UNITED STATES MARINE CORPS
THE BASIC SCHOOL
MARINE CORPS TRAINING COMMAND
CAMP BARRETT, VIRGINIA 22134-5019

PRINCIPLES OF FIRE SUPPORT
B2C0289XQ
STUDENT HANDOUT

Principles of Fire Support

Introduction

The purpose of this instruction is to provide you with a basic understanding of the different fire support assets (artillery, mortars, and naval surface fire support) available to support the Marine Air-Ground Task Force (MAGTF), as well as the capabilities and limitations of these weapons systems.

Importance

Fire support as defined in Joint Publication 1-02 is the application of fires that directly support land, maritime, amphibious, and special operations forces to engage the enemy forces, combat formations, and facilities in pursuit of tactical and operational objectives.

In This Lesson

We will discuss the capabilities and limitations of the fire support assets available to you in the Marine Corps. They include: 60mm Mortars, 81mm Mortars, 155mm Artillery, and Naval Surface Fire Support assets.

This lesson covers the following topics:

Principles of Fire Support (Continued)

Learning Objectives

Terminal Learning Objectives

TBS-FSPT-1002 Given a radio, call signs, frequencies, available supporting arms, equipment, a scheme of maneuver, and a commander's intent, employ supporting arms to achieve desired effect(s) on target that support(s) the ground scheme of maneuver.

Enabling Learning Objectives

TBS-FSPT-1001a Given an evaluation, define fire support capabilities and limitations, without error.

TBS-FSPT-1002a Given a tactical scenario, commander's intent, fire support assets, and targets, determine asset to target match, to economize force, achieve the commander's intent, and accomplish the mission.

M224 60mm Mortars

The M224 60mm mortar is a smooth bore, muzzle loaded, high angle of fire weapon (see diagram below). Three M224 mortars make up a mortar section, which is organic only to an infantry rifle company. It can be fired from either a drop fire mode (conventional method) or trigger fire mode (conventional or hand-held method). A lightweight auxiliary base plate is used when firing the mortar in the hand-held mode. It can be fired in a direct lay mode or through the use of a fire direction center (FDC).

60mm Mortar Section		
Organization	**Weight**	
• One section Section leader – Sergeant 0341 • Three squads each with One M224 Three Marines – Squad leader/Gunner – Corporal 0341 – Assistant gunner – Lance Corporal 0341 – Ammunition man – Private First Class/Private 0341	**Item**	**Weight in Pounds**
	Tube M225	14.4
	Bipod M170	15.2
	Sight M64	2.5
	Base plate M7	14.4
	**Base plate M8	3.6
	Conventional mode	46.5
	**Handheld mode	18.0
	Max Eff Range	3,500m
	ECR	30m

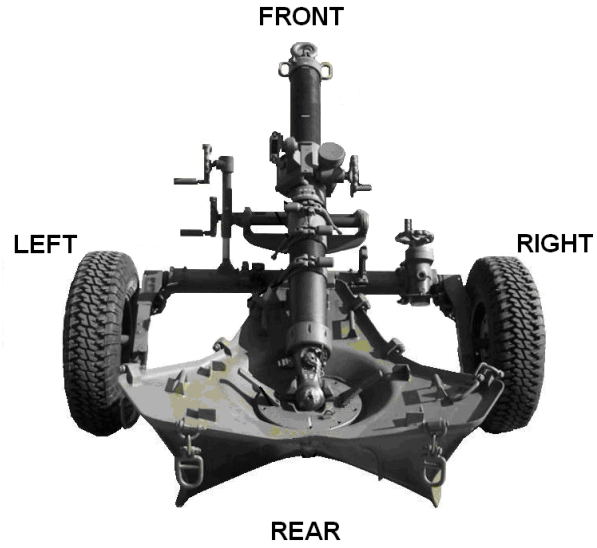
M252 81mm Mortars

The M252 81mm medium extended range mortar (see diagram below) is a crew-served, smooth bore, muzzle loaded, high angle of fire weapon system. It is designed to be fired in the indirect fire mode, cannot be fired handheld, and normally utilizes a FDC. The M252 is highly accurate up to ranges of 4500m to 5700m depending on the munition. A blast attenuation device (BAD) is attached to the muzzle of the cannon assembly to reduce the blast effects on the mortar crew. The M252 is ideally suited to support light infantry forces.

81mm Platoon Organization		
Organization	**Weight**	
• Platoon HQ Platoon commander – First Lieutenant 0302 Platoon Sergeant – Gunnery Sergeant 0848/0369 Ammo technician – Lance Corporal 2311 Ammo man/driver – Private First Class 0341 • Two sections (four squads per section) Section leader – Staff Sergeant 0369 Two ammo men – Lance Corporals 0341 Plotter – Sergeant 0341 Plotter/recorder – Corporal 0341 Recorder/driver – Lance Corporal 0341 Two forward observers – Corporals 0341 • Eight squads each with One M252 Six Marines – Squad Leader – Sergeant 0341 – Gunner – Corporal 0341 – Assistant gunner – Lance Corporal 0341 – Three ammo men – Privates 0341	**Item**	**Weight in Pounds**
	Tube M252	35
	Mount M177	27
	Base plate M3A1	25.5
	Sight M64A1	2.25
	Total weight	89
	Max Range	5,700m
	ECR	35m

M327 120mm Mortars (Expeditionary Fire Support System)

M327 mortar is an extended range mortar system operated by Marine Corps Artillery Units. It can provide all-weather, ground-based, close supporting, accurate, immediately responsive, and lethal indirect fires in support of the Marine Air-Ground Task Force (MAGTF). The M327 mortar is capable of successfully engaging a spectrum of potential point and area targets, including motorized, light armored, and dismounted personnel targets, command and control systems, and indirect fire systems. M327 mortar fires will disrupt, degrade, or destroy as much of the threat force capabilities as possible prior to the initiation of the direct fire engagement and provide accurate, lethal, close-in fires throughout the duration of the engagement. As a critical element of the ground fires triad, the M327 mortar will afford the MAGTF commander increased flexibility in tailoring his fire support systems to support the scheme of maneuver. M327 mortar equipped units are well suited for missions requiring speed, tactical agility, and vertical transportability.



Item	Weight in Pounds
Tube M327	295
Undercarriage	734
Base plate	502
Mortar Stool	70
Total weight	1,601
Max Eff Range	7,900m
ECR	45m

Mortar Capabilities and Limitations

Mortar Capabilities	
Capability	**Description**
High volume of fire	The maximum (30 rds/min) and sustained (20) rds/min for 60mm; 15 rds/min for 81mm) rates of fire allow both mortar systems to provide a considerable amount of ammunition in support of maneuver forces.
Highly responsive asset	The location of the mortar systems closer to the supporting units equates to faster response time.
Light, mobile, and flexible	Both mortar systems are light enough to be hand carried, if necessary, and can be employed in a variety of positions on the ground.
Fires from and into defilade	Mortars can be positioned on the ground to take advantage of protection by terrain; for example, behind a hill mass or in a dry riverbed. Conversely, mortars' inherent high angle fire capability allows them to engage targets located in defilade positions.
CO's "hip pocket artillery"	The 60mm and 81mm mortar are organic assets within the Marine rifle battalion thus increasing their knowledge of the maneuver unit's experience and capabilities due to habitual working relationships.

Mortar Limitations	
Limitation	**Description**
Long time of flight	The high angle nature of fire for the mortar contributes to their longer time of flight for the round to reach the target area. This also makes the mortar system more susceptible to direction-finding radar.
Ammunition consumption	Due to the maximum and sustained rates of fire, mortars expend more ammunition. A smaller effective casualty radius requires both systems to use a greater number of rounds to accomplish the same mission as compared to other fire support systems.
Multiple displacements	The shorter range of both mortar systems require the tubes to move closer to the engagement areas whenever maneuver units reach beyond the range of their mortars. During their movement, mortars have a limited capability to employ their systems to supporting units.

Mortar Capabilities and Limitations (Continued)

Conclusion. The mortars are a crew-served weapon system, which can be found in Marine infantry companies and battalions, except for the 120mm mortar system that belongs to the artillery community. It is a muzzle-loaded, smooth-bored, all weather capable weapon system that Marines can carry and disassemble. In the weapons platoon of an infantry rifle company are three 60mm mortar systems. In the weapons company of the infantry battalion are eight 81mm mortar systems. A Light Armored Reconnaissance (LAR) Battalion also possesses eight 81mm Mortar systems. Mortars are capable of firing a wide variety of ammunition. Due to their increased responsiveness and the fact that they belong to the maneuver commander, mortars are often referred to as the "CO's hip pocket artillery.

Marine Corps Artillery

Generating combat power in support of maneuver at the decisive time and place achieves victory on the battlefield.

Mission. The mission of Marine artillery is to:

- Integrate and deliver lethal and non-lethal fires to enable joint and maneuver commanders to dominate their operational environment across the spectrum of operations.

Artillery conducts three key tasks to accomplish their mission.

- The primary task: to provide close and continuous fire support to the maneuver units. Fire support is provided day or night and in all weather conditions.

- Artillery gives depth to the battlefield. Weapons with ranges of 20+ kilometers have the ability to:

  Attack reserves and assembly areas.

  Interdict supply lines.

  Disrupt the enemy's command and control facilities.

- Deliver counter fire within the range of our weapon systems to ensure freedom of movement for ground forces.

Artillery Weapons Systems

M777A2 155mm Towed Howitzer

Characteristic	Data
Weight of weapon	9,840 pounds
Range	18,100 meters
	30,100 meters with rocket assisted projectile (RAP)
Maximum rate of fire	5 rounds per minute for 3 minutes
Sustained rate of fire	2 rounds per minute
Ammunition available	Standard 155mm ammunition

HIMARS

Characteristic	Data
Weight of weapon	32520 pounds
Range	70,000+ meters
Maximum rate of fire	N/A
Sustained rate of fire	N/A
Ammunition available	M31 (GMLRS) & M48 (ATACMS)

Artillery Weapons Systems

HIMARS Ammunition

Shell	Description
M31	• 200 lb HE warhead (PD, Delay, VT fuze capable) • GPS aided • Range: 15-84+ km • Accuracy: 5m from target
M48 ATACMS	• 500 lb unitary warhead • Range: 70 – 300 km • Accuracy: 5m from target

Artillery Organization

The three active duty artillery regiments and one artillery regiment in the reserve structure are the:

- 10th Marines within the 2nd Marine Division.
- 11th Marines within the 1st Marine Division.**(1) HIMARS BN
- 12th Marines within the 3rd Marine Division.
- 14th Marines (the reserve artillery regiment), an element of the 4th Marine Division (the Reserve Division). **(1) HIMARS BN

The 10th Marine Regiment has two battalions and a headquarters battery and 11th Marine Regiment has four battalions and a headquarters battery. The 12th Marine Regiment has one artillery battalion and a headquarters battery.

Artillery Battalion. The battalion, the basic tactical unit for the artillery, contains: One headquarters battery and three firing batteries (six howitzers in each battery; 18 howitzers in the battalion).

Headquarters Battery. The headquarters battery provides the equipment and personnel to assist the battalion commander in controlling and supporting the battalion.

Battalion Liaison Section

- The liaison officer (LNO) is an 0802 Lieutenant. The section provides artillery liaison personnel to operate (with equipment) with the Fire Support Coordination Center (FSCC) of the supported unit.

- Forward observer (FO) teams. Company fire support teams of the supported maneuver battalion. Each FO team consists of:
    - An FO (0802 lieutenant)
    - A scout observer (0861)
    - One or two radio operators (0621)

Firing Battery. Three firing batteries in each artillery battalion each

- Is commanded by a Captain (0802).
- Has two platoons organized as follows:
    - Has three howitzer sections (with one howitzer in each section).
    - Has one FDC that
        - Exercises technical and tactical fire control for the battery.
        - Communicates with higher headquarters and the supported unit.
    - Has a platoon headquarters element which contains these sections
        - Communication.
        - Motor transport.
        - Medical.

Artillery Organization (Continued)

- **Firing Team**. Regardless of the organization and equipment, the mission of any indirect fire unit remains the same: "to put steel on target as quickly as possible." Accomplishing this goal requires a three-part team (whether the team is artillery, mortars, naval surface fire support, or any other indirect firing organization):

    - The observer —"eyes"
    - The FDC — "brain"
    - The howitzer section — "muscle"

  The Observer — "Eyes." The FO teams and the liaison section provide the link between the maneuver unit and the supporting artillery. The FO will locate and identify targets for the battery or battalion to engage. The liaison officer will assist the infantry battalion FSC in coordination and planning of artillery support. The FOs and LNO "see" the battlefield and feed information to the FDC.

  The FDC — "Brain." The FDC is the brain of the battery. The information gained by the "eyes" is fed here. The fire direction officer (FDO) is responsible for the FDC. Upon hearing the call for fire, the FDO issues a fire order to the FDC. The FDC takes the rough information obtained from the "eyes" and calculates firing data for the howitzer. Data is then sent to the gun line.

  The Howitzer section — "Muscle." The gun line is the muscle. The howitzer section applies the data to the gun and delivers "steel" to the target. The Section Chief (0811 Sergeant), responsible for the howitzer section, ensures that the correct fuze, fuze setting, round, charge, deflection, and quadrant are fired.

Artillery Capabilities and Limitation

The tables below describe the capabilities and limitations of artillery.

Capability	Description
Maneuvering fires	• Can shift fire from one target to another without displacing (physically moving) • This responsiveness allows close integration with maneuvers
Massing fires	• Despite extensive dispersion between batteries and battalions, different units can simultaneously engage one target or a group of targets (two or more targets fired simultaneously) • Whenever possible, artillery battalion will mass its batteries to have greater effect 18 rounds landing at the same time causes greater damage and more casualties than 18 rounds landing six at a time, 20 seconds apart
Surprise fires	• Fires delivered without adjustment, thereby allowing for greater effect • To be effective, an accurate target location must be given or known

Artillery Organization (Continued)

Capability (Cont)	Description (Continued)
All weather capability	• Artillery is not limited by visibility or weather conditions • Is an all weather, 24-hour supporting arm
Fires from and into defilade	• Artillery can be positioned on the ground to take advantage of protection provided by terrain, for example Behind a hill mass In riverbed • Conversely, by using high angle fire, artillery is able to engage targets located in a defilade position
Rapid displacement	Artillery is able to move rapidly from one position to another

Limitation	Description
Slow emplacements	• A battery cannot shoot while displacing unless it conducts a "hip shoot" (the hasty, unplanned occupation of a firing position) • Battery is most vulnerable when on the move
Poor terrain	Broken or rough terrain • Limits mobility • Slows the displacement of batteries • May limit dispersion between howitzers
Close combat	Battery's support is degraded when defending its own position.
Air attack	• Artillery is extremely vulnerable to air attack while displacing • Movement or dust clouds are easily detected from the air
Ammunition/logistics burden	Artillery units must have uninterrupted supply of ammunition to provide continuous fire support • One MTVR, 7-ton truck (with M105 trailer) can carry 120 complete 155mm rounds (projectile, powder, and fuze) • A battalion can fire the equivalent of one truckload of ammunition every minute
Inability to support the initial phase of an amphibious operation	• Artillery will be on ship or en route to the beach during the initial phase of the amphibious assault • Naval gunfire and air must provide initial support
Communication	• To provide support, effective communication must be maintained • Communication is often the Achilles heel of any operation due to the Dispersion between units Terrain Weather Enemy interference
Counter battery radar	If the enemy possesses counter battery radar, they can • Track the projectiles • Determine their origin • Return fire

Artillery Organization (Continued)

Conclusion. Marine artillery provides all-weather fire support to maneuver commanders and is capable of firing in the direct and indirect fire modes. Supporting units can depend on the M777a2 155mm towed howitzer to provide the added weight to any operation. The organization of Marine artillery provides the MAGTF commanders with flexibility. Three firing batteries plus one headquarters battery in the artillery offer constant support, firing a multitude of ammunition ranging from HE to the Excalibur GPS aided projectile. The FO (eyes), FDC (brains), and gun line (muscle) all furnish maneuver units' lethality up to 30,100 meters.

Mortar / Artillery Ammunition

Projectiles	60mm	81mm	120mm	155mm	Effects
HE (High Explosive)	X	X	X	X	Filled with Composition B and TNT. Designed to destroy or inflict casualties on personnel or light skinned vehicles.
WP (White Phosphorus)	X	X	X	X	Designed for screening, obscuring, incendiary (refueling stations), and signaling/marking. HE/WP is optimal if there are vehicles refueling (HE for the vehicles and WP for the fuel).
RP (Red Phosphorus)		X			Same as WP except it produces gray smoke that billows faster and provides a more widespread smoke screen.
Illumination	X (40 Sec)	X (60 Sec)	X (120 Sec)	X (120 Sec)	Illuminates battlefield and used for signaling/marking.
IR Illumination	X	X	X	X	Illuminates battlefield and seen through night vision.
M825 Smoke (WP)				X	Provides 5 to 15 minutes of smoke. Uses 116 felt wedges impregnated with WP for rapid dissemination. Designed for screening / obscuring (optimal) but not for marking.
HE / Rocket Assisted Projectile (RAP)				X	A rocket motor allows the HE projectile to carry up to 30,100 KM.

Mortar / Artillery Ammunition (Continued)

Projectiles	60mm	81mm	120mm	155mm	Effects
Improvised Conventional Munition (ICM)				X	Base ejecting type projectile that contains 88 dual purpose armor defeating and antipersonnel grenades. **ICM can produce duds. Used against heavy armored vehicles.
Excalibur				X	M982, Excalibur is an extended range, GPS guided artillery projectile.

Fuzes	60mm	81mm	120mm	155mm	Effects
Point Detonating (PD) or Quick (Q)	X	X	X	X	Functions on impact. HE/Q and/or PD is effective against personnel and light skinned vehicles.
Delay (D)	X	X	X	X	Causes the projectile to detonate .05 secs after impact (5m-15m). Optimally used with HE, and HE/D is used mostly against enemies with overhead cover. Also used in heavily wooded areas, and times where you want to minimize shrapnel on the battlefield (friendly troops in the maneuver).
Proximity (Prox) / Near Surface Burst (NSB)	X	X			Radio activated and functions when it receives the reflection of a self-transmitted radio signal. Height of burst 0-3 ft (NSB) or 3-13 ft (Prox). HE / Prox and/or NSB is optimal against personnel in the open without overhead cover.
Variable Time (VT)				X	Radio activated and functions when it receives the reflection of a self-transmitted radio signal. VT has a 7m height of burst and HE/VT is optimal against personnel in the open w/out overhead cover.
Time			X	X	Used with WP, Illum, and HE

Naval Surface Fire Support

Three Missions of Naval Surface Fire Support (NSFS). NSFS ships exist to support the assault of an objective by destroying or neutralizing:

- Shore installations that oppose the approach of ships and aircraft (Normally an advance force will split from the main amphibious task force (ATF) body to accomplish tasks in advance of the main force arrival. This advance force normally will include NSFS ships.)
- Defenses that oppose the:
  - Actual landing of the landing force
  - And to provide support for the advance of the landing force ashore

Ships Capable of Providing NSFS. A number of types and classes of ships can fire in support of land operations. Each of these classes of ship will have its own peculiarities and characteristics based on its:

- Configuration
- Primary mission
- Weapons systems

The types of ships that provide NSFS are

- Destroyers (DD)
- Guided missile destroyers (DDG)
- Guided missile cruisers (CG)

Although there are many classes of ships, there are only a few types of gun mounts and computer systems, each of which implies certain capabilities.

Guided Missile Cruisers. The Ticonderoga class guided missile cruisers perform primarily in a battle force role. These ships are

- Multi-mission surface combatants.
- Capable of supporting carrier battle groups, amphibious forces, or operating independently.
- Armed with two 5”/54 gun mounts to support the landing force.

Destroyers. These NSFS platforms are capable of supporting

- Carrier battle groups.
- Surface action groups.
- Amphibious groups.
- Replenishment groups.

The Arleigh Burke class destroyer has one 5”/54 gun mount; the Spruance class has two 5”/54 gun mounts.

Naval Surface Fire Support (Continued)

MK-45 5"/54. The MK-45 is a 54-caliber, lightweight gun that provides surface combatants accurate naval gunfire against

- Fast, highly maneuverable surface targets
- Air threats
- Shore targets during amphibious operations

The MK-45 is controlled by the MK 86 gun fire control system that allows the ship to engage targets while moving. The capabilities of the MK-45 are listed in the table below.

Capability	Measurement
ECR	40 m
Minimum range	910 meters
Maximum range	23,000 meters
Maximum rate of fire	20 rounds/minute
Sustained rate of fire	16 rounds/minute

NSFS Capabilities. To ensure that NSFS ships can provide effective support to a landing force, a planner must have a good foundation in the characteristics of NSFS. The capabilities and limitations should be considered both when planning and adjusting NSFS. These capabilities and limitations are actually a set of related characteristics that can be liabilities in one situation and enhancements in another.

- **Mobility**. Ships can maneuver in the water to position themselves to best support the landing force. Many limitations that will be discussed later can be overcome by planning to take advantage of the ship's mobility. Ships are also able to maneuver to defend themselves against attack.

- **Accuracy**. The gunfire control systems (GFCS) available can place accurate fires on a target from a ship underway, allowing the simultaneous engagement of two targets.

- **Variety of Ammunition**. The types of projectiles and fuzes available are very similar to those found in the firing battery. The projectiles include
  - HE.
  - WP.
  - Illumination.
- **High Initial Velocity**. NSFS is particularly suited for destroying hardened and fortified targets where penetration is necessary before damage can occur. If the target presents a vertical surface to the gun-target line (GTL), this characteristic is enhanced. The muzzle velocity of Naval guns firing full charge is 2650 feet per second (f/s). An M16A2 assault rifle is3250 f/s.
  An artillery piece firing an intermediate charge is about 1200 f/s.
  The ballistic characteristics of NSFS more closely resemble those of an assault rifle than a howitzer.

Naval Surface Fire Support (Continued)

NSFS Capabilities. (Continued)

- **Narrow, Accurate Deflection Pattern**. The high muzzle velocity causes a very accurate deviation dispersion pattern along the GTL, which allows very close placement of fires to maneuver units when the GTL parallels their positions.

- **High Rate of Fire.** The rapid rates of fire for each gun mount are made possible by power hoisting and loading equipment. When engaging personnel-type targets, where reaction time degrades ammunition effectiveness (because personnel seek protection), this high rate of fire is significant for maximizing effects on target.

NSFS Limitations. Many of the NSFS limitations are simply the same characteristics that are capabilities, but studied from a different perspective. Careful, detailed planning can reduce or eliminate the impact of these limitations on combat operations.

- **Effects of Hydrography**. Shoals, minefields, and reefs limit the maneuverability of the ship. Shallow waters may force the ship to stand farther from the beach than would be optimal. The ability to position ships for most effective support is reduced if the areas in which the ships can maneuver are restricted.

- **Fixing Ship's Position**. To provide accurate initial salvos, the ship must determine its location. Both radar and visual means are used to triangulate the ship's position at various times and establish a "track." If the beach is relatively featureless, the ship will have difficulty locating itself precisely enough to provide good fire support. Then AN/UPN-32 and AN/PPN-19 radar beacons can be used to give the ship a fixed reference point.

- **Effects of Weather and Visibility.** NSFS must be observed for maximum effectiveness. If weather conditions are such that spotters are unable to observe the impact of rounds or the targets, most of the rounds fired may have no damaging effect on their intended targets. Additionally, if the ship is relying on visual navigational aids and the weather interferes with visibility, the ship will encounter difficulty fixing its position. A radar beacon can be used to provide a reference point to minimize this problem. Ships cannot provide effective support in excessively stormy weather. Rolls in excess of 15 degrees stress the gun mount stabilizers beyond their design parameters.

- **Changing GTL**. When the ship is maneuvering, the GTL will slowly change. This change may become an important consideration when friendly forces begin to fall along the GTL. A long-range dispersion pattern on the GTL could become a hazard to troops.

Naval Surface Fire Support (Continued)

NSFS Limitations. Changing GTL (Continued)

During the Okinawa campaign in World War II, the Marines were quite successful in overcoming this problem with careful planning. NSFS plans were made such that a series of fire support areas (FSAs) were assigned and placed in an on-call status. As the troops ashore maneuvered to a position where the GTL endangered the forces, the ships were ordered to the next assigned FSA, maintaining a parallel GTL-friendly front line relationship.

- **Long Range Pattern**. Naval guns produce most of their error as a range dispersion pattern oriented along the GTL. When firing with full charge on flat ground, NSFS will be rather difficult to adjust onto point targets because of the large range dispersion. Firing reduced charge can minimize the range dispersion, at the cost of some accuracy in deflection. Adjusting with several salvos per adjustment can assist in the adjustment phase to place a mean point of impact onto the target.

- **Flat Trajectory**. While the high velocity is desirable for giving NSFS its penetrating qualities, the high velocity also creates the flat trajectory that can make the engagement of some targets in defilade impossible. Unlike artillery, naval guns cannot “cut” the charge. Only two powder increments are available: full and reduced charge. When using the reduced charge, the angle of fall is increased, allowing fires to reach some defilade positions, but the range of the weapon is greatly decreased.

- **Magazine Capacity is Limited.** When the ships are shot dry, a re-supply must be arranged. Careful planning can minimize the impact of ships’ non-availability for tactical missions.

For example, a general support (GS) ship could be assigned to an interim DS role while the DS ship is off station. Ships should undergo replenishment before a major attack. Planners should be aware that a certain percentage of ammunition would be reserved for defense of the ship.

When compared to artillery, the limitation of ammunition availability is minor. A typical NSFS ship will carry about 600 5”rounds per mount. If proper planning has been accomplished, re-supply ships will be available. A support ship can steam out, link up with the re-supply vessel, re-supply, and be back on station within 4 to 6 hours.

- **Communications.** Communications is the major limitation of NSFS. Radio is the only means of communication, and the nets are subject to interference both man-generated and atmospheric. Without communications, the only NSFS will be of the preplanned, scheduled variety. Using alternate frequencies or relaying calls for fire via alternate nets can minimize communication problems.

Naval Surface Fire Support (Continued)

NSFS Limitations. Changing GTL (Continued)

Conclusion. Naval surface fire support provides maneuver commanders a responsive asset during amphibious landings and continuing operations ashore. The 5”-54 gun system offers flexibility to commanders by providing fires at ranges up to 23,000 meters using an assortment of ammunition. Successful integration of naval surface fires with maneuver units involves planning early and continuously. Maneuver commanders who employ naval surface fire support provide a unique added dimension to their operations.

Summary

The fundamental principles of our combined arms philosophy centers on the massing of fires, both surface and air, to destroy the enemy’s will and ability to fight.

References

Reference Number or Author	Reference Title
FMFM 2-7	Fire Support in MAGTF Operations
FMFM 6-18.1	TTPs for the Marine Corps Fire Support System
FMFM 6-9	Marine Artillery Support
FM 7-90	Tactical Employment of Mortars
MCWP 3-16	Fire Support Coordination in the Ground Combat Element
MCWP 3-16.6A	Supporting Arms Observer, Spotter and Controller
MCRP 3-16.2	Techniques and Procedures for Fire Support Coordination

Glossary of Terms and Acronyms

Term or Acronym	Definition or Identification
ADAM	Area denial artillery munitions
APAM	Antipersonnel, anti-material
ATF	Amphibious task force
CEM	Combined effects munitions
CG	Guided missile cruiser
CLGP (or copperhead)	Cannon launched guided projectile
DD	Destroyer
DDG	Guided missile destroyer
DP	Dual purpose
DU	Depleted uranium
ECR	Effective casualty radius
FASCAM	Family of scatterable mines
FDC	Fire direction center
FDO	Fire direction officer
FO	Forward observer
FSA	Fire support area
FSC	Fire support coordinator
FSCC	Fire support coordination center
GCE	Ground combat element

Glossary of Terms and Acronyms (Continued)

Term or Acronym	Definition or Identification
GFCS	Gunfire control systems
GP	General purpose
GPS	Global positioning system
GTL	Gun-target line
GS	General support
HE	High explosive
ICM	Improved conventional munitions
INS	Inertial navigation system
IR	Infrared
LAR	Light Armored Reconnaissance
LNO	Liaison Officer
MAGTF	Marine Air Ground Task Force
NSFS	Naval Surface Fire Support
NVG	Night vision goggles
RAAMS	Remote anti-armor mine system
RAP	Rocket-assisted projectile
TTP	Tactics, techniques and procedures
VT	Variable time
WP	White phosphorous

Notes