. He is generally limited in the amount and types of care he can give the patients. His care is limited to treating minor injuries and reducing the effects of serious wounds. He relies on the battery for evacuation support.

In the divisional MLRS battery, there is one combat medic. He can provide limited medical services (first aid and emergency treatment to patients who must be evacuated). Additional medical support is provided by medical companies from the FSBs.

In the nondivisional MLRS battery, medical support is provided by the battalion combat medic section. Normally, an aidman is sent to each battery.

Battalion-Level Support

The battalion treatment team can provide limited medical services (administer first aid, give emergency treatment to patients who must be evacuated, and handle deceased personnel). The section is supervised by a primary care physician. It operates a clearing station and provides medical treatment for the battalion headquarters.

The battalion aid station is normally located with the battalion trains. Ambulance support from the battalion ambulance team (one vehicle) generally is provided to the batteries by placing the ambulance forward with the battalion CP or with the center firing battery. Given the limitations of one ambulance and the likely dispersion of the firing batteries, the battery commanders and platoon leaders should designate a vehicle to be used for casualty evacuation to the battalion aid station.

Evacuation

Evacuation from the unit is mainly the responsibility of the unit. Units are required to evacuate their own personnel to the supporting field hospitals located in the BSA, DSA, or COMMZ. However, the medical companies supporting the MLRS unit can evacuate casualties. Evacuation by using medical company support is done through coordinated or previously established channels to the designated clearing station or combat zone hospital. Beyond that, medical companies are responsible for the evacuation of the patient if care is required beyond the capability of the treatment facility.

Air evacuation support is available to the corps. This support is provided by the aeromedical company from the corps aviation brigade. The external SOP of the supporting unit should be consulted for the procedures to request aeromedical support.

APPENDIX A

AERIAL TRANSPORT OF MLRS AMMUNITION AND EQUIPMENT

Aerial Ammunition Resupply

Ammunition resupply of MLRS units is a critical operation. A technique or capability available to support resupply of the 5,005-pound LP/C or the 4,609-pound M/LPA is the use of the CH-47D helicopter. This appendix supplements the discussion of Class V operations in Chapter 10.

The CH-47D has a load-carrying capacity of 25,000 pounds. Loads can be carried internally or externally by using TOE equipment except for required external load slings.

Internal Load

The CH-47D can carry up to four LP/Cs or M/LPAs internally for a total of 24 rockets or four missiles. Atmospheric or weather conditions in the area will dictate the load-carrying capacity of the CH-47D.

Equipment. The LP/Cs or M/LPAs can be loaded by use of the following equipment:

- CH47-D on-board winch.
- Four (1,000) conveyor rollers, NSN 3910-00-903-1303.
- Twelve sheets of 3/4-inch plywood.

Concept. The LP/Cs or M/LPAs can be loaded two at a time stacked on top of each other. They should be pre-positioned (by using the HEMTT crane) on top of conveyor rollers and one sheet of plywood. The on-board winch can then be used to pull the load into the aircraft. Plywood shoring should be placed down in the deck of the aircraft for the conveyor rollers to travel. The identical procedures are used to load the second two pods. Then all LP/Cs or M/LPAs are tied down with standard 10,000-pound cargo straps.

Off-Loading. It is relatively easy to off-load the aircraft. Four soldiers can push the load down the ramp and use the on-board winch to help brake the load.

Loading Considerations. The following should be considered:

- On- or off-loading requires about 30 minutes.
- A level landing zone is required to ensure the plywood shoring remains level.
- The winch should be hooked onto the aft end of the load to facilitate loading of the second LP/Cs or M/LPAs.

External Load

Current procedures permit only one LP/C or M/LPA to be carried. Four 25-ton slings are required. The front two are 10 feet in length, and the rear two are 12 feet in length. Procedures to carry four LP/Cs or M/LPAs will substantially expedite helicopter resupply when developed.

Movement of Ammunition

Aerial movement of MLRS ammunition is feasible and, given the limited assets of the COSCOM to move LP/Cs or M/LPAs to the ASP, this is a potential solution. Availability of aircraft and the criticality of the mission will be the determinants in the execution of this operation.

Transportation of MLRS Equipment on United States Air Force Aircraft

The following procedures, determined during a practical exercise between Army and United States Air Force (USAF) personnel, will aid those whose MLRS units are deploying by C141-B aircraft.

M985 HEMTT

Loading and off-loading operations require a wood block ramp brace 20 by 11 by 10.5 inches and stair-stepped plywood approach shoring, seven pieces on each side. Air Force publications state and expand on these requirements. Wood should be precut and on hand for each vehicle.

The HEMTT must be backed into the aircraft. Minimal clearance requires skilled and experienced drivers in the HEMTTs.

All LP/Cs or M/LPAs and the HEMTT spare tire must be removed for up-loading.

M270 Launcher

The M2708 hatch cover and antennas must be removed, and the driver's louver must be down over the windshield.

The launcher is driven forward onto the aircraft with C141-B winch assistance.

Plywood matting is required on the tarmac (approach to aircraft) and on the C141-B ramp door.

Note. A DD Form 2133 (Joint Airlift Inspection Record) must be completed for each aircraft. (See below.)

Each type of transport aircraft has a specific manifest form which must be completed for transporting MLRS cargo. (See the sample MAC Form 749 [C-5A Passenger/Cargo Manifest] on the next page.)

DD FORM 2133, JOINT AIRLIFT INSPECTION RECORD

JOINT AIRLIFT INSPECTION RECORD

1. UNIT BEING AIRLIFTED	2. DEPARTURE AIRFIELD	3. DATE

4. TYPE ACFT AND SERIAL NO.	5. MISSION NO.	6. LOAD/CHALK NO.	7. TIME COMPLETED	8. ALCE

LEGEND (Don't check after each item as follows)
✓ = Satisfactory X = Unsatisfactory N/A = Not Applicable

	INCREMENT/SERIAL/DUMPER NUMBER AND TYPE											
A. PREPARATION												
9. Clean (No dirt, trash, paste)												
10 No fluid leaks												
11. Deals weight (Both sides)												
12. Center of balance (Both sides)												
13. Fuel tanks 1/4 to 3/4 (1/2 aircraft ramp)												
14. Fuel tank caps (As required)												
15 Jerry cans secured (Maximum 5 gallons)												
16 Size reduction—antennas, bows												
17. Dimensions (Fits aircraft envelope)												
18. Battery secured												
19. Vehicle equipment secured												
(a) Axe, shovel, pick												
(b) Spare wheel, tools, bow												
20 Mechanical condition												
(a) Engine runs												
(b) Brakes												
21. Tire pressure (Maximum 100 PSI)												
22. Tie down points												
23. Pins for pining hooks and sleeves												
24. Tensors (Drained and purged)												
25. DD Form 1303-3 (As required)												
26. Manifests/number of copies												
B. ACCOMPANYING LOAD												
27. Secured to vehicle _1 Do. 2 Do												
28. Within rated capacity												
29. Compatible cargo (MAC AFR 71-4)												
30. DD Form 1387-2 (As required)												
C. SPECIAL REQUIREMENTS												
31. Shoring – rolling, parking												
32. Ramp												
D. PALLETS												
33. Dimensions – width, hight												
34. DD Form 1387-2 (As required)												
35. Compatible with other cargo												
36. Cargo properly secured												
(a) Netted												
(b) Chained												
37. Inventory list of dangerous materials on the pallet – signed by the shipper												
E. HELICOPTERS (Flyaway)												
38. Battery disconnected												
39. Fuel quantity – 1/4 to 3/4 full												
40. Deals weight (Both sides)												
41. Center of balance (Both sides)												

F. CORRECTED ITEMS

43. BLOCK NO.	LEGEND	43. (Cont)	LEGEND
A.		F.	
B.		G.	
C.		H.	
D.		I.	
E.		J.	

40. REMARKS

44. TRANSPORTED FORCE INSPECTOR SIGNATURE

45. AID FORCE INSPECTOR SIGNATURE

SAMPLE

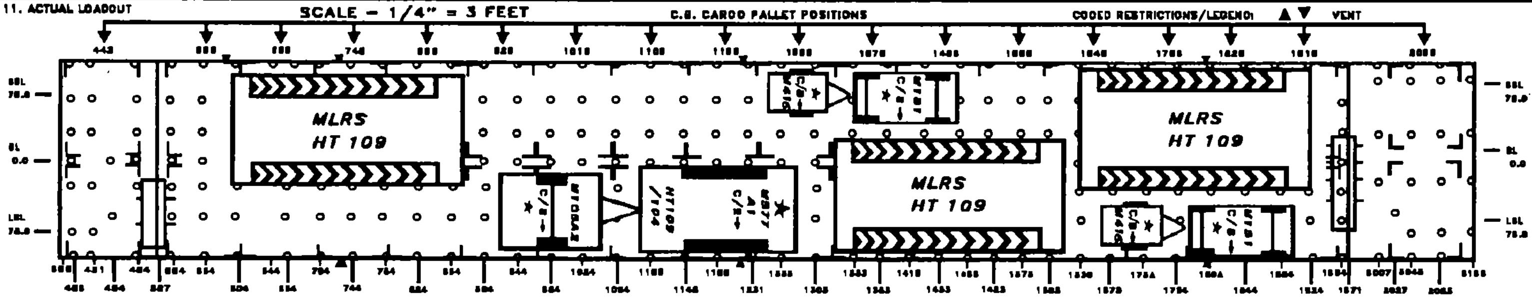
DD FORM 1 SEP 77 2133

MAC FORM 749, C-5A PASSENGER/CARGO MANIFEST

1. UNIT BEING AIRLIFTED (Name or Number)	2. UNIT IDENTIFICATION CODE	3. TYPE MOVEMENT PLAN	4. MOVEMENT DATE	6. UNIT AIRCRAFT LOAD NUMBER	
A 2d, 49th FA	WXYZAR	C5A	12AUG92	1 of 1	PAGE 1 OF 1 PAGES

5. MISSION NUMBER	7. ACFT SERIAL NO. (Last Five)	7a. KNEELING MODE ON LOAD	7b. KNEELING MODE OF LOAD	8. CONFIGURATION	9. DEPARTURE AIRFIELD/ETD	10. DESTINATION AIRFIELD/ETA
		☐ FWD ☐ LEVEL ☐ AFT ☐ N/A	☐ FWD ☐ LEVEL ☐ AFT ☐ N/A	1ST PLT	ALTUS AFB, OK 1315	FT HOOD, TX 1600

11. ACTUAL LOADOUT SCALE – 1/4" = 3 FEET C.G. CARGO PALLET POSITIONS CODED RESTRICTIONS/LEGEND: ▲▼ VENT



LOAD SE-QUENCE a.	ITEM MODEL AND NOMENCLATURE/DESCRIPTION b.	VEHICLE PACKAGE NUMBER c.	SERIAL INCREMENT NUMBER d.	e. REMARKS (Special handling, shoring, etc.) RMKS CODE (From Column 1) (1)	OTHER (2)	f. PLANNED LOAD DATA (Total in inches) LENGTH	WIDTH	HIGHT	WEIGHT (Total Pounds)	g. ACTUAL LOAD DATA HEIGHT (Total Inches)	CUSE -1738	WEIGHT (Total Pounds) (< 31478)	CENTER OF BALANCE (Inches)	FUSELAGE STATION h.
1	M270 SPLL	B21		3A,3B,6,7A		276	120	170	44000	104		43960	G. G.	704
2	M105A2 1½ tn trl	B10T		1A,3A		166	83	55	6000	93		4080	66"	984
3	M577 Carr CP	B10		1A,3A,3B,6,7A		196	100	110	22880	108		21940	3RD (81") Pd Wh I	1188
4	M416 ¼ tn trl	B14T		1B,3A		108	81	41	1100	51		800	47"	1303
5	M270 SPLL	B31		1A,3A,3B,6,7A		276	120	107	44000	104		44460	C. G.	1453
6	M151 ¼ tn trk	B14		1B,6,7A		133	63	51	3000	70		2450	39.66"	1418
7	M270 SPLL	B11		1B,3A,3B,6,7A		276	120	107	44000	104		44080	C. G.	1784
8	M416 ¼ tn trl	B15T		1A,3A		108	81	41	1100	51		780	41"	1724
9	M151 ¼ tn trk	B15		1A,6,7A		133	63	51	3000	70		2520	40"	1844
	20 PACs								4000					
					TOTAL	1672			172 860					1303.17

REMARKS CODES (For use in Column "e(1)")
1 Off center
1A RIGHT
1B LEFT
2 Center line load area required both sides.
3 Headings required
3A PARKING
3B ROLLING
3C SLEEPER
3D BRIDGE
4 Must be driven into aircraft in direction of arrow.
5 Sequence pallets IAW actual weights.
6 DD Form 2133 required
7 Maximum fuel
7A 3/4 TANK
7B 1/2 TANK
7C 1/4 TANK
8 Equipment drained or purged
8A DRAINED
8B PURGED
9 Vent Kit required
OTHER CONDITIONS identify in column e(2)

12. PASSENGER SEATS a. PLANNING DATA: MAXIMUM NO SEATS AVAIL	AVG WEIGHT (LBS EACH)	TOTAL PLANNED WEIGHT	b. ACTUAL DATA: NUMBER SEATS USED	TOTAL WEIGHT (Pounds)	13. DATA APPROVED	14. TYPED OR PRINTED NAME, GRADE AND ORGANIZATION OF PLANNING OFFICIAL	15. SIGNATURE OF PLANNING OFFICIAL
73	200	3000	20	4000			

MAC FORM NOV 80 749 (ONE-TIME) C-5A PASSENGER/CARGO MANIFEST

NOTE. The number of vehicles, equipment, and personnel transported on USAF planes will be determined on the basis of authorized cargo load of the aircraft being used. Certain atmospheric conditions in the destination area (for example, temperature and air density) may cause the allowable cargo load (ACL) to be adjusted lower than the planning ACL. Air movement officers/NCOs must keep this in mind when configuring aircraft loads.

APPENDIX B

MLRS BATTALION AND BATTERY TACTICAL STANDARD OPERATING PROCEDURES

This appendix is designed as a guide and checklist for preparing a field artillery TSOP for the MLRS battalion and MLRS battery. This appendix is not intended to be all-inclusive regarding the information required by an individual unit TSOP. These TSOP outlines are recommended for use by all MLRS battalions and MLRS batteries to standardize TSOPs within the MLRS community. MLRS platoon operations are usually covered within the MLRS battalion or battery TSOP; therefore, a separate MLRS platoon TSOP will not be addressed.

General

The TSOP is a set of instructions covering those features of operations which lend themselves to a definite or standardized procedure to increase effectiveness. The TSOP is an order from the commander that tells his staff and subordinates how he intends to run his unit. Procedures outlined in the unit TSOP apply unless the commander orders otherwise.

This appendix provides an outline for use in developing a TSOP. A sample format is provided for use by all MLRS battalions and MLRS batteries. Standardized formats are very helpful to newly assigned personnel who must quickly find the answers to operations questions. When TSOPs are exchanged with other units during coordination or liaison, they help both units understand the operating procedures of the other.

TSOP Format

The basic format of a TSOP is the implementing memorandum with attached annexes and appendixes. Additionally, a table of contents for attached annexes may be inserted to provide a quick reference to information contained in the TSOP.

Normally, TSOPs are unclassified to facilitate distribution to all levels that need to have the information. However, selected portions of the TSOP may be classified and should be identified as such in the table of contents.

Note. Normally, each annex would start on a separate page. However for presentation here, page breaks are shown by a line between each annex.

AD	=	air defense	**MWR**	=	morale, welfare, and recreation
BDAR	=	battlefield damage assessment and repair	**ORF**	=	operationally ready floats
CI	=	civilian internee	**PERSTAT**	=	personnel status
EEI	=	essential elements of information	**ROM**	=	refuel on the move
GPS	=	global positioning system	**SALUTE**	=	size, activity, location, unit, time, and equipment (memory aid)
LOGPAC	=	logistics package	**SITREP**	=	situation report
LOGSTAT	=	logistical status	**TACJAM**	=	tactical jamming
MEDEVAC	=	medical evacuation	**VINSON**	=	a series of communications security devices
MI	=	military intelligence	**WSRO**	=	weapon system replacement operations
MIJI	=	meaconing, intrusion, jamming, and interference			
MOPP	=	mission-oriented protective posture			

Section I

IMPLEMENTING MEMORANDUM (Battalion and Battery)

DEPARTMENT OF THE ARMY
Unit
Location

OFFICE SYMBOL Date

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Tactical Standing Operating Procedures

1. REFERENCES. This paragraph should contain all references that support the TSOP. A primary reference is the TSOP of the unit's higher headquarters with which it must operate. In cases where a unit has contingency missions with more than one higher headquarters, its TSOP should be written for the primary mission and annotations should be made within the text as appropriate where procedures differ.

2. APPLICABILITY/SCOPE. The purpose of this paragraph is to outline the applicability and/or scope of the TSOP. The paragraph below is one example.

> This TSOP covers only wartime operations after deployment. This TSOP does not and will not repeat doctrine, tactics, or techniques that are provided in FMs, TMs, and MTPs. It applies to all organic, assigned, attached, and OPCON units. It also applies to all supporting units operating in or occupying areas within the battalion or battery area of operation. All TSOP provisions apply except as modified by operations orders and plans. No provision shall replace good judgment and common sense.

3. PURPOSE. The purpose of this paragraph is to describe the purpose of the TSOP. The paragraph below is one example.

> This TSOP prescribes guidance for the conduct of sustained tactical operations. Specifically, it standardizes those routine and/or recurring operational procedures and responsibilities of individuals and/or organic and supporting elements.

4. GUIDANCE TO SUBORDINATE UNITS. As appropriate.

5. PROPONENCY. Overall proponency is usually the battalion S3 or the operations officer at the battery level. The proponent for each annex and appendix may be listed in this paragraph if applicable.

6. CHANGES. The purpose of this paragraph is to outline procedures for making changes to the TSOP. Consider the following topics for inclusion in this paragraph:

- Who is responsible for writing and coordinating changes. Normally the proponent of each annex and/or appendix is responsible for writing changes to his respective annex and/or appendix.
- Who approves changes. Normally the commander approves changes to the TSOP, but the procedure for approval and dissemination must be specified.
- How changes are to be posted. The TSOP should be preceded by a posted changes page.

SIGNATURE BLOCK
RANK, FA
Commanding

DISTRIBUTION: Distribution is usually made in accordance with a unit distribution scheme, such as "DISTRIBUTION: A." Whether distribution is made in accordance with a unit distribution scheme or listed by element and number of copies, the following should be considered:

- What elements need copies within the battalion or battery?
- How many copies are needed by each element?
- Distribution of changes.
- Liaison officer team distribution during operations.
- Distribution to external elements.

Section II
BATTALION TSOP

TABLE OF CONTENTS

Note. Tabs may be used to further divide an appendix if an appendix has many subparts and is considered too lengthy. An example page number for a tab is as follows: A-1-A-1. This means page 1 of tab A to Appendix 1 of Annex A. Subsequent pages within the tab are numbered sequentially as A-1-A-2, A-1-A-3, and so forth. Tabs may be included in the table of contents.

ANNEX A (Operations) to ____ Bn, ____ FA (MLRS) TSOP

The purpose of this annex is to prescribe operations within the battalion. Consider the appendixes below for inclusion in this annex.

Appendix 1 - Battalion Command Post. This appendix shows the physical setup of the battalion CP and establishes internal CP operating procedures. Consider the following topics for inclusion in this appendix:

- CP manning.
- Shift organization and sleep plan.
- Shift changeover time and procedures.
- Overall CP laydown with vehicles.
- TOC internal setup.
- CP communications (internal and external).
- Specific duties and responsibilities.
- Priorities of work.
- Access control.
- Security.
- Load plans.

Appendix 2 - Liaison. This appendix outlines the duties and responsibilities for liaison personnel. Consider the following topics:

- Organization.
- Transportation.
- Communications.
- Checklist for liaison team.
- Liaison functions.
- Liaison responsibilities to supported unit.
- Liaison responsibilities to parent unit.
- Prioritization and formation of ad *hoc teams, as required.*
- Load plans.

Appendix 3 - Movement and Positioning. This appendix prescribes movement and positioning requirements, procedures, and techniques used within the battalion. Consider the following topics:

- Specific duties and responsibilities.
- Movement orders.
- Movement techniques and METT-T.
- Positioning in the offense.
- Positioning in the defense.
- Displacement options.
- Convoy procedures.
- Command and control during movement.

Appendix 4 - Command and Control. This appendix outlines how the battalion will be commanded and controlled. Consider the following topics:

- Responsibilities for command and control.
- Orders process.
- Orders distribution.
- Orders format.
- Succession of command.
- Transfer of CP operations.
- Alternate CP.
- Jump CP operations.
- Assignment of rocket or missile missions to batteries.

Appendix 5 - Fire Direction. This appendix standardizes tactical fire direction procedures and information. Consider the following topics:

- Personnel responsibilities.
- Initialization.
- Equipment maintenance.
- Communications procedures.
- Degraded mode operations procedures.
- Battalion fire direction procedures.
- Platoon and battery fire direction procedures.
- Massed fire procedures.
- Subscriber tables.

Appendix 6 - Survey and Meteorological Support. This appendix prescribes survey operations and identifies responsibilities and procedures for receiving and disseminating met messages. Consider the following topics:

- Personnel responsibilities.
- Survey priorities (for example, PADS, simultaneous observation, and hasty survey).
- Radio communications and requests for survey.
- SCP locations and markings.
- GPS procedures.
- Datum coordination and control.
- Extension of survey.
- Alternate met procedures in case of electronic failure.
- Met message dissemination times.
- Coordination of met requirements.

Appendix 7 - HHSB Operations. This appendix prescribes operating procedures for the HHSB. Consider the following topics:

- Tactical organization.
- Personnel and section responsibilities.
- RSOP.
- Advance party configuration, equipment, and procedures.
- HHSB rearm, refuel, and refit operations.
- Load plans.

Appendix 8 - Firing Battery Operations. This appendix prescribes operating procedures for firing batteries. Consider the following topics:

- Battery deployment configurations.
- Battery OPAREA.
- Battery CP laydown with vehicles.
- BOC and LOC internal setups.
- BOC and LOC manning.
- BOC and LOC shift organizations and sleep plan.
- Shift changeover time and briefing procedures.
- Communications (internal and external).
- Specific duties and responsibilities.
- RSOP.
- Advance party configuration, equipment, and procedures.
- Security.
- Load plans.
- Rearm, refuel, and refit operations.

Appendix 9 - Firing Platoon Operations. This appendix prescribes operating procedures for firing platoons. Consider the following topics:

- Platoon deployment configurations.
- Platoon OPAREA.
- POC internal setup.
- Sleep plan.
- Communications (internal and external).
- Fire direction (hot, cool, cold status; ammo status).
- Positioning (firing points, ammo supply points, survey control points, and rendezvous point).
- Specific duties and responsibilities.
- RSOP.
- Advance party configuration, equipment, and procedures.
- Security.
- Load plans.

Appendix 10 - Launcher Operations. This appendix prescribes operating procedures for launchers. Consider the following topics:

- Fire direction (status, response time, and start-up data).
- Positioning (site selection, masking, and survey).
- Movement.
- Security.
- Specific duties and responsibilities.

Appendix 11 - Civil Military Operations. This appendix prescribes procedures for civil military operations. Consider the following topics:

- Specific duties and responsibilities.
- Communications and coordination with local and/or host nation officials.
- Refugee control.
- Local and/or host nation support.

Appendix 12 - Emergency Destruction. This appendix prescribes operating procedures within the battalion. Consider the following topics:

- Specific duties and responsibilities.
- Priorities.
- Methods.
- Verification and reporting.

ANNEX B (Intelligence) to ____ Bn, ____ FA (MLRS) TSOP

This annex prescribes intelligence operations within the battalion. Consider the following topics:

- Specific duties and responsibilities.
- Control and destruction of classified documents.
- EPW procedures.
- Returnees.
- Security.
- Weather.
- Mapping, charting, and geodesy.
- TACJAM procedures.
- EEI.
- IPB.
- Interface with MI and USAF sensing platforms.

ANNEX C (Air Defense) to ____ Bn, ____ FA (MLRS) TSOP

This annex prescribes air defense operations within the battalion. Consider the following topics:

- AD procedures (active and passive).
- AD warning and weapons control status.
- Hostile aircraft criteria.
- Rules of engagement.
- Attached AD elements (C2 of and support for).

ANNEX D (NBC) to ___ Bn, ___ FA (MLRS) TSOP

This annex provides NBC defense information and prescribes NBC operations within the battalion.

Appendix 1 - NBC Operations. This appendix prescribes NBC readiness and defense operations. Consider the following topics:

- Individual skills.
- NBC teams and/or control parties.
- Warning devices.
- Collective skills.
- Radiation exposure guidance.
- Unmasking procedures.
- Reporting requirements.
- Threat assessment.
- Hazard overlay.

Appendix 2 - NBC Decontamination. This appendix establishes NBC decontamination procedures. Consider the following topics:

- Specific duties and responsibilities.
- Decontamination procedures and levels of decontamination.
- Requests for decontamination support from batteries and platoons and from higher headquarters.

Appendix 3 - MOPP. This appendix provides easily accessible information and standardizes wear of protective clothing and use of equipment. Consider the following topics:

- MOPP levels and dissemination of MOPP.
- Standardized wear of MOPP gear (for example, name labels, and so forth).
- Requisition and issue of protective clothing and equipment.
- Location and contents of individual protective clothing and equipment bags.

Appendix 4 - NBC Threat Warning and Alarm System. This appendix provides easily accessible information and establishes NBC threat warning and alarm procedures and priority means of dissemination within the battalion.

ANNEX E (Signal) to ___ Bn, ___ FA (MLRS) TSOP

This annex prescribes signal operations within the battalion. Consider the following topics:

- Specific duties and responsibilities (staff, batteries, and platoons).
- Comm integration with higher, lower, supported, and adjacent units.
- Signal equipment maintenance.

Appendix 1 - Radio Communications. This appendix provides radio comm information and prescribes radio comm procedures. Consider the following topics:

- External net diagrams.
- Internal net diagrams.
- Priority of nets.
- Specific operating and setup procedures (for example, net control, use of antennas, and so forth).

Appendix 2 - MSE Communications. This appendix provides MSE comm information and prescribes MSE comm procedures. Consider the following topics:

- Affiliation codes and procedures.
- Disaffiliation procedures.
- RAU positioning and coverage.
- J-1077 positioning and access.
- Subscriber information.

Appendix 3 - Communications Security. This appendix establishes comm security procedures. Consider the following topics:

- COMSEC changeover times and procedures.
- Distribution of COMSEC material.
- Loss and recovery of COMSEC material.
- SOI procedures.
- VINSON and MSRT variable control.
- Remote keying procedures.
- MSRT compromise and recovery procedures.
- GPS COMSEC.

Appendix 4 - Resynchronization. This appendix prescribes procedures to resynchronize serialization of digital systems to correct serialization without voice transmission.

ANNEX F (CSS) to ____ Bn, ____ FA (MLRS) TSOP

This annex prescribes CSS operations within the battalion.

Appendix 1 - Battalion Trains. This appendix shows the physical setup of the battalion trains and establishes internal operating procedures. Consider the following topics:

- Specific duties and responsibilities.
- Trains area layout (vehicles and sections).
- Internal communications.
- Security.
- Movement and positioning.

Appendix 2 - ALOC. This appendix shows the physical setup of the ALOC and establishes internal ALOC operating procedures. Consider the following topics:

- Specific ALOC functions.
- ALOC manning.
- Shift organization and sleep plan.
- Shift changeover time and briefing procedures.
- ALOC internal setup.
- C3.
- Specific duties and responsibilities.
- Priorities of work.
- Load plans.

Appendix 3 - Personnel Operations. This appendix prescribes personnel operations within the battalion to support the soldier and batteries. Consider the following topics:

- Maintenance of unit strength (all levels within the battalion).
- Personnel replacement operations.
- Personnel accounting and strength reporting.
- Personnel data base management.
- Casualty management.
- Postal operations.
- EPW and CI operations.
- MWR.
- Other personnel functions (orders, evaluation reports, promotions, personnel actions, personnel assignment and utilization, and awards).
- LOGPAC input.

Appendix 4 - Supply Operations. This appendix prescribes procedures to request, receive, store, and issue supplies. Consider the following topics:

- Specific duties and responsibilities.
- Management of supplies.
- Requisition, flow, and supply distribution (prioritize when applicable).
- All classes of supply (controlled and noncontrolled).
- Water operations, requirements, and points.
- Map supply.
- Publications and blank forms.
- Tabs for preplanned LOGPACs.
- Specific categories of supply (for example, NBC, communications, and small arms).

Appendix 5 - Ammunition Management and Resupply Operations. This appendix prescribes ammunition management and resupply procedures. Consider the following topics:

- Specific duties and responsibilities.
- Requests.
- Resupply procedures used within the battalion.

Appendix 6 - Services. This appendix describes logistics support services within the battalion. Consider the following topics:

- Laundry.
- Clothing exchange.
- Showers.
- CTA-50 exchange.
- Graves registration.

Appendix 7 - Unit Ministry Operations. This appendix prescribes unit ministry operating procedures. Consider the following topics:

- Communications.
- Priority of coverage.
- Coordination of religious services.
- Chaplain support activities.
- Mass burial.
- Civil actions.
- Supplies and logistic support.
- Accommodation of religious practices.
- Lay minister functions.

Appendix 8 - Maintenance Operations. This appendix prescribes maintenance operations. Consider the following topics:

- Specific duties and responsibilities.
- Maintenance priorities.
- Recovery and evacuation priorities.
- Cannibalization and controlled substitution.
- BDAR.
- WSRO.
- Contact teams.
- Equipment density listing.
- Repairable and returnable components and assemblies.
- ORF.
- Equipment evacuation.
- COMSEC maintenance.

Appendix 9 - Refueling Operations. This appendix prescribes refueling operations within the battalion. Consider the following topics:

- Specific duties and responsibilities.
- Fuel request procedures and priorities.
- ROM.
- Day procedures and template.
- Night procedures and template.
- Security.
- Safety.

Appendix 10 - Reconstitution. This appendix prescribes procedures to reconstitute the battalion when it falls below an unacceptable level of combat readiness. Consider the following topics:

- Specific duties and responsibilities.
- Requirement to reconstitute (mass casualties, mass destruction of equipment, and the destruction or loss of effectiveness).
- Method of reconstitution (reorganization and regeneration).

Appendix 11 - Medical Support Operations. This appendix prescribes medical support operations. Consider the following topics:

- Specific duties and responsibilities.
- Locations and deployment configurations of medical assets—CP and/or trains.
- Assignment of medics.
- Communications.
- Field sanitation.
- Combat lifesaver training.
- Evacuation and reporting procedures.
- Priority of evacuation.
- Collection and accountability of individual equipment and effects.
- Treatment and prevention of disease.
- Mental health, dental, and other essential services.

ANNEX G (Safety) to ____ Bn, ____ FA (MLRS) TSOP

This annex prescribes combat safety requirements and provides risk assessment procedures within the battalion.

Appendix 1 - Safety Information and Reporting. This appendix prescribes how command safety information will be distributed and the requirements and means for rendering accident and incident reports.

Appendix 2 - Firing Safety. This appendix prescribes combat firing safety requirements.

ANNEX H (Reports) to ____ Bn, ____ FA (MLRS) TSOP

This annex provides a single consolidated section within the TSOP to prescribe report requirements within the battalion. Normally, reports are segregated by staff functional area. Reports should be tailored to specific requirements of higher headquarters and the commander's need for input into his decision-making process. Avoid requiring information that is duplicated in other reports or that is of minimal value. To the greatest extent possible, coordinate report transmission and effective times to reduce workload and to synchronize staff actions. The means for submitting each report and the priority of each means must be addressed. Many reports are submitted as required and should be so indicated. Consider the reports below within this annex.

Appendix 1 - Personnel and Administration Reports. Consider the following:

- PERSTAT report.
- Casualty feeder report.
- MEDEVAC request.

Appendix 2 - Intelligence and Security Reports. Consider the following:

- Weather report.
- SALUTE report.
- Sensitive items report.

Appendix 3 - Operations Reports. Consider the following:

- SITREP.
- Launcher status report.
- Voice or manual fire mission.
- Recon order.
- Movement order.
- Closing report.
- Request to displace.
- Ammunition assets report.

Appendix 4 - Logistical Reports. Consider the following:

- LOGSTAT report.
- Equipment status report.
- Combat loss report.
- Logistical spot report.
- Emergency resupply request (ammunition and fuel).

Appendix 5 - NBC Reports. Consider the following:

- NBC 1 report.
- NBC 2 report.
- NBC 3 report.
- NBC 4 report.
- NBC 5 report.
- NBC 6 report.
- Chemical downwind message.
- Effective downwind message.
- Request for decontamination support.
- Radiation status report.

Appendix 6 - Communications and Electronics Operations Reports. Consider the MIJI feeder report.

Section III

MLRS BATTERY TSOP

TABLE OF CONTENTS

Note. Tabs may be used to further divide an appendix if an appendix has many subparts and is considered too lengthy. An example page number for a tab is as follows: A-1-A-1. This means page 1 of tab A to Appendix 1 of Annex A. Subsequent pages within the tab are numbered sequentially as A-1-A-2, A-1-A-3, and so forth. Tabs may be included in the table of contents.

ANNEX A (Operations) to ____ Btry, ____ FA (MLRS) TSOP

The purpose of this annex is to prescribe operations within the battery.

Appendix 1 - Battery Command Post. This appendix shows the physical setup of the battery CP and establishes internal CP operating procedures. Consider the following topics:

- Battery CP manning.
- Battery CP laydown with vehicles.
- BOC internal setup.
- BOC shift changeover time.
- Sleep plan.
- CP communications (internal and external).
- Specific duties and responsibilities.
- Priorities of work.
- Security.
- Load plans.

Appendix 2 - Movement and Positioning. This appendix prescribes movement and positioning requirements, procedures, and techniques. Consider the following topics:

- Battery deployment configurations.
- Specific duties and responsibilities.
- Movement orders.
- Movement techniques and METT-T.
- Positioning in the offense.
- Positioning in the defense.
- Displacement options.
- Convoy procedures.
- Command and control during movement.
- RSOP.

Appendix 3 - Command and Control. This appendix outlines how the battery will be commanded and controlled. Consider the following topics:

- Responsibilities for command and control.
- Orders process.
- Orders distribution.
- Orders format.
- Succession of command.
- Transfer of BOC operations.
- Alternate BOC.
- Jump BOC operations.
- ATACMS or rocket missions to selected platoons.

Appendix 4 - Fire Direction. This appendix standardizes tactical fire direction procedures and information within the battery. Consider the following topics:

- Personnel responsibilities.
- Initialization.
- Equipment maintenance.
- Communications procedures.
- Degraded mode operations procedures.
- Battery fire direction procedures.
- Platoon fire direction procedures.
- Massed fire procedures.
- Subscriber tables.

Appendix 5 - Survey and Meteorological Support. This appendix prescribes survey operations within the battery and identifies responsibilities and procedures for receiving and disseminating meteorological messages. Consider the following topics:

- Personnel responsibilities.
- Survey priorities (for example, PADS, simultaneous observation, and hasty survey).
- Radio communications and requests for survey.
- SCP locations and markings.
- GPS procedures.
- Datum coordination and control.
- Extension of survey.
- Alternate met procedures in case of electronic failure.
- Met message dissemination times.
- Coordination of met requirements.

Appendix 6 - Firing Platoon Operations. This appendix prescribes operating procedures for firing platoons. Consider the following topics:

- Platoon deployment configurations.
- Platoon OPAREA.
- POC internal setup.
- Sleep plan.
- Communications (internal and external).
- Fire direction (hot, cool, cold status; ammo status).
- Positioning (firing points, ammo supply points, survey control points, and rendezvous point).
- Specific duties and responsibilities.
- RSOP.
- Advance party configuration, equipment, and procedures.
- Security.
- Load plans.

Appendix 7 - Launcher Operations. This appendix prescribes operating procedures for launchers. Consider the following topics:

- Fire direction (status, response time, and startup data).
- Positioning (site selection, masking, and survey).
- Movement.
- Security.
- Specific duties and responsibilities.

Appendix 8 - Emergency Destruction. This appendix prescribes operating procedures within the battalion. Consider the following topics:

- Specific duties and responsibilities.
- Priorities.
- Methods.
- Verification and reporting.

ANNEX B (Intelligence) to ____ Btry, ____ FA (MLRS) TSOP

This annex prescribes intelligence operations within the battery. Consider the following topics:

- Specific duties and responsibilities.
- Control and destruction of classified documents.
- EPW procedures.
- Returnees.
- Security.
- Weather.
- Mapping, charting, and geodesy.
- TACJAM procedures.
- EEI.

ANNEX C (Air Defense) to ____ Bn, ____ FA (MLRS) TSOP

This annex prescribes air defense operations within the battery. Consider the following topics:

- AD procedures (active and passive).
- AD warning and weapons control status.
- Hostile aircraft criteria.
- Rules of engagement.
- Attached AD elements (C2 of and support for).

ANNEX D (NBC) to ____ Btry, ____ FA (MLRS) TSOP

This annex provides NBC defense information and prescribes NBC operations within the battery.

Appendix 1 - NBC Operations. This appendix prescribes NBC readiness and defense operations within the battery. Consider the following topics:

- Individual skills.
- NBC teams and/or control parties.
- Warning devices.
- Collective skills.
- Radiation exposure guidance.
- Unmasking procedures.
- Reporting requirements.
- Threat assessment.
- Hazard overlay.

Appendix 2 - NBC Decontamination. This appendix establishes NBC decontamination procedures. Consider the following topics:

- Specific duties and responsibilities.
- Decontamination procedures and levels of decontamination.
- Requests for decontamination support from platoons and to higher headquarters.

Appendix 3 - MOPP. This appendix provides easily accessible information and standardizes wear of protective clothing and use of equipment. Consider the following topics:

- MOPP levels and dissemination of MOPP.
- Standardized wear of MOPP gear (for example, name labels, and so forth).
- Requisition and issue of protective clothing and equipment.
- Location and contents of individual protective clothing and equipment bags.

Appendix 4 - NBC Threat Warning and Alarm System. This appendix provides easily accessible information and establishes NBC threat warning and alarm procedures and priority means of dissemination within the battery.

ANNEX E (Signal) to ____ Btry, ____ FA (MLRS) TSOP

This annex prescribes signal operations within the battery. Consider the following topics:

- Specific duties and responsibilities (battery, platoons and launchers).
- Comm integration with higher, lower, supported, and adjacent units.
- Signal equipment maintenance.

Appendix 1 - Radio Communications. This appendix provides radio comm information and prescribes radio comm procedures. Consider the following topics:

- External net diagrams.
- Internal net diagrams.
- Priority of nets.
- Specific operating and setup procedures (for example, net control, use of antennas, and so forth).

Appendix 2 - MSE Communications. This appendix provides MSE comm information and prescribes MSE comm procedures. Consider the following topics:

- Affiliation codes and procedures.
- Disaffiliation procedures.
- RAU positioning and coverage.
- J-1077 positioning and access.
- Subscriber information.

Appendix 3 - Communications Security. This appendix establishes comm security procedures. Consider the following topics:

- COMSEC changeover times and procedures.
- Distribution of COMSEC material.
- Loss and recovery of COMSEC material.
- SOI procedures.
- VINSON and MSRT variable control.
- Remote keying procedures.
- MSRT compromise and recovery procedures.
- GPS COMSEC.

Appendix 4 - Resynchronization. This appendix prescribes procedures to resynchronize serialization of digital systems to correct serialization without voice transmission.

ANNEX F (CSS) to ____ Btry, ____ FA (MLRS) TSOP

This annex prescribes CSS operations within the battery.

Appendix 1 - Battery Trains. This appendix shows the physical setup of the battery trains and establishes internal operating procedures. Consider the following topics:

- Specific duties and responsibilities.
- Trains area layout (vehicles and sections).
- Internal communications.
- Security.
- Movement and positioning.

Appendix 2 - Logistics Operations center. This appendix shows the physical setup of the LOC and establishes internal LOC operating procedures. Consider the following topics:

- Specific LOC functions.
- LOC manning.
- Shift organization and sleep plan.
- Shift changeover time and briefing procedures.
- LOC internal setup.
- C3.
- Specific duties and responsibilities.
- Priorities of work.
- Load plans.

Appendix 3 - Personnel Operations. This appendix prescribes personnel operations within the battery to support the soldier and platoons. Consider the following topics:

- Maintenance of unit strength.
- Personnel replacement operations.
- Personnel accounting and strength reporting.
- Personnel data base management.
- Casualty management.
- Postal operations.
- EPW and CI.
- MWR.
- Other personnel functions (orders, evaluation reports, promotions, personnel actions, personnel assignment and utilization, and awards).

Appendix 4 - Supply Operations. This appendix prescribes procedures to request, receive, store, and issue supplies. Consider the following topics:

- Specific duties and responsibilities.
- Management of supplies.
- Requisition flow and supply distribution (prioritize when applicable).
- All classes of supply (controlled and noncontrolled).
- Water operations, requirements, and points.
- Map supply.
- Publications and blank forms.
- Tabs for preplanned LOGPACs.
- Specific categories of supply (for example, NBC, communications, and small arms).

Appendix 5 - Ammunition Management and Resupply Operations. This appendix prescribes ammunition management and resupply procedures. Consider the following topics:

- Specific duties and responsibilities.
- Requests.
- Resupply procedures used within the battery.

Appendix 6 - Services. This appendix describes logistical support services. Consider the following topics:

- Laundry.
- Clothing exchange.
- Showers.
- CTA-50 exchange.
- Graves registration.

Appendix 7 - Unit Ministry Operations. This appendix prescribes unit ministry operating procedures. Consider the following topics:

- Coordination of religious services.
- Chaplain support activities.
- Mass burial.
- Lay minister functions.

Appendix 8 - Maintenance Operations. This appendix prescribes maintenance operations within the battery. Consider the following topics:

- Specific duties and responsibilities.
- Maintenance priorities.
- Recovery and evacuation priorities.
- Cannibalization and controlled substitution.
- BDAR.
- WSRO.
- DS contact teams.
- Equipment density listing.
- Repairable and returnable components and assemblies.
- ORF.
- Equipment evacuation.
- COMSEC maintenance.

Appendix 9 - Refueling Operations. This appendix prescribes refueling operations within the battery. Consider the following topics:

- Specific duties and responsibilities.
- Fuel request procedures and priorities.
- ROM.
- Day procedures and template.
- Night procedures and template.
- Security.
- Safety.

Appendix 10 - Reconstitution. This appendix prescribes procedures to reconstitute the battery when it falls below an unacceptable level of combat readiness. Consider the following topics:

- Specific duties and responsibilities.
- Requirement to reconstitute (mass casualties, mass destruction of equipment, and the destruction or loss of effectiveness).
- Method of reconstitution (reorganization and regeneration).

Appendix 11 - Medical Support Operations. This appendix prescribes medical support operations. Consider the following topics:

- Specific duties and responsibilities.
- Location of battery medic.
- Priorities for medical support.
- Communications.
- Field sanitation.
- Combat lifesaver training.
- Evacuation and reporting procedures.
- Priority of evacuation.
- Collection and accountability of individual equipment and effects.
- Treatment and prevention of disease.
- Mental health, dental, and other essential services.

ANNEX G (Safety) to ____ Btry, ____ FA (MLRS) TSOP

This annex prescribes combat safety requirements and provides risk assessment procedures.

Appendix 1 - Safety Information and Reporting. This appendix prescribes how command safety information will be distributed within the battery and the requirements and means for rendering accident and incident reports.

Appendix 2 - Firing Safety. This appendix prescribes combat firing safety requirements.

ANNEX H (Reports) to ____ Btry, ____ FA (MLRS) TSOP

This annex provides a single consolidated section within the TSOP to prescribe report requirements within the battery. Normally, reports are segregated by functional area. Reports should be tailored to specific requirements of higher headquarters and the commander's need for input into his decision-making process. Avoid requiring information that is duplicated in other reports or that is of minimal value. To the greatest extent possible, coordinate report transmission and effective times to reduce workload and to synchronize actions. The means for submitting each report and the priority of each means must be addressed. Many reports are submitted as required and should be so indicated. Consider the reports below within this annex.

Appendix 1 - Personnel and Administration Reports. Consider the following:

- PERSTAT report.
- Casualty feeder report.
- MEDEVAC request.

Appendix 2 - Intelligence and Security Reports. Reports. Consider the following:

- Weather report.
- SALUTE report.
- Sensitive items report.

Appendix 3 - Operations Reports. Reports. Consider the following:

- SITREP.
- Launcher status report.
- Voice and/or manual fire mission.
- Recon order.
- Movement order.
- Closing report.
- Request to displace.
- Ammunition assets report.

Appendix 4 - Logistical Reports. Reports. Consider the following:

- LOGSTAT report.
- Equipment status report.
- Combat loss report.
- Logistical spot report.
- Emergency resupply request (ammunition and fuel).

Appendix 5 - NBC Reports. Reports. Consider the following:

- NBC 1 report.
- NBC 2 report.
- NBC 3 report.
- NBC 4 report.
- NBC 5 report.
- NBC 6 report.
- Chemical downwind message.
- Effective downwind message.
- Request for decontamination support.
- Radiation status report.

Appendix 6 - Communications and Electronics Operations Reports. Consider the MIJI feeder report.

APPENDIX C

MLRS FUNCTIONAL COMMAND POSTS

The purpose of this appendix is to provide examples of FCPs for the MLRS battalion, battery, and platoon. It is a guide for the MLRS battalion commander and his staff, the MLRS battery commander and battery HQ and support personnel, and the MLRS platoon leader and platoon HQ personnel. This appendix is based on objective L-series TOEs 06466L000 and 06467L000. The battalion FCPs in this appendix are for an MLRS battalion deployed under option 1—dual CPs. The battery FCPs in this appendix are for an MLRS divisional battery deployed with a split HQ. Each individual unit must adapt these FCPs to its own particular mission and deployment option and to the personnel and equipment authorized in their MTOE. For a discussion of CP functions at the battalion, battery, and platoon levels, see Chapters 5, 6, and 7. For a consolidated list of tasks and subtasks by section, see ARTEP 6-525-MTP and ARTEP 6-398-30-MTP.

SECTION I

MLRS BATTALION COMMAND POST

LEGEND FOR APPENDIX C

acct	=	account	**MKT**	=	mobile kitchen trailer
admin	=	administrative	**off**	=	officer
BFVS	=	Bradley fighting vehicle system	**op**	=	operator
BMO	=	battalion maintenance officer	**ops**	=	operations (radio net)
cdr	=	commander	**pers**	=	personnel
chem	=	chemical	**RATELO**	=	radiotelephone operator
cmpt	=	computer	**rep**	=	representative
CPT	=	captain	**retrans**	=	retransmission
decon	=	decontamination	**sec**	=	section
DSVT	=	digital secure voice terminal	**SP**	=	specialist
gen	=	generator	**supv**	=	supervisor
intel	=	intelligence	**svc**	=	service
LT	=	lieutenant	**TACCS**	=	tactical Army combat computer system
LTC	=	lieutenant colonel	**tech**	=	technician
maint	=	maintenance	**WO**	=	warrant officer

VEHICLES AT THE MLRS BATTALION CP, OPTION 1—DUAL CPs

TOC (O&I M577s)

BN CDR HMMWV

S3 HMMWV

SIGNAL SECTION HMMWV

RETRANS HMMWV

SPCE HMMWV

Note. The battalion commander's vehicle, the retrans vehicle, and the SPCE vehicle will often be away from the CP area.

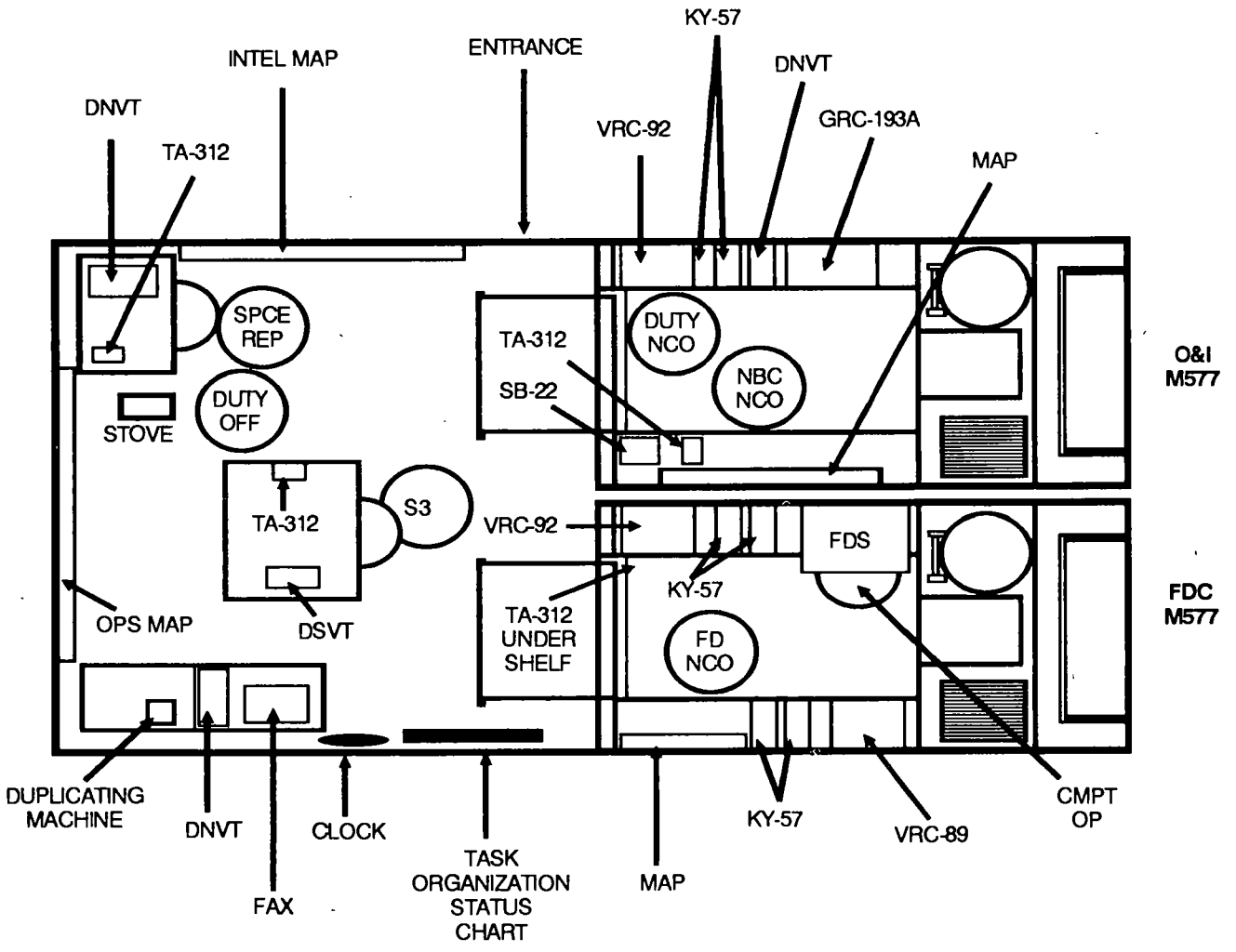
PERSONNEL AT THE MLRS BATTALION CP, OPTION 1—DUAL CPs

SECTION/ELEMENT POSITION	RANK	MOS	NUMBER	TOC SHIFT A/B
BATTALION HQ				
Commander	LTC	13B00	1	
Vehicle Driver	PFC	13M10	1	
Command Sergeant Major	CSM	00Z50	1	
S3	MAJ	13B00	1	
Battalion Signal Officer	CPT	25C00	1	
OPERATIONS AND INTELLIGENCE SECTION				
Operations Officer	CPT	13B00	1	A
Chemical Officer	LT	74B00	1	B
Intelligence Sergeant	MSG	13Z50	1	B
Operations Sergeant	MSG	13Z50	1	A
Chief Fire Direction Computer	SFC	13P40	1	B
Fire Direction Computer	SSG	13P30	1	A
NBC NCO	SSG	54B30	1	A
Fire Direction System Operator	SGT	13P20	2	A/B
Carrier Driver	SPC	13P10	1	
Decontamination Specialist	SPC	54B10	1	B
SURVEY PLANNING AND COORDINATION ELEMENT				
Recon Survey Officer	LT	13D00	1	A
Chief Surveyor	SFC	82C40	1	B
Vehicle Driver	PFC	82C10	1	
BATTALION MAINTENANCE SECTION				
Power Generator Equipment Repairman	SPC	52D10	1	

MLRS BATTALION TOC SHIFTS BY DUTY POSITION

DUTY POSITION	SHIFT A	SHIFT B
Duty Officer	Ops Off	Chem Off
Duty NCO	Ops SGT	Intel SGT
Fire Direction NCO	FD Cmpt	Chief FD Cmpt
Computer Operator	FDS Op	FDS Op
NBC NCO	NBC NCO	Decon Spec
SPCE Representative	RSO	Chief Surveyor

MLRS BATTALION TOC—SIDE-BY-SIDE CONFIGURATION



SECTION II

MLRS BATTALION TRAINS

VEHICLES AT THE MLRS BATTALION TRAINS, OPTION 1—DUAL CPs

PAC 2 1/2-TON TRUCK

BN SUPPLY 2 1/2-TON TRUCK

CHAPLAIN HMMWV

S1 HMMWV

BN SUPPLY HMMWV

BN XO HMMWV

AID STATION 2 1/2-TON TRUCKS

AMBULANCE

HHSB MESS 2 1/2-TON TRUCK AND MKT

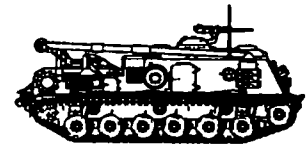
HHSB 1SG HMMWV WITH TRAILER

HHSB SUPPLY 2 1/2-TON TRUCK AND WATER TRAILER

HHSB CDR HMMWV

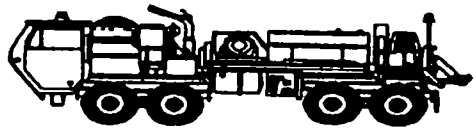
BN MAINT HMMWV

RECOVERY VEHICLE



PLL 2 1/2-TON TRUCK WITH TRAILER

WRECKER



MAINT 2 1/2-TON TRUCK WITH TRAILER

Notes.

1. Depending on the battalion mission, distances between elements within the battalion, and the unit SOP, the battalion aid station may split operations and deploy one 2 1/2-ton truck and one ambulance to the battalion CP. The ambulance also may be further deployed with the center battery.
2. Commanders must consider defense of TOC and LOC if operating in a split HQ configuration.

PERSONNEL AT THE MLRS BATTALION TRAINS, OPTION 1—DUAL CPs

SECTION/ELEMENT POSITION	RANK	MOS	NUMBER	TOC SHIFT A/B
BATTALION HQ				
Executive Officer	MAJ	13B00	1	
Chaplain	CPT	56A00	1	
S1	CPT	13B00	1	A
Battalion Maintenance Officer	CPT	13B00	1	
HHSB HQ				
Commander	CPT	13B00	1	
Vehicle Driver	PFC	13M10	1	
First Sergeant	1SG	13Z5M	1	
Supply Sergeant	SGT	76Y20	1	
Armorer	SPC	76Y10	1	
BATTALION PAC				
Personnel Records Supervisor	SFC	75Z40	1	B
Personnel Services NCO PSNCO	SGT	75B20	1	A
Chaplain Assistant	SPC	71M10	1	
Clerk-Typist	SPC	71L10	1	A
Personnel Admin Specialist	SPC	75B10	1	B
Personnel Admin Specialist	PFC	75B10	1	A
BATTALION SUPPLY				
Property Account Technician	WO2	920A0	1	B
Battalion Supply NCO	SFC	76Y40	1	A
Assistant Battalion Supply NCO	SGT	76Y20	1	B
Supply Sergeant	SGT	76Y20	1	A
Supply Specialist	PFC	76Y10	1	B
Petroleum Heavy Vehicle Operator	SGT	77F20	1	
Petroleum Heavy Vehicle Operator	PFC	13B10	1	
MEDICAL TREATMENT TEAM				
Emergency Treatment NCO	SSG	91B30	1	
Medical Specialist	SPC	91B10	1	
Medical Specialist	PFC	91B10	1	
Physician Assistant	WO2	600AO	1	
AMBULANCE TEAM				
Ambulance Aide/Driver	SPC	91B10	1	
Ambulance Aide/Driver	PFC	91B10	1	
HHSB MESS SECTION				
Food Service Sergeant	SSG	94B30	1	
First Cook	SGT	94B20	1	
Cook	SPC	94B10	1	
Cook	PFC	94B10	1	

PERSONNEL AT THE MLRS BATTALION TRAINS, OPTION 1—DUAL CPs (Continued)

SECTION/ELEMENT POSITION	RANK	MOS	NUMBER	TOC SHIFT A/B
BATTALION MAINTENANCE SECTION				
Unit Maintenance Technician	WO2	915A0	1	
Motor Sergeant	SFC	63B40	1	
Heavy Wheeled Vehicle Mechanic	SGT	63S20	1	
Light Wheeled Vehicle Mechanic	SGT	63B20	1	
PLL Clerk	SGT	76C20	1	A
Recovery Vehicle Operator	SGT	63B20	1	
BFVS Automotive Mechanic	SPC	63T10	1	
Heavy Wheeled Vehicle Mechanic	SPC	63S10	1	
Recovery Vehicle Operator	SPC	63S10	1	
BFVS Automotive Mechanic	SPC	63T10	1	
BFVS Automotive Mechanic	PFC	63T10	1	
Heavy Wheeled Vehicle Mechanic	PFC	63S10	1	
Light Wheeled Vehicle Mechanic	PFC	63B10	1	
TAMMS Clerk	PFC	76C10	1	B

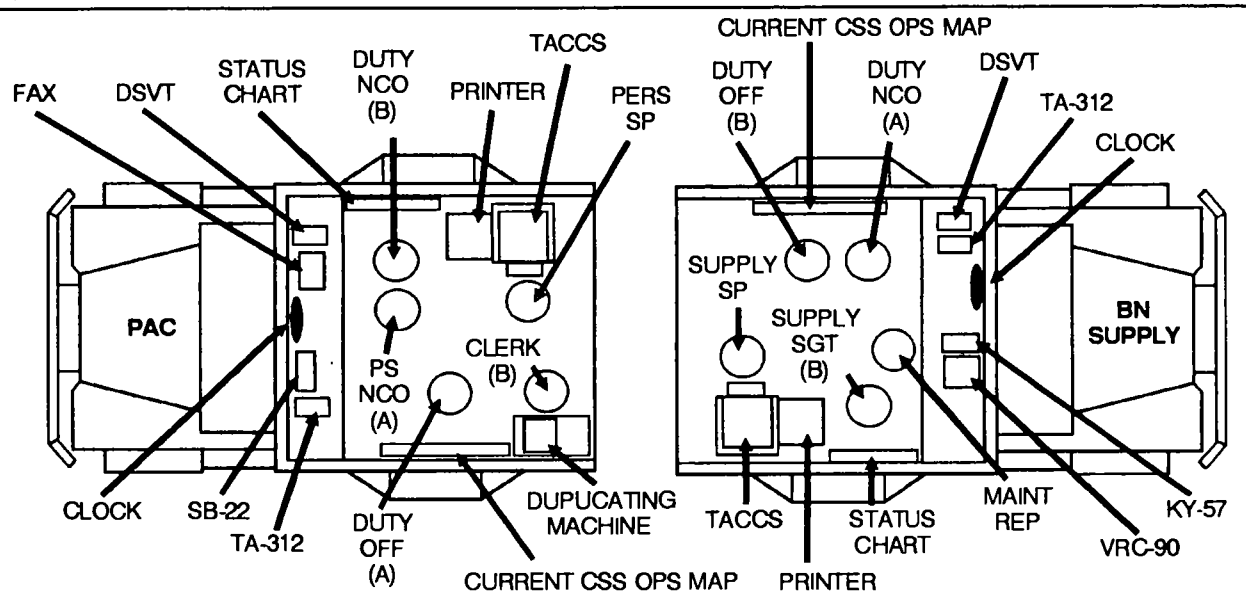
Note. BMO is also the battalion S4 under LTOE 06466L000.

MLRS BATTALION ALOC SHIFTS BY DUTY POSITION

DUTY POSITION	SHIFT A	SHIFT B
Duty Officer	S1	Property Acct Tech
Duty NCO	Bn Supply NCO	Pers Records Supv
Maintenance Representative*	PLL Clerk	TAMMS Clerk
Supply Sergeant		Asst Bn Supply NCO
PSNCO	PSNCO	
Clerk	Clerk Typist	
Supply Specialist	Supply SGT	Supply SP
Personnel Specialist	Pers Admin SP (PFC)	Pers Admin SP (SPC)

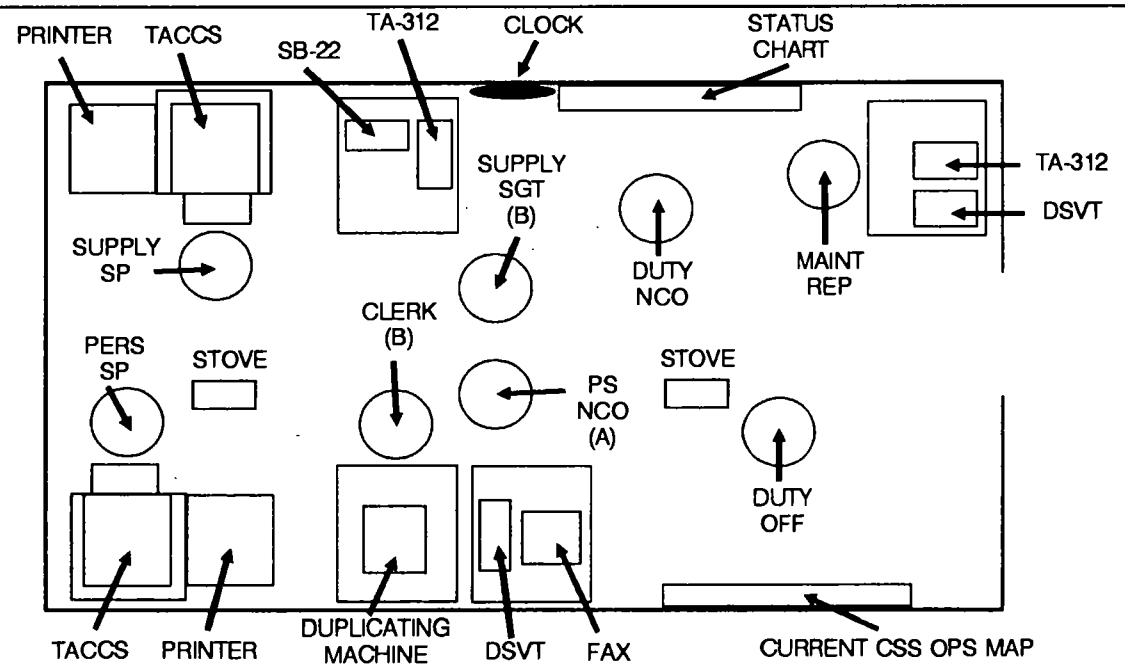
* Subject to local SOP, units may rotate a mechanic.

MLRS BATTALION ALOC IN BUILT-UP 2 1/2-TON TRUCKS



Note. In some units, built-up 2 1/2-ton trucks for the ALOC are not possible because of vehicle haul requirements. See the figure below for the ALOC in a tent.

MLRS BATTALION ALOC IN A GENERAL PURPOSE MEDIUM TENT

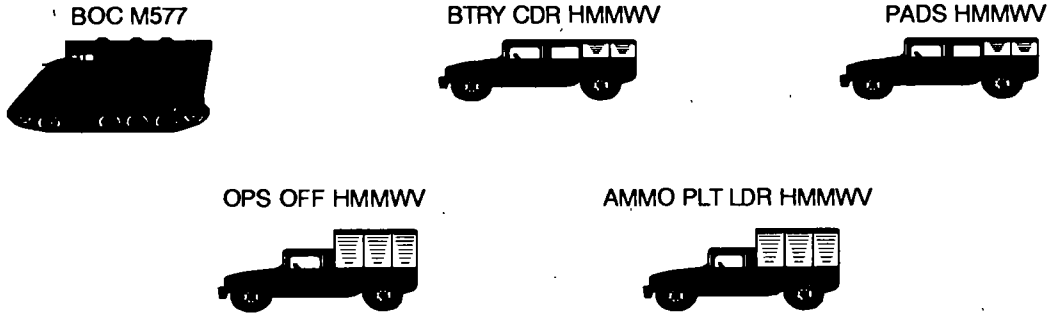


Note. The objective L-series TOE does not have AN/GRA-39 remote radios. The primary comm means is MSE.

SECTION III

MLRS BATTERY COMMAND POST

DIVISIONAL MLRS BATTERY CP–SPLIT HQ



Note. The survey section and the ammo platoon leader will be in and out of the CP area. Depending on local SOP and mission requirements, the ammo platoon leader may be located at the battery trains.

PERSONNEL AT THE DIVISIONAL MLRS BATTERY CP–SPLIT HQ

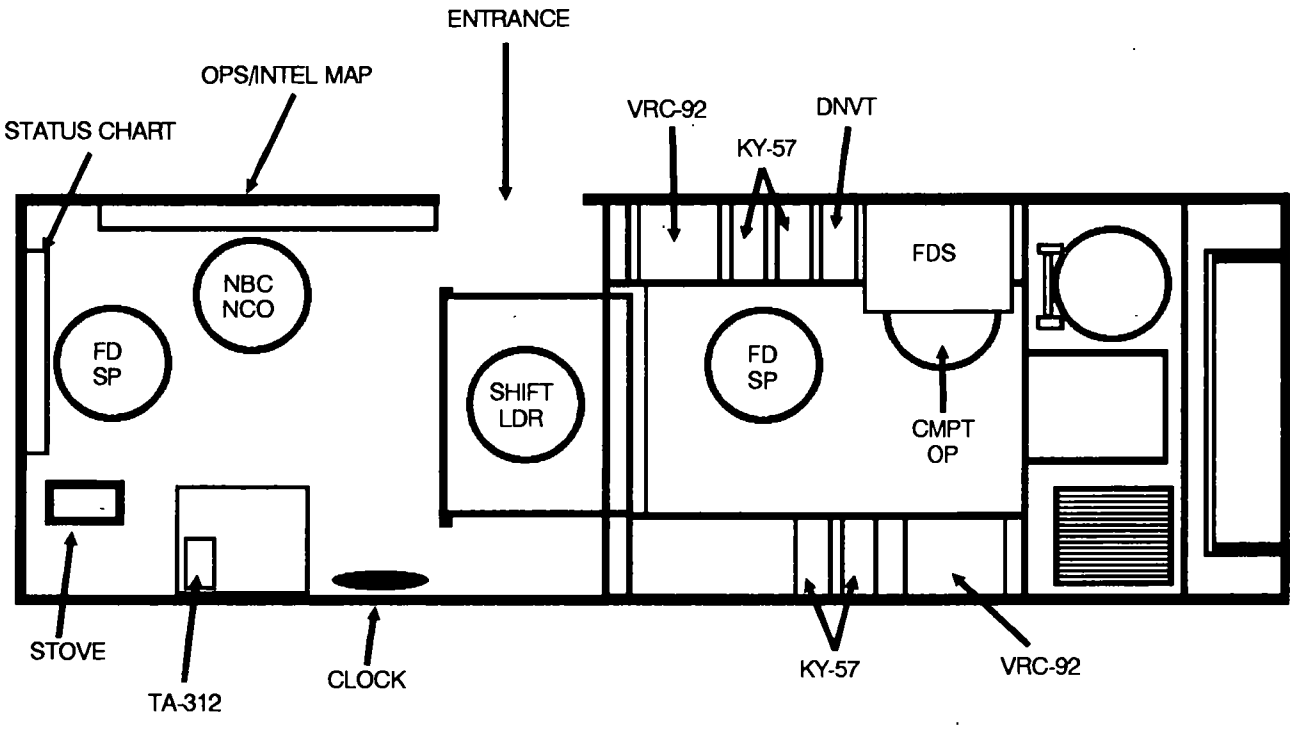
SECTION/ELEMENT POSITION	RANK	MOS	NUMBER	TOC SHIFT A/B
BATTERY HQ				
Battery Commander	CPT	13B00	1	
Vehicle Driver	PFC	13M10	1	
NBC NCO	SSG	54B30	1	B
SURVEY SECTION				
Section Chief	SGT	82C20	1	
Field Artillery Surveyor	PFC	82C10	1	
FIRE DIRECTION CENTER				
Operations Officer	LT	13B00	1	A
Fire Direction Computer	SSG	13P30	1	B
Fire Direction System Operator	SGT	13P20	1	A
Fire Direction Specialist	SPC	13P10	5	A/B
MAINTENANCE SECTION				
Power Generator Equipment Repairman	SPC	52D10	1	

MLRS BOC SHIFTS BY DUTY POSITION

DUTY POSITION	SHIFT A	SHIFT B
Shift Leader	Ops Off	FD Cmpt
NBC NCO		NBC NCO
Computer Operator	FDS Op	FD SP
Fire Direction Specialist	FD SP (2)	FD SP (2)

Note. Personnel must be cross trained to perform administrative and NBC duties.

MLRS BATTERY OPERATIONS CENTER IN M577A2



SECTION IV

MLRS BATTERY TRAINS

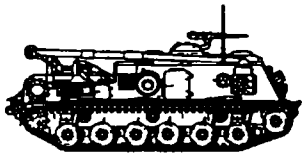
MLRS BATTERY TRAINS–SPLIT HQ

1SG HMMWV

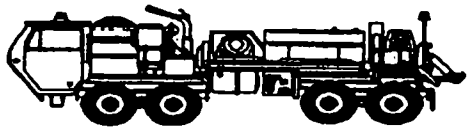
MESS TRUCK WITH MKT

MAINT SEC

RECOVERY VEHICLE



WRECKER



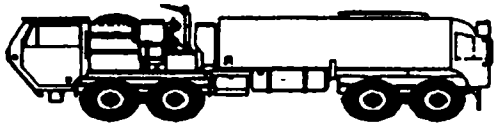
MAINT 2 1/2-TON TRUCK WITH TRAILER

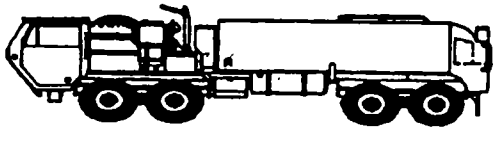
PLL 2 1/2-TON TRUCK WITH TRAILER

5-TON CARGO TRUCK

SUPPLY SEC

POL TANKERS WITH TRAILERS





HMMWVs

2 1/2-TON TRUCK WITH WATER TRAILER

Note. If the battery operates a battery AHA, ammo resupply vehicles will be in and out of the battery trains. The ammo platoon leader and/or the ammo platoon sergeant will usually be located at the battery trains when operating a battery AHA.

PERSONNEL AT THE DIVISIONAL MLRS BATTERY TRAINS

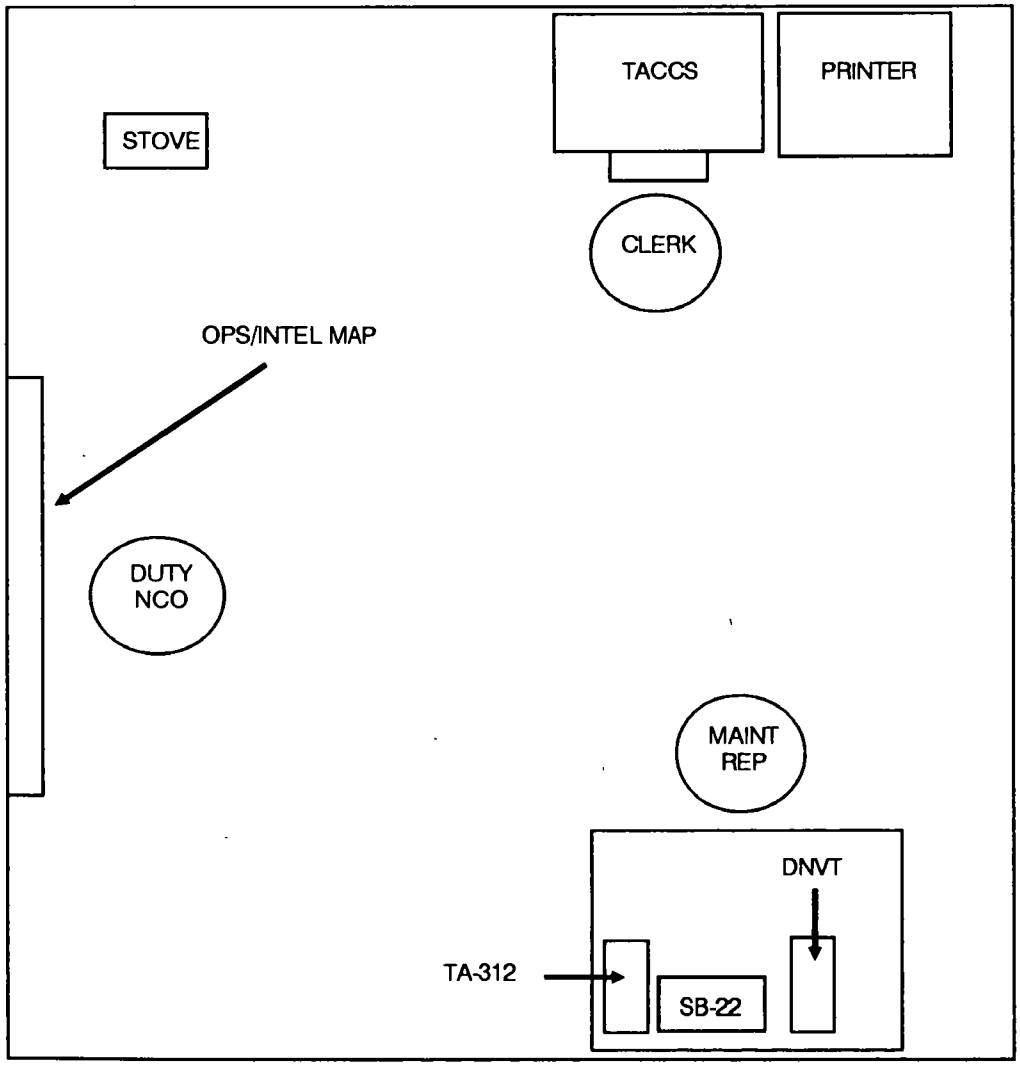
SECTION/ELEMENT POSITION	RANK	MOS	NUMBER	LOC SHIFT A/B
BATTERY HQ				
First Sergeant	1SG	13Z5M	1	
Battery Signal Chief	SSG	31G30	1	
Signal NCO	SGT	31V20	1	
Signal Specialist	PFC	31V10	1	
Unit Clerk	SGT	75B20	1	B
MAINTENANCE SECTION				
Motor Sergeant	SFC	63B40	1	
Heavy Wheeled Vehicle Mechanic	SGT	63S20	1	
Light Wheeled Vehicle Mechanic	SGT	63B20	1	
Recovery Vehicle Operator	SGT	63T20	1	
BFVS Automotive Mechanic	SGT	63T20	1	
BFVS Automotive Mechanic	SPC	63T10	1	
Recovery Vehicle Operator	SPC	63S10	1	
Recovery Vehicle Operator	SPC	63T10	1	
PLL Clerk	SPC	76C10	1	A
Light Wheeled Vehicle Mechanic	SPC	63B10	1	
Heavy Wheeled Vehicle Mechanic	PFC	63S10	3	
BFVS Automotive Mechanic	PFC	63T10	2	
Light Wheeled Vehicle Mechanic	PFC	63B20	1	
TAMMS Clerk	PFC	76C10	1	B
SUPPLY SECTION				
Supply Sergeant	SSG	76Y30	1	B
Armorer	SPC	76Y10	1	A
Vehicle Driver	PFC	13M10	3	
Petroleum Heavy Vehicle Operator	PFC	13M10	2	
Petroleum Heavy Vehicle Operator	SPC	77F10	1	
Petroleum Heavy Vehicle Operator	SPC	13M10	1	
FOOD SERVICE SECTION				
Food Service Sergeant	SFC	94B40	1	
First Cook	SGT	94B20	1	
Cook	SGT	94B20	1	
Cook	SPC	94B10	2	
Cook	PFC	94B10	1	
AMMUNITION PLATOON				
Platoon Sergeant	SFC	13M40	1	A
Section Chief	SSG	13M40	1	B

MLRS BATTERY LOC SHIFTS BY DUTY POSITION

DUTY POSITION	SHIFT A	SHIFT B
Duty NCO	Ammo Plt SGT	Supply SGT
Maintenance Representative	PLL Clerk	TAMMS Clerk
Clerk	Armorer	Unit Clerk

Note. Depending on local SOP and mission requirements, the battery first sergeant and the ammo platoon leader may be included in LOC shifts. Battery LOC could be collocated with the BOC.

MLRS BATTERY LOC IN A GP SMALL TENT



SECTION V

MLRS PLATOON HEADQUARTERS

The POC is usually positioned near the center of the platoon HQ area. The platoon HQ is not usually split into a CP and a trains element like the MLRS battalion and battery may be, because the platoon HQ is not equipped and manned to do so effectively. The POC is the CP of the platoon HQ.

VEHICLES AT THE MLRS PLATOON HQ

POC M577

PLT LDR HMMWV

PLT SGT HMMWV

Note. Ammo resupply vehicles will be in and out of the platoon HQ area.

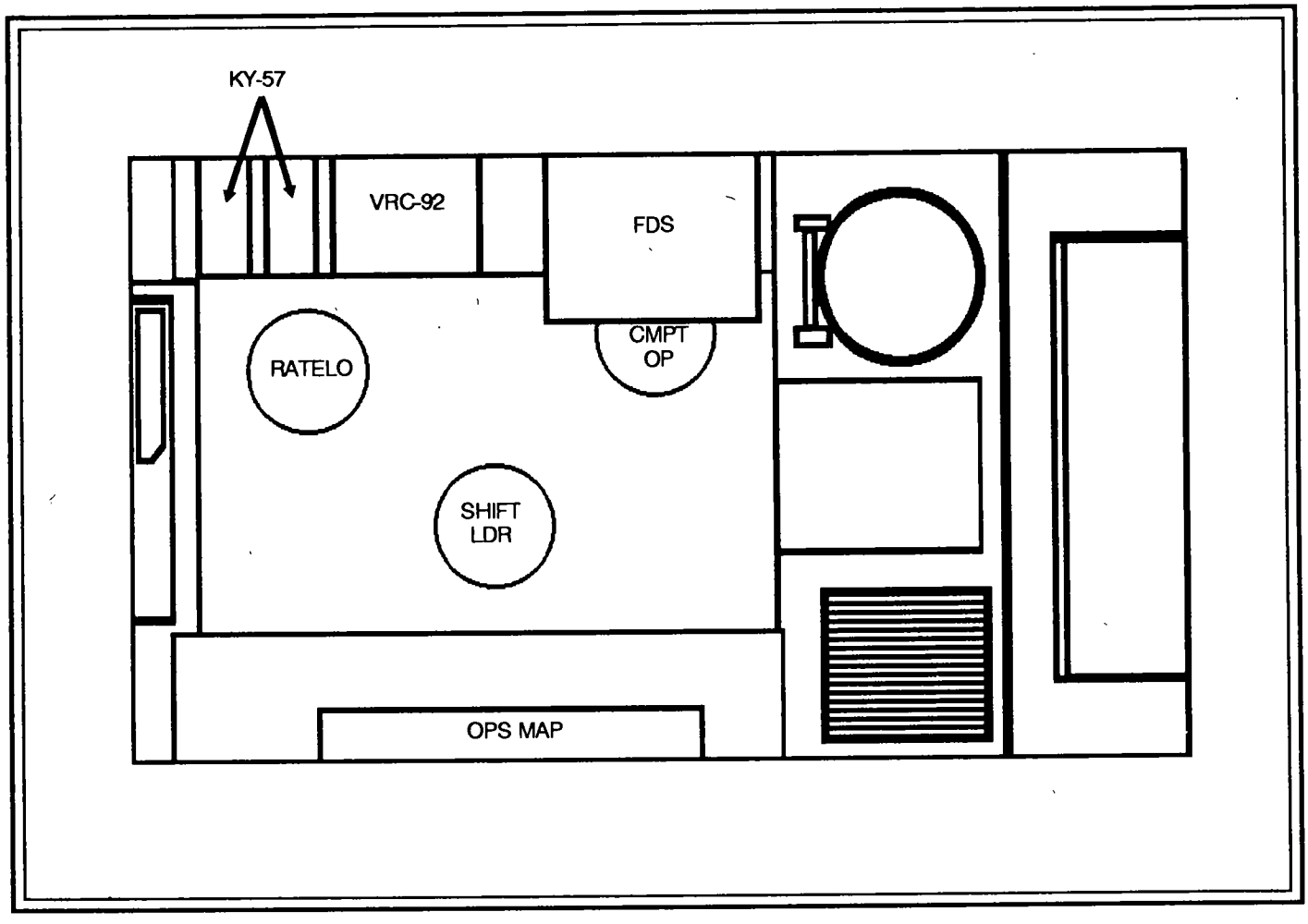
PERSONNEL OF THE MLRS PLATOON HQ AND POC

SECTION/ELEMENT POSITION	RANK	MOS	NUMBER	POC SHIFT A/B
Platoon Leader	LT	13B00	1	A
Platoon Sergeant	SFC	13M40	1	B
Fire Direction System Operator	SGT	13P20	1	A
Recon Sergeant	SGT	13M20	1	
Fire Direction Specialist	SPC	13P10	1	B
Radio Operator	SPC	13M10	1	B
Fire Direction Specialist	PFC	13P10	1	A

MLRS POC SHIFTS BY DUTY POSITION

DUTY POSITION	SHIFT A	SHIFT B
Shift Leader	Plt Ldr	Plt SGT
Computer Operator	FDS Op	FD SP (SPC)
RATELO	Radio Op	FD SP (PFC)

MLRS POC IN M577A2



APPENDIX D

HASTY SURVEY TECHNIQUES–GRAPHIC RESECTION

Description

Graphic resection is a method of determining position based on the known locations of certain visible points. The equipment needed to perform a graphic resection includes an M2 aiming circle, a map sheet, overlay paper or acetate, and a straightedge.

Procedures

Select a location from which three distant points, which appear on the map, are visible. These points are well-defined vertical features, such as towers, trig markers, or church steeples.

Measure the three clockwise angles between these points with the aiming circle: first point to second point, second to third, and third point back around to the first, completing a circle around the horizon. For each angle, measure to the nearest 0.5 mil as follows:

- Set up and level the aiming circle over the proposed SCP.
- With the upper motion, set 0.0 mils on the aiming circle.
- With the lower motion, sight on the first known point.
- With the upper motion, measure the angle to the second point; and record this first reading to the nearest 0.5 mil.
- With this reading on the scales, sight again on the first point by using the lower motion.
- With the upper motion, again measure the angle to the second point; and record the second reading on the upper motion to the nearest 0.5 mil.
- Divide the second reading by 2 to determine the mean angle, which must agree with the first reading to the nearest 0.5 mil. If the first reading is more than 3,200 mils, you must add 6,400 mils to the second reading before dividing by 2. If the two readings do not agree within 0.5 mil, return to the first step.

Add the mean angles from between each point to ensure that the total sum of all three is equal to 6,400 mils ±1.5 mil. Determine the eight-digit grid locations of the three known points from the map or a trig list, and write these beside the points.

Using the overlay paper or acetate, draw a central point, which will represent the location of the aiming circle. Using a straightedge, draw a line (first ray) outward. Using a range-deflection protractor (RDP) or a coordinate scale (less accurate), measure clockwise the number of mils corresponding to the angle between the first and second known points. Draw a line along that mil measurement from the central point outward (second ray). Do this again with the third angle, developing a third ray from the central point outward. With the third ray in place, measure from it, clockwise, back to the first ray. Compare this measurement to the mean angle from the aiming circle. These two angles should agree to within ± 0.5 mil.

Place the overlay with the three lines radiating out from the central point on the map sheet. Position it so that the first ray passes through the first known point from the map, the second through the second point, and likewise for the third. Once all three are aligned, the central point from the overlay paper represents the aiming circle map location.

Use a coordinate scale to determine the eight-digit grid of the aiming circle and the approximate elevation. Record these data for the launcher to use in updating its PDS. A launcher using this SCP should update its PDS after every 4 to 6 kilometers of travel and should not use it for calibration.

APPENDIX E

SAFETY

Safety is a command responsibility in both peacetime training and combat. The MLRS live-fire procedures should include every reasonable effort to avoid the preventable loss of personnel or equipment. Every effort should be made to allow training missions to be executed under as realistic conditions as possible. Appropriate local range regulations and AR 385-63 govern the execution of all MLRS live-fire missions. This appendix augments the noted regulations by providing a description of possible hazardous conditions, a diagram of surface danger areas, and a sample checklist for use by safety personnel during live-fire training missions.

Responsibilities

The **range safety officer** gives the officer in charge (OIC) of firing a safety card. This card states the coordinates of the launcher firing area and of the target(s) to be engaged. The range safety officer identifies any special instructions that must be followed in firing at that range (road guards, time constraints, Air Force overflights, and so on). He is responsible for construction and verification of surface danger zones for MLRS firing areas. He prepares and maintains all waivers for AR 385-62 or -63 and ensures they are approved by a general officer at the installation command level. The range safety officer is responsible for compliance with safety procedures as stated in this appendix.

The **officer in charge** is usually the battery commander. He ensures that all rounds are safely fired toward the designated impact area and that applicable safety regulations and procedures are being followed. Specific duties of the OIC are covered in subsequent paragraphs.

The **operations officer, platoon leader and/or platoon sergeant** is responsible to the OIC for safety in calibrating, starting up, and updating the launcher(s) to be fired. They ensure that accurate data used for practice firing(s) are transmitted and received by the firing launcher(s). Specific duties are covered in subsequent paragraphs.

The **launcher chief of section** is responsible for the operation of his crew from the reload point through the rocket launch. He ensures that all procedures in the launcher are conducted in accordance with applicable TMs and that all reports and checks are verified in accordance with the procedures outlined in this manual. Specific duties of the chief of section are covered in subsequent paragraphs.

The MLRS **battalion commander or div arty commander and the MLRS battery commander** are responsible for selecting, training, and certifying that all personnel tasked with specific safety responsibilities are qualified to perform those duties.

Malfunctions

Procedures for preparation of the launcher for firing and requirements in the event of a malfunction are specified in TM 9-1425-646-10. The following definitions of possible hazardous conditions are provided for common understanding. Note that detection of a dud fuze may require special handling on a firing range but is not considered a hazardous condition.

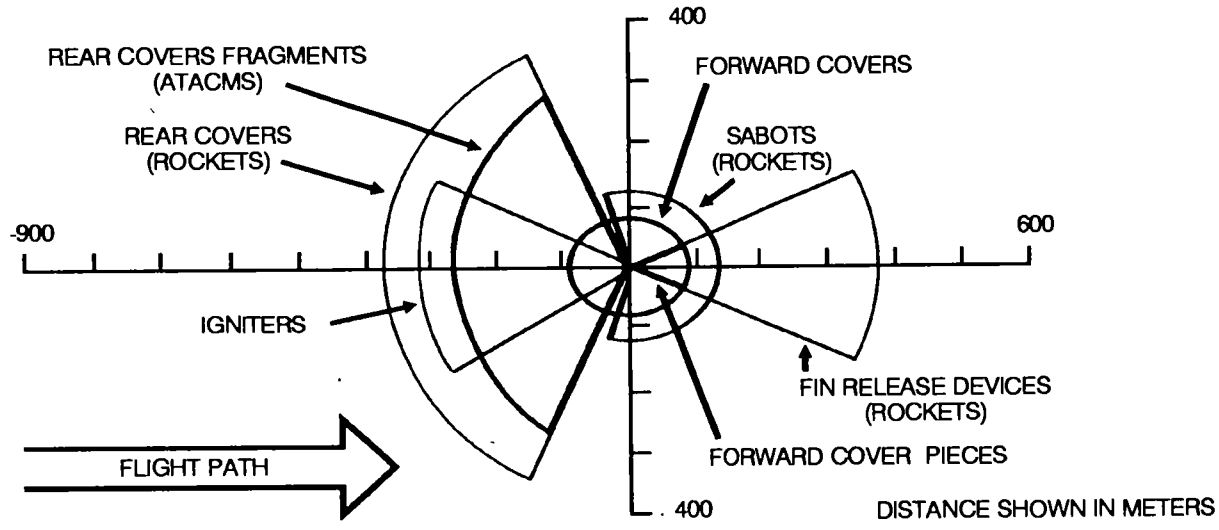
- **Misfire.** A misfire is a failure to fire. Due to faulty equipment, electrical energy cannot pass through the umbilical cables to the rocket or missile igniter.
- **Hangfire.** A hangfire is a failure of the rocket or missile motor to ignite. Electrical energy has passed through the umbilical cables.

In the event of either condition, the launcher can be expected to be unavailable for additional missions for at least 30 minutes.

Launcher Surface Danger Area

The firing of rockets and missiles results in a danger area around the launcher. This danger area is called the launcher surface danger area. The figure on page E-2 shows the launcher surface danger area for rocket and missile firings.

LAUNCHER SURFACE DANGER AREA



Sample Firing Safety Checklist

The checklist below is provided as an example for use at battery, platoon, and section levels during rocket live-fire training exercises.

Note. Missiles are not currently fired by units during peacetime training exercises.

SAMPLE MLRS FIRING SAFETY CHECKLIST

Before rockets are launched, all items on this checklist must be completed. This checklist is applicable at battery, platoon, and section levels.

_____ 1. Target grid location entered into FDS verified by map spot. (OIC, operations officer, and FDC chief)

_____ 2. Firing point and update SCP grid verified by map spot and survey data checked. Firing point and final update point are no more than 700 meters apart. (OIC, PADS team chief, and operations officer)

_____ 3. Surface danger zone computations and safety diagram checked (AR 385-63 and local range regulation). (OIC and operations officer)

_____ 4. Road guards briefed and posted. (OIC and 1SG)

_____ 5. Impact area observers briefed and posted and correct orientation for warhead event verified. (OIC and operations officer)

_____ 6. Radar set(s) oriented (if available). (OIC and operations officer)

_____ 7. Firing point is in a "wet" status with range control. (OIC and operations officer)

_____ 8. Communications have been established between OIC, BOC, firing launcher, road guards, observers, radar, platoon leaders, and range control. (all)

_____ 9. Battery FDS and printer are operational. (operations officer and FDC chief)

_____10. Launcher start-up data verified before launcher was moved. LOST message sent to FDS/PLDMD is enough if compared to survey data card or map spot. Launcher is in "stop" mode for hangfire or misfire and "skip" mode for duds. (safety officers and section chief)

_____11. All training LP/Cs are off-loaded. Launcher has been load-tested not more than 90 days before. (section chief and platoon leader or sergeant)

SAMPLE MLRS FIRING SAFETY CHECKLIST (Continued)

_____12. Practice rocket LP/Cs have been inspected and are serviceable. Ammunition lots are cleared for firing. Correct reload operations have been conducted, and rockets have been selected that will provide a balanced load. (section chief and platoon leader or sergeant)

_____13. Launcher calibration data are current and valid for launcher load. (section chief and platoon leader or sergeant)

_____14. Launcher update data are verified before launcher departs update point (checked for each update). LOST message sent to FDS/PLDMD is enough if compared to survey data card or map spot. (section chief and operations officer)

_____15. Masking data for firing point entered into the FCS and verified by the launcher section chief or platoon leader. (operations officer, section chief, and platoon leader or sergeant)

_____16. Launcher crew received final briefing from _____. (section chief and platoon leader or sergeant)

_____17. Current met message verified and transmitted to firing launcher. (operations officer and FDC chief)

_____18. Fire mission data verified at BOC (target and firing point grid, rockets, method of fire control). Map-spot target location. (operations officer and FDC chief)

_____19. Fire mission processed by battery FDS for intermediate mask checks. (operations officer)

_____20. Fire mission transmitted to firing launcher. (operations officer and section chief)

_____21. Firing launcher is at correct firing point (platoon leader visually verifies). (OIC, platoon leader or sergeant, and section chief)

_____22. FDS received hard copy (SPLL LOST message) of the actual firing data below after the LLM was laid. (operations officer or FDC chief)

a. Launcher location.

b. Target location.

c. Launcher heading.

d. Azimuth of fire.

e. Quadrant elevation.

f. Fuze setting.

_____23. LLM is correctly oriented (platoon leader visually verifies). (OIC, platoon leader or sergeant, and section chief)

_____24. Firing point is still in a wet status. No check fire has been declared. Voice data have been received, and BOC has hard copy message. (OIC and operations officer)

_____25. Launcher section chief verified that there are no fault prompts or BIT lights displayed on the FCP. If any fault prompt or BIT light is displayed, check fire. (section chief or gunner)

All of the above items have been completed and verified. The launcher is safe to fire.

_____

Signature of OIC or safety officer or section chief

_____26. Transmit command fire message, and alert observers who are oriented on the impact area. (OIC and operations officer)

_____27. All rockets launched successfully. (OIC, safety officer, and section chief)

_____28. Observers, if required, verify warhead event over correct impact area and report data to the BOC for plotting.

_____29. Battery commander authorizes launcher to stow and move from firing point. (OIC)

Note. Personnel in parentheses are routinely responsible personnel.

APPENDIX F

TARGET TYPES

The table below shows and defines the legal entries for the target type and subtype fields. The types and/or subtypes which are computed by using effects and those computed by using volley fire are also defined. Also listed are the subtype legal entries for each target type, which are entered in the second subfield.

Those targets listed as effects (EFF) will be computed by using effects only if there is an entry in the EFF field of the FM;RFAF message. All other targets will be computed for number of volleys to be fired even if there is an entry in the EFF field. If there is an entry in the volleys (VOL) field, all targets will be computed for volley fire.

TARGET TYPES AND SUBTYPES

TYPE, FIRST SUBFIELD		SUBTYPE, SECOND SUBFIELD		COMPUTATION
Entry	*Definition*	*Entry*	*Definition*	*Vol/Eff*
ADA	Air defense artillery	UNK	Unknown	EFF
		LT	Light	EFF
		MDM	Medium	EFF
		HV	Heavy	EFF
		MSL	Missile	EFF
		POS	Position	EFF
ARMOR	Armor	UNK	Unknown	VOL
		LT	Light	EFF
		MDM	Medium	VOL
		HV	Heavy	VOL
		APC	Armored personnel carrier	EFF
		POS	Position	EFF
ARTY	Artillery	UNK	Unknown	VOL
		LT	Light (any towed system; for example, D20, D30, M1976, M46, B4M, or UNK)	EFF
		MDM	Medium (any open mount system; for example, 152 SP gun, 203 SP gun, or UNK)	EFF
		HV	Heavy (any closed mount system; for example, 2S3, 2S1, or UNK)	EFF
		POS	Position	EFF
ASSY	Assembly area	UNK	Unknown	EFF
		TRP	Troops	EFF
		TRPVEH	Troops and vehicles	EFF
		TRPMEC	Mechanized troops	EFF
		TRPARM	Troops and armor	EFF
BLDG	Building	UNK	Unknown	VOL
		WOOD	Wood	VOL
		MASNRY	Masonry	VOL
		CONC	Concrete	VOL
		MET	Metal	VOL
		SPCL	Special purpose	VOL

TARGET TYPES AND SUBTYPES (Continued)

TYPE, FIRST SUBFIELD		SUBTYPE, SECOND SUBFIELD		COMPUTATION
Entry	*Definition*	*Entry*	*Definition*	*Vol/Eff*
BRIDGE	Bridge	UNK	Unknown	VOL
		FTPON	Foot pontoon	VOL
		VEHPON	Vehicle pontoon	VOL
		CONC	Concrete	VOL
		WOOD	Wood	VOL
		STEEL	Steel	VOL
		SITE	Site	VOL
		RAFT	Raft	VOL
		FERRY	Ferry	VOL
CEN	Center	UNK	Unknown	VOL
		SMALL	Small	VOL
		BN	Battalion	VOL
		REGT	Regiment	VOL
		DIV	Division	VOL
		FWD	Forward	VOL
EQUIP	Equipment	UNK	Unknown	EFF
		RDR	Radar	EFF
		EW	Electronic warfare	EFF
		SLT	Searchlight	EFF
		GDNC	Guidance unit	EFF
		LS	Loudspeaker	EFF
MORT	Mortar	UNK	Unknown	VOL
		LT	Light (for example, towed)	VOL
		MDM	Medium (for example, in an armored vehicle)	VOL
		HV	Heavy (for example, large caliber open mount)	VOL
		VH	Very heavy (for example, large caliber closed mount)	VOL
PERS	Personnel Personnel type targets are EFFECTS targets only when degree of protection (DOP) is half prone and half standing (PRAND) or PRONE	UNK	Unknown	VOL-EFF
		INF	Infantry	VOL-EFF
		OP	Observation post	VOL-EFF
		WKPTY	Work party	VOL-EFF
		POS	Position	VOL-EFF
RKTMSL	Rocket missile	UNK	Unknown	EFF
		APERS	Antipersonnel	EFF
		LTMSL	Light missile	EFF
		MDMMSL	Medium missile	EFF
		HVMSL	Heavy missile	EFF
		POS	Position	EFF
		ATANK	Antitank gun	EFF
SUPPLY	Supply dump	UNK	Unknown	VOL
		AMMO	Ammunition	VOL
		PTL	Petroleum, oil	VOL
		BRGEQ	Bridging equipment	VOL
		CLI	Class I	VOL
		CLII	Class II	VOL

TARGET TYPES AND SUBTYPES (Continued)

TYPE, FIRST SUBFIELD		SUBTYPE, SECOND SUBFIELD		COMPUTATION
Entry	*Definition*	*Entry*	*Definition*	*Vol/Eff*
TER	Terrain feature	UNK	Unknown	VOL
		ROAD	Road	VOL
		JCT	Road junction	VOL
		HILL	Hill	VOL
		DEFILE	Defile	VOL
		LDGSTR	Landing strip	VOL
		RR	Railroad	VOL
VEH	Vehicle	UNK	Unknown	EFF
		LTWHL	Light wheeled vehicle	EFF
		HVWHL	Heavy wheeled vehicle	EFF
		RECON	Reconnaissance	VOL
		BOAT	Boat	EFF
		ACFT	Aircraft	EFF
		HELO	Helicopter	EFF
WPN	Weapon	UNK	Unknown	VOL
		LTMG	Light machine gun	VOL
		ATG	Antitank gun	VOL
		HVMG	Heavy machine gun	VOL
		RCLR	Recoilless rifle	VOL
		POS	Position	VOL

GLOSSARY

ABCA	American, British, Canadian, Australian
ACA	airspace coordination area
acct	account
ACFT	aircraft (target subtype)
ACL	allowable cargo load
ACR	armored cavalry regiment
AD	air defense
ADA	air defense artillery
admin	administrative
admin/log	administration/logistics (radio net)
AFATDS	advanced field artillery tactical data system
AFU	ammunition and fire unit
AG	adjutant general
AHA	ammunition holding area
ALOC	administrative and logistical operations center
AM	amplitude modulated
AMC	at my command
ammo	ammunition
AMTP	ARTEP mission training plan
AOE	Army of Excellence
APAM	antipersonnel and antimateriel
APC	armored personnel carrier
APERS	antipersonnel (target subtype)
AR	Army regulation
ARTEP	Army training and evaluation program
ARTY	artillery
ARTY UNK	artillery, type unknown (mnemonic)
AS	Australia
ASAS	all-source analysis system
ASL	authorized stockage list
ASP	ammunition supply point
ASSY	assembly area (target type)
ATACMS	Army tactical missile system
ATANK	antitank gun (target subtype)
ATCCS	Army tactical command and control system
ATG	antitank gun (target subtype)
ATHS	airborne target handover system
ATI	artillery target intelligence
ATP	ammunition transfer point
ATI;CDR	artillery target intelligence; coordinate (mnemonic)
ATIZ	artillery target intelligence zone
BC	battery commander, boom controller
BCD	FA brigade, corps artillery, division artillery
BCS	battery computer system
BCU	battery computer unit
BDAR	battlefield damage assessment and repair
bde	brigade
BE	Belgium
BFVS	Bradley fighting vehicle system
BGEOM	battlefield geometry
BITE	built-in test equipment
bldg	building
BMO	battalion maintenance officer
bn	battalion
BOC	battery operations center
BRGEQ	bridging equipment (target subtype)
BSA	brigade support area
BSO	battalion signal officer
btry	battery
C2	command and control
C3	command, control, and communications
C3I	command, control, communications, and intelligence
CA	Canada
CANTCO	cannot comply
carr	carrier
CAS	close air support
cdr	commander
C-E	communications-electronics
CEN	center (target subtype)
CFF	call for fire
CFFZ	call-for-fire zone
CFL	coordinated fire line

CFZ	critical friendly zone
chem	chemical
CI	civilian internee
CLI	Class I (target subtype)
CLII	Class II (target subtype)
cmd	command (radio net)
CMP	communications processor
cmpt	computer
CMSC	communications mode selector control
comm	communications
COMMZ	communications zone
COMSEC	communications security
CONC	concrete (target subtype)
COSCOM	corps support command
CP	command post
CPT	captain
CROS	crossover geometry
CS	combat support
CSA	corps storage area
CSM	command sergeant major
CSR	controlled supply rate
CSS	combat service support
CTA	common table of allowances
CTT	commander's tactical terminal
CVC	combat vehicle crewman
CZ	censor zone
D	digital (radio net)
D3	decide-detect-deliver
DA	Department of the Army, Denmark
DAG	division artillery group (enemy)
decon	decontamination
DISCOM	division support command
DIV	division (target subtype)
div arty	division artillery
DMD	digital message device
DMMC	division materiel management center
DNVT	digital nonsecure voice telephone
DOP	degree of protection
DPICM	dual-purpose improved conventional munitions
DRMASK	down-range mask
DS	direct support
DSA	division support area
DSU	direct support unit
DSVT	digital secure voice terminal
ECCM	electronic counter-countermeasures
ECOF	effects cutoff factor
EEI	essential elements of information
eff	effects
EOD	explosive ordnance disposal
EPW	enemy prisoner of war
EQUIP	equipment (target type)
EU	electronics unit
EW	electronic warfare
FA	field artillery
FAADC2	forward area air defense command and control
fax	facsimile
FCP	fire control panel
FCS	fire control system
FCU	fire control unit
FD	fire direction (radio net)
FDC	fire direction center
FDO	fire direction officer
FDS	fire direction system
FEBA	forward edge of the battle area
FFE	fire for effect
1LT	first lieutenant
1SG	first sergeant
FIST	fire support team
FLOT	forward line of own troops
FM	field manual; frequency modulated
FM;CHECK	check fire message (mnemonic)
FM;FDSMOD	fire mission; fire direction system modification (mnemonic)
FM;RFAF	fire mission; request for additional fires (mnemonic)
FP	firing point
FR	France
FRAGO	fragmentary order

FS	fire support
FSB	forward support battalion
FSCL	fire support coordination line
FSCM	fire support coordinating measures (mnemonic)
FSCOORD	fire support coordinator
FSE	fire support element
FSO	fire support officer
ft	foot
FTPON	foot pontoon (target subtype)
FU	fire unit (mnemonic)
FWD	forward (target subtype)
FWR	fire when ready
GDNC	guidance unit (target subtype)
GE	Germany
gen	generator
GPF	ground processing facility
GPS	global positioning system
GPU	general purpose user
GRCS	Guardrail common sensor
GRREG	graves registration
GS	general support
GSM	ground station module
GSR	general support reinforcing
GTA	graphic training aid
HA	hide area
HE	high explosive
HELO	helicopter (target subtype)
HEMAT	heavy expanded-mobility ammunition truck
HEMTT	heavy expanded-mobility tactical truck
HF	high frequency
HHB	headquarters and headquarters battery
HHS	headquarters, headquarters and service
HHSB	headquarters, headquarters and service battery
HI	high
HMMWV	high-mobility, multipurpose wheeled vehicle
how	howitzer
HPT	high-payoff target
HQ	headquarters
HV	heavy (target subtype)
HVMG	heavy machine gun (target subtype)
HVMSL	heavy missile (target subtype)
HVWHL	heavy wheeled vehicle (target subtype)
IAW	in accordance with
ID	identification
IEU	improved electronics unit
IGAMMO	ignore ammunition (mnemonic)
IGU	inertial guidance unit
IHFR	improved high-frequency radio
in	inch
INF	infantry (target subtype)
INOP	inoperational
IPB	intelligence preparation of the battlefield
ISRP/PDS	improved stabilization reference package/position determining system
JCT	road junction (target subtype)
JMEM	joint munitions effectiveness manual
JSTARS	joint surveillance target attack radar system
kg	kilogram
km	kilometer
lchr	launcher
LCHRLST	launcher lost
LDF	lightweight digital facsimile
LDGSTR	landing strip (target subtype)
LLM	launcher-loader module
LO	liaison officer, low
LOC	logistics operations center, line of contact
LOGPAC	logistics package
LOGSTAT	logistical status
LP	listening post
LP/C	launch pod/container
LS	loudspeaker (target subtype)
LT	light, lieutenant
LTACFIRE	lightweight tactical fire direction system
LTC	lieutenant colonel
LTMG	light machine gun (target subtype)

LTMSL	light missile (target subtype)
LTWHL	light wheeled vehicle (target subtype)
m	meter
M	medium
MACOM	major Army command
maint	maintenance
MAP MOD	map modification
MASNRY	masonry (target subtype)
MAXRKTS	maximum rockets (mnemonic)
MBA	main battle area
MCS	maneuver control system
MDM	medium (target subtype)
MDMMSL	medium missile (target subtype)
MDS	met data system
MED	medium
MEDEVAC	medical evacuation
MET	metal (target subtype)
met	meteorology
MET CM	computer met (mnemonic)
MET TA	met target area (mnemonic)
MET TALL	met target area low level (mnemonic)
METT-T	mission, enemy, terrain, troops, and time available
METZNE	met zone (mnemonic)
MFOM	MLRS family of munitions
MFR	mission fired report
MIJI	meaconing, intrusion, jamming, and interference
MKT	mobile kitchen trailer
M/LPA	missile/launch pod assembly
MLRS	multiple launch rocket system
MLRSIZ	multiple launch rocket system size (mnemonic)
MMC	materiel management center
MMS	met measuring set
MOPP	mission-oriented protective posture
MORT	mortar (target type)
MORT UNK	mortar, type unknown (mnemonic)
MSB	main support battalion
MSE	mobile subscriber equipment
MSL	missile (target subtype)
MSR	main supply route
MSRT	mobile subscriber radiotelephone terminal
MST	maintenance support team
MTO	message to observer
MTOE	modification tables of organization and equipment
MWR	morale, welfare, and recreation
NATO	North Atlantic Treaty Organization
NBC	nuclear, biological, chemical
NCO	noncommissioned officer
NCS	net control station
NE	Netherlands
NMC	not-mission-capable
NO	Norway
NSN	national stock numbe
O&I	operations and intelligence
off	officer
OIC	officer in charge
op	operator
OP	observation post
OPAREA	operational area
OPCON	operational control
OPER	operational
OPLAN	operation plan
OPORD	operation order
ops	operations (radio net)
OPSEC	operations security
ops/F	operations/fire (radio net)
ORF	operationally ready float
PA	power amplifier
PAC	personnel and administration center
PADS	position and azimuth determining system
PDS	position determining system
PDU	power distribution unit
pers	personnel
PERS	personnel (target type)
PERSTAT	personnel status
PFC	private first class

PIM	payload interface module
PLDMD	platoon leader's digital message device
PLG	program load group
PLL	prescribed load list
plt	platoon
PLU	power load unit
PMCS	preventive maintenance checks and services
PO	Portugal
POC	platoon operations center
POL	petroleum, oils and lubricants
POS	position (target subtype)
PRAND	half prone and half standing (mnemonic)
PSNCO	personnel services noncommissioned officer
PTL	petroleum, oil (target subtype)
QE	quadrant elevation
QSTAG	quadripartite standardization agreement
R	reinforcing
RAG	regimental artillery group (enemy)
RAM	random access memory
RAP	rocket-assisted projectile
RATELO	radiotelephone operator
RATT	radio teletypewriter
RAU	remote access unit
RCLR	recoilless rifle (target subtype)
RDP	range-deflection protractor
RDR	radar (target subtype)
recon	reconnaissance
REGT	regiment (target subtype)
rep	representative
retrans	retransmission
RFA	restrictive fire area
RFL	restrictive fire line
RKTMSL	rocket missile (target type)
RL	reload point
ROM	refuel on the move
RP	release point
RR	railroad (target subtype)
RRP	replacement receiving point
RSO	reconnaissance and survey officer
RSOP	reconnaissance, selection, and occupation of position
RSR	required supply rate
RSV/T	resupply vehicle and trailer
RX	repairable exchange
S1	adjutant
S2	security and intelligence officer
S3	operations officer
S4	battalion maintenance officer
S&S	supply and service
S&T	supply and transport
SAIK	stand-alone installation kits
SALUTE	size, activity, location, unit, time, and equipment (memory aid)
SCP	survey control point
SDZ	surface danger zone
SEAD	suppression of enemy air defenses
sec	section
SFC	sergeant first class
SGT	sergeant
SIGINT	signals intelligence
SIGSEC	signal security
SINCGARS	single-channel ground and airborne radio system
SITREP	situation report
SKO	sets, kits, and outfits
SLAR	side-looking airborne radar
SLT	searchlight (target subtype)
SNVT	short/no-voltage tester
SOI	signal operation instruction
SOP	standing operating procedure
SP	self-propelled, start point, specialist
SPC	specialist (rank)
SPCE	survey, planning, and coordination element
SPCL	special purpose (target subtype)
SPLL	self-propelled launcher loader (M270)
SRP/PDS	stabilization reference package/position determining system
SSG	staff sergeant
STANAG	standardization agreement

supv	supervisor
svc	service
SVF	standard volleys factor
SYS;PTM	plaintext message (mnemonic)
T	towed
TA	target acquisition
TACCS	tactical Army combat computer system
TACFIRE	tactical fire direction system
TACJAM	tactical jamming
TAMMS	the Army Maintenance Management System
TCF	tactical combat force
tech	technician
TER	terrain feature (target type)
TFC	tactical fire control
TGTG	target geometry (mnemonic)
THM	terminal homing munition
TLE	target location error
TM	technical manual
TOC	tactical operations center
TOE	tables of organization and equipment
TOT	time on target
trig	trigonometric
trk	truck
trl	trailer
TRP	troops (target subtype)
TRPARM	troops and armor (target subtype)
TRPMEC	mechanized troops (target subtype)
TRPVEH	troops and vehicles (target subtype)
TSOP	tactical standing operating procedure
TTF	time to fire
TTT	timed time on target
TTU	tape transport unit
TU	Turkey
TWR	timed when ready
UBL	unit basic load
UK	United Kingdom
UNK	unknown (target subtype)
US	United States
USAF	United States Air Force
USAFAS	United States Army Field Artillery School
USMTF	United States message text format
(V)	voice (radio net)
VEH	vehicle (target type)
VEHPON	vehicle pontoon (target subtype)
VFMED	variable format message entry device
VH	very heavy (target subtype)
VHF	very high frequency
VINSON	a series of communications security devices
vol	volleys, volume
WKPTY	work party (target subtype)
WO	warrant officer
WPN	weapon (target type)
WSRO	weapon system replacement operations
XO	executive officer
ZNE	zone of responsibility

PIM	payload interface module
PLDMD	platoon leader's digital message device
PLG	program load group
PLL	prescribed load list
plt	platoon
PLU	power load unit
PMCS	preventive maintenance checks and services
PO	Portugal
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VEHPON	vehicle pontoon (target subtype)
VFMED	variable format message entry device
VH	very heavy (target subtype)
VHF	very high frequency
VINSON	a series of communications security devices
vol	volleys, volume
WKPTY	work party (target subtype)
WO	warrant officer
WPN	weapon (target type)
WSRO	weapon system replacement operations
XO	executive officer
ZNE	zone of responsibility

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MLRS FDC FIRE MISSION LOG

For use of this form, see FM 6-60. The proponent agency is TRADOC.

DATE

UNIT

TARGET NUMBER (a)	TARGET EASTING (b)	TARGET NORTHING (c)	UNIT ASSIGNED (d)	TIME OF RECEIPT (e)	NUMBER OF ROUNDS TO FIRE (f)	AMMO TYPE TO FIRE (g)	METHOD OF CONTROL / TOT TIME (h)	TIME MSN SENT (i)	MISSION STATUS (j)	TIME MFR RECEIVED (k)	NUMBER OF ROUNDS FIRED (l)	REMARKS (m)

DA FORM 7232-R, AUG 92

MLRS FDC FIRE MISSION LOG (CONTINUED)

INSTRUCTIONS

IDENTIFICATION

Enter the date the form is initiated. Every 24-hour period (at 0001), change date with entire line entry across form on first unused line.

Enter the complete unit designation (for example, 2/A/4/27 FA).

DATA

(a) Enter the target number.

(b) Enter target grid easting (four digits) (nearest 100 meters).

(c) Enter the target grid northing (four digits) (nearest 100 meters).

(d) Enter the unit assigned the mission (platoon or launcher). For multiple launcher fire, use additional lines, leaving C, D, and E blank immediately below the first entry for tnat mission.

(e) Enter the time mission is received.

(f) Enter the number of rounds assigned for the target (if effects type, enter percent requested and/or number of rounds).

(g) Enter the type of ammunition by J-code.

(h) Enter the method of control or TOT time.

(i) Enter the time mission is transmitted to platoon or launcher.

(j) Enter mission status (for example, ADVRDY, CANCOM, EXECUT, AIMING, ARMED, FIRING, CCMCOM, TIMDEP, MFMTMN, READY, MISFIR, HNGFIR, or CKFIRE).

(k) Enter time platoon or launcher fired the mission (time mission fired report [MFR] received).

(l) Enter number of rounds fired on target.

(m) Enter any additional information specific to this mission (for example, fire plan name, EOM (for end of mission), misfires, hangfires, reassigned, and so forth).

MLRS LAUNCHER FIRE MISSION LOG

For use of this form, see FM 6-60. The proponent agency is TRADOC.

DATE	SECTION CHIEF	UNIT/SECTION

TARGET NUMBER (a)	TARGET COORDINATES (b)	FIRING POINT (c)	METHOD OF CONTROL (d)	AMMUNITION			TIME OF FIRST FIRE (h)	REMARKS (i)
				TYPE (DODIC) (e)	NUMBER OF ROUNDS ASSIGNED (f)	NUMBER OF ROUNDS FIRED (g)		

DA FORM 7233-R, AUG 92

MLRS LAUNCHER FIRE MISSION LOG (CONTINUED)

INSTRUCTIONS

IDENTIFICATION

Enter rank and last name of section chief.

Enter complete unit designation, to include launcher number (for example, 1/2/A/4-27 FA).

Enter date form is initiated. Every 24-hour period, change date with a single line entry across entire form.

DATA

(a) Enter target number.

(b) Enter target grid coordinates (eight digits).

(c) Enter actual firing point grid.

(d) Enter method of control.

(e) Enter type of ammunition by Department of Defense identification code (DODIC) (H104, PL81).

(f) Enter number of rounds assigned for target.

(g) Enter number of rounds fired. If different than (i), explain in Remarks column.

(h) Enter time of first fire.

(i) Remarks column should be used when—

1. FCS malfunctions occur during mission.
2. Weapon related malfunctions occur.
3. LP/Cs or M/LPAs are off-loaded with rounds remaining.
4. Any other information regarding the mission and/or launcher deemed appropriate by the section chief, or as directed by unit TACSOP.

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By Order of the Secretary of the Army:

GORDON R. SULLIVAN
General, United States Army
Chief of Staff

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CHAPTER 1

SYSTEM DESCRIPTION

The multiple launch rocket system is a highly mobile, rapid-fire, surface-to-surface, free-flight rocket and guided missile system. It is designed to complement cannon artillery; to attack the enemy deep; and to strike at counterfire, air defense, and high-payoff targets. It can supplement other fire support systems by engaging a dense array of mechanized targets during surge periods. The MLRS battalion is a corps asset and can be attached to a field artillery (FA) brigade or to division(s) within the corps. The MLRS battery is organic to armored and mechanized infantry divisions. Light infantry divisions may receive MLRS support from corps assets.

Section I

INTRODUCTION

Characteristics

The MLRS incorporates on-board self-location, directional control, ballistic computation, digital communications systems, organic resupply capabilities, and tactical fire direction. The "soldier's system," MLRS is the front-runner in the Army's effort to modernize its fire support (FS) systems. Its firepower, range, survivability, and effectiveness make MLRS one of the most formidable weapon systems on the modern battlefield.

An MLRS unit usually is assigned a mission of general support (GS) or general support reinforcing (GSR). If the unit is assigned a GSR or reinforcing (R) mission, the force artillery headquarters must accommodate MLRS unit limitations by modifying the standard tactical mission. A mission of direct support (DS) is not appropriate for an MLRS unit because of the system characteristics and the unit structure. The MLRS operations are characterized by rapid emplacement, engagement, and displacement (shoot-and-scoot tactics) of widely dispersed launchers.

Component

The system consists of the components described below.

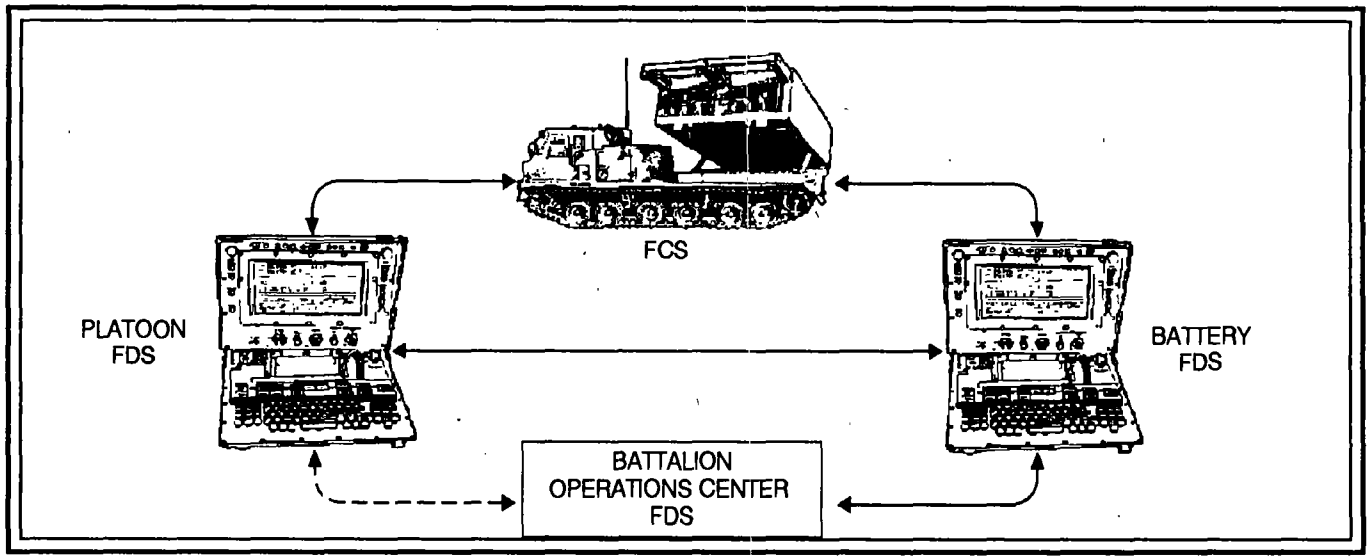
M270 Launcher. Each launcher has the on-board capability to receive a fire mission, determine its location, compute firing data, orient on the target, and fire as many as 12 rockets or 2 missiles before reloading.

Launch Pod/Containers and Missile Launch Pod Assemblies. Each launch pod/container (LP/C) holds six rockets, and each missile launch pod assembly (M/LPA) holds one missile. Up to 12 rockets can be fired in less than 60 seconds and can be aimed at single or multiple aimpoints. One or both missiles can be fired in less than 10 seconds and can be aimed at one or two separate aimpoints. Rockets or missiles can be fired individually, or a designated number can be fired at specified intervals. The rockets and missiles are factory loaded in launch pods.

Ammunition Resupply Vehicles and Trailers. The ammunition resupply capability for MLRS is provided by the heavy expanded-mobility tactical truck (HEMTT) M985 and the heavy expanded-mobility ammunition trailer (HEMAT) M989/M989A1. Each one can carry four launch pods for a total of 48 rockets or 8 missiles in a HEMTT and HEMAT load. (The HEMAT M989 is limited to two launch pods during peacetime operations. The HEMAT M989A1 does not have this limitation.)

Command, Control, and Communications System. The MLRS has an automated command, control, and communications (C3) system to provide command and control of subordinate launchers and to facilitate communication on the battlefield. Major components of the C3 system are the fire control system (FCS), located in the launcher, and the fire direction systems (FDSs), located at platoon headquarters and at the battery and battalion operations centers.

MAJOR COMPONENTS OF THE MLRS COMMAND, CONTROL, AND COMMUNICATIONS SYSTEM



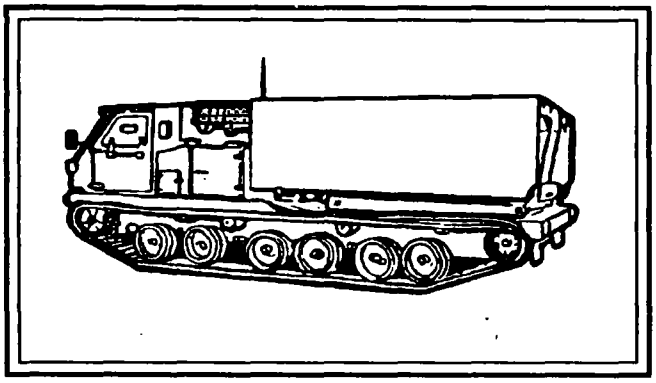
Section II

LAUNCHER AND SUBSYSTEMS

M270 Launcher

The M270 launcher is a highly mobile, lightly armored, tracked carrier vehicle with a launcher-loader module (LLM) mounted on the vehicle bed. The launcher has a three-man crew (section chief, gunner, and driver). Personal equipment is stored in the crew equipment storage containers located in the carrier under the LLM cage. References are listed in the references at the back of this publication.

M270 LAUNCHER



M993 Carrier Vehicle

The carrier vehicle is an elongated version of the Bradley fighting vehicle with 80 percent common components. It is 6.3 meters (m) (22 feet [ft] 11 inches [in]) long, 2.6 meters (8 ft 6 in) high, and 2.97 meters (9 ft 9 in) wide. When heaviest (loaded with M26 rocket LP/Cs), the launcher weighs approximately 24,700 kilograms (kg) (54,600 pounds). It can climb 60-percent slopes, ford 1.1 meters (40 in) of water, and climb 1-meter vertical walls. The launcher has a cruising range of 483 kilometers (km) (300 miles) and can be transported by C-141B and larger cargo aircraft. (See Appendix A.)

The vehicle cab is constructed of aluminum armor plate, providing ballistic protection to the crew. It is fitted with an M13A1 gas particulate filter unit. This unit protects the crew from chemical and biological agents and radioactive particles when each crew member connects his individual protective mask to the filter.

M269 LLM

The LLM is best described as consisting of two sections—a mechanical section and an electrical section.

CHAPTER 2

ORGANIZATION

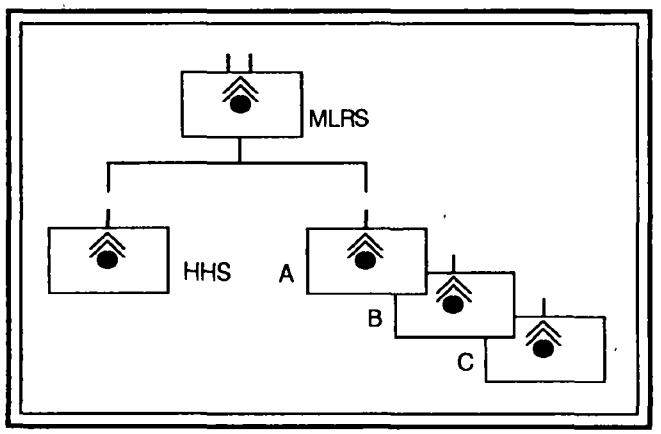
The MLRS battalion is a corps asset and is usually attached to an FA brigade (bde) within the corps. The battalion (bn) is organized and equipped to provide FA rocket and missile fires in support of the corps and to reinforce the fires of other FA units. An MLRS battery (btry) is organic to the armored and mechanized infantry divisions as a separate battery in the division artillery (div arty). This MLRS battery is the organic GS artillery for the division.

MLRS Battalion

The MLRS battalion is composed of a headquarters, headquarters and service battery (HHSB) and three firing batteries with nine launchers each.

The battalion can operate as a single unit, or it can detach batteries to perform separate tactical missions. When conducting separate battery operations, the MLRS battalion headquarters may assume control of one or more of its own batteries and of divisional MLRS batteries. In this role, the battalion headquarters may act as an MLRS controlling headquarters in coordination with the force artillery commander.

MLRS BATTALION



Headquarters, Headquarters and Service Battery

The HHSB is organized only in MLRS battalions. It is organized and equipped to coordinate administrative, logistical, maintenance, and communications support for the battalion headquarters and three firing batteries. The functional elements of the HHSB are discussed below.

Battalion Headquarters

The battalion headquarters consists of the battalion commander and his staff: the executive officer (XO), adjutant (S1), operations officer (S3), battalion maintenance officer (S4), battalion signal officer (BSO), chaplain, and command sergeant major (CSM). This headquarters controls and coordinates battalion activities. Equipment includes two 1 1/4-ton HMMWVs and two secure FM radios.

Battery Headquarters

The battery headquarters is supervised by the battery commander (BC) and the first sergeant (1SG). It includes the supply sergeant, an armorer, and a driver. It provides command and control and administrative, supply, and limited security support to the battery. The TOE equipment includes two HMMWVs, one 2 1/2-ton truck, and one secure FM radio.

Operations and Intelligence Section

The operations and intelligence (O&I) section is supervised by the S3. It is staffed with an operations officer; an intelligence sergeant; an operations sergeant; a chemical officer; a nuclear, biological, chemical (NBC) noncommissioned officer (NCO); a chief fire direction computer; four fire direction computer personnel; and a decontamination specialist. The O&I section makes up most of the battalion TOC and fire direction center (FDC). The O&I section has tactical control over and provides tactical fire direction to the batteries. It provides intelligence and security information, performs tactical operations, supervises NBC operations, and develops training plans for the battalion. Equipment includes two M577 command post (CP) carriers, one HMMWV, one high-frequency (HF) amplitude modulated (AM) radio, and four secure FM radios.

Survey Planning and Coordination Element

The survey planning and coordination element (SPCE) is supervised by the reconnaissance and survey officer (RSO). It includes a chief surveyor and a vehicle driver. The SPCE normally operates as a part of the battalion TOC, planning and coordinating the battalion survey efforts. The SPCE is not equipped with surveying equipment but is an administrative center only. Equipment includes one HMMWV with one secure FM radio.

Liaison Section

The liaison section is supervised by the liaison officer (LO). It includes a liaison sergeant and a liaison specialist. The section provides liaison to a reinforced artillery unit when the MLRS battalion is assigned an R or a GSR mission. Equipment includes one HMMWV and one secure FM radio.

Signal Section

Battalion signal support is provided by the signal section, which is supervised by the BSO. The signal section is responsible for the maintenance and repair support of the battalion communications (comm) systems and establishes and maintains the FM retransmission station as required. Equipment includes two HMMWVs, one of which is equipped with a secure FM retransmission radio.

Personnel and Administration Center

The battalion personnel and administration center (PAC) is supervised by the battalion S1. It includes a PAC supervisor, a clerk-typist, two personnel administrative specialists, a personnel services NCO (PSNCO), and a chaplain assistant. It provides administrative and legal support and helps the battalion commander provide for the welfare of the battalion personnel. Equipment includes a HMMWV, a 2 1/2-ton truck, and a facsimile (fax) machine.

Battalion Supply Section

The battalion supply section is supervised by the S4/battalion maintenance officer. It includes a warrant officer property accountability technician, three supply sergeants, petroleum tanker operators, and a supply specialist. The section coordinates the overall supply activities of the battalion and conducts supply operations in support of the HHSB. It works closely with the O&I section in monitoring the resupply of ammunition and fuel. Equipment includes a 2 1/2-ton truck, a HMMWV, a HEMTT fuel tanker, and one secure FM radio.

Medical Treatment Team

Battalion medical support is provided by the medical treatment team. The ambulance team and a combat medical section support the medical treatment team. Battalion medical activities are supervised by the primary care physician. Support personnel include a physician assistant, an emergency treatment NCO, two medical specialists, two ambulance drivers, and three combat medics. The medical teams provide sick call, limited medical services, and emergency medical treatment for patients who must be evacuated. Equipment includes two 2 1/2-ton trucks, one HMMWV ambulance, and two secure FM radios.

HHSB Mess Section

The HHSB mess section is supervised by a food service sergeant. It includes three cooks, one 2 1/2-ton truck, and a field kitchen trailer. The mess section provides mess support to the HHSB.

Battalion Maintenance Section

The battalion maintenance section is supervised by the S4/battalion maintenance officer and is staffed with a warrant officer maintenance technician and 15 HHSB maintenance personnel. It provides automotive maintenance and recovery support to the HHSB and technical advice and expertise to the battalion and battery commanders on matters concerning maintenance operations. It coordinates maintenance and maintenance supply with the intermediate DS unit and maintenance support teams within the battalion. The section is organized and equipped to field on-site unit maintenance teams for equipment repair. The section keeps its own prescribed load list (PLL). It can draw, transport, and issue or install all organizational repair parts for the HHSB. Equipment includes one HMMWV, two 2 1/2-ton trucks, one HEMTT wrecker, one tracked recovery vehicle, and three secure FM radios.

CHAPTER 3

DUTIES OF KEY PERSONNEL

Although the duties of key personnel in the MLRS unit closely parallel those in other artillery units, they are unique in some ways. Generally, MLRS battalion and battery personnel are responsible for tasks performed by higher grades in cannon units. The discussions in this chapter cover the major duties of personnel in MLRS units. They are not intended to be all-inclusive but rather to highlight major functions unique to the system.

Section I

MLRS BATTALION

Battalion Commander

The battalion commander, aided by the battery commanders and staff, controls all the tactical, training, logistical, and administrative activities of the battalion. He directs employment of the battalion in accordance with assigned missions and the guidance from force FA headquarters. He works closely with the commanders of supported and supporting units to ensure that the battalion can accomplish its mission. He establishes policies to promote discipline and morale within the battalion.

Executive Officer

The XO directs, supervises, and ensures coordination of the staff sections. He oversees all logistical functions within the battalion, acts on behalf of the commander to direct the logistical support of the battalion, and commands the battalion in the absence of the commander.

S1 Officer

The S1 coordinates and directs the activities of the battalion PAC to ensure that the commander's policies, guidance, and orders for personnel administration are implemented. The S1 is the main staff advisor to the commander in the areas of personnel management, morale, discipline, and equal opportunity. He maintains the unit strength through requisition of new personnel and outprocessing of departing soldiers.

S3 Officer

The S3 officer is responsible for operations, intelligence, planning, and training within the battalion. Through the O&I section, he provides tactical and fire direction control to the batteries. He directs the employment of the batteries to meet the needs of the supported units. He plans for the employment of the batteries and recommends the allocation of resources based on the current tactical situation and proposed future actions. He prepares and publishes command standing operating procedures (SOPs), operation plans (OPLANs), and operation orders (OPORDs). He is responsible for establishing and directing the battalion training plan.

Battalion Maintenance Officer (S4)

The battalion maintenance officer coordinates all logistical functions for the battalion (S4). He is responsible for the continuous flow of all classes of supply (except Class VIII, medical) to the battalion. He identifies the support requirements, provides them to the supporting unit, and coordinates with the supporting unit to ensure requirements are met. He recommends policies and procedures to increase unit logistic readiness posture. He provides guidance on the execution of logistics operations to the battery supply and maintenance sections.

Operations Officer

The operations officer directs the operations of the battalion FDC. He functions as the S2, directing the actions of the intelligence sergeant. He ensures that all fire direction and intelligence information is processed and dispersed to the batteries; that the commander's guidance on all fire direction and security matters is properly executed; and that fire direction and intelligence information is kept on maps and charts, including ammunition and weapons status.

Reconnaissance and Survey Officer

The RSO directs the operations of the SPCE and is the battalion's principal advisor on survey operations. He is mainly concerned with coordinating timely survey control for the firing batteries. He maintains current maps and triangulation (trig) lists and keeps the battery PADS survey sections informed of available survey information. He may conduct reconnaissance, selection, and occupation of position (RSOP) for the headquarters. He may also perform S2 functions if the operations officer becomes fully engaged in FDC operations.

Field Artillery Liaison Officer

The LO directs the liaison section. He represents the battalion commander with supported units when the battalion is given an R or GSR mission. He advises the supported commander on battalion capabilities, limitations, and disposition. He recommends employment options and helps coordinate fires of the MLRS battalion with other fire support assets. He keeps the MLRS battalion commander informed on the current situation of the supported unit and on future requirements.

Chemical Officer

The chemical officer advises the commander and staff on NBC defense matters. He prepares the NBC portion of plans and orders and prepares NBC estimates and SOPs for defense against NBC attacks. He exercises staff supervision over NBC training throughout the battalion.

Battalion Signal Officer

The BSO is a special staff officer who has operational control of the signal and radio sections. He advises the commander on communications within the battalion. He advises the commander and staff on electronic counter-countermeasures (ECCM), signals security (SIGSEC), comm training, comm planning, and CP site selection. He prepares the signal annex of the unit OPORDs, OPLANs, and SOPs. He supervises the installation, operation, and maintenance of the battalion comm system and equipment. He coordinates with signal units for comm support. He safeguards the communications security (COMSEC) equipment, serves as the COMSEC custodian and/or COMSEC officer for the unit subaccount, and issues and accounts for COMSEC equipment. He guides and assists the battery radio repair personnel.

HHSB Commander

The HHSB commander is responsible for maintaining personnel and equipment readiness within the HHSB. He ensures provision of supply, maintenance, mess, and administrative support for HHSB elements. He must work closely with the staff officers, as most of the soldiers assigned to the battery work within the staff. He may conduct RSOP for the battalion HQ and act as the battalion CP area commander.

Battalion FA Vehicle Maintenance Technician

The battalion maintenance technician advises the commander and coordinates external maintenance support. With the S4/battalion maintenance officer, he provides technical advice and expertise to the battalion and battery commanders. He recommends maintenance procedures and policies to facilitate support. He coordinates for maintenance and repair parts support from DS maintenance units and supervises the battalion maintenance section in the absence of the S4/battalion maintenance officer.

Property Accountability Technician

The property accountability technician coordinates all supply activities in the battalion. He is responsible for maintaining property accountability and the battalion property book. He helps the battery supply sergeants request and receive supplies by coordinating with supporting supply activities. He works closely with the O&I section in monitoring the resupply of ammunition and fuel. He supervises the battalion supply section in the absence of the S4/battalion maintenance officer.

Primary Care Physician

The battalion primary care physician advises the commander on all health-related issues. He is responsible for immediate medical services for field casualties within the battalion and coordinates all medical support with higher headquarters in coordination with the S3 and S1. He supervises the operations of the battalion medical treatment team.

Chaplain

The battalion chaplain advises commanders on moral and ethical matters. He coordinates and conducts garrison and field services and soldier welfare ministries. He provides counseling as required for all soldiers and helps maintain the morale and spiritual well-being of all personnel.

Section II

MLRS FIRING BATTERY

Battery Commander

The firing battery commander is responsible for executing the tactical mission given the battery by the force FA headquarters. He is responsible for maintaining discipline and morale within the battery. He ensures supply, maintenance, mess, and administrative support is provided for the unit.

Reconnaissance, Selection, and Occupation of Position

The firing battery commander depends heavily on map reconnaissance (recon) for the selection of positions for the battery elements. He must be familiar with terrain analysis and must keep close contact with the controlling artillery headquarters. He works through the controlling artillery headquarters to resolve position conflicts with the maneuver commanders. Thorough map recon and terrain analysis are essential because of the extended frontages, the wide dispersion of battery elements, and the fast pace of the battle. The BC develops movement plans only after coordinating routes of march and positions with the controlling headquarters. He usually will not perform ground recon of firing platoon operational areas (OPAREAs), as this is done by the platoon leader.

Ammunition Resupply

The commander must closely monitor the ammo status of the battery by coordinating with the BOC, the firing platoon, and the ammo platoon leaders. This is best done by using the BOC to collect, maintain, and monitor the ammo status. The commander can then efficiently designate the amount of ammunition to be deployed to firing elements or retained under battery control. The distance and convoy time required for resupply from the ammunition supply point (ASP) or ATP make this a critical job.

Situation Updates

The commander, through the BOC, keeps the controlling headquarters informed of the battery situation at all times. Information in these periodic updates includes launcher firing status, ammo status, and other information that affects the mission.

Command and Control

Command and control (C2) of widely dispersed battery elements is increasingly difficult. This is because of the extended frontages and dispersion of battery elements, comm limitations, and the terrain. Detailed SOPs and advance planning minimize the difficulty and provide continuity of operations when direct communication is impaired. The commander should provide frequent situation updates to the BOC and all platoon leaders. He is aided by the BOC and the first sergeant in carrying out his C2 responsibilities.

Executive Officer

The firing battery has no XO. The commander should designate which of the lieutenants is second in command. The responsibilities of both the operations officer and the ammo platoon leader include some of the duties of the traditional FA battery XO. However, it is up to the commander to decide which, if either, of these individuals will act as the XO.

Operations Officer

The operations officer is, in effect, the S3 of the firing battery. He supervises the BOC, which is the C2 center of the battery. He keeps tactical situation maps and overlays; plans and coordinates tactical movements and positioning, with the commander's guidance; and processes intelligence information. He directs logistical efforts in coordination with the 1SG and ammo platoon leader or, if in use, with the battery logistics operations center (LOC). As the point of contact between the controlling artillery headquarters and all battery elements, he informs the commander of all directives from higher headquarters, passes reports to higher headquarters when appropriate, and establishes and maintains communications with higher headquarters and all battery elements. He supervises the C2 of battery elements, according to the commander's guidance, and orchestrates the commander's guidance during all movements of the battery elements. He also supervises comm procedures and net discipline. His primary concern is with the tactical control of the battery.

The operations officer is also responsible for the smooth operation of the FDC. Although he is not a fire direction officer (FDO), he supervises the FDC chief's actions and is responsible for ensuring the timely transmittal of fire

missions and other data to the firing elements. He is concerned with selection of launcher sections to fire, sequence of firing point usage, fire support coordinating measures, terrain mask areas, status of the firing platoons, met data, and all other fire direction information.

The operations officer also plans, directs, and monitors survey operations. He ensures the battery PADS team has current survey information (trig lists, SCP lists, and so on) for the battery area of operations. He directs the priority of survey to the deployed firing platoons. He selects the general area for the emplacement of the SCPs in the platoon OPAREA in coordination with the firing platoon leader, platoon sergeant, and PADS team chief. His selection is based on terrain analysis, map recon, and existing survey information. He coordinates with higher headquarters for additional survey coordination and support, as necessary. He provides survey information on points established by the battery PADS team to higher headquarters, when requested. The operations officer is usually the battery training officer.

Ammunition Platoon Leader

The ammo platoon leader is usually the firing battery logistics officer with responsibility for coordinating all ammo resupply for the battery. His responsibilities include ammo resupply operations for the supporting ATP or ASP, positioning the ammo platoon elements within the battery ammunition holding area (AHA), and establishing communications. Also, he may perform the duties of battery motor officer. As such, he coordinates with the BOC for maintenance support and directs maintenance efforts. Through the BOC, he keeps the commander informed of the maintenance situation.

The ammo platoon leader must coordinate with the BOC to plan for ammo resupply of the firing platoons and convoys to the ATP or ASP. If the distance to resupply points is great, he may have to arrange for refueling, rations, approval of the route, and intelligence information for the convoy. He coordinates with the BOC to keep the commander informed of the battery ammo status and the status of the ammo platoon elements. If ammo resupply has been decentralized, the firing platoon leader will update the BOC; and if the battery is using a LOC, he may supervise its operation.

Firing Platoon Leader

The firing platoon leader is responsible for the tactical control of the firing platoon. He reconnoiters and selects platoon OPAREAs on the basis of guidance from the BOC and battery commander. He selects the location of the platoon HQ, entry control point, firing points, reload points (RL), and AHAs. These positions should enhance platoon survivability and communications between the platoon HQ and the deployed launchers The position for the platoon HQ must afford good communications with the BOC.

The firing platoon leader selects the location of the platoon SCPs. If the SCPs are not established by PADS, he establishes survey control by the use of alternate methods of survey.

The firing platoon leader designates platoon launchers for firing selected munitions. He also designates the operational status of the launchers and determines their employment sequence on the basis of guidance from the BOC commander and mission requirements. He then sends this information to the BOC, and the BOC selects the launchers to fire.

He establishes communication with the BOC and ensures that the BOC is informed of the status of the platoon. He supervises and assigns missions to the platoon recon sergeant.

The firing platoon leader and platoon sergeant coordinate the maintenance effort within the platoon. They ensure operator unit-level FCS and LLM maintenance is performed. They control any DS-level FCS and LLM mechanic maintenance support teams (MSTs) assigned to the platoon. They may request additional maintenance support when needed.

First Sergeant

The firing battery 1SG is the senior NCO in the battery. He provides leadership and guidance to the battery's enlisted personnel. He is the primary administrative and logistics coordinator for the battery. He is responsible for all internal and external administrative and logistical duties, with the exception of rocket ammunition. His principal duties in this area include the following:

- Coordinating with the controlling headquarters to determine the location and status of support activities. These activities include the supporting maintenance activity; nearest water and ration distribution point; nearest petroleum, oils and lubricants (POL) distribution point; supporting shower and laundry points; and supporting Class II and Class VII activities.
- Guiding and supervising internal battery support activities, such as battery supply, maintenance, and food service operations.
- Directly supervising the battery clerk, comm repairmen, and aidman.

CHAPTER 4

OPERATIONS

Successful MLRS operations start with a sound organization for combat and subsequent task organization that maximize MLRS capabilities. Key to this process is a complete understanding of employment considerations and a thorough analysis of the factors of METT-T (mission, enemy, terrain, troops, and time available).

General Employment Considerations

On the modern battlefield, corps and division commanders' areas of operations normally include all areas occupied by enemy forces who could jeopardize completion of the current corps or division mission. Often, MLRS can engage enemy forces to the full depth of those areas of operations. Therefore, fire support planners must consider many factors when planning to employ MLRS.

System Capabilities

The tremendous flexibility of the MLRS makes it an important fire support asset to maneuver commanders at all levels. This flexibility is vested in the MLRS C3 capabilities; the organizational structure; and the system range, firepower, and munitions.

The MLRS **C3 system** can interface with many types of other C3 and C3I systems. This allows for interface with target acquisition (TA) and sensor systems. These systems include the Firefinder radar and the JSTARS and Guardrail signals intelligence systems. The FDS at platoon, battery, and battalion levels can interface directly with the TACFIRE, the LTACFIRE, DMDs, other FDSs, the cannon BCS, the ASAS, the AFATDS, the ATHS, the GSM, and the CTT.

The **organizational structure** of MLRS units emphasizes autonomy. It allows assignment of tactical missions down to the firing battery and platoon levels. The MLRS firing batteries are equipped to operate independently from parent battalion control. The MLRS firing platoons may execute separate standard or nonstandard tactical missions for limited periods. Augmentation of platoon assets increases this semi-independent capability.

The MLRS **range, firepower, and munitions** give fire support planners flexibility in supporting the maneuver plan. Every M270 launcher will be modified or produced with the capability of firing the MFOM. However, the launcher FCS must be configured to fire the desired munition types. The tables below compare the firepower and volume on targets that MLRS munitions provide in terms of equivalent 155-mm and 203-mm artillery. The effects comparison is based on the 155-mm and 203-mm weapon systems joint munitions effectiveness manuals (JMEMs). Firepower comparison is for reference and comparison only. The number of rockets fired on a target will depend on target type, size, altitude, range, and effects desired.

Planning and Coordination

Employment of the MLRS requires thorough planning and coordination. Operation orders and fire support plans should include detailed tasks and instructions for MLRS units. These instructions must include types and amounts of each munition by unit and FCS configurations for specific launchers and units. Mission planning, processing, and launcher response times must be considered.

RANGE COMPARISON

SYSTEM	MINIMUM RANGE	MAXIMUM RANGE
MLRS M26 Rocket (DPICM)	10 km	32 km
MLRS M39 Missile (APAM)	25 km	100+ km
M109 A2/A3 (155-mm, SP) How	none	18.1 km (23.5 km with RAP)
M198 (155-mm, T) How	none	18.1 km (30 km with RAP)
M110 (203-mm, SP) How	none	23 km (30 km with RAP)
M119/M102 (105-mm, T) How	none	11.5 km (15.1 km with RAP)

LEGEND: DPICM = dual-purpose improved conventional munitions **How** = howitzer **RAP** = rocket-assisted projectile **T**= towed

MUNITIONS COMPARISON

MLRS M26 ROCKET	155-MM HOWITZER	203-MM HOWITZER
644 Submunitions per Rocket (M77)	88 Submunitions per Round (M483A1)	180 Submunitions per Round
1 Rocket	7.32 Rounds	3.6 Rounds
1 Launcher Load (12 Rockets)	3.6 Battalion Volleys[1] (88 Rounds)	1.8 Battalion Volleys[1] (180 Rounds)
1 Battery (9 Launchers) (108 Rockets; 69,552 Submunitions)	33 Battalion Volleys[1] (792 Rounds) (69,696 Submunitions)	16 Battalion Volleys[1] (384 Rounds) (69,552 Submunitions)
M39 (ATACMS) MISSILE	**LANCE HE**	
1,000 M74 Bomblets per Missile	580 M74 Bomblets per Missile	
[1]24-gun Battalion.		

EQUIVALENT VOLUME OF FIRES COMPARISON

SYSTEM	TARGET TYPE		
	Personnel	***Light Materiel***	***Self-Propelled Artillery***
MLRS M26 Rocket	12 Rockets	12 Rockets	12 Rockets
155-mm DPICM	10 Battalions (240 Rounds)	3 Battalions (72 Rounds)	3 Battalions (72 Rounds)
203-mm DPICM	5 Battalions (117 Rounds)	2 Battalions (35 Rounds)	2 Battalions (35 Rounds)
Lance HE (APAM)	2 Missiles	2 Missiles	Not in Lance JMEM

Mission and Enemy

The commander's scheme of maneuver and the enemy's capabilities and predicted courses of action identified by the intelligence preparation of the battlefield (IPB) are the next consideration in employing the MLRS.

Close Operations. In the close fight, the MLRS best supports the maneuver commander with rocket fires. Rocket range makes the MLRS ideal for augmenting cannon fires in counterfire, suppression of enemy air defenses (SEAD), interdiction, and deep fires. The MLRS M26 rocket has a large "footprint," compared to cannon fire coverage. That and its multiple aimpoint capability make the MLRS ideal for attacking large or inaccurately located targets well forward of the forward line of own troops (FLOT). The targets best suited for MLRS rocket engagement are personnel, light materiel, and self-propelled (SP) artillery. Because of the large footprint of the MLRS M26 rocket and the probability of dud munitions, fire support planners must use the same planning considerations as for 155-mm or Air Force delivered DPICM. Specifically, they must be careful not to assign missions or targets that are too close to friendly troops. Consideration must also be given to MLRS employment in areas friendly units will occupy or pass through.

Deep Operations. AirLand Battle doctrine requires the field artillery to provide deep fires and fires in support of other deep operations. The MLRS can best support the commander's deep operations plans with M39 (ATACMS) missile fires. With ranges exceeding 100 kilometers, the M39 (ATACMS) is ideal for attack of long-range, high-payoff targets (HPTs). The methodology for planning and executing deep operations is decide-detect-deliver (D3). This methodology requires that targets and their areas of engagement be planned during the decide phase. In deep operations, most fires are planned and scheduled as opposed to immediate, unscheduled fires on targets of opportunity. In the planning process of the decide phase, the following must be considered:

- Availability and location of properly-configured MLRS units and/or launchers.
- The M39 missile stockage levels and locations. Management and delivery of munitions depend heavily on fire planning decisions made early in the decide phase.

- Target acquisition and sensor system availability, C3 linkage to the MLRS firing unit, and target acquisition and sensor systems cuing to detect and/or track targets.

These assets (launchers, munitions, and TA and sensor systems) are limited. Therefore, fire support planners must carefully plan and coordinate the development of deep targets and their attack. The warhead description and capabilities of the M39 (ATACMS) missile are addressed in Chapter 1. The D3 methodology and the doctrine for planning and executing fire support in deep operations are addressed in FM 6-20-30 and FM 6-20-10.

Rear Operations. The objective of rear operations is to ensure freedom of maneuver and continuity of operations through sustainment. Use of MLRS fires in support of rear operations is limited because MLRS is an area fire weapon; it is not the FS weapon of choice for rear operations. MLRS fires may, however, be required in support of division or corps response operations and/or tactical combat force (TCF) operations. Once committed, the TCF normally is given priority of fires to support its operations.

Positioning

Proper positioning of MLRS units increases effectiveness and survivability. Positioning is a function of the support required: division front, corps front, and so on. Positioning close to the FLOT increases the ability of the MLRS units to range deep targets; however, it may reduce their survivability against enemy artillery counterfire and ground and air forces. Whenever possible, MLRS battalion and battery HQ elements should position out of range of enemy artillery. Normally, all M270 launchers should be positioned from 5 to 15 kilometers behind the FLOT. This positioning can keep the enemy from determining an MLRS unit's mission or type of configuration merely by analyzing its location on the battlefield. The largest limiting factor, however, is communications. The amount of land an MLRS unit requires must also be considered. Terrain requirements depend on METT-T and current plans.

Fire Planning

Maneuver and force FA commanders must consider the items discussed below when planning for MLRS fire support.

Fire Missions. The MLRS, in support of close operations, uses two basic types of fire missions—planned (scheduled) and targets of opportunity (unscheduled). Use of MLRS fires typically requires long planning times. The MLRS is suited more for planned missions. Both scheduled and unscheduled missions are used in the offensive and defensive phases of the close battle. (For further discussion of fire planning, see Chapter 9.)

Configuration Time. Normally, all the weapon files required to carry out anticipated missions are loaded in the unit FCS before fire missions begin. Changing from one munition to another takes no additional time if the correct weapon files are loaded. Unusual circumstances may warrant loading additional files; however, this is not a normal occurrence.

Planning Time. The MLRS units require at least 30 minutes to execute any fire plan. (See Chapter 9 for more information.)

Launcher Response Time. The MLRS response time on any given mission may vary from 2 to 20 minutes. (See Chapter 9 for more information.)

Munition Load. The MLRS units may carry any of the MFOM. The unit mission dictates munition load and resupply necessities. Mission changes may require exchange of part or all of a unit's ammo stocks.

Munition Range. The minimum and maximum munition ranges must be considered in positioning elements and assigning missions.

> **Note.** More detailed discussions of MLRS battalion, battery, and platoon operations are in Chapters 5, 6, and 7.

Survivability

Movement. The shoot-and-scoot tactics combined with the wide dispersion of elements help MLRS elements avoid detection and minimize vulnerability. Survivability is enhanced by the rapid transmission rate of digital message traffic and by secure voice communications. Quick emplacement and displacement enhance survivability. However, they also require more planning and coordination because of competition for terrain. Firing platoon leaders and battery commanders must coordinate with maneuver unit commanders throughout all phases of an operation.

Mission. The M270 firing missiles may be less vulnerable to counterfire than are firing rockets. This is due to a shorter time from initial launch to movement from the firing point and randomly selected off-axis firings. The M270 firing missiles may, however, be a higher priority enemy target and are required to be on the firing point for a longer period of fire mission processing before launch.

Detection. The key to MLRS survival on the battlefield is the avoidance of detection. Enemy forces can detect MLRS units firing either rockets or missiles by the means discussed below.

Air-Ground Observation. Until it fires, an M270 launcher normally is difficult to detect by air-ground observation. During firing, the large signature of the launch provides easy location of the firing point by direct observation.

Counterbattery Radar. At lower firing elevations (less than 300 mils), MLRS rockets are difficult to detect by counterbattery radar. At firing elevations greater than 300 mils, the rockets can be more easily acquired because of their higher trajectory. The ATACMS off-axis launch, low radar cross section, and semiballistic guided flight program further reduce MLRS vulnerability to enemy radar acquisition.

Sound Ranging. The vulnerability of MLRS to detection by sound ranging is comparable to that of cannon artillery. Enemy sound ranging techniques are highly advanced and extremely accurate.

Flash Ranging. The MLRS is readily detected by flash ranging because of the large visual signature of the launcher firing. Enemy flash ranging techniques are highly advanced and extremely accurate.

Radio Direction Finding. Overuse of radio communications can make detection by enemy radio direction finding more likely. This is especially true because of the radio-intensive nature of MLRS operations. Terrain masking, short transmissions, and use of low radio power and directional antennas can improve survivability.

Task Organization

The maneuver commander establishes the command and control of MLRS units through his organization for combat. This is a two-step process as follows:

- Step 1—Establish a **command relationship** by placing the unit in a specific tactical organization.
- Step 2—Assign a **tactical mission.** (MLRS batteries and battalions, whether part of a div arty or an FA brigade, will always be assigned tactical missions. The MLRS batteries of an MLRS battalion may also be assigned tactical missions.)

> **Note.** The FM 6-20 series gives a detailed description of these steps.

Tactical Mission Assignment

Considerations

The normal mission of the corps MLRS battalion and the divisional battery is general support. Both can also perform a GSR mission. The MLRS battalion and divisional battery also are organized and equipped to perform the reinforcing tactical mission. The MLRS divisional battery does not have an organic liaison capability; however, it can perform the R mission by using internal personnel. Direct support is not an appropriate mission for MLRS units for the following reasons:

- The MLRS rocket fires lack the precision accuracy required for DS, and the large footprints of MLRS warheads may endanger friendly maneuver units. Danger close for MLRS M26 rockets is 2 kilometers at maximum range.
- The MLRS has extensive ammo resupply considerations.
- The MLRS lacks the munitions normally required for a DS mission (for example, illumination and smoke).
- The MLRS comm nets are insufficient for the DS mission.
- The use of MLRS in the decentralized DS mode denies the force FA commander the use of an important asset needed to influence the battle.

Tactical Missions

Direct Support. This mission is not appropriate for an MLRS unit.

Reinforcing. If assigned an R mission, the MLRS unit should operate on the reinforced artillery battalion operations/fire (ops/F) (very high frequency [VHF]-FM) (digital) and command (cmd) (VHF-FM) (voice) nets. Communication with the force FA headquarters should be maintained with the HF AM radio and/or mobile subscriber equipment. (To use MSE, a node must be nearby.) The MLRS battalion has a liaison section to help in implementing and executing an R mission. There is no organic liaison capability at the firing battery. The BC can do this to some extent. A major consideration in giving an MLRS unit an R mission is the ammo expenditure rate. In an R role, expenditure of MLRS ammo may exceed the unit resupply capability. Another consideration is ensuring the reinforced unit understands MLRS capabilities and limitations.

General Support Reinforcing. The GSR mission requires the MLRS unit to furnish fires for the force as a whole as its first priority and to reinforce the fires of another FA unit as the second priority. A GSR unit remains under the tactical control of the force FA headquarters and responds on a first-priority basis to the needs of that headquarters. The GSR mission gives the force commander flexibility to meet the needs of various tactical situations. In the R or GSR mission, two inherent responsibilities must be addressed—liaison and communications.

Liaison. The MLRS battalions are authorized and assigned a liaison section under the L-series TOE. Battery-level liaison requirements can be met by the ammo platoon leader or other personnel. However, the presence of the battery officers and senior NCOs is critical to sustained operations. Therefore, the loss of personnel to a liaison mission would degrade overall battery capabilities.

Communications. When conducting a GSR mission, the battalion or firing battery should maintain FM communications with the force FA headquarters on both the force FA cmd and ops/F nets. Digital traffic from the reinforced unit can be sent to the MLRS battalion or battery on either internal or external nets, addressed directly to the MLRS TOC or BOC. Another solution is to use the battalion MSE or improved high-frequency radio (IHFR) capability to maintain communication with the reinforced unit. The liaison officer uses his HMMWV radio, operating on the controlling FA or battalion cmd (voice) net to coordinate with the MLRS battalion TOC.

General Support. An MLRS unit assigned a GS mission provides FA support for the force as a whole. This is the most centralized mission for the force commander. It provides fires that are immediately responsive to his needs. Planned fires and fires against HPTs are best provided by those MLRS units with a GS mission. Assigning a GS MLRS unit a priority of fires allows the commander to influence specific areas of the battlefield. The priority of fires option can fulfill many of the R and GSR needs.

Nonstandard Mission. The MLRS unit is well-suited for a variety of nonstandard missions. If the commander's intent cannot be satisfied with one of the standard FA tactical missions, a nonstandard tactical mission may be assigned. These missions amplify, limit, or change one or more of the inherent responsibilities or spell out contingencies not covered by those responsibilities. A nonstandard mission may be assigned if there is not enough artillery to cover all the contingencies or if an FA battalion, FA battery, or MLRS platoon is required to meet the responsibilities of more than one tactical mission. (Additional information appears later in this chapter.)

Inherent Responsibilities

Field artillery battalions normally meet their FA support requirements through one of the four basic standard tactical missions. Assignment of a tactical mission implies that an FA commander will meet each of the seven inherent responsibilities of his mission, as applicable. The table below depicts the seven inherent responsibilities as well as the automated responsibility of commander's criteria as they relate to the four basic standard tactical missions.

The following paragraph and table implement STANAG 2934 and QSTAG 217.

Operations With Allied Units

Several of the NATO and American, British, Canadian, Australian (ABCA) alliance members as well as other countries are deploying or planning to deploy MLRS with their armies. Currently, Germany, France, Italy, The Netherlands (Holland), Turkey, the United Kingdom, Japan, and Bahrain have MLRS. American MLRS units may find themselves operating with allied MLRS or other FA units. Therefore, they must be familiar with allied standard artillery tactical missions and inherent responsibilities. QSTAG 217 and STANAG 2934 define ABCA and NATO tactical tasks and responsibilities for control of artillery.

SEVEN INHERENT AND AUTOMATED RESPONSIBILITIES OF FIELD ARTILLERY STANDARD TACTICAL MISSIONS

AN FA 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 FA HQ.	1. Reinforced FA. 2. Own observers.[1] 3. Force FA HQ.	1. Force FA HQ. 2. Reinforced unit. 3. Own observers.[1]	1. Force FA HQ. 2. Own observers.[1]
Has as its zone of fire—	Zone of action of supported unit.	Zone of fire of reinforced FA.	Zone of action of supported unit to include zone of fire of reinforced FA unit.	Zone of action of supported unit.
Furnishes FIST or FSE[2]—	Provides temporary replacements for casualty losses as required.	No requirement.	No requirement.	No requirement.
Furnishes liaison officer—	No requirement.	To reinforced FA unit HQ.[3]	To reinforced FA unit HQ.[3]	No requirement.
Establishes communication with—	Company fire support officers (FSOs) and supported maneuver unit HQ.	Reinforced FA unit HQ.	Reinforced FA unit HQ.	No requirement.
Is positioned by—	DS FA unit commander or as ordered by force FA HQ.	Reinforced FA unit or as ordered by force FA HQ.	Force FA HQ or reinforced FA unit if approved by force FA HQ.	Force FA HQ.
Has its fires planned by—	Develops own fire plans.	Reinforced FA unit HQ.	Force FA HQ.	Force FA HQ.
Has its commander's criteria established by—	Establishes own commander's criteria.	Reinforced FA unit HQ.	Force FA HQ.	Force FA HQ.

[1]Includes all TA means not deployed with supported unit (radar, aerial observers, survey parties, and so on).

[2]A fire support element (FSE) for each maneuver brigade, battalion, or cavalry squadron and one fire support team (FIST) with each company or ground cavalry troop are trained and deployed by the FA unit authorized these assets by TOE. After deployment, FISTs and FSEs stay with the supported maneuver unit throughout the conflict.

[3]The MLRS battalion only.

TACTICAL TASKS AND RESPONSIBILITIES FOR CONTROL OF ARTILLERY (NATO AND ABCA)

ARTILLERY WITH A TACTICAL TASK OF	ANSWERS CALLS FOR FIRE IN PRIORITY FROM	ESTABLISHES LIAISON WITH	ESTABLISHES COMMUNICATION WITH	FURNISHES FORWARD OBSERVERS TO[1]	WEAPONS MOVED AND DEPLOYED BY (POSITIONED BY)	HAS AS ITS ZONE OF FIRE	HAS ITS FIRES PLANNED BY	NATIONS TO WHICH TERMINOLOGY APPLIES
Direct support	1. Directly supported formation or unit. 2. Own observers. 3. Force field artillery.[2]	Directly supported formation or unit (battalion, regiment, or brigade).	Directly supported maneuver formation or unit.	Each maneuver company of the directly supported formation or unit.	Direct support artillery unit commander or as ordered by force field artillery HQ.[2]	Zone of action of the directly supported formation or unit.	Develops own fire plans in coordination with directly supported formation or unit.	BE, CA, DA, FR, GE, IT, NL, PO, TU, UK, US
	1. Directly supported formation or unit. 2. Any other formation or unit as authorized by the controlling HQ.	Directly supported formation or unit.	Directly supported formation or unit.	Directly supported formation or unit.	Next higher artillery HQ.	Zone of action of the directly supported formation or unit or as ordered by higher artillery HQ.	Artillery formation or unit in direct support in conjunction with directly supported formation or unit.	AS
In support	1. Supported formation or unit. 2. Any other formation or unit as authorized by the controlling HQ.	No inherent requirement.	No inherent requirement.	No inherent requirement.	Next higher artillery HQ.	Zone of action of the supported formation or unit or as ordered by higher artillery HQ.	Next higher artillery HQ.	AS
At priority call	1. Formation or unit to which placed at priority call. 2. Any other supported formation or unit. 3. Any other formation or unit as authorized by the controlling HQ.	No inherent requirement.	No inherent requirement.	No inherent requirement.	Next higher artillery HQ.	Zone of action of the formation or unit to which placed at priority call or as ordered by higher artillery HQ.	Formation or unit to which placed at priority call.	AS
General support	1. Force field artillery HQ[2] and target acquisition artillery. 2. Own observers.	No inherent requirement.	No inherent requirement.	No inherent requirement.	Force field artillery HQ.[2]	Zone of action of the supported formation or unit or zone prescribed.	Force field artillery HQ.[2]	BE, CA, DA, FR, GE, IT, NL, NO, PO, TU, UK, US
General support reinforcing	1. Force field artillery HQ.[2] 2. Reinforced artillery unit. 3. Own observers.	Reinforced artillery unit.	Reinforced artillery unit.	Reinforced artillery unit if approved by force field artillery HQ.[2, 3]	Force field artillery HQ[2] or reinforced artillery unit if approved by force field artillery HQ.[2]	Zone of action of the supported formation or unit to include zone of fire of the reinforced artillery unit.	Force field artillery HQ[2] or as otherwise specified.	BE, CA, DA, FR, IT, NL, PO, TU, UK, US
Reinforcing	1. Reinforced artillery unit. 2. Own observers. 3. Force field artillery HQ.[2]	Reinforced artillery unit.	Reinforced field artillery HQ.	Reinforced field artillery unit.[2]	Reinforced artillery unit or as ordered by force field artillery HQ.[2]	Zone of fire of reinforced artillery unit or zone prescribed.	Reinforced artillery unit.	BE, CA, DA, FR, IT, GE, NL, NO, PO, TU, UK, US
Reinforcing by fire (mutual support)	1. Supported formation or unit and own observers. 2. Force field artillery HQ.[2]	Supported formation or unit and reinforcing artillery unit.	Supported formation or unit and reinforcing artillery unit.	No inherent requirement.	Unit commanding officer or as ordered by force artillery HQ.[2]	Zone of supported formation or unit or zone prescribed by force artillery HQ.[2]	Own FDC and reinforced artillery unit.	FR

[1]The US will not furnish forward observers but will furnish fire support teams (on request).
[2]Force artillery headquarters or higher artillery headquarters.
[3]Applies also to the provision of liaison officers.

LEGEND:

AS	= Australia	**FR**	= France	**NO**	= Norway	**US**	= United States
BE	= Belgium	**GE**	= Germany	**PO**	= Portugal		
CA	= Canada	**IT**	= Italy	**TU**	= Turkey		
DA	= Denmark	**NL**	= Netherlands	**UK**	= United Kingdom		

Offensive Operations

An MLRS unit must be prepared to support the five basic types of offensive operations:

- Movement to contact.
- Hasty attack.
- Deliberate attack.
- Exploitation.
- Pursuit.

A detailed discussion of these operations and the responsibilities of the fire support coordinator (FSCOORD) for each of them is in FMs 6-20-30, 6-20-40, and 6-20-50.

Movement to Contact

Units make movement to contact to gain or regain contact with the enemy. Once contact is made, the commander can further develop the situation.

The MLRS can provide support during both movement and follow-on operations once contact is made. With its long range, MLRS is ideally suited to provide fire support to covering forces and flank guard formations.

The MLRS must be integrated into the march columns to ensure responsive supporting fires during the initial action. By planning for delivery of immediate mass MLRS fires, the commander can help the supported unit as it seizes and retains the initiative.

Hasty Attack

Movements to contact end when contact is made, with a series of meeting engagements and/or hasty attacks. These operations require extremely responsive fires to compensate for the relatively small amount of maneuver power initially echeloned forward.

The MLRS can best be used in support of hasty attacks by delivering deep fires against reserve or reinforcing formations, counterfires, and fires reinforcing the DS artillery of attacking brigades.

Although time normally will not be available for detailed formal MLRS fire planning, MLRS units may be able to provide SEAD support to close air support (CAS) and Army aviation operations.

Deliberate Attack

A deliberate attack is planned in detail. It is undertaken after time-consuming reconnaissance, acquisition, and development of targets and a thorough analysis of all factors affecting the situation. The MLRS units may still be able to provide SEAD support to CAS and Army aviation operations. Also, MLRS can provide effective mass fires against enemy counterattack forces.

Exploitation and Pursuit

Exploitation and pursuit operations follow successful attacks. They involve rapid movement forward to secure deep objectives and maintain contact with retreating enemy units. The 32+ kilometer range of MLRS rockets, the 100+ kilometer range of missiles (ATACMS), and system mobility enable MLRS to effectively support exploitation and pursuit operations.

Exploitation and pursuit operations are characterized by rapid movement and continuous hasty attacks. Maneuver units usually are unable to coordinate extensively or directly for fire support. Without this coordination, MLRS use in these operations must adhere to positive clearance of fires procedures.

Use of MLRS in these operations requires terrain positions close to the line of departure or FLOT. From these positions, MLRS can support operations well beyond the forward edge of the battle area (FEBA). The MLRS units can leapfrog forward to support the maneuver advance. This requires the MLRS units to be integrated into exploiting and/or pursuing the unit scheme of maneuver.

Ammunition is a prime consideration in selecting MLRS units to support exploitation and pursuit operations. Intelligence operations will determine what types of targets will be encountered and, therefore, what munitions will be needed. The ability to resupply these munitions is an important factor. Resupply capability must be evaluated; the additional distance between rapidly advancing MLRS units and their resupply points in the division and corps areas must be considered. Ammunition will have to be "pushed" forward to maintain resupply requirements.

The long range and accuracy of the ATACMS can be especially effective in supporting a long-range exploitation and pursuit operation. The ATACMS can be used to disrupt attempts to slow or stop friendly maneuver forces or to interdict and neutralize enemy counteroffensives. The ATACMS targets might include enemy forces that are mining high-speed avenues, setting up ambush points and battle positions, trying to demolish bridges, and setting up other obstacles to friendly advance. The ATACMS also can attack reserve forces that are maneuvering to counterattack. The force FA commander and maneuver commander must coordinate extensively with the MLRS units of the supporting corps artillery for such missions.

Defensive Operations

In defensive operations, the corps and division commanders normally have more centralized control of MLRS assets to ensure that they are immediately responsive to the force commander. However, MLRS units may be attached to or under the operational control (OPCON) of armored cavalry regiments (ACRs) or other covering force units. The duration of the attachment or OPCON and other instructions and restrictions should be delineated in the OPORD.

The MLRS units can support defensive operations with fires by providing the following:

- Counterfire and SEAD fires.
- Fires on enemy C3 assets and maneuver assembly areas to disrupt command, control, and attack preparations.
- Engagement of enemy forces as far forward as possible. Attack of targets with MLRS DPICM will strip enemy forces of light armor and infantry support and will cause mobility and firepower kills to heavy armor.
- Long-range missile fires on second-echelon forces and other HPTs.

A Firefinder-MLRS direct link is most effective during defensive operations. This link allows rapid detection and destruction of enemy artillery and mortars as they fire in support of their maneuver's advance.

Defensive operations require different positioning considerations. The positioning of MLRS in the security area, to range more deeply, must be carefully considered and planned. Considerations include the following:

- Increased security risks to MLRS units.
- Communications requirements.
- Availability of survey control in the security area.
- Limited logistical support as a result of positioning far forward.
- Availability of suitable firing positions and routes.

In MLRS unit positioning, munition minimum range must be considered. The units could be positioned at different, staggered distances from the FEBA or FLOT, which would overcome minimum range limitations.

The MLRS units should not be positioned on major avenues of approach. This is to prevent enemy breakthroughs from jeopardizing the unit or forcing it to displace prematurely. It would also preclude displacing several MLRS platoons or batteries at the same time and losing that fire support.

Nonstandard Employment Techniques

The flexibility of MLRS unit organization, delivery of fires, and ammo types makes it a versatile system usable in ways that are nonstandard to cannon artillery.

Nonstandard Missions

Nonstandard MLRS missions include those discussed below.

An MLRS firing battery answers calls for fire from a combat aviation brigade. The FDS can communicate digitally with an aerial observer in an OH-58D through the helicopter's ATHS. It also can communicate digitally with an observer using a DMD or other hand-held digital device in an OH-58A or OH-58C helicopter. The battery FDC also can receive voice calls for fire from aerial observers. All of these configurations allow the MLRS firing battery to engage the variety of targets the aviation brigade can acquire.

A battery from an MLRS battalion is attached to an FA brigade or div arty for positioning and movement but remains GS to the corps.

A battery from an MLRS battalion is attached to an FA brigade which is DS to an ACR or separate maneuver brigade but remains GS to the regiment or brigade.

An MLRS battalion is attached to an FA brigade which is reinforcing a Marine Corps or coalition army force artillery headquarters. However, the MLRS battalion is positioned by and has its fires planned by the reinforcing FA brigade headquarters, not the force FA headquarters.

A nondivisional MLRS battery is GSR to a DS cannon battalion but is positioned by and has its fires planned by the reinforcing FA unit headquarters.

Delivery of Fires

Flexibility in delivery of fires includes the following:

- Methods of fire control (such as time on target [TOT]).
- The moving target location prediction capability of the FDS.
- The multiple target aimpoint and mission capability of the launcher.

An example of fire delivery flexibility is the concentration of an MLRS battalion rocket TOT to neutralize a large, moving enemy mechanized force. An MLRS battalion TOT can saturate a 5-square-kilometer area with 208,656 M77 DPICM submunitions in less than 1 minute. This is the equivalent firepower of seventy 24-gun 155-mm

howitzer battalions or a TOT from 1,680 155-mm howitzers. Using the FDS to interface with allied systems, a single German MARS (MLRS) battery of eight launchers can fire 2,688 AT2 antiarmor mines to stop or slow the enemy in the engagement area and thereby achieve better DPICM effects. (See Chapter 9 for delivery of fires information.)

Munitions

The variety of munitions, the firepower, and the organizational flexibility of the MLRS lend the system to munition-based roles. This nonstandard technique consists of matching munitions to units on the basis of mission needs. This technique simplifies unit C2 and may simplify ammo resupply operations when MLRS units are designated to fire either ATACMS or DPICM rather than a mix. For example, specific MLRS batteries or platoons may be designated to fire only ATACMS missiles.

Target Acquisition and Sensor System Interface

The MLRS C3 system interfaces directly with all digital comm systems. Therefore, it is easily linked to any TA or sensor systems equipped with digital communications. This linkage allows faster response for attack of detected targets. Three of the most likely sources of target information are the Firefinder radar, the OH-58D helicopter, and the JSTARS or Guardrail SIGINT systems.

Firefinder Radar

The MLRS FDS at all levels can interface directly with the Firefinder DMD emulator in a digital, nonsecure mode. This link gives the force FA commander an extremely fast, responsive, and effective counterfire capability. Through zone management and the use of common sensor boundaries, MLRS-Firefinder operations can orient on the maneuver commander's battlefield priorities while still providing counterfires to the force as a whole. Specific commander's guidance is essential for providing targeting zone and report criteria for the radar section and engagement and effects criteria for the MLRS unit. (See FM 6-121 for more detailed information.)

Firefinder Targeting

Messages. The Firefinder DMD emulator can transmit six and receive nine message types. The MLRS FDS can receive only the FM;RFAF, FM;FOCMD, and SYS;PTM messages.

Zones. Up to nine zones can be entered in the Firefinder radars. All zones may be one of four types discussed below or any combination of the four types. These zones prioritize target detections and determine in which format the detection will be reported.

A **critical friendly zone** (CFZ) is an area, usually a friendly unit or location, that the maneuver commander designates as critical. It is used to protect an asset whose loss would seriously jeopardize the mission. When the computer predicts that an enemy round will impact in a CFZ, the location of the weapon that fired the round will be reported by the computer in precedence ahead of all other detections. Any location of a weapon firing into a CFZ will result in an immediate call for fire (FM;RFAF message) unless it is manually overridden by the radar operator. The FM;RFAF message is received by TACFIRE as a Priority 1 message. Thus, a CFZ provides for the most responsive submission of targets to the fire support system.

A **call-for-fire zone** (CFFZ) designates a search area forward of the FLOT that the maneuver commander wants suppressed, neutralized, or destroyed. An area designated as a CFFZ would likely be on a suspected regimental artillery group (RAG) or division artillery group (DAG) position. Its designation would be closely tied to information developed during the IPB process. A CFFZ provides the second most responsive priority of requests for fire generated by the radar. A target identified in a CFFZ will generate an FM;RFAF Priority 2 message. However, the commander may upgrade this to a Priority 1 message for certain CFFZs.

The **artillery target intelligence zone** (ATIZ) is an area in enemy territory that the maneuver commander wishes to monitor closely. Any weapons acquired in this zone will be reported to the TACFIRE computer ahead of all target detections except CFZ and CFFZ. However, the detections will result only in a target report (ATI;CDR).

A **censor zone** (CZ) is an area from which the commander wishes to ignore all target detections. The CZs must be used very judiciously, since the computer does not report to the operator a round originating from a CZ. A CZ may be used to ignore a friendly artillery position that, because of its aspect angle to the radar, could be detected as enemy artillery. This situation could occur when the FLOT is uneven or when friendly units are in enemy territory.

Attack Criteria. Firefinder generates only a target grid location and a mortar, type unknown (MORT UNK) or an artillery, type unknown (ARTY UNK) target description. Since Firefinder cannot discriminate between target size or specific type, the commander must establish specific attack criteria (for example, six M26 (DPICM) rockets for all mortar targets).

CHAPTER 5

MLRS BATTALION OPERATIONS

The MLRS battalion is assigned to the corps artillery; however, it normally is attached to an FA brigade of the corps artillery for command and control. The corps commander further exercises command and control of the battalion by assigning it a mission. The mission may be a standard tactical mission, or it may be a nonstandard mission if a standard tactical mission will not accomplish the commander's intent. Instructions covering features of combat operations which lend themselves to definite or standardized procedures without loss of effectiveness should be covered by tactical SOP (TSOP). (For a guide and checklist for preparing an MLRS battalion TSOP, see Appendix B.)

Employment Guidelines

There are several options for employing the battalion across the corps front. In all options, one of the first considerations is terrain needed to position elements of the battalion. For example, the battalion requires at least 13 position areas (as much terrain as three DS cannon battalions) to support operations: nine platoon OPAREAs of 3 by 3 kilometers each, three battery HQ positions, and a battalion HHSB location. Battalion split headquarters operations would add another four locations (three battery trains and one battalion trains).

Battalion HQ and HHSB organization during tactical operations will vary according to the factors of METT-T. Normally, a battalion CP and a battalion trains are formed. The organization, functions, and procedures of these elements should be standardized and included in the unit TSOP.

> **Note.** The logistical and administrative elements of the HHSB and any headquarters elements not located with the battalion CP are centralized in one location—the battalion trains. The CP in the battalion trains is the administrative and logistical operations center (ALOC).

Options For Employment

Discussed below are the corps commander's options for employing the battalion and the advantages and disadvantages of each.

Option 1

The corps commander retains direct control of the MLRS battalion through the corps artillery headquarters TOC. Normally, this option is used only in controlling MLRS units configured for delivering ATACMS fires. The corps artillery TOC does the following:—

- Coordinates movement, positioning, and delivery of fires of the MLRS unit(s) to support the corps operations.
- Monitors ammunition status.
- Coordinates combat support (CS) and combat service support (CSS) for the MLRS unit(s).

The **advantages** of Option 1 are as follows:

- Intelligence-generated targets can be sent directly from the sensor platform to the CTT or GSM at the MLRS battalion for immediate attack. Targets also can be sent by the corps to the MLRS battalion.
- The corps commander can directly influence the battle as an active participant rather than as an allocator of combat power. He applies long-range missile fires at decisive points to help shape the close fight.

The **disadvantages** of Option 1 are as follows:

- Communications may be constrained by the distances over which the MLRS battalion and corps artillery TOC have to communicate.
- Terrain management for launchers is time-consuming. The coordination for OPAREAs and firing points requires clearance through the corps FSE, division FSE, brigade FSEs and, in some cases, battalion FSEs.
- Requests for additional fires from within the corps must be routed through the div arty and corps and then sent to the battalion for execution.

Option 2

The corps commander attaches the MLRS battalion to an FA brigade. If the corps commander keeps the FA brigade under his control with a GS or GSR mission, the corps FSE will send requests for fire through the FA brigade HQ to the MLRS battalion. The battalion may continue to receive target data directly from sensors through the CTT and GSM. If the corps commander allocates or prioritizes the brigade fires to a division (reinforcing a div arty), the division FSE will send requests for fire through the div arty and then through the FA brigade HQ to the MLRS battalion.

The **advantages** of Option 2 are as follows:

- Communications relayed through the FA brigade HQ facilitate C2 of MLRS unit and launcher operations.
- The MLRS can still effectively respond to targets requested by corps.
- The corps commander can still establish priorities of fires. This will increase the combat power within a subordinate unit area.
- The FA brigade is more capable of assisting and supporting the attached MLRS battalion than a corps artillery TOC or div arty.

The **disadvantages** of Option 2 are as follows:

- When brigade fires are not allocated to a division, the processing time for division requests for fire is increased. (A quick fire link might be established from div arty to the FA brigade to preclude this problem.)
- Coordination with maneuver units for position areas may be difficult and time-consuming.

Option 3

The corps commander allocates some or all of the MLRS units directly to the divisions, thus increasing their combat power. This decentralized employment of the MLRS battalion may be most appropriate to fast-paced offensive operations. The MLRS battalion, or its batteries, may be attached to a committed division. This division normally would further attach the MLRS unit to the div arty. This places all the GS artillery in the division area under a single FA commander. A firing battery from a corps MLRS battalion can be assigned as GS or GSR to the division. The div arty must provide information on the following:

- Required supply rates for ammunition.
- Target attack criteria.
- The SEAD criteria.
- Interdiction requirements.
- Supportability of future operations.

If the corps commander attaches an MLRS battalion to a division, the battalion, operating with the div arty, may assume control (OPCON) of the divisional MLRS battery. The battalion normally will be assigned a GS mission for the division. Priority of fires, with specific target criteria, can be established and shifted quickly within the division in accordance with the plan for fire support.

The **advantages** of Option 3 are as follows:

- Communications distances between the MLRS unit and the force FA CP are reduced.
- Additional MLRS units give the division more immediately available combat power.

The **disadvantages** of Option 3 are as follows:

- It may be time-consuming to change the task organization and get the pure battalion back under the corps artillery or FA brigade control when required.
- Fire planning and MLRS attack of targets identified at corps and echelons above corps are degraded because there are no immediately available MLRS fires at that level.
- With all MLRS assets attached to the divisions, no MLRS units could be assigned the mission of GS to the corps for ATACMS fires.

Note. The versatility of MLRS allows combinations of these options. Firing batteries can be detached and assigned separate tactical missions within the corps or allocated to subordinate units.

Battalion Headquarters

The MLRS is an extremely versatile and flexible system. Therefore, the MLRS battalion commander must consider several options when organizing the staff for tactical operations. In addition to the factors of METT-T, he must consider survivability, dispersion, support requirements, past experience, and SOPs. He can devise almost any option to accomplish the unit mission. Several options are addressed below.

CHAPTER 6

MLRS FIRING BATTERY OPERATIONS

The MLRS firing battery is the basic unit of employment of the MLRS. This chapter addresses battery employment and operations. Platoon-level operations, which differ from battery-level operations, are addressed in Chapter 7. Instructions covering features of combat operations which lend themselves to definite or standardized procedures without loss of effectiveness should be covered by TSOP. (For a guide and checklist for preparing an MLRS battery TSOP, see Appendix B.)

Section I

EMPLOYMENT

Battery Headquarters

The battery HQ provides command, control, and logistical support to the battery. The command element and the BOC provide the command and control; the rest of the headquarters has the assets to enable the battery to function independent of any battalion control. The elements and sections organic to the battery HQ perform almost all service support functions normally associated with the battalion.

Battery Operations Center

Like a battalion TOC, the MLRS BOC is the C2 center of the battery. The BOC directs all battery operations in coordination with the battery commander. It directly controls FDC, survey, and NBC operations. It monitors ammo and launcher status and directs and coordinates battery internal and external logistics and support operations.

The BOC operates in the FDC M577A2 tent extension. The battery and battalion command (voice) nets can be remoted to field tables in the extension. The BOC uses the SB-22 switchboard to connect it with the essential HQ elements, such as the ammo platoon CP, observation posts (OPs), listening posts (LPs), maintenance, supply, and the commander's tent. The BOC personnel maintain situation maps and overlays. They maintain SCP, ammunition, maintenance, and similar status charts and post other operational information in the tent extension.

The battery operations officer supervises the BOC. The BC can establish a BOC staff whose shifts may include the operations officer, the ammo platoon leader and sergeant, the chief fire direction computer, the NBC NCO, and the supply sergeant.

The BOC passes movement orders and other information for the subordinate platoons directly to platoon HQ. There they are processed and dispersed to firing sections as required.

Fire Direction Center

The MLRS firing battery FDC operates as a subelement of the BOC. With the FDS, it can receive fire missions, fire direction information, and related digital traffic directly from TACFIRE or from variable format message entry devices (VFMEDs) at any level (corps artillery, div arty, FA brigade, and battalion). It can receive data from an MLRS battalion, battery, or platoon FDS; from a cannon battery BCS (limited); from a Firefinder radar; or from other designated target acquisition or sensor systems. The battery FDC may determine the number of rockets and/or missiles to fire and chooses the launcher to fire. To process fire missions, it must have the map mod, launcher location, launcher firing points, ammunition, and assigned firing positions. The FDC uses this information to select and control all firings of the battery launchers. The FDC maintains a DA Form 1594 and a DA Form 7232-R (MLRS FDC Fire Mission Log). (See example in Chapter 7.)

Support

Mess, supply, comm, and maintenance sections may be collocated with the BOC at the battery HQ. When collocated, wire communications should be established from these sections to the BOC. The BOC is the focal point for support requests, planning, and coordination.

Split Headquarters Operations

Considerations

The MLRS battery HQ usually deploys in one location, the battery CP, with the BOC handling both C3 and logistics coordination. However, the commander may choose to split his headquarters operations between a BOC at the battery CP and a LOC at the battery trains, the same as MLRS and cannon battalions may split operations between an ALOC and a TOC. The situations below may require split operations.

Terrain. An elevated location is needed by the BOC for communications. The logistics elements (ammo platoon, maintenance, and supply) require a good road net and firm ground. If these two needs cannot be met at the same location, the commander may choosc to separate the elemcnts; for example, he may place the BOC on a hill and the trains in a nearby town (preferably in a valley).

Enemy. Because of enemy counterfire or air attack capability, the commander may choose to split operations. This precludes total neutralization of the headquarters platoon, if detected. The BOC's large comm output or logistics area traffic patterns may jeopardize the entire headquarters. Split headquarters operations reduce the chances of complete detection.

Logistics Operations Center Establishment

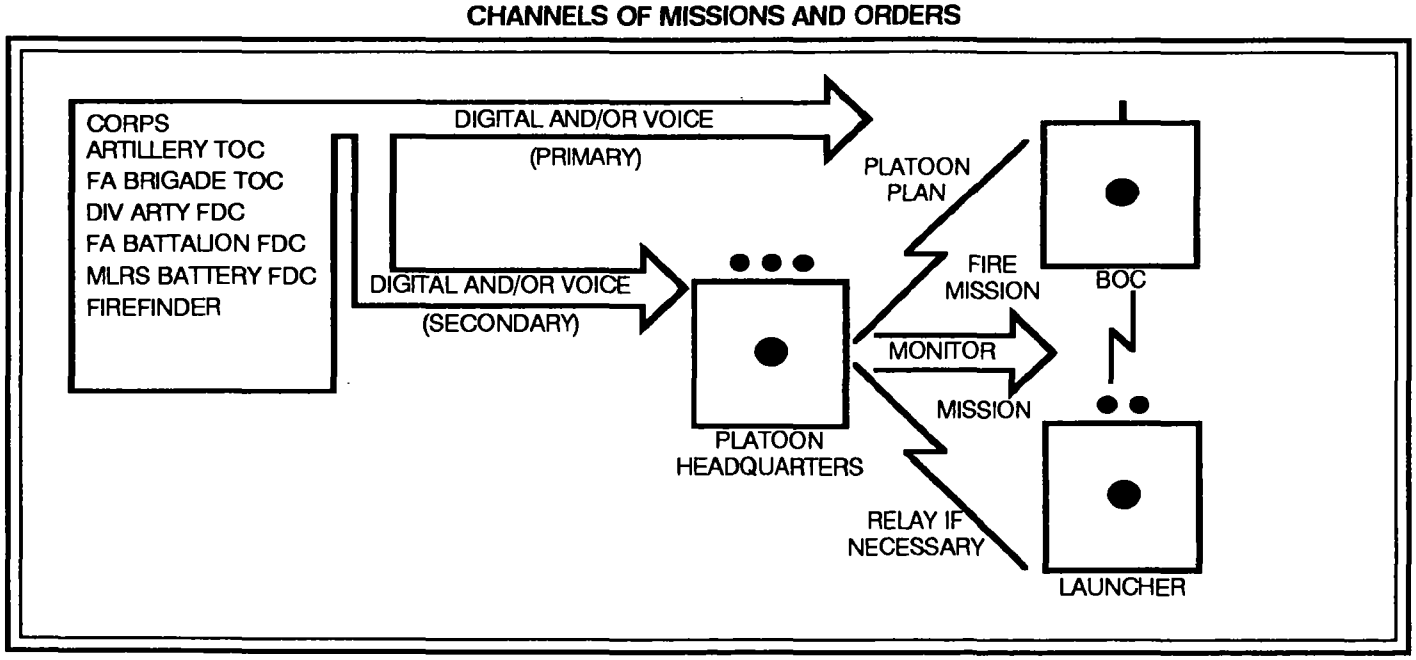
Split headquarters operations can be accomplished by the firing battery establishing a battery trains with a LOC as a logistics command post. The LOC activities are directed by the BOC. The LOC is directly supervised by the ammo platoon leader and/or first sergeant. The commander decides which assets to deploy with the LOC and which to leave with the BOC. His decision is based on the options discussed below.

Ammunition. The commander can deploy all ammo assets to the platoons. This reduces the size, signature, and C2 problems of the battery CP and trains; but it adds to those of the platoons. Ammo vehicles could either go directly to the ATP and/or ASP from the platoons for ammunition resupply or stop first at the LOC or MLRS battalion ALOC.

Support Elements. The commander can deploy all support elements to the battery trains. This leaves only the commander and operations officer (with their drivers and HMMWVs) and the FDC with the BOC. This option virtually eliminates vehicular signature and trafficability needs from the battery CP. However, it reduces battery CP personnel and battery CP defensibility.

Wire Communications. When the LOC is located near the BOC (800 to 1,000 meters), wire line communications can be used between the two operations centers. This reduces C3 problems and the comm signature caused by separation. The BOC remains the main comm terminal and forwards all logistics information and support requests to the LOC. The LOC is not required to maintain a 24-hour radio net station to support the battery. This also allows the centers to serve as OPs or LPs for each other and to deploy reaction forces when attacked.

CHANNELS OF MISSIONS AND ORDERS



Radio Communications. Distance increases C3 and defense problems and requires the LOC to monitor the battery command or other designated frequency. The radio in the ammo platoon's or first sergeant's HMMWV can be used to monitor the net; however, this restricts the use of the vehicle. Increased distance may be necessitated by terrain or by enemy counterfire capability.

Coordination

The LOC must coordinate with the BOC on all decisions and efforts to prevent conflicting and incorrect direction of support activities. The BOC, with its better access to tactical situation information, is the command element.

Detachment of the MLRS Firing Platoon

The MLRS firing platoon with a platoon FDS can provide fire support in a detached mode without a parent MLRS battery or battalion. Logistical support of the detached platoon is the most significant problem in this type of operation. For a short time, a cannon battalion could provide limited support while the platoon's assigned ammo section provides short-haul Class V resupply. The platoon could be assigned a nonstandard GSR or R role to support an attack or to counter an enemy thrust. Detailed support must be planned and specific resources allocated to support the platoon before this type of mission is executed.

Section II

RECONNAISSANCE, SELECTION, AND OCCUPATION OF POSITION

Planning

Frequent moves are common to MLRS operations. Survival on the modern battlefield necessitates such tactics. Because MLRS operations are dispersed, firing platoons conduct their own RSOP and the BC and first sergeant conduct the recon and selection for only the battery HQ positions.

The BC must anticipate movement and plan in advance for displacement. He must keep the controlling headquarters advised of all factors that will impact on the movement of a platoon, the headquarters, or the battery as a whole.

Because of the size of platoon OPAREAs (3 x 3 km), also referred to as goose eggs, the BC must try to quickly acquire information of possible alternate or supplementary positions for his elements. He must, therefore, have enough lead time to plan and conduct his reconnaissance and selection. The MLRS chain of command must continuously reconnoiter the next OPAREAs.

Method

Fortunately, MLRS units are well-adapted to the technique of moving frequently and can move with minimal notice. The keys to successful RSOP are discipline, teamwork, and rehearsal. Battery and platoon RSOPs are executed in a three-step process.

The **first step** is that, on receiving the approximate next position from higher headquarters, a recon party reconnoiters it. At the battery level (battery HQ positions), this party usually consists of the BC or first sergeant and a driver. At the platoon level, this party is usually the recon sergeant with the platoon leader or platoon sergeant. Ammo personnel sometimes are included at both levels. They offer advice on the placement of their vehicles and give more defensive firepower to the recon party. The recon party traverses the designated position and determines how best to use it. The actual locations are reported after the occupation.

The **second step** is the assembly, movement, and occupation of the advance party. The advance party prepares the selected position for occupation by the main body; conducts a security sweep, if required, and an NBC sweep of the area; and, if necessary, establishes a jump BOC and/or provides continued support fires with an advance firing element.

The **third step** is the assembly, movement, and occupation of the main body. The main body usually begins this step only after the advance party, with its jump BOC or firing section, has emplaced and is ready to take over the mission. This step can actually be a series of movements by small infiltration groups or echelons.

Preparation

Preparation must include briefing the advance party and chain of command on the following:

- Mission.
- Tentative next locations.
- Proposed routes.
- Adjacent units.
- Possibly the designation of a platoon operations center (POC) as jump BOC if the BOC displaces and can no longer communicate.
- Enemy situation (threat to movement and occupation).

In planning the RSOP, an analysis of the factors of METT-T is essential.

Mission

Fire support is the overall mission. At the battery level, only one firing platoon should displace at a time. At the platoon level, continuous fire support can be provided by moving a launcher forward with the advance party. The advance launcher becomes operational in the new OPAREA before the main body leaves the old one. This enables the battery and platoon to continue to provide maximum possible fire support. Speed in occupation is essential to providing fast, effective fire support.

Enemy

All members of the battery must fully understand the enemy situation and related factors. An imminent enemy offensive requires increased MLRS fire support, which is degraded during moves. Enemy rear area incursions jeopardize moving elements; enemy target acquisition and counterfire capabilities may change the distance or frequency of displacement.

Terrain

Terrain dictates time and distance requirements, primary and alternate routes, positioning possibilities within the assigned goose egg, and many other factors.

Troops

Commanders and platoon leaders must consider the availability of troops and their state of morale, rest, and training.

Time Available

The maximum time possible must be allotted to MLRS commanders and leaders for the RSOP. However, the time available for RSOP changes constantly; and planning must include variations and contingencies.

Reconnaissance

At least four recons are required to move the entire battery into a new position (one for battery HQ and three for the firing platoons). The three types of recon are map, air, and ground.

Map Reconnaissance

The map recon is preliminary to the ground or air recon. Potential positions and routes to them are selected. This method is very fast; it allows unsuitable routes to be eliminated. Also, likely ambush sites, rendezvous points, checkpoints, and other pertinent locations can be identified on the map. The major disadvantages of the map recon are as follows:

- Actual terrain conditions cannot be determined. Terrain features change with time, especially vegetation and the presence of man-made features. The map publication date should be checked.
- Surface conditions of the route and the position cannot be determined accurately.
- Other units may be in the position.
- Enemy forces may be in the area.

Air Reconnaissance

An air recon is made in conjunction with map and ground recons, whenever possible. If time and resources are available, information gained from an air recon is very useful. Air recons are faster than ground recons. However, they may give an inaccurate picture of the surface conditions and may reveal the route and the new position to the enemy.

Ground Reconnaissance

This is the best type of recon because the routes and position can be physically examined. However, this is the slowest type of recon.

Selection of Position

Battery Headquarters

The battery commander or first sergeant must consider many factors in the selection of the battery HQ area.

Mission. Mission is the most important consideration. The position should provide for ease of both C3 and logistical support of the firing platoons.

Tactical Situation. The tactical situation largely dictates the following:

- Location of the position area.
- Whether the headquarters is split into a battery CP and battery trains.
- The technique of positioning the vehicles.
- The use of terrain in defense of the unit.

Communications. The position must allow optimum communications between the battery HQ, controlling FA HQ, platoon HQ, and launchers. Often the battery HQ location must be well forward and on elevated terrain. Terrain communications masking must be used to enhance survivability.

Defensibility. The position should permit both active and passive defense so that it—

- Can be entered without enemy observation.
- Offers good cover and concealment.
- Has more than one entrance and exit.
- Takes advantage of existing terrain features.

Trafficability. The soil must be firm enough to support the vehicles of the unit. If an urban location (town or village) is used, the street widths, turn radii, and overhead objects must allow adequate clearances for the heavy and large (55-foot-long HEMTT-HEMAT) battery vehicles.

Weather. Weather conditions and the effect of weather on the terrain must be considered.

Road Network Availability. The headquarters area should be on or near the main supply route (MSR) used by battery resupply and support vehicles going to and from the platoons, ATPs, ASPs, and supply distribution points.

Other Factors. Additional factors to be considered are as follows:

- Zone of supported force.
- Location of ATPs and ASPs.
- Location of maneuver units.
- Weather and trafficability in the supported zone.

Firing Platoon

Platoon OPAREAs are selected by the same criteria. However, the following must also be considered:

- Existing survey control.
- Planning ranges for munition loads (for example, 10 to 32 km for M26 rockets).
- Fire unit status, available launchers, and ammo types.
- Terrain masks (both immediate and down-range masks).

Battery Headquarters Survivability Occupation and Positioning

The primary method of survivability for an MLRS firing battery is the avoidance of detection. Battery headquarters, firing platoons, and ammunition platoons should use natural and man-made camouflage, noise and light discipline, and terrain to keep from being detected from the ground or air.

The firing battery headquarters position should be set up to take advantage of all means of cover and concealment, natural and man-made. The .50 caliber machine gun, M60 machine guns, antitank weapons, and M203 grenade launchers should be positioned to fire at likely enemy avenues of approach. The LPs and OPs should be in place to provide sufficient early warning to the battery so that it can displace when the threat is too great.

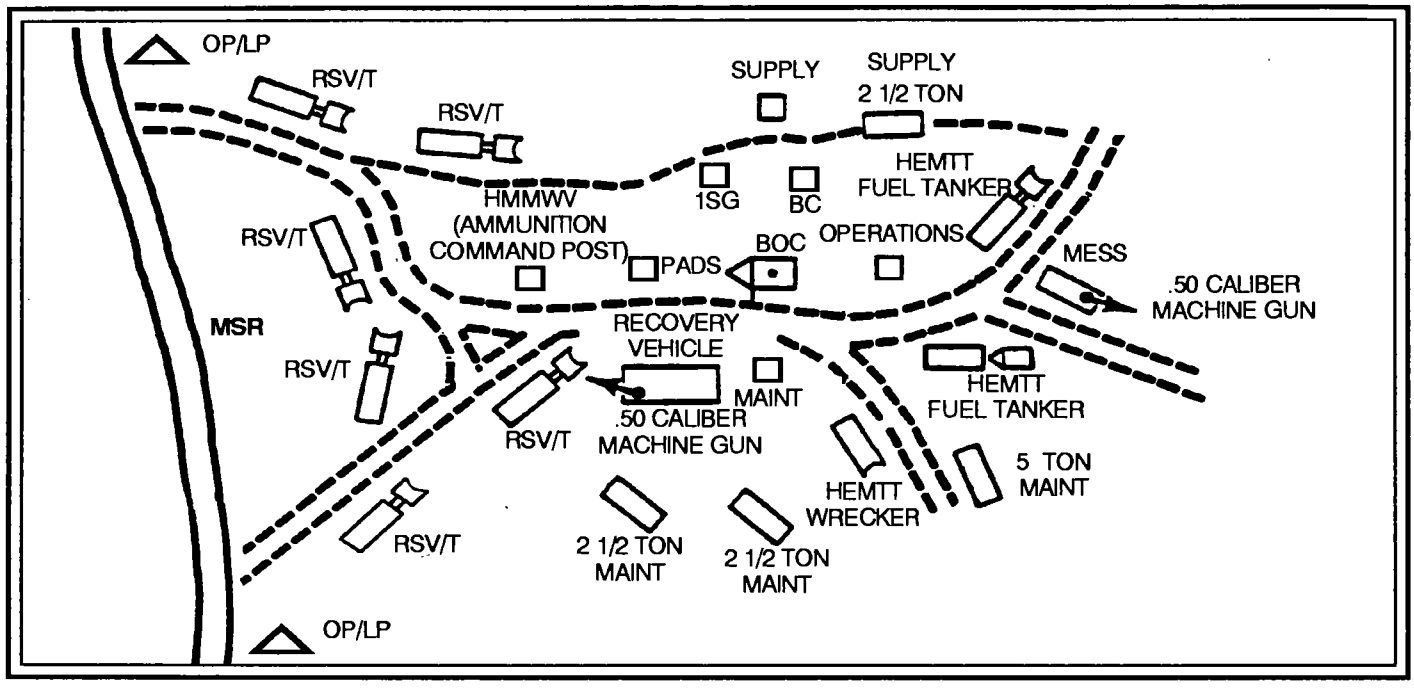
The BOC must stay attuned to the current tactical situation and ensure that information is disseminated to all battery elements. Especially important is information pertaining to enemy locations and disposition, friendly units in or near platoon OPAREAs, the NBC threat, and locations of friendly and enemy minefields.

Depending on the ammo resupply techniques used or the support available, the battery HQ can have as many as 50 to 70 personnel and 20 or more vehicles to emplace. The area required can be up to 500 meters in radius. These requirements highlight the need for a well-trained but relatively light advance party.

The positions to be occupied must incorporate the selection factors already listed, with emphasis on communications and concealment. Built-up areas such as towns and villages, in many cases, provide better hide areas than rural locations.

When selecting positions, battery leaders must consider each element of the battery HQ. See the following illustration and discussions.

SAMPLE BATTERY CP



Battery Operations Center

The BC or first sergeant should locate the BOC on elevated terrain for communications. It should be in the center of the headquarters position for maximum protection against ground attack and for ease of headquarters internal wire communications.

Mess

This section should be located on firm, accessible ground; should have good drainage; and should be upwind from the field latrine. The mess section TOE .50 caliber machine gun, mounted on the M35A2 truck, should be positioned to cover critical areas of the headquarters position, such as an avenue of approach. The machine gun can be dismounted and emplaced on a tripod.

Maintenance and Direct Support Attachments

This section should be placed to cover a portion of the defensive perimeter and to allow maintenance vehicles to move in and out easily in support of the platoons. The maintenance (maint) section has a .50 caliber machine gun mounted on the recovery vehicle and an M60 machine gun. Both should be sited and used for position defense or emplaced (dismount the .50 caliber) at an LP and/or OP. The section also should be located on firm, accessible ground that gives dispersion of the section vehicles and vehicles being repaired and recovered. Maintenance recovery vehicles usually move last in the march order.

Supply

This section requires firm terrain as well. The supply vehicles (not including the POL tankers) are placed to cover a portion of the headquarters position. The supply and POL vehicles are placed for easy access to and from the position. The supply section has an M60 machine gun which can be emplaced as part of the position defense or on an LP or OP.

Ammunition Holding Area

The AHA should be adjacent or closest to the MSR. It should be large enough to hold 6 to 12 of the battery HEMTT-HEMATs. It should be easily located, in darkness or daylight, by the ammo platoon personnel. Placed closest to the MSR, the AHA controls the main access route into the area.

Other Headquarters Elements

The rest of the headquarters platoon usually locates near the BOC. The NBC NCO works in the BOC, while the commander's vehicle and tent usually are located within 50 meters of the BOC. The PADS survey section should be located within easy access of the BOC.

Section III

BATTERY MOVEMENT

Displacement Options

The MLRS battery displacement options resemble those of other FA units; however, the BOC directs and controls the displacement of subordinate platoons. The BC usually is directed to displace by battery, echelon, or platoon. Some considerations in selecting an option for displacement are as follows:

- Continuous fire support.
- Overall tactical situation.
- Immediate and future requirements of the supported unit.
- Characteristics of the terrain to be traversed.
- Distance of march.
- Enemy capabilities.
- Command and control capabilities.

Displacement by Platoon

This is the most common and preferred method of MLRS displacement. One firing platoon at a time is displaced, either as a complete platoon, by echelons within the platoon, or by individual vehicle infiltration.

Displacement by Battery Echelon

In this method, one or two of the major elements of the battery are moved in two or more groups, such as two firing platoons. Then elements of the battery HQ or ammo platoon and the rest of the battery are moved.

Displacement by Battery

This method, displacement of the entire battery at once, is the least preferred. It is seldom used by an MLRS battery. However, distance, mission, route priorities, or the overall tactical situation may dictate a battery-level move. The MLRS battalion, if controlling two or more batteries, may use this method.

Jump Battery Operations Center

Each BOC tries to maintain C3 and fire direction processing while moving; often, this is not possible. Batteries can send a BOC slice forward with the headquarters advance party to act as jump BOC. Since the battalion FDS cannot control launchers, automated fire direction is lost when the battery FDS cannot communicate. Therefore, each battery should designate a platoon to assume fire direction control of the battery as the headquarters displaces or if the FDS becomes non-mission-capable. The platoon FDS then enters the digital net with the div arty TACFIRE, MLRS battalion FDS, or corps TACFIRE. Once this link occurs, the platoon assumes the role of battery FDC. If the entire C2 mission is passed to a platoon (for example, if the BOC were destroyed), the BC and/or battery operations officer moves to the designated POC to best influence the action and to ensure the continuity of operations. The battery commander's FM secure radio helps in the establishment of voice net links. In this case, the BC may choose to relocate personnel to the designated POC. There they help with the increased workload.

Tactical Marches

A tactical march is the movement of a unit or elements of a unit under actual or simulated combat conditions. There are several methods for moving the battery or platoon in a tactical configuration. Each method has specific advantages and disadvantages. The BC decides which method or combination is best.

Open Column

The open column is used for daylight movements when there is an adequate road network that is not overcrowded, when enemy detection is not likely, when time is an important factor, or when the travel distance is great. Vehicle interval in an open column is generally 100 meters.

The **advantages** of the open column are as follows:

- Speed (the fastest method of march).
- Reduced driver fatigue.
- Improved vision on dusty roads.
- Ease in passing individual vehicles.
- Ease in dispersing vehicles as a passive defense measure against an air attack.
- Less chance of the entire unit being ambushed.
- Less vulnerability to indirect fire.

The **disadvantages** of the open column are as follows:

- Greater column length requires more road space.
- Other traffic often becomes interspersed in the column.
- Communication within the column is complicated.

Close Column

In close column movement, the vehicle interval is less than 100 meters. At night, each driver observes the cat's-eyes of the blackout markers on the vehicle in front of him and maintains an interval of 20 to 50 meters. If the driver sees two marker lights, the interval is too large; if he sees eight marker lights, the interval is too small. Four visible marker lights indicate he is maintaining the proper interval. During daylight, close column is used to maintain maximum command and control during periods of limited visibility or when moving through built-up or congested areas.

The **advantages** of the close column are as follows:

- Simplicity of command and control.
- Reduced column length.
- Concentration of defensive firepower.

The **disadvantages** of the close column are as follows:

- The column is vulnerable to enemy observation and attack.
- The strength and nature of the column are quickly apparent to enemy observers.
- Convoy speed is reduced.
- Driver fatigue is increased.

Infiltration

When the battery moves by infiltration, vehicles are dispatched individually or in small groups without reference to a march table. Though this technique is time-consuming and the vehicles are difficult to control, it is used when the enemy has good target acquisition means and quick reaction capabilities.

The **advantages** of infiltration are as follows:

- Vehicles are less vulnerable to hostile observation.
- Opportunities for covert operations are increased.
- Defense against air and artillery attack is provided.
- The enemy is deceived as to the size of the unit.

The **disadvantages** of infiltration are as follows:

- It is time-consuming.
- It is difficult to command and control.
- Vulnerability of small elements is increased.

Terrain March

The terrain march is an off-road movement to reduce vulnerability and to avoid traffic. A unit using this type of movement should travel close to tree lines, along gullies, and close to hill masses. When enemy observation or interdiction by artillery fire or air attack is likely, a terrain march should be conducted. A unit may move safely on a road for some distance and change to a terrain march at a point where enemy observation becomes likely or vehicle congestion makes an inviting target.

The terrain march should be considered when traveling to alternate positions; but first, the following factors should be considered:

- Displacement time may be increased.
- Ground recon is required.
- Soil conditions may complicate this type of movement.
- Wheel or track marks to the new position may be left.
- Extensive coordination is required to avoid traveling through other unit areas.

The MLRS unit employing the terrain march may move in open column, in close column, or by infiltration.

Conduct of the Movement

Preparation for the move should include the following actions:

- Conduct preventive maintenance checks and services (PMCS) of equipment.
- Recover wire.
- Replace section equipment in the proper storage areas.
- Remove overhead cover and camouflage.
- Load all service elements, such as mess and maintenance.

The **organization** of the column varies according to the tactical situation, the threat, and the position to be occupied. The following considerations apply:

- Vehicles should be arranged in an order that facilitates speed, occupation of the new position, and defense during movement and occupation.
- Preparations should be made for personnel in convoy to return fire, if attacked.
- Key personnel and equipment should be dispersed throughout the column. This enhances command and control during attack and precludes losing a large number of critical soldiers and equipment to enemy action.

The following **control measures** help in the movement:

- The start point (SP) is a geographical feature, identifiable on the ground and on a map. It is the initial control point where the first vehicle of a unit convoy crosses at a specified start time.
- A checkpoint is a geographical feature, identifiable on the ground and on a map. It is used in reporting progress along the route of march and also as a target in planning fires in defense of the convoy.
- The release point (RP) is a geographical feature, identifiable on the ground and on a map. It is the final control point where the last vehicle of a unit convoy crosses at a reported time.
- A rally point is a geographical feature, identifiable on the ground and on a map. It is used as a point of assembly and recovery from dispersion due to enemy attack. The designated rally point(s) should be located near or on the alternate route of march to the new position.
- A route-marking detail marks the route by posting signs and/or personnel at critical locations to guide the convoy. Details concerning traffic control and route marking are in FM 19-25 and FM 55-30.
- Predetermined signals, such as colored flags and flashlights, should be established by SOP to aid in convoy control.

March Discipline

Officers and NCOs ride where they can best control and supervise the march of their units. The senior person in each vehicle is responsible for ensuring that all orders concerning the march are carried out.

The column must keep moving. The unit SOP should indicate who stops to pick up mission-essential personnel and equipment if a vehicle breaks down. Usually, the driver stays with the vehicle and the maintenance section stops to help. If the disabled vehicle cannot be repaired in a reasonable time or be recovered by the unit, the position and condition of the vehicle are reported to higher headquarters for recovery. To be available for the rest of the unit, the maintenance section must be prepared to proceed along the route of march independently and as soon as possible. The maintenance section and all other sections must have maps and must be thoroughly briefed concerning the route of march.

Each vehicle commander must watch for signs, markers, signals, and other traffic.

March discipline is attained through training and internal control within the marching unit. The specific objective of march discipline is to ensure cooperation and effective teamwork by march personnel as follows:

- Respond immediately and effectively to all signals.
- Relay all signals promptly.
- Obey traffic regulations and the instructions of traffic control personnel.
- Use cover, concealment, camouflage, dispersion, radio listening silence, blackout precautions, and other protective measures against air, ground, and NBC attack.
- Maintain correct speeds, positioning, and intervals between vehicles within the column.
- Recognize route-marking signals and signs.
- Use correct procedures for handling disabled vehicles.

During extended vehicle marches from rear areas to the main battle area (MBA), sites that provide cover and/or concealment should be selected for the halts needed to service equipment or to rest personnel. Security must be maintained at these locations.

March Column Contingencies

Immediate Action Procedures

An MLRS firing battery or platoon is a high-priority target for the enemy. The MLRS units are most vulnerable to attack while moving; therefore, they must establish an SOP for defensive actions if attacked on the march. In establishing this SOP, the BC or platoon leader must consider the following:

- Enemy situation (kinds of attack to be expected).
- Organic resources available to counter each kind of attack.

- Nonorganic support available to counter attacks (fire support from FA units and so on).
- Amount of time available for training the unit in particular defensive actions (such as infantry squad tactics in response to a blocked ambush).
- Type of comm system to be employed with defensive actions (flags, radio, arm-and-hand signals, and so on).
- Means of protecting the battery or platoon.
- Methods to neutralize the attack.

March Column Under Artillery Attack

The defensive action in response to artillery fire is to move out of the danger area, report the situation to higher headquarters, and request immediate counterfire. If a unit expects hostile artillery fire during the march, it can reduce its vulnerability by using one of the following methods of movement:

- Open column or infiltration.
- Movement during darkness or other periods of reduced visibility.
- Terrain march.

March Column Under Air Attack

Under an air attack, the unit should immediately engage the aircraft with all air defense weapons available in the column. At the same time, it should disperse off both sides of the road and halt. High-performance aircraft can be effectively engaged with low-volume, independent, small-arms fire. As the aircraft approach, all personnel in the column should fire their weapons in the air to form a wall of bullets through which the aircraft must fly.

Roadblocks

When halted by a roadblock, the unit must apply, on both sides of the roadblock, the maximum amount of firepower available. If nonorganic support is available, such as close air support or covering artillery or armor, the convoy commander or controlling authority should request it immediately. If the roadblock cannot be neutralized, the unit must disengage under cover of supporting fires. Upon disengaging, the unit should meet at a designated rally point and then resume its march by using an alternate route. An attempt to crash through a roadblock with vehicles before the roadblock is checked for mines can result in unnecessary loss of equipment and personnel. Also, the road may become completely blocked by disabled vehicles.

Ambush

There are two types of ambush—blocked and unblocked. Both must be countered in the same manner: Get out of the kill zone, and neutralize the ambushing force with firepower.

If the route is blocked, maximum available fire should be placed immediately on the attacking forces. Personnel in the kill zone should dismount, attack as infantry, and evacuate the kill zone as soon as possible. Convoy personnel not in the kill zone also must react immediately and outflank the ambushing forces.

In an unblocked ambush, the convoy should increase its speed and move through the ambush area while placing the maximum amount of small-arms fire on the attackers.

The area may have been identified during the map inspection as a likely ambush site, and on-call fires may have been planned. If so, the convoy commander or controlling authority executes on-call fires. Otherwise, he immediately sends a fire request to the FDC of the controlling FA headquarters.

The ambush or any other enemy action may be of such magnitude that the column is broken up. Then individual elements should go on their own to the new position or designated rally points.

Section IV
SURVEY AND METEOROLOGICAL SUPPORT

Survey Support

Each MLRS firing battery has a survey section, equipped with one PADS. It provides survey control for the primary, alternate, and future positions of the supported unit.

The accuracy of the data produced by PADS is directly related to the accuracy of its starting data. Whenever possible, starting data for the battery PADS should be at least of fourth-order accuracy. These data can be obtained from the SPCE at higher headquarters, from trig lists, or from other artillery units operating in the same area as the MLRS unit. When surveyed starting data are not available, PADS can use information from overprinted maps; from graphic resection; or, in the absence of these, from assumed starting data.

Survey control is provided to the platoons by the battery PADS team, using 10-minute zero velocity correction. The points the battery survey team establishes should be considered SCPs. Ideally, the SCPs are located on readily identifiable and accessible terrain, such as road junctions, every 6 to 8 kilometers throughout primary, future, and alternate OPAREAs. The launcher personnel must be able to locate each point and stop the launcher at the SCPs without excessive maneuvering. Within platoon OPAREAs, SCPs for launcher update are established at the entrance to the OPAREA and at the reload points. The POC personnel give SCP coordinates and altitude to each launcher section and the PADS survey section. Then they leave these data on a tag at a marker to identify the SCP.

The PADS section, located in the battery HQ area, coordinates survey with the advance party. The section ensures platoon SCPs are in place before the battery displaces. It is controlled by the BOC and directed to link up with the platoon leader requiring survey support. The locations of all SCPs are maintained on the BOC situation map or charts for future use. Upon completion of his survey mission, the PADS chief reports directly to the BOC for further instructions.

If there is no survey control, the platoon leader must establish alternate methods of survey. He uses one of the following options:

- Use adjacent unit SCPs or their survey assets to extend survey control into the OPAREA.
- Use SCPs outside the OPAREA. Depending on the number of SCPs and their distance from the firing points, this method may severely limit platoon operations, since launchers must be updated after 6 to 8 kilometers of travel.
- Use the launcher SRP/PDS to establish SCPs in the OPAREA by transferring survey from other SCPs and known points. This method may create some accuracy loss (accuracy depends on the distance traveled by the launcher); however, it is as accurate as hasty survey techniques up to an 8-kilometer transfer distance, and it is faster.
- Use hasty survey (graphic resection) to establish SCPs. The steps for establishing survey control through graphic resection are described in Appendix D. If hasty survey is used to establish an SCP, each launcher position determining system (PDS) should be updated after every 4 to 6 kilometers of travel.
- Use map spotting. Well-trained map readers using Graphic Training Aid (GTA) 5-2-12 often can establish an SCP to the same accuracy as by using hasty survey techniques. Map spotting should be used only as a last resort. Launchers using map-spotted SCPs should update their PDSs after every 4 to 6 kilometers of travel.

Meteorological Support

The MLRS is sensitive to met conditions and uses met message data as part of the fire direction computation. The on-board FCS of the launcher uses all lines of the current computer met message to compute rocket firing data.

Met messages usually are received in a digital secure mode from the controlling headquarters TACFIRE. They are routed through the battalion or battery FDS and sent to the FCS. The battery FDS sends met messages to all launchers and platoon FDSs simultaneously.

The platoon FDS can store the message and retransmit it to a launcher if necessary. Both the platoon FDS and the launcher FCS can be manually loaded with met data through keyboard entry if required.

The FDS interfaces directly with the met data system (MDS) or met measuring set (MMS). Current met information can be obtained by communicating directly with the MDS on the met section net. The MDS is deployed down to FA brigade; while the MMS is used by light infantry, airborne, and air assault division artilleries.

Section V

FIRE MISSION PROCESSING

Fire Direction Responsibilities

The FDS usually performs the fire direction tasks automatically. If the FDS in the FDC is inoperable, then either a platoon FDS processes the mission; or the BOC and/or FDC personnel manually perform these tasks. Responsibilities include the following:

- Target analysis and selection of type and number of rockets and/or missiles to fire.
- Down-range mask checks.
- Fire support coordinating measure and air corridor checks.

- Selection of platoon and launcher to respond.
- Transmission of fire orders.
- Recording the missions.

For MLRS rocket missions, the MLRS battalion or battery FDC determines the number of aimpoints and the number of rockets to fire at each aimpoint to achieve the required effects. Effects guidance is provided by the controlling FA headquarters on the basis of the maneuver commander's requirements.

Similarly, missile (ATACMS) missions can be processed by the MLRS battalion or battery FDC. The FDS can process targets to determine target aimpoints and the number of missiles necessary to achieve the required effects as specified in the commander's guidance. However, because of the deep, high-payoff nature of many ATACMS targets, effects processing may be done at levels above the MLRS unit. In this case, the unit receives the fire mission through the digital fire direction radio net or through the battalion CTT or GSM for manual input. The fire mission includes aimpoints, number and type of munitions (warheads) to fire, and any other targeting guidance.

Selection of the launcher to fire is based on information given to the BOC and/or FDC by the firing platoons. This information includes launcher and ammo status and the firing platoon leader's plan for use of his launcher sections in responding to fire missions. The platoon leader designates firing points and the preferred sequence of use for each of his firing sections. The battery FDC enters the platoon leader's data into the FDS and uses those data as the primary criteria for launcher selection.

The battery FDC is responsible for identifying potential down-range mask problems and ACA and other fire support coordinating measure (FSCM) violations. Down-range masks, ACAs, and other fire support coordinating measures are plotted on the fire direction capabilities map in the FDC and entered into the FDS. The battery FDS checks automatically for down-range mask, ACA, and other FSCM violations. The results of these checks may require the FDC to select a different platoon or launcher to fire or to defer the mission. The MLRS battalion FDS also automatically checks down-range mask when selecting a firing battery to fire. Down-range masks, FSCMs, and ACAs are plotted on an overlay of the fire direction capabilities map. Any FSCM and ACA violations should be reported to higher HQ.

The battery FDC sends the call for fire directly to the launcher selected to fire the mission. Usually, it is transmitted over the battery fire direction net (FM digital) from the FDS to the launcher FCS. The appropriate platoon HQ monitors the fire order with its FDS. The platoon FDS can be used to relay digital messages between the FDC and the launcher. If digital traffic is not possible, the mission can be sent to the launcher over the battery command net (FM voice) for the crew to input through the fire control panel.

Firing Data Computation

The FDS does all fire mission functions except compute the actual firing data. This function is controlled by the launcher FCS. When the FDS is operational, FDC personnel, at a minimum, record and print the mission and plot the target on the fire direction capabilities map. The fire mission log may be used to record the mission if the FDS printer is not operational. The data recorded on the fire mission log include the following:

- Target number.
- Target grid.
- Unit assigned—launcher, platoon, or battery.
- Time of receipt.
- Number of rounds—volleys or percent of effects.
- Ammo type.
- Method of control and/or TOT time.
- Time to send to launcher.
- Mission status.
- Time mission fired report received.
- Number of rounds fired.
- Remarks.

CHAPTER 7

MLRS FIRING PLATOON OPERATIONS

The operational unit of the MLRS battery is the MLRS firing platoon. It conducts semiautonomous operations under the control of the battery, occupies an independent area of operations, and conducts its own RSOP. The MLRS firing platoon can be considered analogous to a cannon firing battery for fire support, positioning, and logistics considerations. (For discussion of the FA cannon battery, see FM 6-50.) The MLRS firing section (one launcher) is analogous to the cannon battery or platoon in that each is considered a unit of fire. Tactically, the platoon leader must do all of those tasks usually associated with the cannon battery commander. The leaders of the firing platoon must be innovative and creative in their approach to operations. The uniquely independent operations of an MLRS firing platoon place great responsibility on personnel to meet their missions. Instructions covering features of combat operations which lend themselves to definite or standardized procedures without loss of effectiveness should be covered by TSOP. Preparation of MLRS platoon TSOPs is normally guided by a battery TSOP. (For a guide and checklist for preparing an MLRS battery TSOP, see Appendix B.)

Platoon Headquarters

Platoon Operations Center

The POC is located in an M577A2 with an FDS. The POC is manned by MLRS fire direction personnel and is supervised by the platoon leader or the platoon sergeant. The recon sergeant also may work in the POC when he is in the platoon HQ position. The platoon leader or platoon sergeant should locate the POC on elevated terrain for communications and should center it in the platoon HQ position for maximum protection against ground attack and ease of platoon internal wire communications.

Command and Control

The platoon leader and platoon sergeant are responsible for the command and control of platoon operations and for advising the BC and/or BOC on their launcher and ammo status. The BC and/or BOC direct the platoon leader and sergeant concerning the specific number of operational launchers that are postured for specific munitions and ready to fire status. Because of the limited number of personnel available, the platoon leader and platoon sergeant usually work shifts; thus, they keep the POC operational 24 hours a day. They are responsible for coordinating ammo resupply with the BOC. The POC personnel monitor all traffic between the BOC and the launchers by using the platoon FDS. Loss of the platoon FDC would severely hinder platoon command and control. The BOC personnel maintain a DA Form 1594 and a DA Form 7232-R. (A reproducible copy of DA Form 7232-R is at the back of this book.) An example of an MLRS FDC Fire Mission Log is shown below.

MLRS FDC FIRE MISSION LOG

MLRS FDC FIRE MISSION LOG

For use of this form, see FM 6-60. The proponent agency is TRADOC.

DATE: 30 MAR 92 — UNIT: 2/A/4/27/FA

TARGET NUMBER (a)	TARGET EASTING (b)	TARGET NORTHING (c)	UNIT ASSIGNED (d)	TIME OF RECEIPT (e)	NUMBER OF ROUNDS TO FIRE (f)	AMMO TYPE TO FIRE (g)	METHOD OF CONTROL TOT TIME (h)	TIME MSN SENT (i)	MISSION STATUS (j)	TIME MSN RECEIVED (k)	NUMBER OF ROUNDS FIRED (l)	REMARKS (m)
XA 0011	6812	1624	1-1-A	2330	12	JEO	AMC	2331	READY	2332	12	EOM
XA 0013	6747	1581	1-3-A 2-3-A	2335	15	JEO	2350	2334	READY	2335	15	EOM 1-3-A & 2-3-A
XA 0016	6688	1589	2-1-A	2336	8	JEO	WR	2336	READY	2336	8	EOM
XA 0018	6751	1499	1-2-A	2340	6	JEO	WR	2340	CANCOM	2341	0	EOM Ammo Prob—FP A6
XA 0018	6751	1499	3-2-A	2341	6	JEO	WR	2342	READY	2342	6	EOM Reassigned from 1-2-A
						31 MAR 92						
XA 0001	6915	1833	2-1-A	0015	2	JEE	0030	0016	READY	0016	2	EOM

Support

The POC is the hub of platoon support activities. The attached MST stays with the platoon HQ and is deployed in accordance with (IAW) unit SOP. Launchers, in an inoperational (INOP) status move to the platoon HQ area to reduce the command, control, and resupply burden.

Operational Area

An MLRS platoon area should be large enough to be trimmed to a 3- by 3-kilometer (goose egg) OPAREA by the platoon leader's map and ground recon. Smaller areas severely restrict the platoon leader's employment options, the length of time the platoon can stay there, and the survivability of the platoon. The entire OPAREA may not be used intensively. However, after use by MLRS launchers, the firing point (FP) areas may be subjected to intense enemy counterfire; therefore, they are considered highly dangerous. Except for cases of tactical neccessity, launchers should use a firing point only once. The signature of the M270—noise, smoke, and fire—make it easily identifiable from a great distance, especially in open terrain. Quality terrain is desired by all units, and parts of the MLRS platoon OPAREA can be used by other units. However, units are discouraged from occupying positions within 500 meters of any FP. There are six types of positions within the OPAREA; each type may have several locations. These positions are discussed below.

Firing Point

Each platoon OPAREA should have at least nine FPs, three for each launcher. Each launcher section chief is responsible for selecting his firing points. The platoon leader should select desired firing areas from which firing points are selected. The following are considerations in selecting a firing point:

- It should be on a level point within 150 meters of the given FP grid from which a launcher can fire. (The launchers cannot fire from slopes greater than 89 mils.)
- There should be no immediate mask in the probable direction of fire.
- Hide areas (HAs) should be located within 20 to 100 meters of the FP.
- The FP may be located on a road. (For rocket missions, the road should be perpendicular to the general azimuth of fire; and for missile missions, the road should parallel the general azimuth of fire. The road should lead directly to the RL or the next FP. This reduces ground signature, response time, and time required to "scoot.")
- Communications must be established with the BOC and the POC.

Hide Area

The hide area is selected by the launcher section chief. It is an area in which to hide the launcher while awaiting a fire mission. It should be a covered and concealed position close to the designated FP (not more than 100 meters away). A launcher in the HA must be able to communicate with the POC and should be able to communicate with the BOC. The HA should be on a road leading to the FP to reduce ground signature and to speed response time.

Reload Point

The reload point is where the launchers upload launch pods and the HEMTT-HEMATs off-load. This is the most vulnerable point for each element. Each platoon OPAREA should have at least two RLs. They should be collocated with SCPs to reduce travel time and the distance of the launchers. The RL selection is based on the following:

- Cover and concealment for a HEMTT-HEMAT and launcher in the position at the same time.
- Maneuver room for the 100-foot turning radius of the 55-foot-long HEMTT-HEMAT.
- Firm ground or pavement for supporting vehicles and launch pods.
- Covered and concealed route from AHA to RL.
- Trafficability.

Survey Control Point

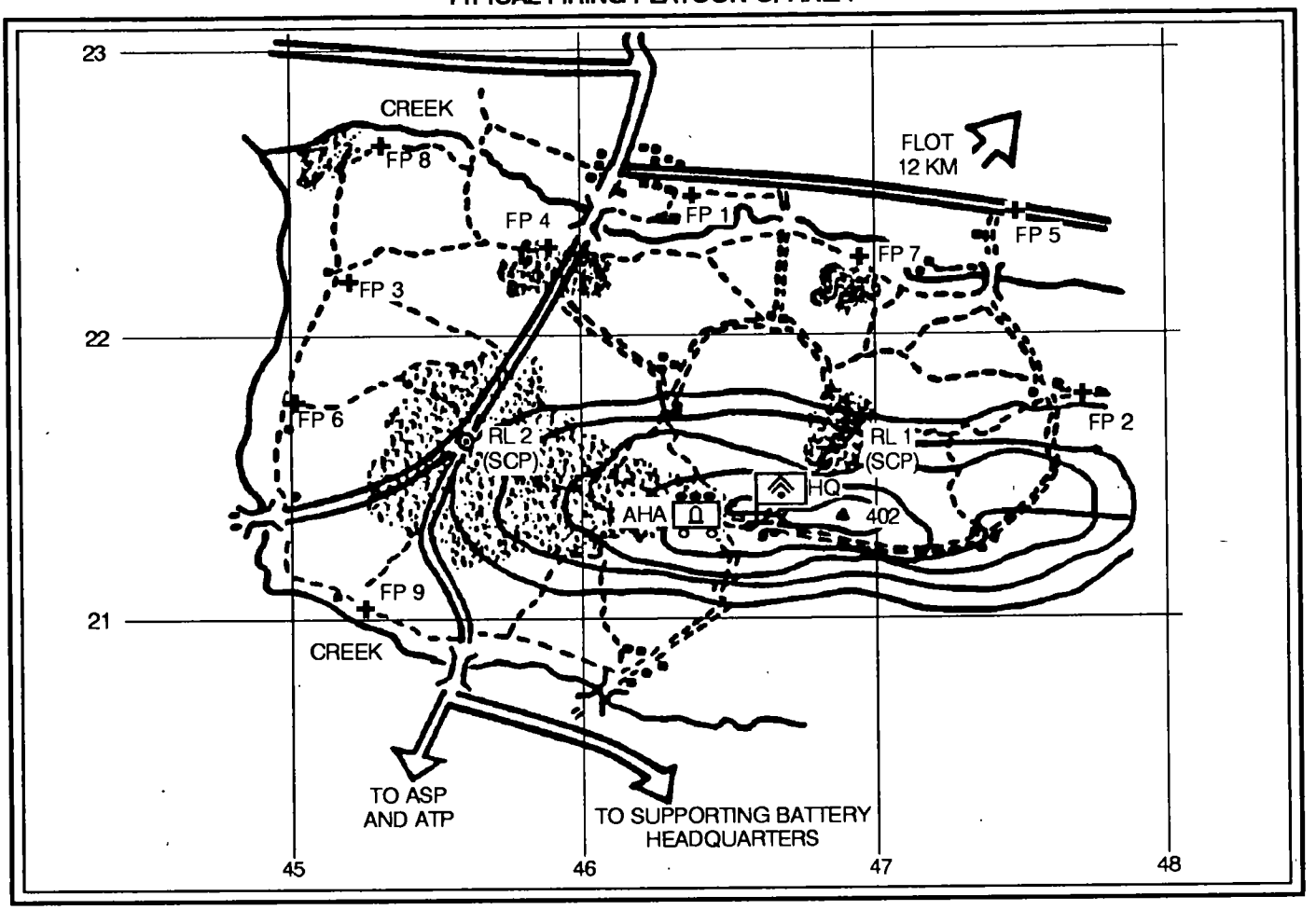
The SCP is where the launchers update or begin calibration of the SRP/PDS. At least two SCPs should be established in the OPAREA. These should be collocated with the RLs, as mentioned above. The same considerations, except in the area of Class V resupply, apply for SCPs as for RLs.

Platoon Headquarters

Platoon HQ is where the M577A2 CP track, the platoon leader's HMMWV, the recon sergeant's HMMWV, and, if attached, the 27M DS MST vehicles are positioned. Normally, inoperational launchers (being serviced, crew resting, and so on) are also positioned here. Each platoon OPAREA should have a primary platoon HQ location and an alternate location, if possible. The platoon HQ location is based on the following:

- Optimum communications with the BOC and launchers.
- Cover and concealment.
- Comm mask between the position and the enemy.
- Defensibility with the AHA.
- Trafficability.

TYPICAL FIRING PLATOON OPAREA



Ammunition Holding Area

The AHA is where the attached ammo section positions its vehicles (four to six HEMTT-HEMATs). It can be collocated with the platoon HQ if the ground threat is greater than the air attack or counterfire threat. Otherwise, the AHA should be 100 to 300 meters from the platoon HQ and astride the main entrance route into the platoon HQ for entry control. The AHA selection considerations are as follows:

- Cover and concealment.
- Trafficability.
- Maneuver room for the 55-foot-long HEMTT-HEMATs.
- Proximity to the MSR.
- Defensibility with platoon headquarters.

Reconnaissance, Selection, and Occupation of Position

Procedures

The platoon leader receives the general proposed location, in the form of a goose egg, from his BC by either digital, voice, or messenger communications. Leaders in the platoon should follow the RSOP procedures in Chapter 6. A sample platoon RSOP procedure is outlined below.

Recon Party. Reconnaissance is the responsibility of the platoon leader and the primary duty of the recon sergeant. The recon party also may include the platoon sergeant in the platoon leader's absence and/or the ammo section chief (or his representative) to advise on AHA positioning.

Moving the Platoon. One of the advantages of MLRS is that the system requires very little, if any, position preparation. The MLRS firing platoon uses no advance

party. The position preparation that does occur is either completed during the reconnaissance or does not impact on operations and is completed after occupation. When the commander has directed that the platoon maintain a firing capability during the displacement, the unit moves by platoon echelon. This means that the platoon leader moves a launcher, an ammunition HEMTT/HEMAT, the battery PADS vehicle, and a fire direction specialist forward before the main body. If the platoon moves by echelon, the first echelon normally completes the tasks below; otherwise, the recon party completes them or they are done after occupation.

- Coordinates and emplaces SCPs.
- Conducts a mounted security check of the platoon headquarters and AHA positions.
- Establishes communications with the BOC and assumes command and control when the main body with platoon headquarters moves.
- Lays wire line from platoon headquarters location to the AHA and/or entry control point.
- Occupies a firing point with one launcher and notifies the BOC of platoon OPAREA data and single firing point information. When the launcher is operational in a new OPAREA, the BOC normally directs the platoon main body to displace.

Considerations

The arrangement of the platoon OPAREA depends on METT-T. Primary considerations in the recon and selection are based on the following:

- Communications with the BOC.
- Open areas for firing points.
- Dispersion requirements of platoon locations; for example, FPs, HAs, RLs, SCPs, platoon HQ, and AHAs.
- Maximum cover and concealment for the platoon HQ, HAs, RLs, SCPs, and AHAs.
- Trafficability within the OPAREA and location of the MSR.

Trafficability

Trafficability is absolutely critical to MLRS operations. The recon party must develop a sound traffic plan. Considerations are discussed below.

Limitations of the HEMTT-HEMAT. The HEMTT-HEMAT—

- Bogs and slides easily on soft, muddy, snowy, sandy, or icy surfaces.
- Requires a 100-foot radius for turning. Routes requiring sharp turns or positions requiring turnarounds must be carefully checked.
- Is top-heavy when fully loaded.

Limitations of the Launcher. The launcher leaves a readily identifiable signature on the ground when it pivot-steers or turns sharply. Routes that would require such maneuvers should not be used.

Roads, Clearances, and Grades. All positions should be placed on or near roads, if possible. Special consideration should be given the following:

- Road widths (urban areas) and grades (steep slopes for winter and wet weather usage).
- Tunnel heights and widths.
- Bridge capacities.
- Overhead electrical wires (train, telephone, power, and so on).

Serviceability of Roads. Hard, all-weather roads must be used, if possible, to prevent bogging down vehicles and leaving ground signatures.

Routing. The traffic pattern should route all HEMTT-HEMAT runs to RLs that are away from FPs (where counterfire is heaviest). Launchers should operate in separate road network areas where they will not risk collision in poor visibility, at high speed. The HEMTT-HEMATs should be routed away from these areas for the same reason. Main enemy avenues of approach and major friendly MSRs should be avoided, as both bring unwanted traffic and attention to the OPAREA.

Displacement Route. A recognizable displacement route from the OPAREA for all elements should be established.

Dispersion

Part of the survivability of MLRS is based on dispersion within the OPAREA. Minimum preferred distances between elements are defined below.

The **firing point**, the likeliest point for receiving counterfire, should be at least 500 meters from any other FP (800 meters is preferable) and 800 meters from any other position or element within the OPAREA except hide areas.

The **reload point** should be at least 800 meters from FPs and at least 500 meters from any other element or location.

Survey control points are usually collocated with RLs. If not, the same dispersion rules should be followed as for RLs.

The **platoon HQ** and **ammunition holding area** are located within the above restrictions. They can be collocated or separated by up to 300 meters, depending on the situation and METT-T.

Security

Because of the limited number of personnel, lack of crew-served weapons, and large size of the platoon area, defense against a ground attack is limited. The keys to survivability are the avoidance of detection and passive defense. The platoon sergeant is in charge of the platoon area security and does the following:

- Coordinates with DS cannon and maneuver units within the OPAREA for direct fire support.
- Uses mines and trip flares if available. (This requires extensive coordination.)
- Gives a rendezvous grid to each launcher for use in case of hasty or emergency displacement.
- Places the M60 machine gun on the most likely avenue of approach to the platoon HQ (usually with LP and/or OP at the entry control point in the AHA).
- Has launcher chiefs dismount one man in the HA to provide local security, except during a fire mission.

Launcher Survey Control

Calibration

The crew calibrates the launcher SRP/PDS every 30 days or whenever the launcher track system or SRP/PDS is replaced or repaired. The launcher requires two SCPs, 4 to 6 kilometers apart, located to at least fourth-order accuracy. One point is used to initialize the SRP/PDS for location. The launcher is driven to the second SCP at about 40 kilometers per hour, and the first set of calibration corrections is determined. The launcher is then driven back to the starting SCP, where a second set of calibration data is computed. If both sets of calibration data are within tolerance (0.4 percent of distance travelled), the system is functional and the second set of data is used.

Update

To update the SRP/PDS position, the crew drives up to an SCP and enters the data from the point into the FCS. An updated SRP/PDS holds its firing accuracy up to 8 kilometers before requiring another update.

Survey Control Points

Although cover and concealment are factors in SCP selection, utility should be the primary consideration. The SCP must be readily accessible so the driver can stop the launcher with the rear edge of the left drive sprocket aligned next to the SCP marker. The area and SCP marker must be such that the driver can position the launcher without ground guidance or excessive maneuvering. The SCPs should be collocated with a reload point, if possible. This allows easy return of the launcher to operational status.

Alternate Survey

If PADS support is not available, survey control can be obtained from trig lists, from adjacent unit survey, by transferring survey with the launcher SRP/PDS, and by other means. (See Chapter 6 for more information on alternate means for establishing survey control.) Graphic resection and map-spot data are not considered adequate for launcher initialization or calibration except in an emergency situation.

Launcher Response Posture

Definitions

On the basis of METT-T, the force FA commander's guidance, and ammo resupply and launcher maintenance status, the commander determines how his unit launchers will be postured. A launcher response posture is its readiness to respond to fire missions. Through several generations of software for the FCS and FDS, the terms *hot, cool,* and *cold* have come to indicate launcher response posture.

Hot. Hot status indicates the launcher is fully capable of firing. Usually, the status is based on the launcher's electrical and mechanical systems, not on its location or ammunition load. A launcher may be hot and, therefore, mechanically capable of firing. However, it may not be on or near an FP; or perhaps it may not have any, or enough, or the right type of ammunition aboard.

Cool. Cool status indicates a launcher is capable of firing but only after a warm-up period.

Cool status indicates the launcher SRP/PDS has been turned off but that all other systems are on and fully functional. To reduce long-term wear on the components, the crew enters the FCS auxiliary menu, selects SPLL COOL, and turns the SRP/PDS off. About 8 minutes are required to align the SRP/PDS and return it to operational capacity when it is turned on again.

The FDS is notified of SPLL COOL status when the crew sends a LCHR LST launcher status message, indicating that the launcher is INOP—SPLL COOL. The FDS will not select an INOP launcher to fire.

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

Technical Posturing

Fire Control System Posturing. The launcher crew makes one or more entries into the FCS to notify the BOC of the launcher status and location. These LCHR LST messages are entered as launcher OPER or INOP. Additional explanatory entries and the launcher's current location and altitude are entered.

OPER. Upon entering OPER into the LCHR LST message, the crew must choose a numeric code to further identify the launcher status. For OPER messages, these are location codes. When LCHR LST is sent, the FDS displays the launcher status (OPER or INOP), current ammo load, and code location (FP and so on). Code messages may be assigned by unit SOP; however, only the code number will appear on the FDS. For example, OPER 06 might indicate that the launcher is fire-mission-capable but is displacing with the platoon to a new OPAREA.

INOP. The crew usually sends an INOP LCHR LST message to the BOC when the launcher is NMC. Instead of indicating locations, like OPER codes do, INOP codes indicate reasons for the launcher being INOP. The codes may be assigned messages under unit SOP. The messages are displayed on the FDS when LCHR LST is transmitted. For example, INOP 07 might mean that the launcher is INOP if the crew is conducting PMCS or refueling.

LCHR LST. After entering the OPER or INOP codes, the crew must verify and enter the launcher's grid coordinates and altitude for transmission to the FDS. LCHR LST is transmitted after the location fields are edited. The LCHR LST messages can also be used to send additional information. If a fire mission is stored in the FCS, the crew edits and transmits the fire mission target number. If no fire mission is stored, the target number is sent blank. The number and type(s) of rockets on board also can be sent. This updates the FDS on the launcher ammo load. If the LLM has been laid for a fire mission, the crew can transmit azimuth of fire, quadrant elevation (QE), and fuze time. If the LLM is not laid, these data are all zeros.

Fire Direction System Posturing. The FDS shows launchers as either OP, PART, MOBL, COOL, or INOP. The MOBL, COOL, or INOP launchers are not considered by the FDS when selecting a launcher to fire. The FDS continuously displays each launcher status as well as the code location and/or reason for the status. This provides easy reference for the BOC personnel in determining the battery's overall and individual launcher status and location. The FDS also can transmit a command message to a launcher, directing the crew to bring the launcher to a hot (OP) status. This message automatically turns on the SRP/PDS to begin the process.

Tactical Posturing

The BC directs the platoons to have a specific number of launchers in hot (OPER) status. The number is based on guidance from the controlling FA headquarters, METT-T, total launchers available, ammunition available, crew available, and fatigue. The platoon gives the BOC information on crew and launcher status and decides which launchers to posture as directed. The platoons usually rotate their launchers through hot status, changing individual launchers and maintaining the total number of required hot launchers.

The commander can further modify these postures by using the OPER and INOP entries. For instance, he wants the FDS to select launchers to fire only if they are fully loaded and positioned in HAs. Therefore, he directs all crews to send INOP LCHR LST messages under all other circumstances. These INOP LCHR LST messages could be misunderstood to indicate NMC launchers. Therefore, they might be submitted as INOP—SPLL COOL, indicating that they are only temporarily INOP because of their location or ammo status. Launchers sending INOP—SPLL COOL LCHR LST messages, like those sending other INOP LCHR LST messages, will not be selected by the FDS for fire missions.

Fire Mission Cycle

The BOC processes fire missions for the MLRS firing battery. Mission assignments given the BOC by each firing platoon HQ are based on the following information:

- Platoon OPAREA.
- Grid locations of FPs and RLs.
- Requested and actual SCP locations.
- Requested FP and RL employment sequence.
- Number and type of rockets or missiles currently on board each launcher and on HEMTT-HEMATs in the platoon OPAREA.
- Launcher status and locations.

CHAPTER 8

MLRS COMMUNICATIONS

The ability of MLRS units to provide fires depends on a responsive, dependable comm system. The MLRS units must be prepared to rely on voice and/or digital radio communications, usually over long distances, with many diverse and highly mobile units. They will accomplish radio communications by using the new SINCGARS FM radios and the new IHFRs.

Responsibilities

The successful execution of a mission requires an understanding of the fundamental responsibilities so that all elements work toward establishing and maintaining the critical comm links.

Commander. The commander is responsible for the adequacy and proper use of the comm system within his command. He is also responsible for its efficient operation in the system of the next higher command. The authority to establish, maintain, control, and coordinate the various comm systems within a command may be exercised by a subordinate in the name of the commander. The responsibilities of the commander, however, cannot be delegated.

Echelons of Command. The senior unit is responsible for the establishment of communications with its subordinate units, whether organic or attached. This responsibility is mainly one of planning and directing the establishment of the linking comm systems, since assets belonging to either the senior headquarters or the subordinate unit may be used (senior to subordinate).

Tactical Missions. Comm responsibilities are inherent to tactical artillery missions. Normally, tactical artillery missions are assigned only to a field artillery battalion. Each of the four standard tactical missions have seven inherent responsibilities. One is the establishment of communications.

Direct Support. An artillery unit with the mission of direct support has the responsibility of establishing communications with the supported maneuver unit headquarters (supporting to supported). Normally, an MLRS unit is not assigned this type of mission.

Reinforcing. An MLRS unit with the mission of reinforcing must establish communications with the reinforced artillery unit headquarters (reinforcing to reinforced).

General Support. An MLRS unit with the mission of general support does not have an inherent responsibility for establishing external communications with any other unit. However, the senior MLRS unit must establish communications with its subordinate MLRS units (senior to subordinate).

General Support Reinforcing. An MLRS unit with the mission of general support reinforcing must establish communications with its subordinate MLRS units and with the reinforced artillery unit headquarters (senior to subordinate and reinforcing to reinforced).

Battle Area. Lateral commands must maintain communications with each other to ensure coordination of the combat effort. The command on the left establishes communications with the command to its right, as facing the FEBA or FLOT (left to right).

Joint Maintenance. Regardless of who is responsible for establishing a comm system, all units being served by the system help restore it if it is disrupted.

Net Discipline. This responsibility must be self-policing and required of all elements. For example, voice traffic can be carried over the FM digital fire net, but it should be avoided if at all possible to prevent disruption of digital transmission. The net control station (NCS) is responsible for enforcing net discipline.

User Responsibilities. The comm equipment in an MLRS unit is becoming general purpose user (GPU). This means that the user of the equipment must install, operate, and maintain his organic terminal devices according to the standards and procedures established by the technical manual (TM).

MLRS Battalion Communications

Type of Unit. The MLRS battalions may be organic or attached to field artillery brigades or organic to corps artillery. The model is the 3 x 9 MLRS battalion. Units with MTOEs other than the model will have to adjust accordingly.

External Communications. The battalion operates on three external FM and two AM radio nets to communicate by voice and digitally with higher headquarters.

Force FA Cmd Net (VHF-FM)(V). This secure net is the primary voice (V) command and control link between higher headquarters and the MLRS battalion.

Force FA Ops/F Net (VHF-FM)(D). This secure net provides the digital link between the battalion FDS and the controlling headquarters TACFIRE.

Force Admin/Log Net (VHF-FM)(V). The battalion ALOC operates in this secure net on an "as required" basis.

Corps Arty Cmd and Ops/F Nets AM/SSB)(V-FAX). These nets provide the battalion link to the corps headquarters. One radio is on the corps cmd net, and the other radio is on the corps ops/F.

> **Note.** Radio set AN/GRC-193 will replace RATT AN/GRC-142. Radio set AN/GRC-213 will replace radio set AN/GRC-106.

Internal Communications. The MLRS battalion communicates with the subordinate batteries mainly by secure FM voice and secure digital means. Wire is used only within the battalion headquarters, headquarters and service (HHS) elements because of the position of the batteries and the limited quantity of wire.

Battalion Cmd Net (VHF-FM)(V). This secure net is the main voice cmd and control net used by the commander, his staff, subordinate commanders, and BOCs and as an alternate fire direction (FD) net. The NCS is the battalion O&I section.

Battalion Fire Direction Net (VHF-FM)(D). This secure net is used exclusively for digital (D) communications between BOCs. No voice traffic should be used on this net. The NCS is the battalion FDC.

Battalion HF Cmd/Ops Net (HF-AM)(V or D). This net facilitates secure long-range communications between the battalion FDC and the BOCs. This net uses an HF AM radio for voice or digital communications with the batteries.

Battalion Admin/Log Net (VHF-FM)(V). This secure net is used to reduce the amount of traffic on the cmd net. The NCS is the ALOC.

to be fired at a target. This information may be transmitted from higher headquarters or manually input. It is recorded on the TTU, which stores the data after setup. When this message is executed during setup, the SYS;AUTO message is displayed.

The **SYS;AUTO** message is used to select certain messages for automatic processing. Once the setup data are completed, the FDS is ready to receive data base information.

> **Note.** Procedures for system setup and communications are discussed in TM 11-7440-283-12-1-2-1, Chapter 4. The full setup process is referred to as a cold start.

FDS Data Base

After setup is complete and communications have been established, the operator must build the data base. The data base is a collection of information including the general area of operations (map mod), met data, down-range masks, FSCMs, ACAs, ammunition, and fire unit locations. The information for the data base may be received by voice or in written form for manual entry or by digital traffic for automated processing.

Establishing and maintaining the data base are the most difficult and time-consuming tasks the FDS operator has. Without accurate and up-to-date data, the MLRS unit cannot perform its mission of providing timely and accurate fires in support of combat operations.

FDS DATA BASE STORAGE CAPABILITIES

DATA TYPE	NUMBER
Map Modification (MAP MOD)	1
Meteorology (met) files	(4)
• Computer Met (MET; CM)	2
• Target Area Met (MET; TA)	1
• Target Area Low Level (MET; TALL)	1
Fire Units	(36)
• Launchers	18
• Platoons	18
Firing Point	81
Survey Control Points	18
Ammunition Storage Sites	32
Battlefield Geometry (BGEOM)	(45)
• Airspace Coordination Area (ACA)	10
• Downrange Masks (DRMASK)	15
• FSCM	(20)
– Coordinated Fire Line (CFL)	20
– Fire Support Coordination Line (FSCL)	1
– Restictive Fire Area (RFA)	20
– Restictive Fire Line (RFL)	20
• Crossover Geometry (CROS)	20
• Target Geometry (TGTG)	20
• Zone of Responsibility (ZNE)	20
Rendezvous Points	9
Hide Areas	81
Postures	27
Datums	60

Section II

FIRE PLANNING

Commander's Criteria

The commander influences TACFIRE or LTACFIRE tactical fire control (TFC) solutions by establishing his commander's intent, which is used to develop the commander's criteria for engaging targets. These criteria guide the computer selection of units to fire, munitions, and volume of fire for each mission. The TACFIRE selects targets for MLRS engagement. It helps in the fire planning, collation of intelligence, and TFC for MLRS.

The commander's criteria should be entered into TACFIRE before the fight begins. When they have been entered, the computer will execute the criteria without a delay in fire mission processing. (See TC 6-40A for more information.)

Commander's criteria are established, are updated as the situation changes, and may be overridden manually whenever a situation warrants. As circumstances and SOP dictate, the battalion operations officer, battery

operations officer, and/or fire direction personnel can override the commander's modifications on a mission-to-mission basis. A specific request for fire overrides the commander's criteria. Extreme care must be used in modifying the execution of the commander's criteria, since their effect on the TACFIRE (or LTACFIRE) and FDS solutions influences the outcome of the battle.

The parameters involved in establishing the commander's criteria are discussed below.

In assigning a tactical mission (GS, GSR, or R) to MLRS, particular attention must be paid to the maneuver commander's content. In assigning MLRS units a GS or GSR mission, the force FA headquarters commander's criteria are used. When an MLRS unit is given an R mission, TACFIRE uses the reinforced unit commander's criteria; this causes a change in the FDS data base.

These examples of commander's modifications should be considered when determining how to implement the commander's guidance. Together, they will make up the commander's criteria for the TFC for MLRS.

Ignore Ammunition

The IGAMMO (ignore ammunition) modification directs the computer to select units to fire regardless of the ammunition on hand. This keeps a fire unit from being excluded solely on the basis of not having the required ammunition. When IGAMMO is in effect, the controlled supply rates are violated, since all ammo constraints are ignored. Fire planners use IGAMMO in the fire planning modifications when planning future fires to determine ammo requirements. Usually, IGAMMO is not used for current TFC operations.

Maximum Rockets

The commander can limit the number of volleys that a fire unit or weapon type may fire against a single target or target type. MAXRKTS (maximum rockets) is specified for each weapon type and applies to each fire unit with that weapon. The lower the MAXRKTS, the more fire units the computer must select to achieve the required volleys or desired effects on a target. If not specified for a particular weapon type, MAXRKTS defaults to six rockets.

Fire Unit Selection

The commander can assign an ordering number for each battalion and each fire unit within a battalion. He must be careful when ordering fire units, because the one ordered first will always be chosen before others. Therefore, it is recommended that all units be ordered equally. Fire units can then be selected on the basis of busy status, frequency of assignment, and the order entered into the AFU file.

Exclusions

A commander can exclude fire units, weapon types, shells, or fuzes from consideration during TFC. The MLRS FDS can exclude fire unit, warhead, rocket, and missile types.

Attack Methods

The attack methods table in the computer defaults to a desired effects value of 10 percent for M77 DPICM effects-type targets. Default value for ATACMS is 30 percent. An MLRS standard volleys factor (SVF) of six is the default for all volleys targets. The commander can override the attack criteria for each target type and can specify an SVF for an effects target. However, he cannot specify desired effects for a volleys target. For a volleys target, the SVF works with the volleys size factor (VSF) to generate the computer recommendation for the total number of volleys to fire on the target. The FDS or TACFIRE operator can override attack criteria by assigning the number of volleys to fire on the target on a mission-to-mission basis for either effects or volleys targets. Effects processing for MLRS targets is performed by battalion, battery, and platoon FDS—not by TACFIRE.

Munition Selection Matrix

The table below gives the fire planner a matrix for determining the best MLRS munition with which to defeat a target.

MUNITION SELECTION MATRIX

MUNITION	CHARACTERISTICS	TARGETS
M26 Rocket	M77 DPICM 644 Bomblets Per Rocket	Personnel Light Armor and Soft Vehicles
M39 Missile	M74 APAM 1,000 Bomblets Per Missile	Personnel and/or Materiel

transportation. However, a unit may not be able to transport its entire basic load in a single lift. Unit transportation assets are based on resupply rate, not the higher basic load. The major Army command (MACOM) establishes the stockage level for the UBL. The basic load includes MLRS launch pods, small-arms ammunition, explosives, mines, fuzes, detonators, pyrotechnics, and associated items. It does not include TOE items, such as explosive components of sets or kits.

Required Supply Rate. The required supply rate (RSR) is the estimate of the amount of ammunition needed to sustain operations, without restrictions, for a specific length of time. The RSR is a result of the unit forecast for ammunition, which is based on the tactical situation and mission. The MLRS battalion S3 or div arty S3 and divisional MLRS battery commander are responsible for determining ammo requirements and submitting forecasts to the next higher headquarters. The RSR is expressed in terms of rounds per unit, per individual, or per weapon per day. The unit RSR is reported as part of operations or logistics reports. These requirements are compared with assets expected to be available for the period to determine the controlled supply rate (CSR).

Controlled Supply Rate. The CSR is the amount of ammunition use that can be sustained with available assets. The CSR also is expressed as rounds per unit, per individual, or per weapon per day. The theater commander determines the CSR for each item of ammunition. In turn, the commander of each subordinate tactical unit determines a CSR for his units at the lower levels. The CSRs for individual items may vary from one command to the next. The corps commander uses the CSR to prioritize unit ability to expend ammunition, consistent with the mission requirements of the overall force. This ensures enough ammunition for all units on the basis of their missions. The CSR may be communicated to subordinate commands through the logistics support channels; or it may be published in the OPORD, a fragmentary order (FRAGO), or the fire support portion of the OPORD. The statement "The CSR is the RSR" is used if there are no restrictions. Except in emergency situations, units may not draw more than their CSRs without authority from their next higher headquarters.

Expenditure. This is the amount of ammunition used by a unit. During combat, ammunition is considered expended at the corps level when the ASP issues it to the user. Ammunition for the ATPs is considered expended when it leaves the CSA or ASP for the ATP.

Battalion and Battery External Resupply

The MLRS battalion S4 or MLRS battery commander plans for all Class V resupply. He uses input from the battalion commander, the battalion and div arty S3s, or the operations officer and ammo platoon leader. If low density munitions are stored at different locations, the unit may need to dedicate an appropriate number of RSV/Ts for resupply as required.

Resupply Options

The tactical situation dictates which of three options for resupply is used by the MLRS unit.

Decentralized. This option requires ammo crewmen to drive their RSV/Ts straight from the firing platoon AHA to the ATP or ASP for resupply. This option requires well-trained ammo personnel, since they must navigate to the ATP or ASP on their own and complete the required documentation for ammo pickup. This option eliminates the time-consuming stopovers at the battery AHA and/or battalion trains areas. This option is most appropriate when the ATP or ASP is located close to the platoon area and there is a high demand for ammunition.

Centralized. This option centralizes control of the resupply assets under the BOC and ammo platoon headquarters. The RSV/Ts of the ammo platoon are divided between the three firing platoon AHAs and the battery AHA. Firing platoons send empty RSV/Ts to the battery AHA, and full replacement RSV/Ts from the battery AHA are sent back. When several empty RSV/Ts are gathered at the battery, they are dispatched in convoy to the supporting ammo resupply location. Normally, the convoy is led by the ammo platoon sergeant, who handles all documentation and any coordination at the supporting ammo resupply location. This is the normal method of resupply during most operations.

Consolidated. The MLRS battalion may choose to allocate a number of RSV/Ts from each battery to the battalion trains to be used as a reserve and/or battalion-level AHA. Drivers bring empty RSV/Ts to the battalion trains, where they up-load and return to the batteries and platoons. Drivers from the battalion trains convoy directly from the trains area to the supporting ammo resupply location. There they refill, return, and transload to empty RSV/Ts from the batteries. This option reduces navigational errors caused by unfamiliar routes, since the battery drivers do not go any further than the battalion and the battalion drivers make the same circuit to the ATP or ASP.

Routing

Ammunition resupply routing must be carefully coordinated and controlled, since MLRS batteries may have to go to more than one location for ammunition. Movement on MSRs will require clearance by the appropriate MCC. The MLRS munitions may be picked up at an ATP, at an ASP, at the CSA, or at a combination of two or more locations. Coordination and synchronization are key to accurate and timely resupply. At the ATP, ASP, or CSA, MLRS personnel are required to transload their own MLRS ammunition.

Resupply by Air

Army aviation assets can be used to transport limited quantities of ammunition. However, transport of MLRS ammunition by air may not be practical given the limited haul capacity of aviation assets. (See Appendix A.)

Section V
SERVICES

Definition

Services are those sustainment support functions provided to an armed force that are not included in supply, maintenance, transportation, or personnel services. They consist of food service, bath and clothing exchange, laundry, bakery, graves registration, and textile renovation.

Services in the division, particularly in the forward areas, are limited. They are provided by the S&S company of the MSB with corps augmentation. Many of the sections and platoons that perform wartime services are not authorized during peacetime.

Graves Registration

Graves registration (GRREG) is a dual responsibility. The unit must recover, identify, and transport the dead to the GRREG point. From there, the S&S company personnel further evacuate to division and corps collection points. The GRREG consists of prompt identification of the remains, evacuation of remains out of the division area, prompt and accurate administrative recording and reporting, and emergency burial when required.

Because of the chance of massive fatalities in an NBC environment, the use of regular GRREG methods may be impossible. In this case, special GRREG task groups may be formed and mass burial may be required. Mass burial requires the approval of the theater GRREG officer. If there are no GRREG units in the area or if contact with higher headquarters is lost, the senior officer decides whether remains should be buried in a mass grave or evacuated to the rear.

Bath and Clothing Exchange

Bath and clothing exchange are provided by the S&S company of the MSB when augmented by corps for divisional units or by the S&S battalion of the corps for nondivisional units. This support is generally on an area basis but may be moved to the BSA when needed. Clothing exchange and bath teams also are used in radioactive decontamination of personnel.

Laundry and Renovation

Laundry and renovation support is provided to division and corps units as soon as the tactical situation permits. This support is provided by the S&S company of the MSB for divisional units and by the corps field service companies for nondivisional units.

Decontamination

Complete NBC decontamination is performed by the unit with help from the division or corps NBC company providing specialized equipment and expertise. Priorities for decontamination are established by higher headquarters. Therefore, decontamination support may not be immediately available. This support is coordinated through the FA brigade HQ for MLRS battalions in an FA brigade, through corps artillery HQ for MLRS battalions under corps control, and through the div arty HQ for the divisional MLRS battery.

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